Dell Pro 16 Plus

PB16255

Owner's Manual

Regulatory Model: P135F
Regulatory Type: P135F004
May 2025
Rev. A01

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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Views of Dell Pro 16 Plus

Right

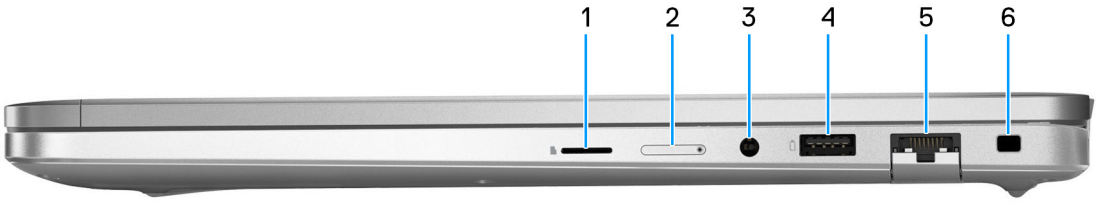


Figure 1. Right view

1. **microSD-card slot**

   Reads from and writes to the microSD-card.

2. **Nano-SIM card slot (optional)**

   Insert a SIM card to connect to a mobile broadband network.

   NOTE: Availability of the SIM card slot depends on the region and configuration ordered.

3. **Global headset jack**

   Connect headphones or a headset (headphone and microphone combo).

4. **USB 3.2 Gen 1 port with PowerShare**

   Connect devices such as external storage devices and printers. It provides data transfer speeds up to 5 Gbps.

   PowerShare enables you to charge your USB devices even when your computer is turned off.

   NOTE: If your computer is turned off or in a hibernate state, you must connect the power adapter to charge your devices using the PowerShare port. You must enable this feature in the BIOS setup program.

   NOTE: Certain USB devices may not charge when the computer is turned off or in a sleep state. In such cases, turn on the computer to charge the device.

5. **RJ45 ethernet port (1 Gbps)**

   Connect an RJ45 ethernet cable from a router or a broadband modem for network or Internet access, with a transfer rate of 10/100/1000 Mbps (maximum 1 Gbps).

6. **Security-cable slot (wedge-shaped)**

   Connect a security cable to prevent unauthorized movement of your computer.

Left

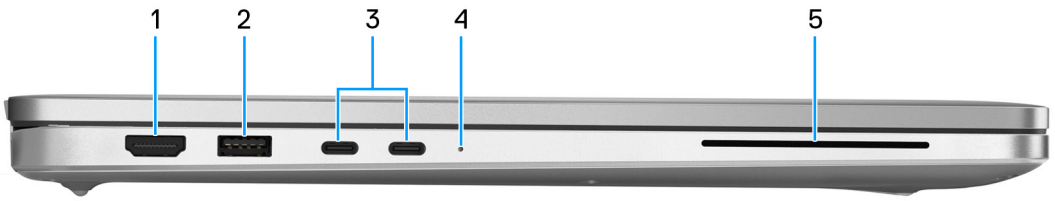


Figure 2. Left view

1. **HDMI 2.1 Transition-minimized differential signaling (TMDS) port**

   Connect to a TV, external display, or another HDMI-in enabled device. Provides video and audio output.

2. **USB 3.2 Gen 1 port**

   Connect devices such as external storage devices and printers. Provides data transfer rate of up to 5 Gbps.

3. **USB (40 Gbps) Type-C with DisplayPort Alt Mode/Power Delivery ports (2)**

   Supports USB Type-C and data transfer rates of up to 40 Gbps.

   NOTE: A 40 Gbps-certified cable is required to achieve the maximum performance of 40 Gbps.

   NOTE: DisplayPort 2.1 is supported in computers shipped with AMD Ryzen AI 300 series processors. DisplayPort 1.4a is supported in computers shipped with AMD Ryzen 200 series processors. Enables you to connect to an external display using a display adapter.

   NOTE: A USB Type-C to DisplayPort adapter (sold separately) is required to connect a DisplayPort device.

   NOTE: Supports Power Delivery that enables two-way power supply between devices. Provides up to 5 V/3 A power output that enables faster charging.

   NOTE: AMD Ryzen AI series support maximum resolution 7680 x 4320, 60 Hz, with Display Stream Compression. AMD Ryzen series support maximum resolution 3840 x 2160, 240 Hz, with Display Stream Compression.

4. **Battery-status light**

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

   - Solid white — The battery is charging. When the charge is complete the LED turns off.

   If the computer is running on a battery, the battery light operates as follows:

   - Off — The battery is adequately charged (or the computer is turned off).
   - Solid amber — The battery charge is critically low. A low battery state is approximately 30 minutes or less of battery life remaining (Amber 590 nm +/- 3 nm).

5. **smart card reader slot (optional)**

   Using smart card provides authentication in corporate networks.

Front

Figure 3. Front view

1. **Left microphone**

   Provides digital sound input for audio recording and voice calls.

2. **Infrared camera (optional)**

   Enhances security when paired with Windows Hello face authentication.

3. **Infrared emitter (optional)**

   Emits infrared light, which enables the infrared camera to sense and track motion.

4. **Camera shutter**

   Slide the privacy shutter to the left to access the camera lens.

5. **Camera**

   A camera enables you to video chat, capture photos, and record videos.

6. **Camera-status light**

   Turns on when the camera is in use.

7. **Right microphone**

   Provides digital sound input for audio recording and voice calls.

Top

Figure 4. Top view

NOTE: The fingerprint reader is available either on the power button or on the palmrest depending on the configuration ordered.

1. **Power button with optional fingerprint reader**

   Press to turn on the computer if it is turned off, in sleep state, or in hibernate state.

   When the computer is turned on, press the power button to put the computer into sleep state; press and hold the power button to force shut-down the computer.

   NOTE: You can customize the power-button behavior in Windows.

2. **Fingerprint reader (optional)**

   Press your finger on FIPS 201-certified fingerprint reader to log in to your computer. The fingerprint reader enables your computer to recognize your fingerprints as a password.

   NOTE: Configure the fingerprint reader to register your fingerprint and enable access.

3. **NFC/Contactless smart card reader (optional)**

   Enables NFC-enabled devices to connect to your computer and supports data transfer across the devices.

4. **Touchpad**

   Move your finger on the touchpad to move the mouse pointer. Tap to left-click and two fingers tap to right-click.

Bottom

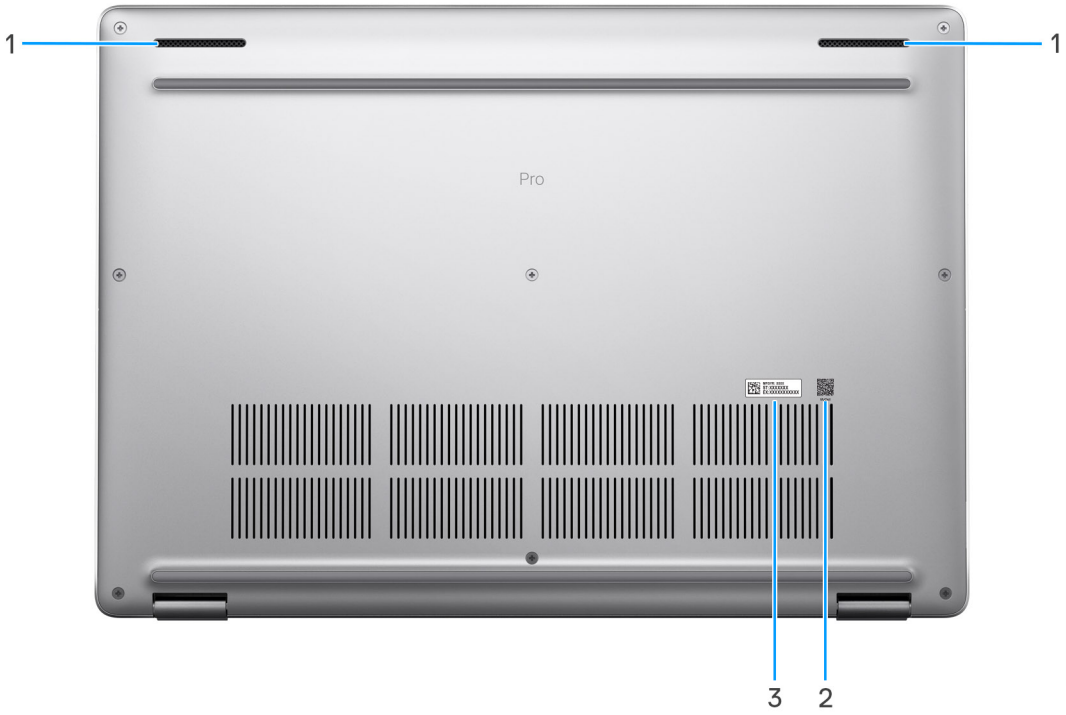


Figure 5. Bottom view

1. **Speakers (2)**

   Provide audio output.

2. **MyDell QR Code**

   MyDell is your hub for content personalized to your Dell Pro 16 Plus, including videos, articles, manuals, and easy access to support.

3. **Service Tag label**

   The Service Tag is a unique alphanumeric identifier that enables Dell service technicians to identify the hardware components in your computer and access warranty information.

Service Tag

The service tag is a unique alphanumeric identifier that allows Dell service technicians to identify the hardware components in your computer and access warranty information.

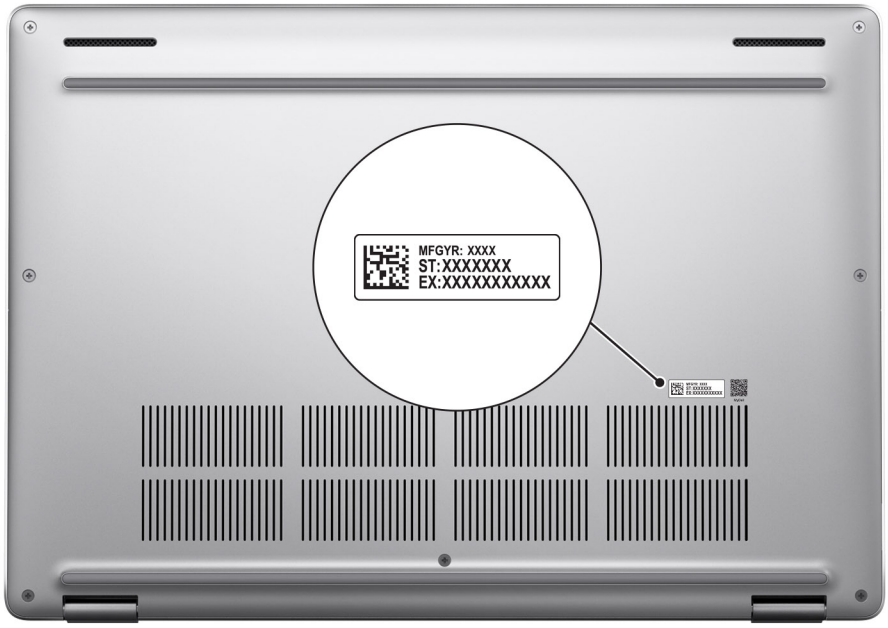


Figure 6. Service Tag location

Battery-charge status light

The following table lists the battery-charge status light of your Dell Pro 16 Plus PB16255.

Table 1. Battery-charge status light behavior

Power source	LED behavior	System power state	Battery charge level
AC adapter	Off	S0 or S5	Fully charged
AC adapter	Solid white	S0 or S5	< Fully charged
Battery	Off	S0 or S5	11-100%
Battery	Solid yellow (590+/-3 nm)	S0 or S5	< 10%

- S0 (ON): Computer is turned on.
- S4 (Hibernate): The computer consumes the least power in the Hibernate state than in the ON or OFF state. The computer is almost in the OFF state. The context data is written to a storage device, allowing you to resume from where you left when the computer is turned on.
- S5 (OFF): The computer is in a shutdown state.

2

Set up your Dell Pro 16 Plus

About this task

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

Steps

1. Connect the power adapter and press the power button.

Figure 7. Connect the power adapter and press the power button.

NOTE: The battery will go into power-saving mode during shipment to conserve charge on the battery. Ensure that the power adapter is connected to your computer when it is turned on for the first time.

2. Finish the operating system setup.

   For Ubuntu:

   Follow the on-screen instructions to complete the setup. For more information about installing and configuring Ubuntu, search in the Knowledge Base Resource at Dell Support Site.

   For Windows:

   Follow the on-screen instructions to complete the setup. When setting up, it is recommended that you:

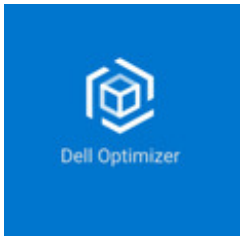
   - Connect to a network for Windows updates.

     NOTE: If connecting to a secured wireless network, enter the password for the wireless network access when prompted.

   - If connected to the Internet, sign-in with an existing Microsoft account or create an account. If not connected to the Internet, create an offline account.
   - On the **Support and Protection** screen, enter your contact details.

3. Locate and use Dell apps from the Windows Start menu—Recommended.

Table 2. Locate Dell apps

Resources	Description
	Dell Optimizer is an application that is designed to enhance computer performance and productivity by optimizing settings for power, battery, display, collaboration touchpad, and presence detection. It also provides access to applications purchased with your new computer. For more information, see Dell Optimizer User's Guide at Dell Support Site.
	**Dell Product Registration** Register your computer with Dell.
	**Dell Help & Support** Access help and support for your computer.
	**SupportAssist** SupportAssist is a proactive and predictive technology that offers automated technical support for Dell computers. It proactively monitors both hardware and software, addressing performance issues, preventing security threats, and automating engagement with Dell Technical Support. For more information, see SupportAssist documentation at Dell Support Site. **NOTE:** In SupportAssist, click the warranty expiry date to renew or upgrade your warranty.

3

Specifications of Dell Pro 16 Plus

Dimensions and weight

The following table lists the height, width, depth, and weight of your Dell Pro 16 Plus PB16255.

Table 3. Dimensions and weight

Description	Values
Height:	
Front height	19.85 mm (0.78 in.)
Rear height	20.55 mm (0.81 in.)
Maximum Height	21.35 mm (0.84 in.)
Width	358 mm (14.09 in.)
Depth	251.40 mm (9.89 in.)
Starting weight **NOTE:** The weight of your computer depends on the configuration that is offered.	1.86 kg (4.12 lb) (minimum)

Processor

The following table lists the details of the processors that are supported in your Dell Pro 16 Plus.

Table 4. Processor (For computers shipped with AMD Ryzen AI 300 series)

Description	Option one	Option two	Option three
Processor type	AMD Ryzen AI 5 PRO 340	AMD Ryzen AI 7 PRO 350	AMD Ryzen AI 9 HX PRO 370
Configurable Thermal Design Power (cTDP)	15 W–54 W	15 W–54 W	15 W–54 W
Thermal Mode/Thermal Design Power (TDP)			
Optimized	17 W	17 W	17 W
Performance	19 W	19 W	19 W
Processor core count	6	8	12
Processor thread count	12	16	24
Processor speed	Up to 4.8 GHz	Up to 5.0 GHz	Up to 5.1 GHz
Processor cache L2	6 MB	8 MB	12 MB
Processor cache L3	16 MB	16 MB	24 MB
Integrated graphics	AMD Radeon 840M Graphics	AMD Radeon 860M Graphics	AMD Radeon 890M Graphics
Neural Processing Units (NPU) Performance	Up to 50 TOPS	Up to 50 TOPS	Up to 50 TOPS

Table 5. Processor (For computers shipped with AMD Ryzen 200 series)

Description	Option one	Option two	Option three	Option four	Option five	Option six
Processor type	AMD Ryzen 3 210	AMD Ryzen 5 220	AMD Ryzen 5 PRO 215	AMD Ryzen 5 PRO 220	AMD Ryzen 5 PRO 230	AMD Ryzen 7 PRO 250
Configurable Thermal Design Power (cTDP)	15 W–30 W	15 W–30 W	15 W–30 W	15 W–30 W	15 W–30 W	15 W–30 W
Thermal Mode/Thermal Design Power (TDP)						
Optimized	17 W	17 W	17 W	17 W	17 W	17 W
Performance	19 W	19 W	19 W	19 W	19 W	19 W
Processor core count	4	6	6	6	6	8
Processor thread count	8	12	12	12	12	16
Processor speed	Up to 4.7 GHz	Up to 4.9 GHz	Up to 4.9 GHz	Up to 4.9 GHz	Up to 4.9 GHz	Up to 5.1 GHz
Processor cache L2	4 MB	6 MB	6 MB	6 MB	6 MB	8 MB
Processor cache L3	8 MB	16 MB	16 MB	16 MB	16 MB	16 MB
Integrated graphics	AMD Radeon 740M Graphics	AMD Radeon 740M Graphics	AMD Radeon 740M Graphics	AMD Radeon 740M Graphics	AMD Radeon 760M Graphics	AMD Radeon 780M Graphics
Neural Processing Units (NPU) Performance	Not applicable	Not applicable	Not applicable	Not applicable	Up to 16 TOPS	Up to 16 TOPS

Chipset

The following table lists the details of the chipset that is supported by your Dell Pro 16 Plus.

Table 6. Chipset

Description	Values
Chipset	Integrated in the processor
Processor	• AMD Ryzen 3/5 • AMD Ryzen 5/7 PRO • AMD Ryzen AI 5/7 PRO • AMD Ryzen AI 9 HX PRO
DRAM bus width	LPDDR5X Quad 32-bit channel
Flash EPROM	64 MB
PCIe bus	Up to Gen4

Operating system

Your Dell Pro 16 Plus supports the following operating systems:

For computers shipped with AMD Ryzen 200 series processors:

- Windows 11 Home
- Windows 11 Pro
- Windows 10 Home

- Windows 10 Pro

NOTE: If you downgrade your computer from Windows 11 to Windows 10 22H2, Dell Technologies support follows the Microsoft Windows 10 End of Support plan.

NOTE: Windows 10 Home and Windows 10 Pro is supported only on computers shipped with AMD Ryzen 200 series processors.

For computers shipped with AMD Ryzen 300 series processors:

- Windows 11 Home
- Windows 11 Pro

Memory

The following table lists the memory specifications of your Dell Pro 16 Plus.

Table 7. Memory specifications

Description	Values
Memory slots	On-board memory **NOTE:** The memory is integrated on the system board and is not upgradeable.
Memory type	LPDDR5X
Memory speed	7500 MT/s
Maximum memory configuration	64 GB
Minimum memory configuration	16 GB
Memory configurations supported	• 16 GB: LPDDR5X, 7500 MT/s • 32 GB: LPDDR5X, 7500 MT/s • 64 GB: LPDDR5X, 7500 MT/s

Ethernet

The following table lists the wired ethernet Local Area Network (LAN) specifications of your Dell Pro 16 Plus.

Table 8. Ethernet specifications

Description	Values
Model	• Realtek RTL8111EPP Integrated 10/100/1000M ethernet controller DASH configuration • Realtek RTL8111HS Integrated 10/100/1000M ethernet controller Non-DASH configuration
Transfer rate	10/100/1000 Mbps

External ports and slots

The following table lists the external ports and slots of your Dell Pro 16 Plus .

Table 9. External ports and slots

Description	Values
Network port	One RJ45 Ethernet port (optional)
USB ports	• Two USB Type-C ports with a DisplayPort Alt Mode/ Power Delivery • **NOTE:** You can connect a Dell Docking Station to this port. For more information, search in the Knowledge Base Resource at Dell Support Site. • One USB 3.2 Gen 1 (5 Gbps) port with PowerShare • One USB 3.2 Gen 1 (5 Gbps) port
Audio port	Global headset jack
Video port(s)	One HDMI 2.1 TMDS port
Media-card reader	One smart card reader slot (optional)
Power-adapter port	USB Type-C power input
Security-cable slot	One wedge-shaped security slot
SIM-card slot	Nano-SIM card slot (optional)
SD card slot	One micro-SD card slot

Internal slots

The following table lists the internal slots of your Dell Pro 16 Plus.

Table 10. Internal slots

Description	Values
M.2	• One M.2 2230 or M.2 2280 solid state drive slot • One M.2 3042 for 4G WWAN slot (optional) **NOTE:** To learn more about the features of different types of M.2 cards, search in the Knowledge Base Resource at Dell Support Site.

Wireless module

The following table lists the Wireless Local Area Network (WLAN) module that is supported on your Dell Pro 16 Plus.

Table 11. Wireless module specifications

Description	Values
Model number	MediaTek MT7925
Transfer rate	Up to 2882 Mbps

Table 11. Wireless module specifications (continued)

Description	Values
Frequency bands supported	2.4 GHz/5 GHz/6 GHz
Wireless standards	• Wi-Fi 802.11a/b/g • Wi-Fi 4 (Wi-Fi 802.11n) • Wi-Fi 5 (Wi-Fi 802.11ac) • Wi-Fi 6E (Wi-Fi 802.11ax) • Wi-Fi 7 (Wi-Fi 802.11be)
Encryption	• 128-bit AES-CCMP • 256-bit AES-GCMP • 256-GMAC
Bluetooth wireless card	Bluetooth 5.4 wireless card
	NOTE: The functionality of the Bluetooth wireless card may vary depending on the operating system that is installed on your computer.

WWAN module

The following table lists the Wireless Wide Area Network (WWAN) module that is supported in your Dell Pro 16 Plus PB16255.

NOTE: The WWAN module is available only on certain configurations and in certain regions.

NOTE: Availability of the eSIM feature on this module depends your region.

NOTE: For instructions on how to setup SIM or eSIM connections on your computer, see the *SIM/eSIM Setup Guide for Windows* available with your product documentation at Dell Support Site.

Table 12. WWAN module specifications

Description	Values
Model number	DW5826e, Qualcomm Snapdragon SDX12 Global LTE-Advanced, CAT12
Form factor	M.2 3042 Key-B
Host interface	USB 3.0/2.0
Network standard	LTE FDD/TDD, WCDMA, GPS/BDS/GLONASS/Galileo/QZSS
Transfer data rate	• Up to 600 Mbps DL (CAT12) • Up to 150 Mbps UL
Operating frequency bands	• LTE (B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B18, B19, B20, B25, B26, B28, B29, B32, B38, B39, B40, B41, B42, B43, B48, B66, B71) • WCDMA (1,2,4,5,6,8,9,19)
Power supply	DC 3.135 V to 4.4 V, Typical 3.3 V
SIM card	Supported through external SIM slot **NOTE:** The availability of eSIM functionality embedded on the module is dependent on the region and specific carrier requirements.
eSIM with dual SIM (DSSA)	Supported

Table 12. WWAN module specifications (continued)

Description	Values
Antenna diversity	Supported
Radio on/off	Supported
Wake On Wireless	Supported
Temperature	• Normal operating temperature: –30°C to +70°C • Extended operating temperature: –40°C to +85°C • Storage temperature: –40°C to +85°C
Antenna connector	• WWAN Main Antenna x 1 • WWAN Diversity Antenna x 1
NOTE: For instructions to find your computer's International Mobile Equipment Identity (IMEI) number, search in the Knowledge Base Resource at Dell Support Site.	

Audio

The following table lists the audio specifications of your Dell Pro 16 Plus.

Table 13. Audio specifications

Description		Values
Audio controller		Realtek ALC3329
Stereo conversion		Supported
Internal audio interface		Soundwire interface
External audio interface		Global headset jack
Number of speakers		Two
Internal-speaker amplifier		Supported (audio codec integrated)
External volume controls		Keyboard shortcut controls
Speaker output:		
	Average	2 W
	Peak	2.5 W
Microphone		Dual-array microphones

Storage

This section lists the storage options on your Dell Pro 16 Plus.

Your computer supports one of the following storage configurations:

Table 14. Storage specifications

Storage type	Interface type	Capacity
One M.2 2280 self-encrypting drive	PCIe Gen4 NVMe, up to 64 Gbps	Up to 2 TB

Table 14. Storage specifications (continued)

Storage type	Interface type	Capacity
One M.2 2230 self-encrypting drive	PCIe Gen4 NVMe, up to 64 Gbps	Up to 1 TB

Keyboard

The following table lists the keyboard specifications of your Dell Pro 16 Plus PB16255.

Table 15. Keyboard specifications

Description	Values
Keyboard type	• Standard backlit keyboard • Standard non-backlit keyboard
Keyboard layout	QWERTY
Number of keys	• Arabic, Canada Bilingual (MUI), Chinese-T, English International, English US, French (Canadian), Greek, Hebrew, Korean, Thai, Ukrainian, and Russian: 99 keys • Belgian, Bulgarian, Czech/Slovakian (MUI), Danish, English UK, Estonian, French European, German, Hungarian, Italian, Nordic (MUI), Norwegian, Portuguese, Spanish (Castillian), Spanish (Latin America), Swedish/Finnish, Swiss European (MUI), Turkish, Turkish F, Slovenian: 100 keys • Japanese: 103 keys • Portuguese (Brazil), French (Canadian) ACNOR: 101 keys
Keyboard size	X=18.05 mm key pitch Y=18.05 mm key pitch
Keyboard shortcuts	Some keys on your keyboard have two symbols on them. These keys can be used to type alternate characters or to perform secondary functions. To type the alternate character, press Shift and the desired key. To perform secondary functions, press Fn and the desired key. **NOTE:** You can define the primary behavior of the function keys (F1–F12) by changing the **Lock Mode standard** in the BIOS setup program. **NOTE:** If Copilot in Windows is not available on your computer, pressing the Copilot key launches Windows search. For more information about Copilot in Windows, search in the Knowledge Base Resource at the Dell Support site.

Keyboard shortcuts of Dell Pro 16 Plus

NOTE: Keyboard characters may differ depending on the keyboard language configuration. Keys that are used for shortcuts remain the same across all language configurations.

Some keys on your keyboard have two symbols on them. These keys can be used to type alternate characters or to perform secondary functions. The symbol that is shown on the lower part of the key refers to the character that is typed out when the key is pressed. If you press shift and the key, the symbol that is shown on the upper part of the key is typed out. For example, if you press **2**, 2 is typed out; if you press **Shift** + **2**, @ is typed out.

The keys F1-F12 at the top row of the keyboard are function keys for multimedia control, as indicated by the icon on the key. Press the function key to enable the task represented by the icon. For example, pressing F1 mutes the audio (see the table below).

However, if the function keys F1-F12 are needed for specific software applications, multimedia functionality can be disabled by pressing **Fn** + **Esc**. Later, multimedia control can be invoked by pressing **Fn** and the respective function key. For example, mute audio by pressing **Fn** + **F1**.

NOTE: You can also define the primary behavior of the function keys (F1–F12) by changing **Function Key Behavior** in the BIOS setup program.

Table 16. Function key primary behavior

Function key	Primary behavior
F1	Mute or unmute audio
F2	Decrease volume
F3	Increase volume
F4	Mute or unmute microphone
F5	Change the brightness of backlit keyboard (for backlit keyboard only)
F6	Decrease display brightness
F7	Increase display brightness
F8	Switch to external display
F9	Not applicable
F10	Print screen
F11	Home
F12	End

The **Fn** key is also used with selected keys on the keyboard to invoke secondary functions.

Table 17. Secondary behavior

Function key	Secondary behavior
Fn + F1	Operating system and application-specific F1 behavior
Fn + F2	Operating system and application-specific F2 behavior
Fn + F3	Operating system and application-specific F3 behavior
Fn + F4	Operating system and application-specific F4 behavior
Fn + F5	Operating system and application-specific F5 behavior
Fn + F6	Operating system and application-specific F6 behavior
Fn + F7	Operating system and application-specific F7 behavior
Fn + F8	Operating system and application-specific F8 behavior
Fn + F9	Operating system and application-specific F9 behavior
Fn + F10	Operating system and application-specific F10 behavior
Fn + F11	Operating system and application-specific F11 behavior
Fn + F12	Operating system and application-specific F12 behavior
Fn + Copilot	Operating system Context menu behavior.
Fn + Esc	Toggle Function key lock
Fn + PgUp (cursor up)	Scroll up the document or page
Fn + PgDn (cursor down)	Scroll down the document or page

Camera

The following table lists the camera specifications of your Dell Pro 16 Plus.

Table 18. Camera specifications

Description		Option 1	Option 2
Number of cameras		One	Two
Camera type		RGB camera	RGB + IR camera
Camera location		Front camera	Front camera
Camera sensor type		CMOS sensor technology	CMOS sensor technology
Camera resolution:			
	Still image	2.07 megapixels	2.07 megapixels
	Video	1920 x 1080 at 30 fps	1920 x 1080 at 30 fps
Infrared camera resolution:			
	Still image	Not applicable	0.23 megapixels
	Video	Not applicable	640 x 360 at 15 fps
Diagonal viewing angle:			
	Camera	80.2 degrees	80.2 degrees
	Infrared camera	Not applicable	86.6 degrees

Touchpad

The following table lists the touchpad specifications of your Dell Pro 16 Plus.

Table 19. Touchpad specifications

Description		Values
Touchpad resolution:		>=300 dpi
Touchpad dimensions:		
	Horizontal	125 mm (4.92 in.)
	Vertical	88 mm (3.46 in.)
Touchpad gestures		For more information about the touchpad gestures that are available on: • Windows, see the Microsoft Knowledge Base article at Microsoft Support Site. • Ubuntu, see Ubuntu Support Site.

Fingerprint reader (optional)

The following table lists the specifications of the optional fingerprint-reader of your Dell Pro 16 Plus.

Table 20. Fingerprint reader specifications

Description	Fingerprint reader on power button	FIPS 201-certified fingerprint reader on palmrest
Sensor technology	Capacitive	Capacitive
Sensor resolution	500 dpi	508 dpi
Sensor pixel size	108 mm x 88 mm	256 mm x 360 mm

Power adapter

The following table lists the power adapter specifications of your Dell Pro 16 Plus.

Table 21. Power adapter specifications

Description	Option one	Option two	Option three	Option four
Type	60 W adapter, USB-C	65 W adapter, USB-C	100 W adapter, USB-C	60 W AC adapter, USB-C
Power-adapter dimensions:				
Height	22 mm (0.87 in.)	28 mm (1.10 in.)	26.50 mm (1.04 in.)	22 mm (0.86 in.)
Width	55 mm (2.16 in.)	51 mm (2.01 in.)	60 mm (2.36 in.)	55 mm (2.16 in.)
Depth	66 mm (2.60 in.)	112 mm (4.41 in.)	122 mm (4.80 in.)	66 mm (2.60 in.)
Input voltage	100 VAC to 240 VAC	100 VAC to 240 VAC	100 VAC to 240 VAC	100 VAC to 240 VAC
Input frequency	50 Hz to 60 Hz	50 Hz to 60 Hz	50 Hz to 60 Hz	50 Hz to 60 Hz
Input current (maximum)	1.70 A	1.70 A	1.70 A	1.70 A
Output current (continuous)	• 20 V/3 A (continuous) • 15 V/3 A (continuous) • 9 V/3 A (continuous) • 5 V/3 A (continuous)	• 20 V/3.25 A (continuous) • 15 V/3 A (continuous) • 9 V/3 A (continuous) • 5 V/3 A (continuous)	• 20 V/5 A (continuous) • 15 V/3 A (continuous) • 9 V/3 A (continuous) • 5 V/3 A (continuous)	• 20 V/3 A (continuous) • 15 V/3 A (continuous) • 9 V/3 A (continuous) • 5 V/3 A (continuous)
Rated output voltage	• 20 VDC • 15 VDC • 9 VDC • 5 VDC	• 20 VDC • 15 VDC • 9 VDC • 5 VDC	• 20 VDC • 15 VDC • 9 VDC • 5 VDC	• 20 VDC • 15 VDC • 9 VDC • 5 VDC
Temperature range:				
Operating	0°C to 40°C (32°F to 104°F)	0°C to 40°C (32°F to 104°F)	0°C to 35°C (32°F to 95°F)	0°C to 35°C (32°F to 95°F)

Table 21. Power adapter specifications (continued)

Description	Option one	Option two	Option three	Option four
Storage	–20°C to 70°C (–4°F to 158°F)	–40°C to 70°C (–40°F to 158°F)	–40°C to 70°C (–40°F to 158°F)	–20°C to 70°C (–40°F to 158°F)

CAUTION: Operating and storage temperature ranges may differ among components, so operating or storing the device outside these ranges may impact the performance of specific components.

Power adapter requirements (for computers that are shipped with a 3-cell, 45 Wh battery)

NOTE: If you did not purchase the Dell-branded power adapter that is recommended for your computer, ensure that the power adapter you use meets the following requirements.

The following table lists the power adapter requirements for your Dell Pro 16 Plus.

Table 22. Power adapter requirements

Description	Value
Power that is required from a power adapter to achieve optimal performance.	65 W
Power that charges the computer at a slower speed. **NOTE:** A warning message may appear informing you about the use of a lower-powered adapter and slower charging speed.	Less than 60 W
Minimum power that is required from a power adapter to operate the computer and charge the battery. **NOTE:** A warning message appears informing you about the use of a lower-powered adapter and slower charging speed.	45 W
USB Power Delivery (PD) fast charging	Supported
ExpressCharge mode	Supported **NOTE:** Ensure that the computer with a 45 Wh battery is connected to a 65 W power adapter for this feature to be supported. **NOTE:** ExpressCharge mode must also be enabled in the BIOS Setup screen. Select **Power** > **Battery Configuration** > **ExpressCharge**, then press **Enter**.

Power adapter requirements (for computers that are shipped with a 3-cell, 55 Wh battery)

NOTE: If you did not purchase the Dell-branded power adapter that is recommended for your computer, ensure that the power adapter you use meets the following requirements.

The following table lists the power adapter requirements for your Dell Pro 16 Plus.

Table 23. Power adapter requirements

Description	Value
Power that is required from a power adapter to achieve optimal performance.	65 W

Table 23. Power adapter requirements (continued)

Description	Value
Power that charges the computer at a slower speed. **NOTE:** A warning message may appear informing you about the use of a lower-powered adapter and slower charging speed.	Less than 60 W
Minimum power that is required from a power adapter to operate the computer and charge the battery. **NOTE:** A warning message appears informing you about the use of a lower-powered adapter and slower charging speed.	45 W
USB Power Delivery (PD) fast charging	Supported
ExpressCharge mode	Supported **NOTE:** Ensure that the computer with a 55 Wh battery is connected to a 100 W power adapter for this feature to be supported. **NOTE:** ExpressCharge mode must also be enabled in the BIOS Setup screen. Select **Power** > **Battery Configuration** > **ExpressCharge**, then press **Enter**

Battery

The following table lists the battery specifications of your Dell Pro 16 Plus.

Table 24. Battery specifications

Description		Option one	Option two	Option three	Option four
Battery type		3-cell, 45 Wh, ExpressCharge, ExpressCharge Boost	3-cell, 55 Wh, ExpressCharge, ExpressCharge Boost	3-cell, 45 Wh, Long Life Cycle, ExpressCharge, ExpressCharge Boost	3-cell, 55 Wh, Long Cycle Life, ExpressCharge, ExpressCharge Boost
Battery voltage		11.25 VDC	11.70 VDC	11.25 VDC	11.70 VDC
Battery weight (minimum)		0.20 kg (0.44 lb)	0.22 kg (0.48 lb)	0.20 kg (0.44 lb)	0.22 kg (0.48 lb)
Battery dimensions:					
	Height	72.80 mm (2.83 in.)	72.80 mm (2.83 in.)	72.80 mm (2.83 in.)	72.80 mm (2.83 in.)
	Width	254.80 mm (10.03 in.)	254.80 mm (10.03 in.)	254.80 mm (10.03 in.)	254.80 mm (10.03 in.)
	Depth	6.30 mm (0.25 in.)	6.30 mm (0.25 in.)	6.30 mm (0.25 in.)	6.30 mm (0.25 in.)
Temperature range:					
	Operating	• Charge: 0°C to 45°C (32°F to 113°F) • Discharge: 0°C to 70°C (32°F to 158°F)	• Charge: 0°C to 45°C (32°F to 113°F) • Discharge: 0°C to 70°C (32°F to 158°F)	• Charge: 0°C to 45°C (32°F to 113°F) • Discharge: 0°C to 70°C (32°F to 158°F)	• Charge: 0°C to 45°C (32°F to 113°F) • Discharge: 0°C to 70°C (32°F to 158°F)
	Storage	–20°C to 65°C (–4°F to 149°F)	–20°C to 65°C (–4°F to 149°F)	–20°C to 60°C (–4°F to 140°F)	–20°C to 60°C (–4°F to 140°F)

Table 24. Battery specifications (continued)

Description	Option one	Option two	Option three	Option four
Battery operating time	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.
Battery charging time (approximate) ⓘ **NOTE:** Control the charging time, duration, start and end time, and so on using the Dell Power Manager application. For more information about Dell Power Manager, search in the Knowledge Base Resource at Dell Support Site.	**Standard charge/ Predominately AC User Charge Method:** • 0°C to15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours • 16°C to 45°C maximum allowable charge time from 0% to 100% RSOC is 3 hours **Express Charge Method:** • 16°C to 45°C maximum allowable charge time from 0% to 80% RSOC is 1 hours • 16°C to 45°C maximum allowable charge time from 0% to 100% RSOC is 2 hours **Express Charge Boost charge Method:** • 16°C to 45°C maximum allowable charge time from 0% to 35% RSOC is 20 min	**Standard charge/ Predominately AC User Charge Method:** • 0°C to 15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours • 16°C to 45°C maximum allowable charge time from 0% to 100% RSOC is 3 hours **Express Charge Method:** • 16°C to 45°C maximum allowable charge time from 0% to 80% RSOC is 1 hours • 16°C to 45°C maximum allowable charge time from 0% to 100% RSOC is 2 hours **Express Charge Boost charge Method:** • 16°C to 45°C maximum allowable charge time from 0% to 35% RSOC is 20 min	**Standard charge/ Predominately AC User Charge Method:** • 0°C to 15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours • 16°C to 45°C maximum allowable charge time from 0% to 100% RSOC is 3 hours **Express Charge Method:** • 16°C to 45°C maximum allowable charge time from 0% to 80% RSOC is 1 hours • 16°C to 45°C maximum allowable charge time from 0% to 100% RSOC is 2 hours **Express Charge Boost charge Method:** • 16°C to 45°C maximum allowable charge time from 0% to 35% RSOC is 20 min	**Standard charge/ Predominately AC User Charge Method:** • 0°C to 15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours • 16°C to 45°C maximum allowable charge time from 0% to 100% RSOC is 3 hours **Express Charge Method:** • 16°C to 45°C maximum allowable charge time from 0% to 80% RSOC is 1 hours • 16°C to 45°C maximum allowable charge time from 0% to 100% RSOC is 2 hours **Express Charge Boost charge Method:** • 16°C to 45°C maximum allowable charge time from 0% to 35% RSOC is 20 min
Coin-cell battery	No	No	No	No

⚠ **CAUTION: Operating and storage temperature ranges may differ among components, so operating or storing the device outside these ranges may impact the performance of specific components.**

⚠ **CAUTION: Dell recommends that you charge the battery regularly for optimal power consumption. If your battery charge is completely depleted, connect the power adapter, turn on your computer, and then restart your computer to reduce the power consumption.**

Power requirements (for computers that are shipped with a 3-cell, 45 Wh battery)

NOTE: The information in this section is applicable to the European Union (EU) countries.

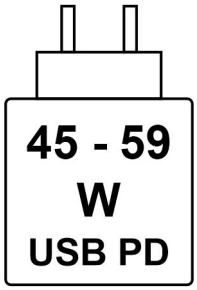


Figure 8. Pictogram for power charging requirements

The power that is delivered by the charger must be between a minimum of 45 Watts that is required by the radio equipment, and a maximum of 59 Watts in order to achieve the maximum charging speed.

This computer supports USB Power Delivery (PD) fast charging.

Power requirements (for computers that are shipped with a 3-cell, 55 Wh battery)

NOTE: The information in this section is applicable to the European Union (EU) countries.

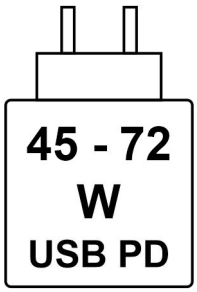


Figure 9. Pictogram for power charging requirements

The power that is delivered by the charger must be between a minimum of 45 Watts that is required by the radio equipment, and a maximum of 72 Watts in order to achieve the maximum charging speed.

This computer supports USB Power Delivery (PD) fast charging.

Display

The following table lists the display specifications of your Dell Pro 16 Plus.

Table 25. Display specifications

Description	Option one	Option two	Option three
Display type	16-inch Full High Definition Plus (FHD+)	16-inch Full High Definition Plus (FHD+)	16-inch Quad High Definition Plus (QHD+)
Touch options	No	Yes	No

Table 25. Display specifications (continued)

Description		Option one	Option two	Option three
Display-panel technology		Wide Viewing Angle (WVA)	Wide Viewing Angle (WVA)	Wide Viewing Angle (WVA)
Display-panel dimensions (active area):				
	Height	215.42 mm (8.48 in.)	215.42 mm (8.48 in.)	215.42 mm (8.48 in.)
	Width	344.68 mm (13.57 in.)	344.68 mm (13.57 in.)	344.68 mm (13.57 in.)
	Diagonal	406.46 mm (16.00 in.)	406.46 mm (16.00 in.)	406.46 mm (16.00 in.)
Display-panel native resolution		1920 x 1200	1920 x 1200	2560 x 1600
Luminance (typical)		300 nits	300 nits	300 nits
Megapixels		2.3	2.3	4.1
Color gamut		45% NTSC	45% NTSC	100% SRGB
Pixels Per Inch (PPI)		142 ppi	142 ppi	189 ppi
Contrast ratio (typical)		1000:1	1000:1	1000:1
Response time (maximum)		35 ms	35 ms	35 ms
Refresh rate		60 Hz	60 Hz	120 Hz
Horizontal view angle		+/- 80 degrees (min)	+/- 80 degrees (min)	+/- 80 degrees (min)
Vertical view angle		+/- 80 degrees (min)	+/- 80 degrees (min)	+/- 80 degrees (min)
Pixel pitch		0.18 mm x 0.18 mm	0.18 mm x 0.18 mm	0.13 mm x 0.13 mm
Power consumption (maximum)		4.45 W	5.60 W	4 W
Anti-glare vs glossy finish		Anti-glare	Anti-glare	Anti-glare

GPU—Integrated

The following table lists the specifications of the integrated Graphics Processing Unit (GPU) supported by your Dell Pro 16 Plus.

Table 26. GPU—Integrated

Controller	Memory size	Processor
AMD Radeon 740M Graphics	Shared system memory	AMD Ryzen 3 210
AMD Radeon 740M Graphics	Shared system memory	AMD Ryzen 3 220
AMD Radeon 740M Graphics	Shared system memory	AMD Ryzen 5 Pro 220
AMD Radeon 740M Graphics	Shared system memory	AMD Ryzen 5 PRO 215
AMD Radeon 760M Graphics	Shared system memory	AMD Ryzen 5 Pro 230
AMD Radeon 780M Graphics	Shared system memory	AMD Ryzen 7 Pro 250
AMD Radeon 840M Graphics	Shared system memory	AMD Ryzen AI 5 PRO 340

Table 26. GPU—Integrated (continued)

Controller	Memory size	Processor
AMD Radeon 860M Graphics	Shared system memory	AMD Ryzen AI 7 PRO 350
AMD Radeon 890M Graphics	Shared system memory	AMD Ryzen AI 9 HX PRO 370

Hardware security

The following table lists the hardware security of your Dell Pro 16 Plus.

Table 27. Hardware security

Hardware security
Trusted Platform Module (TPM) 2.0 discrete
FIPS 140-2 certification for TPM
TCG Certification for TPM (Trusted Computing Group)
Finger Print Reader in Power Button available with ControlVault 3 Plus
ControlVault 3 Plus Advanced Authentication with FIPS 140-3 Level 3 Certification
Contacted smart card and ControlVault 3 Plus
Contactless smart card, NFC, and ControlVault 3 Plus
SED SSD NVMe, SSD, and hard drive (Opal and non-Opal) per SDL
FIPS 201 Full Scan FPR and ControlVault 3 Plus

Smart card reader

Contactless smart card reader

This section lists the contactless smart card reader specifications of your Dell Pro 16 Plus. This module is only available in computers shipped with smart card readers.

Table 28. Contactless smart card reader specifications

Title	Description	Dell ControlVault 3 Plus Contactless smart card reader with NFC
FeliCa Card Support	Reader and software capable of supporting FeliCa contactless cards	Yes
Prox (Proximity) (125 kHz) Card support	Reader and software capable of supporting Prox /Proximity/125 kHz contactless cards	No
ISO 14443 Type A Card Support	Reader and software capable of supporting ISO 14443 Type A contactless cards	Yes
ISO 14443 Type B Card Support	Reader and software capable of supporting ISO 14443 Type B contactless cards	Yes
ISO/IEC 21481	Reader and software capable of supporting ISO/IEC 21481 compliant contactless cards and tokens	Yes

Table 28. Contactless smart card reader specifications (continued)

Title	Description	Dell ControlVault 3 Plus Contactless smart card reader with NFC
ISO/IEC 18092	Reader and software capable of supporting ISO/IEC 21481 compliant contactless cards and tokens	Yes
ISO 15693 Card Support	Reader and software capable of supporting ISO15693 contactless cards	Yes
NFC Tag Support	Supports reading and processing of NFC-compliant tag information	Yes
NFC Reader Mode	Support for NFC Forum Defined Reader mode	Yes
NFC Writer Mode	Support for NFC Forum Defined Writer mode	Yes
NFC Peer-to-Peer Mode	Support for NFC Forum Defined Peer to Peer mode	Yes
NFC Proximity OS Interface	Enumerates NFP (Near Field Proximity) device for operating system to use	Yes
PC/SC operating system interface	Personal Computer/Smart Card specification for integration of hardware readers into personal computer environments	Yes
CCID driver compliance	Common driver support for Integrated Circuit Card Interface Device for operating system level drivers	Yes
Dell ControlVault support	The device connects to Dell ControlVault for usage and processing	Yes

NOTE: 125 Khz proximity cards are not supported.

Table 29. Contactless card types supported

Interface	Card type	Supported functionality
NFC Forum (Microsoft Proximity Device)	Type 1 tag	Read/Write NDEF
	Type 2 tag	Read/Write NDEF
	Type 3 tag	Read/Write NDEF
	Type 4 tag	Read/Write NDEF
	Type 5 tag	Read/Write NDEF
	P2P	Exchange NDEF
RFID (Microsoft Smartcard Device)	ISO14443A	Read UUID and APDU Exchange (ISO7816)
	ISO14443B	Read UUID and APDU Exchange (ISO7816)
	Sony FeliCa	Read UUID only
	Legacy iClass (ISO15693)	Read UUID only
	Mifare Classic	Read UUID only
	Low Frequency (125 KHz)	Not supported

Table 30. Supported cards

Manufacturer	Card
HID	jCOP readertest3 A card (14443a)
	1430 1L
	DESFire D8H
	DESFIRE 4K Standard - 1450NGGNN
	iClass 16K/16 - 2002PGGMN
	iClass SR 16K/16 - 2002HPGGMN
	iCLASS 2K tag
	iCLASS GP - 2003 PGGMN
	iClass Clamshell - 2080PMSMV
	iClass Prox 16K/16 - 2022BGGMNN
	Mifare M1P 1430 NGGNN
	iclass Prox 2020BGGMNM
	DesFire D8P 1456CSGMN
	iCLASS MIFARE Px GM49Y 2623BNPGGBNAB
	iCLASS MIFARE Px 8M1L
	iClass SEOS JW 5006PGGMN
	Crescendo iCLASS Px G8H
	iCLASS Seos IY
	SEOS JMC4 J1Y 5806VNG1NNN4
	SEOS Key FOB 5266PNNA
	SEOS Clamshell 5656PMSAV
	SEOS + Prox 5106RGGMNN
	SEOS + DESFire 5906PNG1ANN7
	SEOS iClass 5006PGGMN7
	Seos Essential + Prox 551PPGGANN
	iCLASS 2K 2000PGGMN
	iCLASS 2K 3000PGGMN
	MIFARE DESFire 3700CPGGAN
	iCLASS DP
	DESFire 1Y
NXP/Mifare	Mifare DESFire 8K White PVC card
	Mifare Classic 1K White PVC card
	NXP Mifare Classic S50 ISO card
	Mifare DESFire 2K
	Mifare Plus S 2K/4K
	Mifare Plus X 4K
G&D	idOnDemand - SCE3.2 144K

Table 30. Supported cards (continued)

Manufacturer	Card
	SCE6.0 FIPS 80K Dual + 1K Mifare
	SCE6.0 nonFIPS 80K Dual + 1K Mifare
	SCE6.0 FIPS 144K Dual + 1K Mifare
	SCE6.0 nonFIPS 144K Dual + 1K Mifare
	SCE7.0 FIPS 144K
Oberthur	idOnDemand - OCS5.2 80K
	ID-One Cosmo 64 RSA D V5.4 T = 0 card
	ID-One Cosmo 128K V5.5 card
Gemalto	TOP DL GX4 144K card
Sony	FeliCa RC-S962
	FeliCa RC-S965
	FeliCa RC-S966
PIVKey	C910 PKI
NIST	PIV1
IDENTIV	PIV programmed cards
	uTrust
Transport cards	Oyster (London) MIFARE DESFire
	T-Money (Korea)
	Octopus Card (Hong Kong)
	SUICA (Japan)

Table 31. Qualified NFC tags

NFC tag	Supported
Tap and do - NFC Forum Type 1 Tag - Topaz 512 (BCM920203)	Yes
Tap and do - NFC Forum Type 1 Tag - Topaz 512 (BCM20203T512)	Yes
Tap and do - NFC Forum Type 1 Tag - Topaz (BCM20203T96)	Yes
Tap and do - NFC Forum Type 2 Tag - Mifare UltraLight	Yes
Tap and do - NFC Forum Type 2 Tag - Mifare UltraLight C	Yes
Tap and do - NFC Forum Type 2 Tag - NTAG203	Yes
Tap and do - NFC Forum Type 3 Tag - FeliCa Lite RC-S965	Yes
Tap and do - NFC Forum Type 3 Tag - FeliCa RC-S962	Yes
Tap and do - NFC Forum Type 4 Tag - Mifare DESFire EV1Card 2K	Yes
Tap and do - NFC Forum Type 4 Tag - Mifare DESFire EV1Card 4K	Yes
Tap and do - NFC Forum Type 4 Tag - Mifare DESFire EV1Card 8K	Yes
Tap and do - ISO 15693 - Tag-it Plus	Yes

Table 31. Qualified NFC tags (continued)

NFC tag	Supported
HID I-code ISO card	Yes

Contacted smart card reader

The following table lists the contacted smart card reader specifications of your Dell Pro 16 Plus.

Table 32. Contacted smart card reader specifications

Title	Description	Dell ControlVault 3 Plus Contacted smart card reader
ISO 7816-3 Class A Card Support	Reader capable of reading 5 V powered smart card	Yes
ISO 7816-3 Class B Card Support	Reader capable of reading 3 V powered smart card	Yes
ISO 7816-3 Class C Card support	Reader capable of reading 1.8 V powered smart card	Yes
T = 0 support	Cards support character level transmission	Yes
T = 1 support	Cards support block level transmission	Yes
EMVCo Certified	Formally certified based on EMVCo smart card standards	Yes
PC/SC operating system interface	Personal Computer/Smart Card specification for integration of hardware readers into personal computer environments	Yes
CCID driver compliance	Common driver support for Integrated Circuit Card Interface Device for operating system level drivers	Yes
Windows Certified	Certified by the Windows Hardware Certification program	Yes
FIPS 201 (PIV/HSPD-12) Compliant	Device compliant with FIPS 201/PIV/ HSPD-12 requirements	Yes
ISO 7816-1 Compliant	Specification for the physical characteristics of integrated circuit cards with contacts	Yes
ISO 7816-2 Compliant	Specification for the dimensions and location of the contacts	Yes
ISO 7816-3 Compliant	Specification for electrical interface and transmission protocols	Yes
ISO 7816-4 Compliant	Specification for organization, security, and commands for interchange	Yes
Dell ControlVault support	The device connects to Dell ControlVault for usage and processing	Yes

Operating and storage environment

This table lists the operating and storage specifications of your Dell Pro 16 Plus.

Airborne contaminant level: G1 as defined by ISA-S71.04-1985

Table 33. Computer environment

Description	Operating	Storage
Temperature range	0°C to 35°C (32°F to 95°F)	–40°C to 65°C (–40°F to 149°F)
Relative humidity (maximum)	10% to 90% (non-condensing)	0% to 95% (non-condensing)
Vibration (maximum)*	0.66 GRMS	1.30 GRMS
Shock (maximum)	110 G†	160 G†
Altitude range	–15.20 m to 3048 m (–49.87 ft to 10000 ft)	–15.20 m to 10668 m (–49.87 ft to 35000 ft)
CAUTION: Operating and storage temperature ranges may differ among components, so operating or storing the device outside these ranges may impact the performance of specific components.		

* Measured using a random vibration spectrum that simulates the user environment.

† Measured using a 2 ms half-sine pulse.

ComfortView Plus

WARNING: Prolonged exposure to blue light from the display may lead to long-term effects such as eye strain, eye fatigue, or damage to the eyes.

Blue light is a color in the light spectrum which has a short wavelength and high energy. Chronic exposure to blue light, particularly from digital sources may disrupt sleep patterns and cause long-term effects such as eye strain, eye fatigue, or damage to the eyes.

The display on this computer is designed to minimize blue light and complies with TÜV Rheinland's requirement for low blue light displays.

Low blue light mode is enabled at the factory, so no further configuration is necessary.

To reduce the risk of eye strain, it is also recommended that you:

- Position the display at a comfortable viewing distance between 20 and 28 inches (50 cm and 70 cm) from your eyes.
- Blink frequently to moisten your eyes, wet your eyes with water, or apply suitable eye drops.
- Take an extended break for 20 minutes every two hours.
- Look away from your display, and gaze at a distant object at 20 ft (609.60 cm) away for at least 20 seconds during each break.

4

Working inside your computer

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 in this document assumes that you have read the safety information that shipped with your computer.

WARNING: Before working inside your computer, read the safety information that is shipped with your computer. For more safety best practices, see Dell Regulatory Compliance Home Page.

WARNING: Disconnect your computer from 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 your computer to an electrical outlet.

WARNING: For laptop computers, discharge the battery completely before removing it. Disconnect the AC power adapter from the computer and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button is pressed.

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

CAUTION: You should only perform troubleshooting and repairs as authorized or directed by the Dell technical support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

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.

CAUTION: To avoid damaging the components and cards, handle them by their edges, and avoid touching the pins and the contacts.

CAUTION: When you disconnect a cable, pull it by its connector or its pull tab, not the cable itself. Some cables have connectors with locking tabs or thumbscrews that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending the connector pins. When connecting cables, ensure that the connector on the cable is correctly oriented and aligned with the port.

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

CAUTION: Exercise caution when handling rechargeable Li-ion batteries in laptops. Swollen batteries should not be used and should be replaced and disposed properly.

Before working inside your computer

About this task

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

Steps

1. Save and close all open files and exit all open applications.
2. Shut down your computer. For Windows operating system, 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. Turn off all the attached peripherals.
4. Disconnect your computer and all attached devices from their electrical outlet.
5. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.

   CAUTION: To disconnect a network cable, unplug the cable from your computer.

6. Remove any media card and optical disc from your computer, if applicable.

Safety precautions

This section details the primary steps to be followed before disassembling any device or component.

Observe the following safety precautions before any installation or break-fix procedures involving disassembly or reassembly:

- Turn off the computer and all attached peripherals.
- Disconnect the computer from AC power.
- Disconnect all network cables and peripherals from the computer.
- Use an ESD field service kit when working inside your computer to avoid electrostatic discharge (ESD) damage.
- Place the removed component on an anti-static mat after removing it from the computer.
- Press and hold the power button for 15 seconds to discharge the residual power in the system board.

Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done by using a field service electrostatic discharge (ESD) kit. When connecting a bonding wire, ensure that it is connected to bare metal and never to a painted or nonmetal surface. Ensure that the wrist strap is secure and in full contact with your skin. Remove all jewelry, watches, bracelets, or rings before grounding yourself and the equipment.

Electrostatic discharge—ESD protection

ESD is a major concern when you handle electronic components, especially sensitive components such as expansion cards, processors, memory modules, and system boards. A slight charge 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.

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 module that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code that is 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 memory module receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms that are 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, and so on.

Intermittent failures that are also called latent or "walking wounded" are difficult to detect and troubleshoot.

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. Wireless anti-static straps 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, use the anti-static wrist strap to discharge the static electricity from your body. For more information about the wrist strap and ESD wrist strap tester, see Components of an ESD Field Service Kit.
- 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.

CAUTION: It is critical to keep ESD-sensitive devices away from internal parts that are insulated and often highly charged, such as plastic heat sink casings.

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 laptop environment. Servers are typically installed in a rack within a data center; desktops or laptops 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 computer 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 component 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 anti-static mat, in the computer, or inside an ESD bag.

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 anti-static mat and to any bare metal on the computer being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the anti-static mat. ESD-sensitive items are safe in your hand, on the anti-static mat, in the computer, or inside an ESD 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 anti-static mat is not required, or connect 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 anti-static mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, anti-static mat, and bonding wire. Never use wireless wrist straps. Always be cautious 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 an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap before each service, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. To perform the test, plug the bonding-wire of the wrist-strap 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.

NOTE: It is recommended to always use the traditional wired ESD grounding wrist strap and protective anti-static mat when servicing Dell products. In addition, it is critical to keep sensitive parts separate from all insulator parts while servicing the computer.

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.

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, disks, or any other parts that you removed before working on your computer.
4. Connect your computer to their electrical outlets.

   NOTE: To exit service mode, ensure to connect the AC adapter to the power-adapter port on your computer.

5. Press the power button to turn on the computer.

BitLocker

CAUTION: If BitLocker is not suspended before updating the BIOS, the BitLocker key is not recognized the next time that you reboot the computer. You will be prompted to enter the recovery key to progress, and the computer displays a prompt for the recovery key on each reboot. If the recovery key is not known, this can result in data loss or an operating system reinstall. For more information, see Knowledge Article: updating the BIOS on Dell computers with BitLocker enabled.

The installation of the following components triggers BitLocker:

- Hard disk drive or solid state drive
- System board

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #0
- Phillips screwdriver #1
- Plastic scribe
- Flat-head screwdriver (<4 mm)

Screw list

NOTE: When removing screws from a component, it is recommended to note the screw type and 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 depending on the configuration ordered.

Table 34. Screw list

Component	Screw type	Quantity	Screw image
Base cover	Captive screws	8	
Battery	M2x4 Captive screws	1 4	
Wireless antennas	M2x2.5	4	
4G WWAN-card bracket	M2x2.5	1	
Solid state drive bracket	M2x3	2	
M.2 2230 Solid state drive	M2x4	1	
M.2 2280 Solid state drive	M2x4	1	
Fan	M2x4	3	
Speaker	M1.6x3	4	
Heat sink	Captive screw	4	
System board	M2x3.5 M2x3 M2x2.5	2 8 1	
Type-C module	M2x5	3	
Power button **NOTE:** Applicable to computer shipped both with and without a fingerprint reader	M2x2.2	2	
I/O Board	M2x1.4	5	
Keyboard	M2x2.2	22	
keyboard filler	M2.5x5	3	
Smart card reader	M2x2.2	4	

Table 34. Screw list (continued)

Component	Screw type	Quantity	Screw image
Display-cable bracket	M2x3	2	
Fingerprint-reader bracket	M2x3	1	
Display panel	M2x2	2	
Display hinges	M2.5x5	6	
Hinge cap	M2.5x3.5	2	
USH board	M2x2	2	

Major components of Dell Pro 16 Plus

The following image shows the major components of Dell Pro 16 Plus.

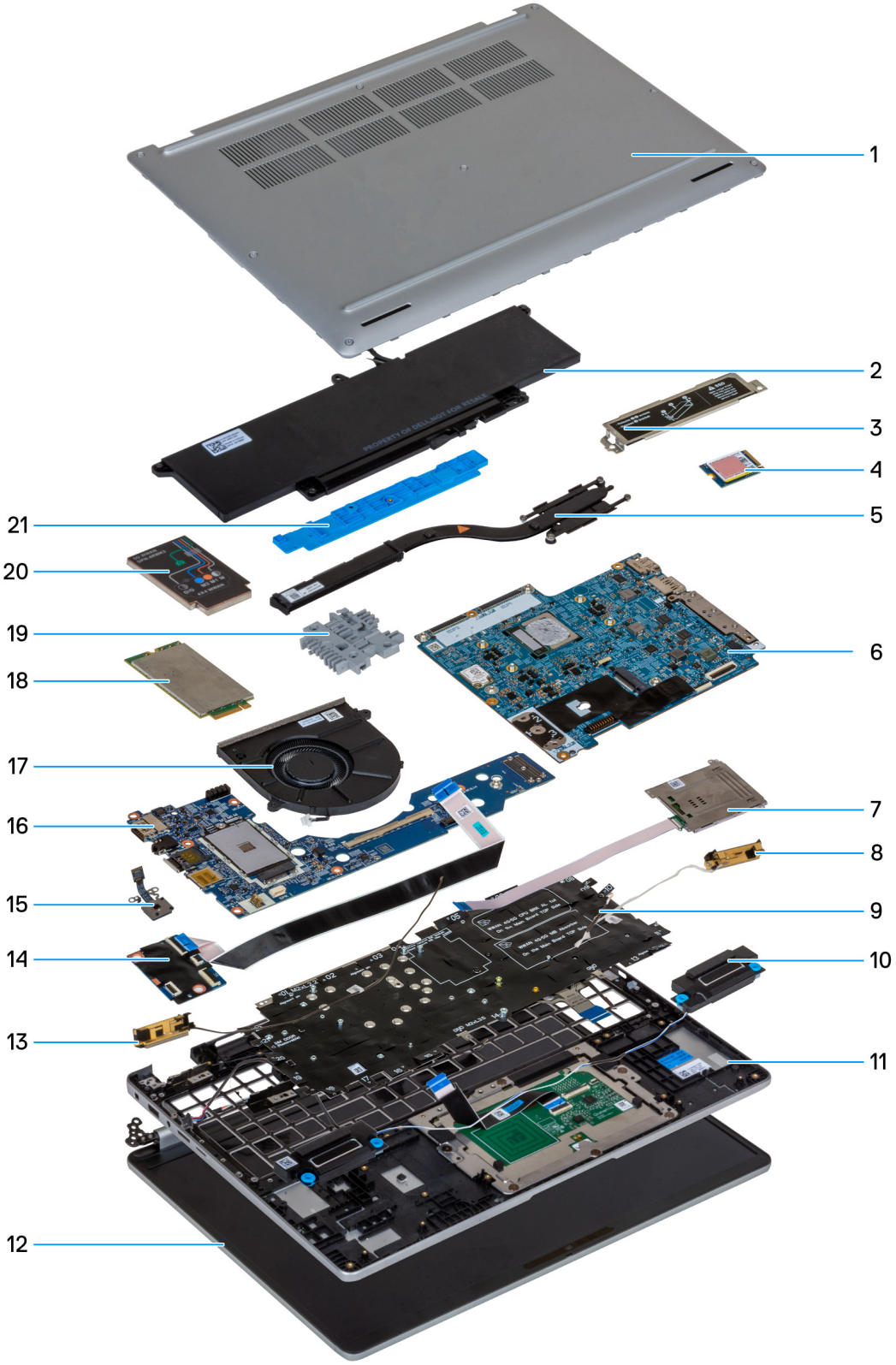


Figure 10. Major components of your Dell Pro 16 Plus

1. Base cover
2. Battery

3. M.2 2230/M.2 2280 SSD shield
4. M.2 2230/M.2 2280 SSD
5. Heat sink
6. System board
7. Smart card reader (optional)
8. WLAN Antennas
9. Keyboard
10. Speakers
11. Palm-rest assembly
12. Display assembly
13. WLAN Antennas
14. USH board
15. Power button
16. I/O board
17. Fan
18. 4G WWAN card
19. keyboard filler
20. 4G WWAN-card shield
21. Battery support bracket

NOTE: Dell provides a list of components and their part numbers for the original system configuration purchased. These parts are available according to warranty coverage purchased by the customer. Contact your Dell sales representative for purchase options.

5

Removing and installing Customer Replaceable Units (CRUs)

The replaceable components in this chapter are Customer Replaceable Units (CRUs).

CAUTION: Customers can replace only the Customer Replaceable Units (CRUs) following the safety precautions and replacement procedures.

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

SIM-card tray (optional)

Removing the SIM-card tray (optional)

Prerequisites

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

NOTE: The procedure for SIM-card tray removal is only applicable for computers that are shipped with a WWAN module.

CAUTION: Removing the SIM-card tray when the computer is turned on can cause data loss or damage to the card. Ensure that your computer is turned off or the network connections are disabled.

About this task

The following images indicate the location of the SIM-card tray and provide a visual representation of the removal procedure.

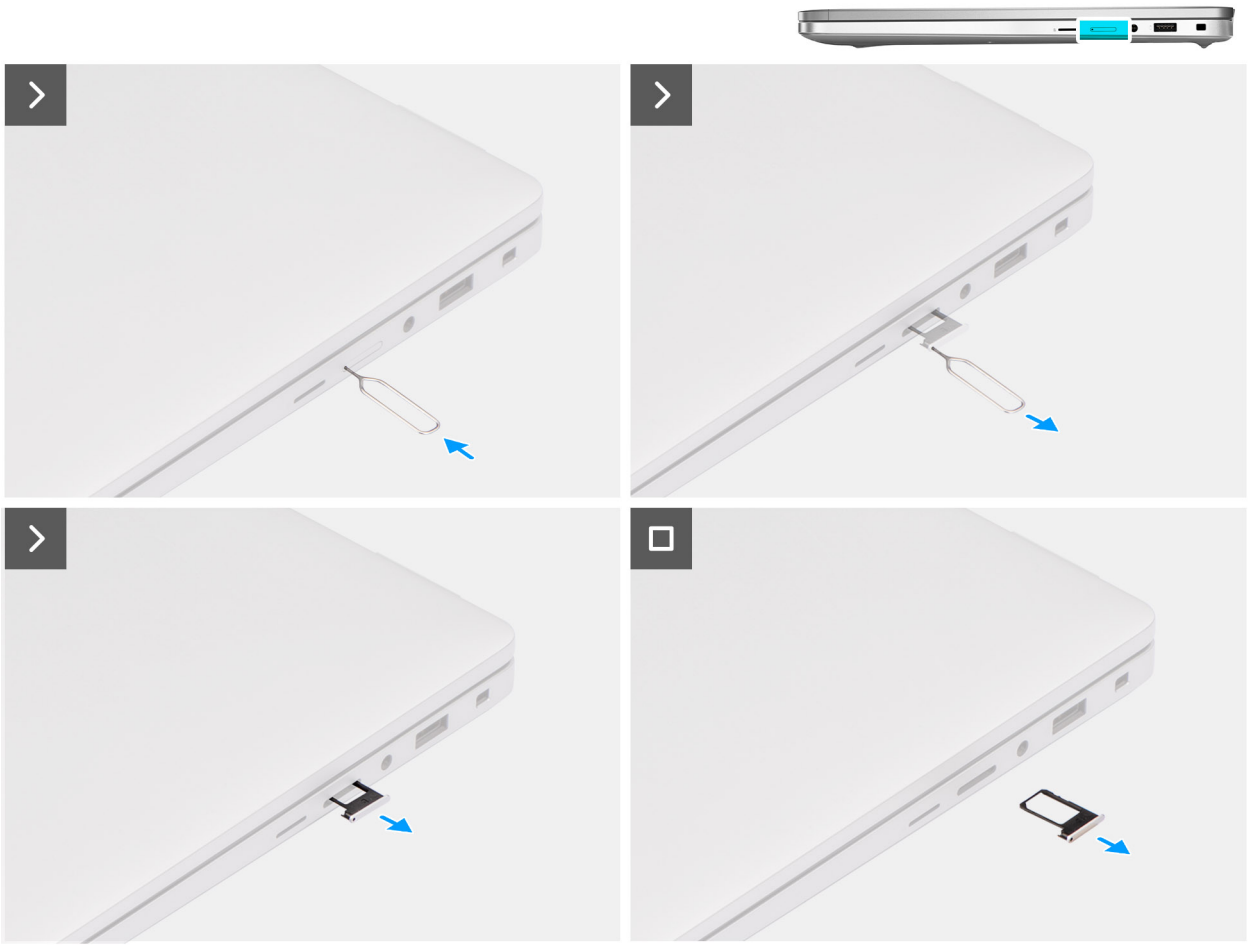


Figure 11. Removing the SIM-card tray

Steps

1. Insert a SIM-ejector pin into the release hole to release the SIM-card tray.
2. Push the SIM-ejector pin to disengage the lock, and eject the SIM-card tray.
3. Slide the SIM-card tray out of the slot on the computer.

Installing the SIM-card tray (optional)

Prerequisites

NOTE: The procedure for SIM-card tray installation is only applicable for computers that are shipped with a WWAN module.

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

About this task

The following images indicate the location of the SIM-card tray and provide a visual representation of the installation procedure.

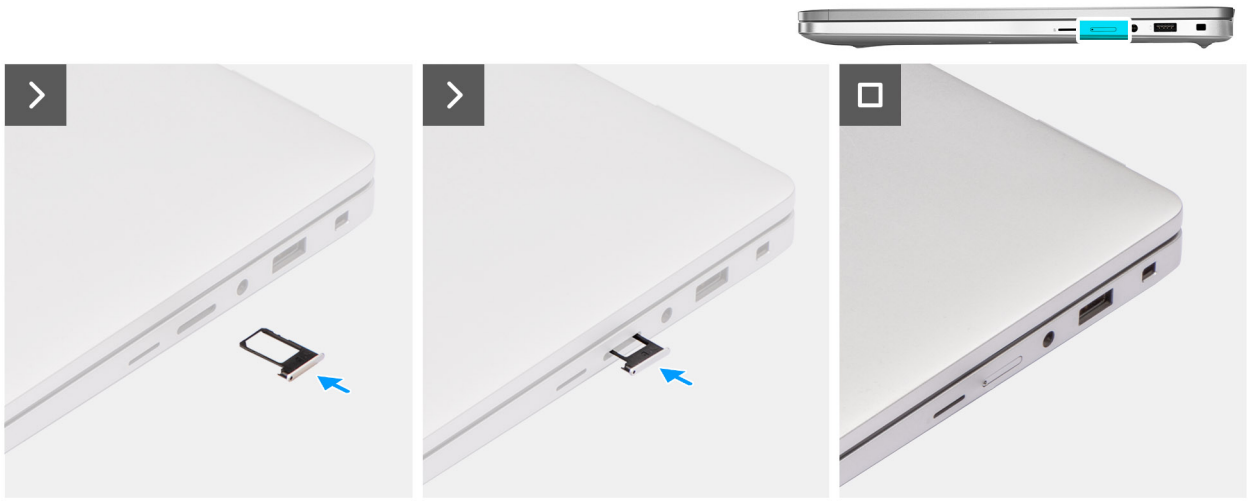


Figure 12. Installing the SIM-card tray

Steps

1. Align the SIM-card tray with the slot on the computer and carefully slide it in.
2. Slide the SIM-card tray into the slot, until it clicks into place.

Next steps

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

Base cover

Removing the base cover

Prerequisites

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

   CAUTION: If you are unable to turn on the computer, if your computer is unable to enter Service Mode, or the computer does not support Service Mode, proceed to disconnect the battery cable.

2. Remove the SIM-card tray (optional).

About this task

NOTE: Before removing the base cover, ensure that there is no microSD-card that is installed in the microSD-card slot on your computer.

The following images indicate the location of the base cover and provide a visual representation of the removal procedure.

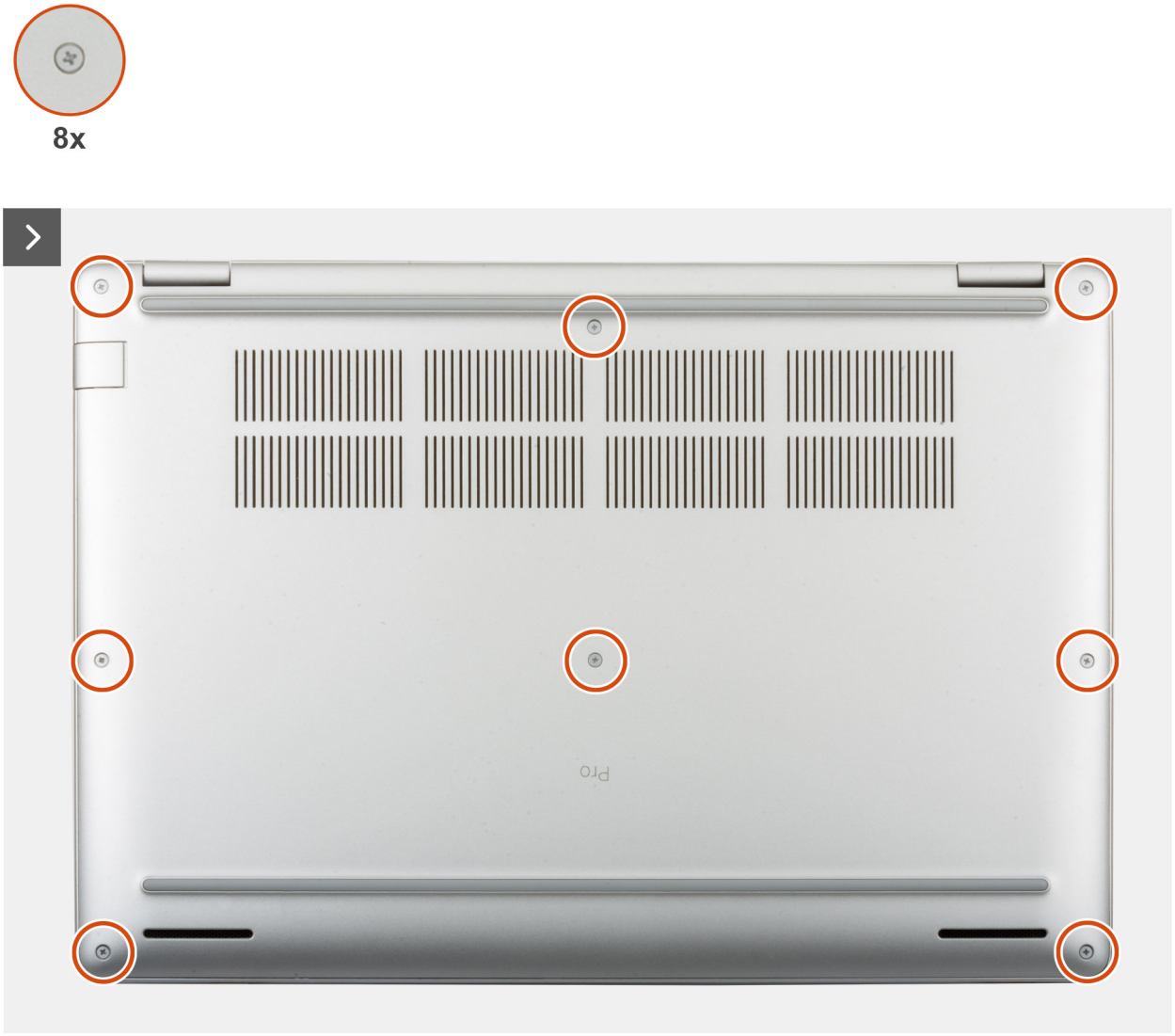


Figure 13. Removing the base cover

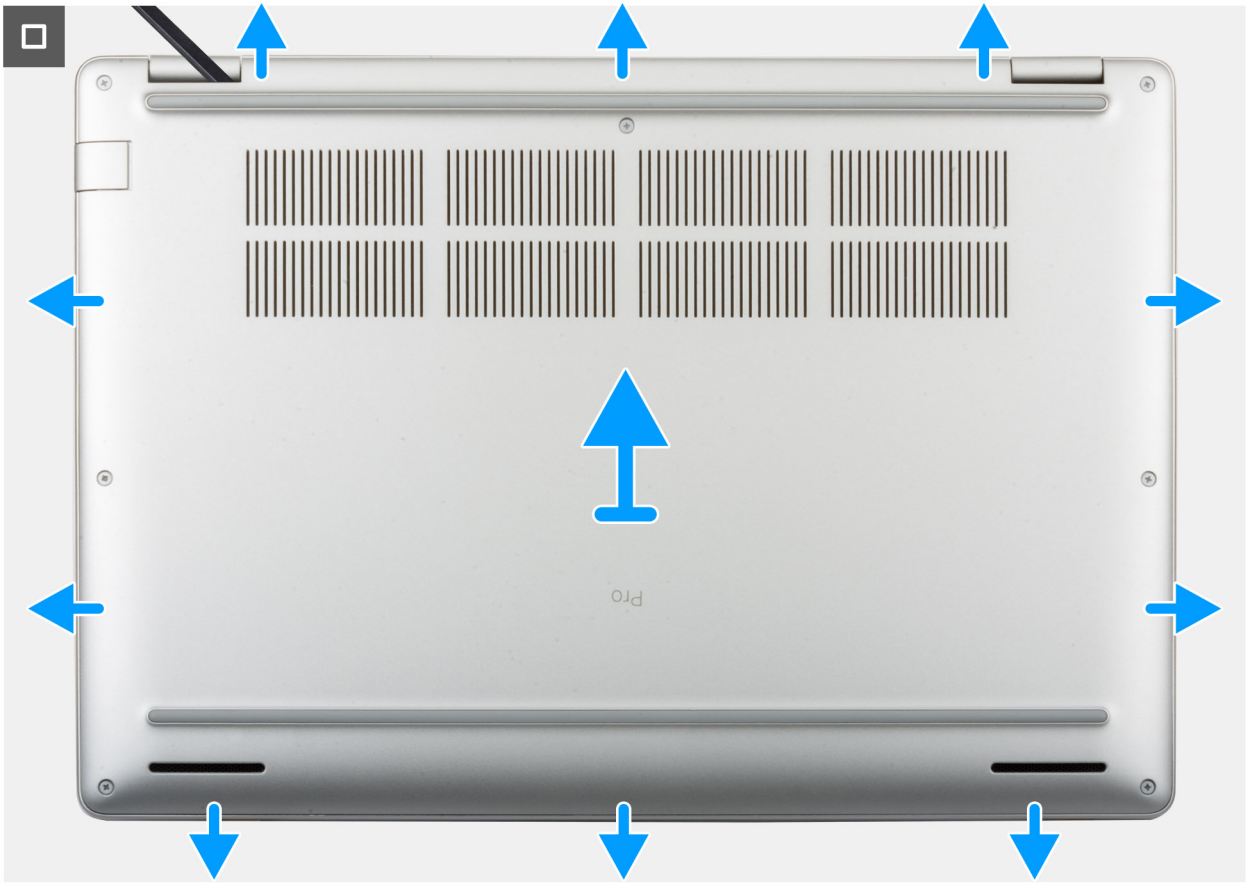


Figure 14. Removing the base cover

Steps

1. Loosen the eight captive screws that secure the base cover to the palm-rest assembly.
2. Using a plastic scribe, pry open the base cover from the recesses that are located in the U-shaped indents at the top edge of the base cover near the hinges.
3. Lift the base cover off the palm-rest assembly.

NOTE:

Ensure that your computer is in Service Mode. If your computer is unable to enter Service Mode, peel off the tape and disconnect the battery cable from the battery-cable connector (BATT1) on the system board. Press and hold the power button for five seconds to ground the computer and drain the flea power.

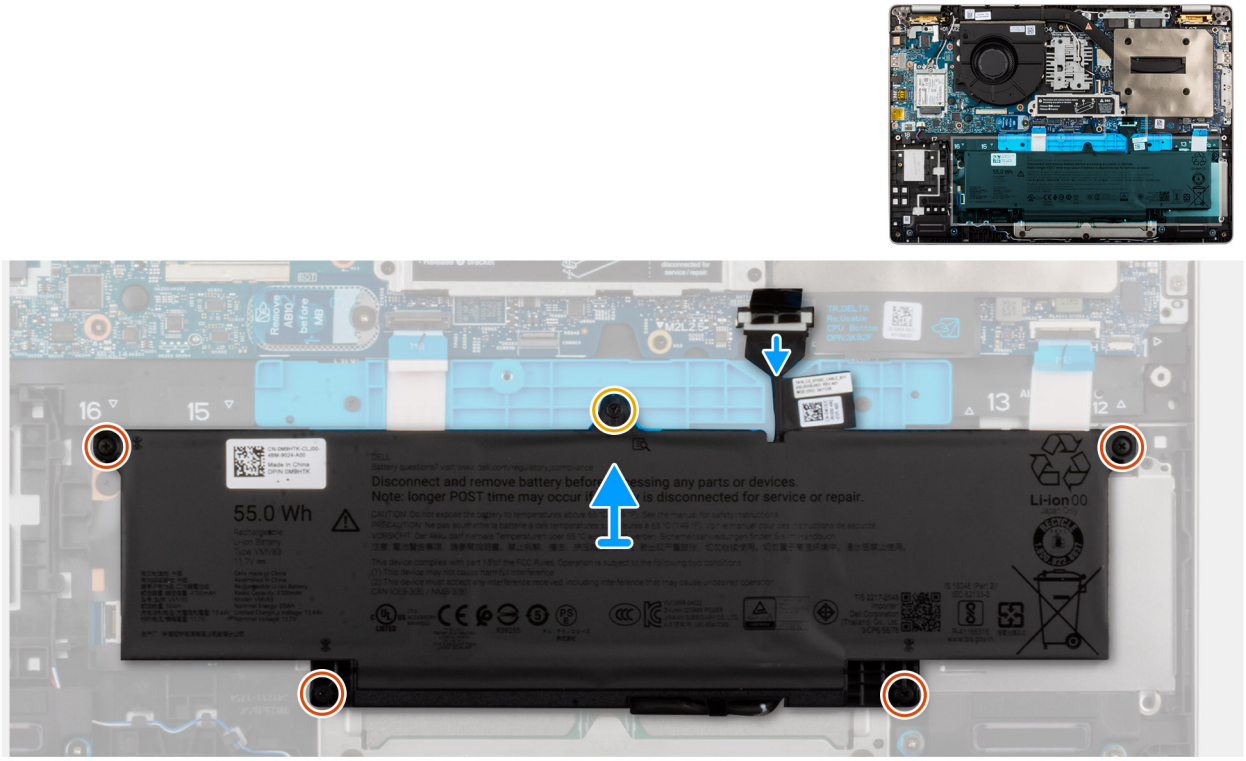


Figure 15. Disconnecting the battery cable

4. Press and hold the power button for five second to ground the computer and drain the flea power.

Installing the base cover

Prerequisites

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

About this task

The following images indicate the location of the base cover and provide a visual representation of the Installing procedure.

Figure 16. Connecting the battery cable

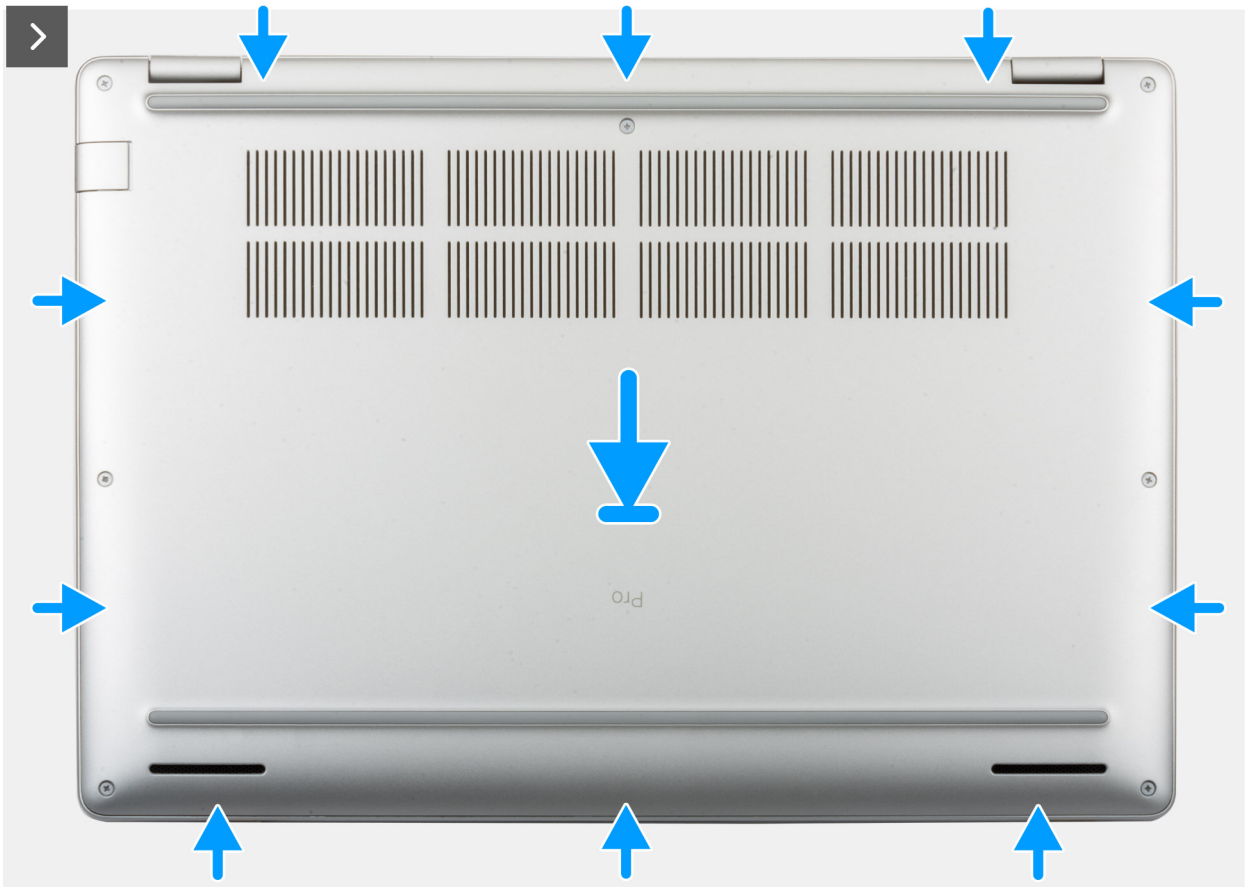


Figure 17. Installing the base cover

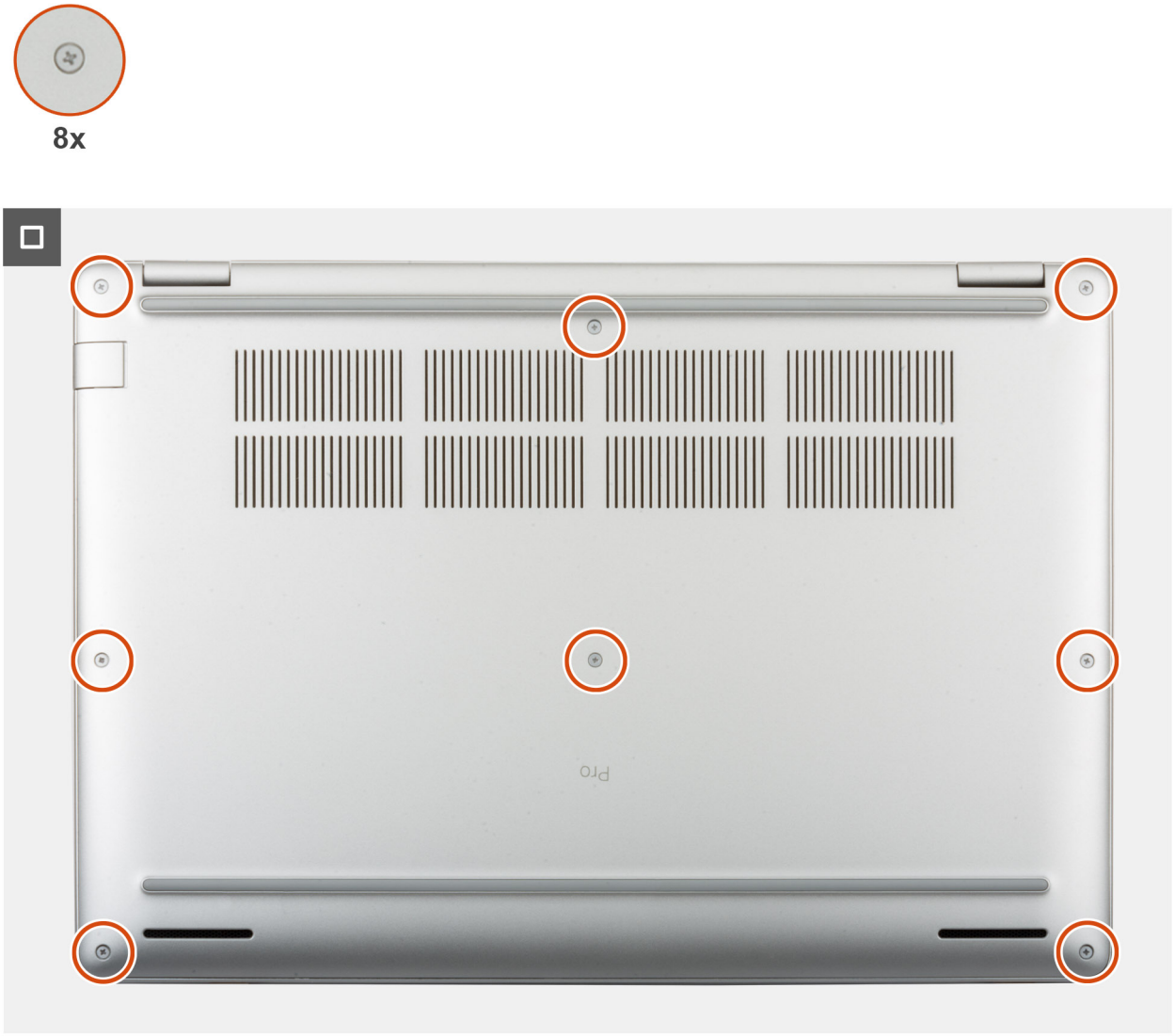


Figure 18. Installing the base cover

NOTE: If you have disconnected the battery cable, ensure to connect the battery cable. To connect the battery cable, follow step 1 in the procedure.

Steps

1. Connect the battery cable to the battery-cable connector (BATT1) on the system board.
2. Adhere the tape on the battery cable to the battery.
3. Align the screw holes on the base cover with the screw holes on the palm-rest assembly, and then snap the base cover into pla
4. Tighten the eight captive screws that secure the base cover to the palm-rest assembly.

Next steps

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

   NOTE: Ensure that your computer is in Service Mode. For more information, see Before working inside your computer.

2. Install the SIM-card tray (optional).

Battery

Rechargeable Li-ion battery precautions

WARNING:

- **Exercise caution when handling rechargeable Li-ion batteries.**
- **Discharge the battery completely before removing it. Disconnect the AC power adapter from the computer and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button is pressed.**
- **Do not crush, drop, mutilate, or penetrate the battery with foreign objects.**
- **Do not expose the battery to high temperatures, or disassemble battery packs and cells.**
- **Do not apply pressure to the surface of the battery.**
- **Do not bend the battery.**
- **Do not use tools of any kind to pry on or against the battery.**
- **To prevent accidental puncture or damage to the battery and other components, ensure that no screws are lost or misplaced during the servicing of the computer.**
- **Always purchase genuine batteries from Dell Site or authorized Dell partners and resellers.**
- **Swollen batteries should not be used and should be replaced and disposed properly. For guidelines on how to handle and replace swollen rechargeable Li-ion batteries, see Handling swollen rechargeable Li-ion batteries.**

Removing the battery

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.

About this task

CAUTION: Removing the battery resets the BIOS settings to the default values. It is recommended that you note the BIOS settings before removing the battery.

The following images indicate the location of the battery and provide a visual representation of the removal procedure.

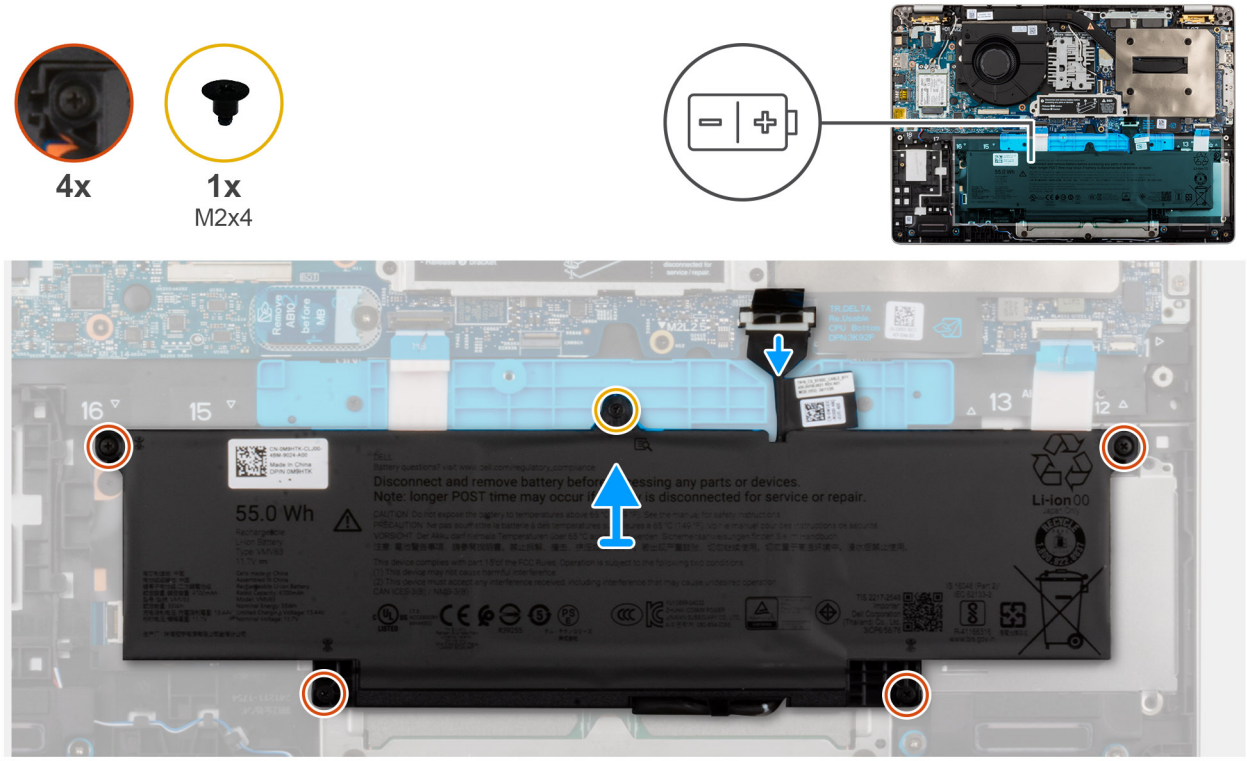


Figure 19. Removing the battery

Steps

1. Disconnect the battery cable from the battery cable connector (PBATT1) on the system board (if not disconnected earlier).
2. Loosen the four captive screws that secure the battery to the palm-rest assembly.
3. Remove the screw (M2x4) that secures the battery to the palm-rest assembly.
4. Lift the battery off the palm-rest assembly.
5. If you are replacing the battery, remove the battery cable to transfer it to the replacement battery. For more information, see Removing the battery cable.

Installing the battery

Prerequisites

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

About this task

The following images indicate the location of the battery and provide a visual representation of the installation procedure.

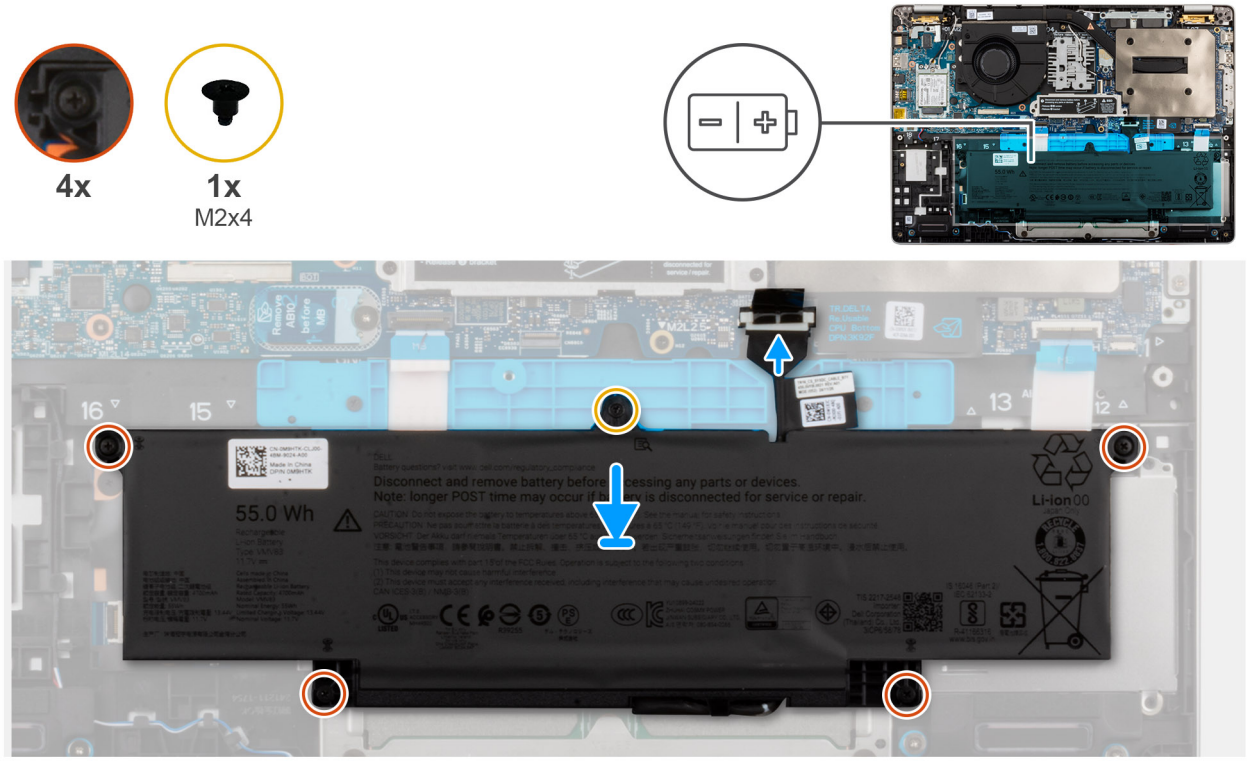


Figure 20. Installing the battery

Steps

1. If the battery cable was removed for replacing the battery, you must transfer the battery cable from the old battery to the replacement battery. For more information, see Installing the battery cable.
2. Align the screw holes on the battery with the screw holes on the palm-rest assembly.
3. Tighten the four captive screws that secure the battery to the palm-rest assembly.
4. Replace the screw (M2x4) that secures the battery to the palm-rest assembly.
5. Connect the battery cable to the battery cable connector (BATT1) on the system board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the base cover.

Installing the battery

Prerequisites

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

About this task

The following images indicate the location of the battery and provide a visual representation of the installation procedure.

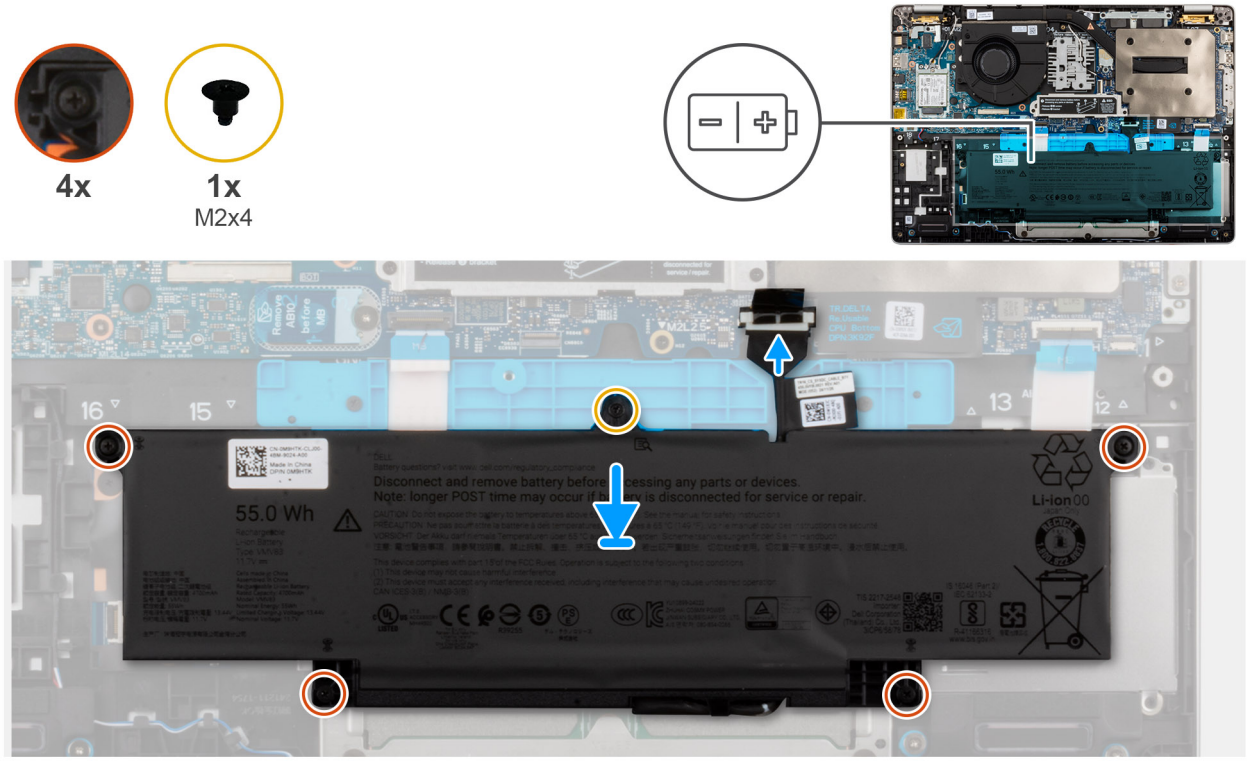


Figure 21. Installing the battery

Steps

1. If the battery cable was removed for replacing the battery, you must transfer the battery cable from the old battery to the replacement battery. For more information, see Installing the battery cable.
2. Align the screw holes on the battery with the screw holes on the palm-rest assembly.
3. Tighten the four captive screws that secure the battery to the palm-rest assembly.
4. Replace the screw (M2x4) that secures the battery to the palm-rest assembly.
5. Connect the battery cable to the battery cable connector (BATT1) on the system board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the base cover.

Battery cable

Removing the battery cable

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.

About this task

The following images indicate the location of the battery cable and provide a visual representation of the removal procedure.

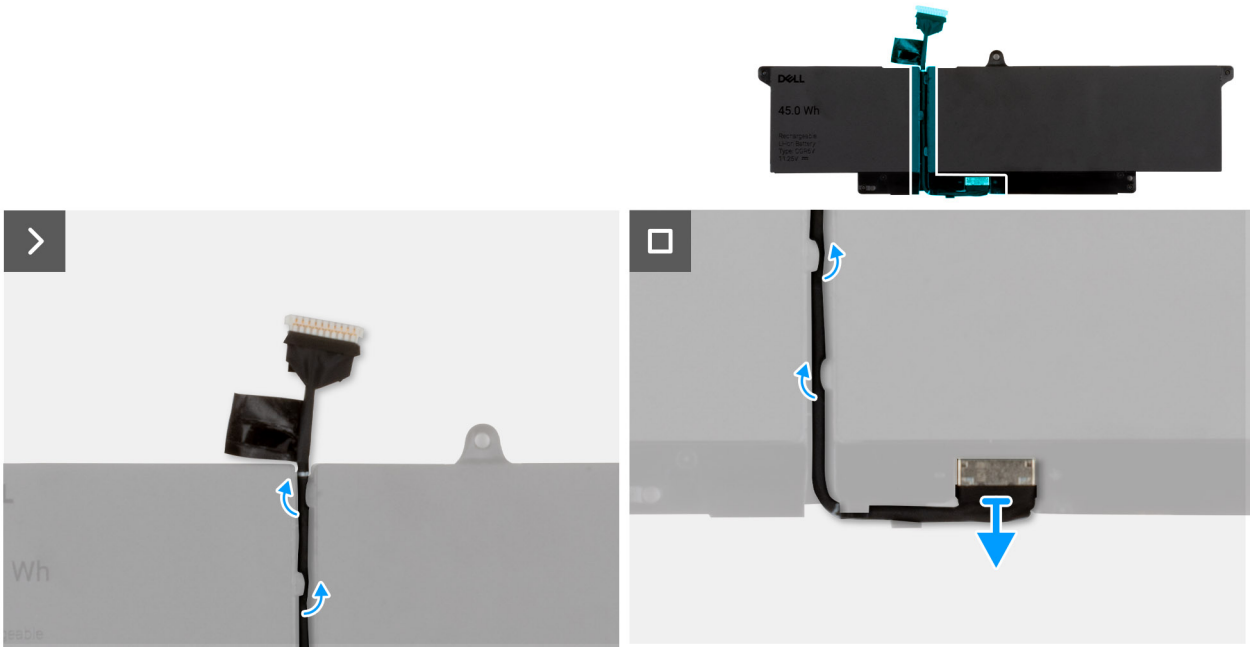


Figure 22. Removing the battery cable

Steps

1. Remove the battery cable from the routing guides on the battery.
2. Disconnect the battery cable from the connector on the battery.

Installing the battery cable

Prerequisites

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

About this task

The following images indicate the location of the battery cable and provide a visual representation of the installation procedure.

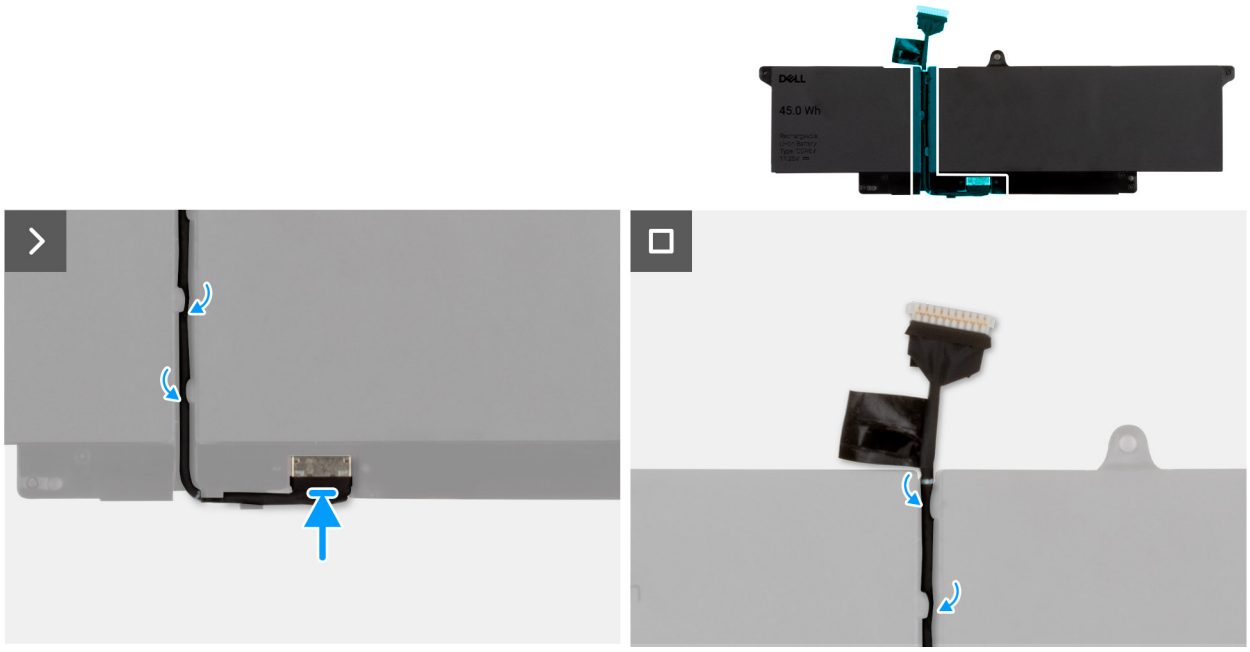


Figure 23. Installing the battery cable

Steps

1. Connect the battery cable to the connector on the battery.
2. Align and route the battery cable through the routing guides on the battery.

   NOTE: When installing the battery cable, ensure that the cable is properly routed under the securing tabs.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the battery.
4. Install the base cover.

Solid State Drive (SSD)

Removing the M.2 2230 SSD

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.

About this task

The following images indicate the location of the M.2 2230 SSD and provide a visual representation of the removal procedure.

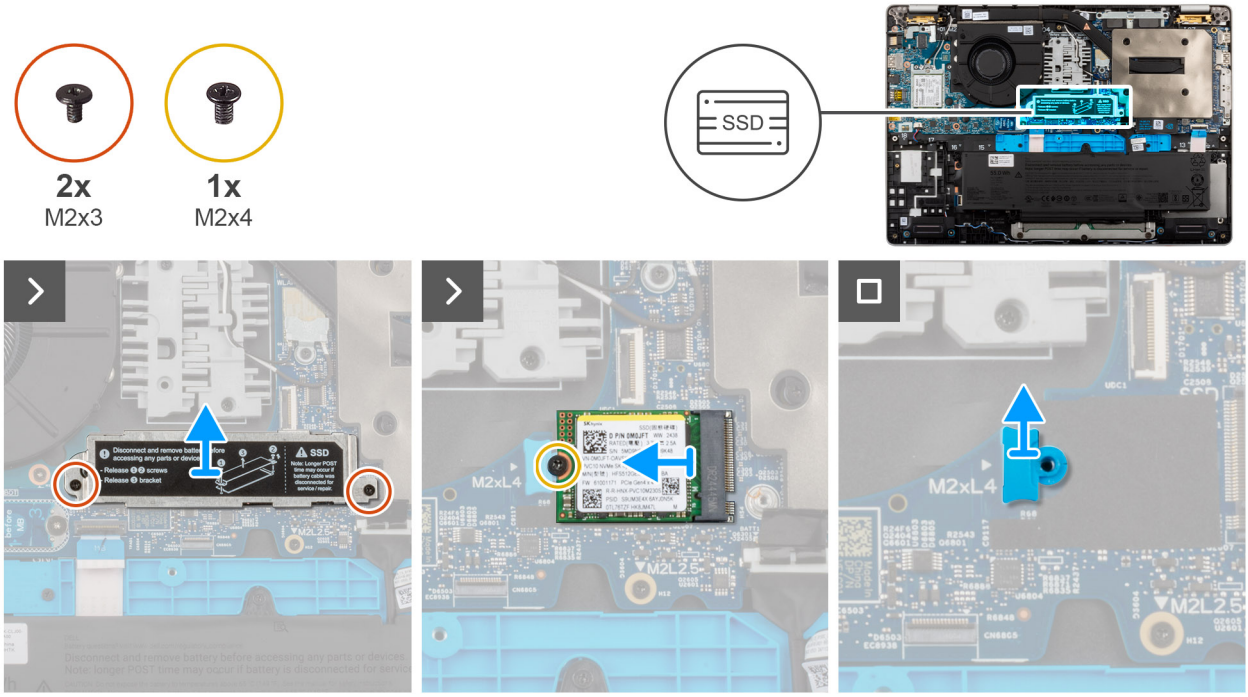


Figure 24. Removing the M.2 2230 SSD

Steps

1. Remove the two screws (M2x3) that secure the SSD thermal shield to the palm-rest assembly.
2. Remove the SSD thermal shield off the SSD.

   NOTE: If the thermal pads get separated from the shielding cover or are adhered to the SSD while replacing the SSD, they must be adhered back to the SSD cover before reinstalling it to the computer.

3. Remove the screw (M2x4) that secures the M.2230 SSD to the system board.
4. Lift the M.2 2230 SSD mounting bracket off the system board.

   NOTE: For models shipped with M.2 2230 SSD, ensure that the SSD mounting bracket is transferred when the system board is removed or replaced.

Installing the M.2 2230 SSD

Prerequisites

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

About this task

The following images indicate the location of the M.2 2230 SSD and provide a visual representation of the installation procedure.

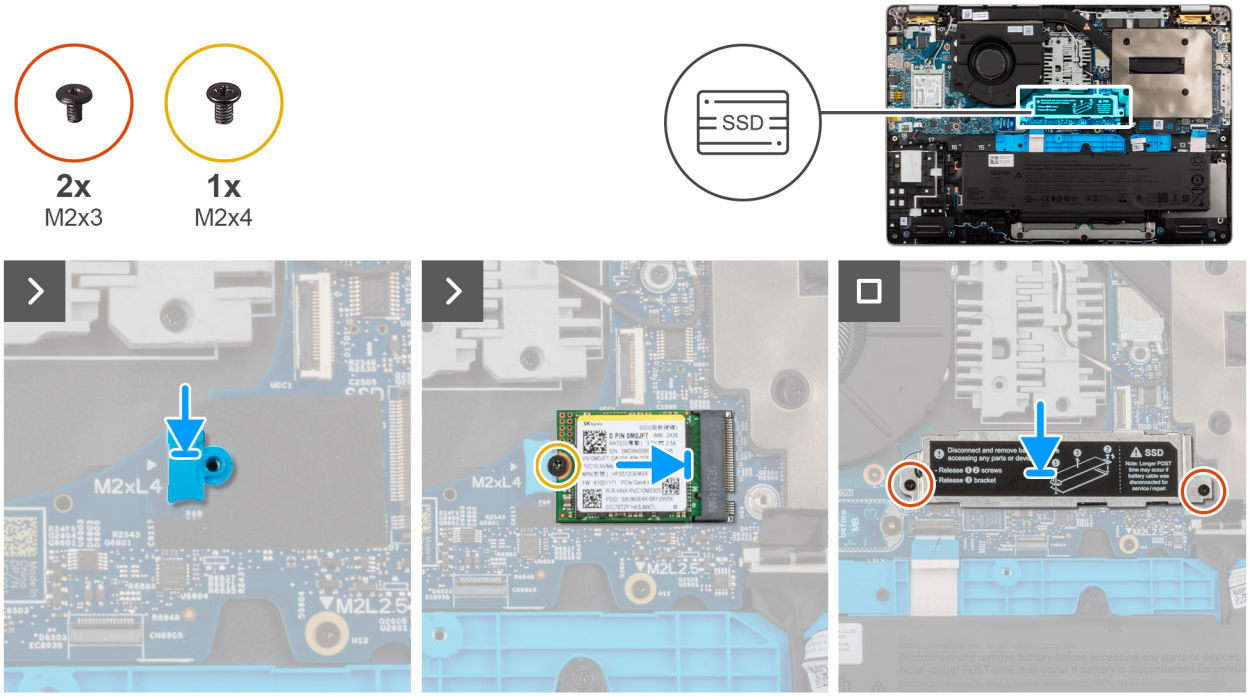


Figure 25. Installing the M.2 2230 SSD

Steps

1. Align and place the M.2 2230 SSD mounting bracket on its slot on the system board.
2. Align the notch on the M.2 2230 SSD with the tab on the M.2 2230 SSD slot.
3. Slide the M.2 2230 SSD on to its slot on the system board.
4. Replace the screw (M2x4) that secure the M.2 2230 SSD to the system board.
5. Align the screw holes on the SSD thermal shield with the screw holes on the system board.
6. Replace the two screws (M2x3) that secures the SSD thermal shield to the system board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the base cover.

Removing the M.2 2280 SSD

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.

About this task

The following images indicate the location of the M.2 2280 SSD and provide a visual representation of the removal procedure.

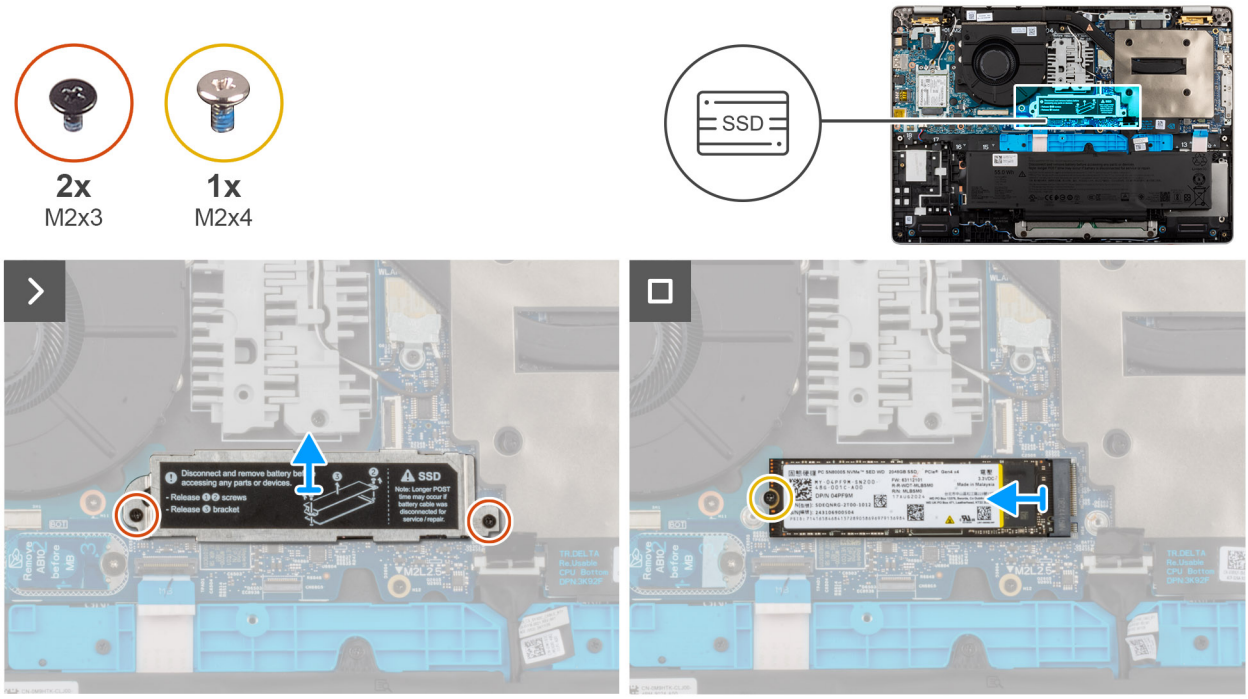


Figure 26. Removing the M.2 2280 SSD

Steps

1. Remove the two screws (M2x3) that secure the SSD thermal shield to the system board.
2. Lift the M.2 2280 SSD thermal shield off the SSD .

   NOTE: If the thermal pads get separated from the shielding cover or gets adhered to the SSD while replacing the SSD, the technicians must readhere the thermal pad to the SSD cover before reinstalling it to the computer.

3. Remove the screw (M2x4) that secure the M.2 2280 SSD to the system board.
4. Slide and remove the M.2 2280 SSD off the system board.

Installing the M.2 2280 SSD

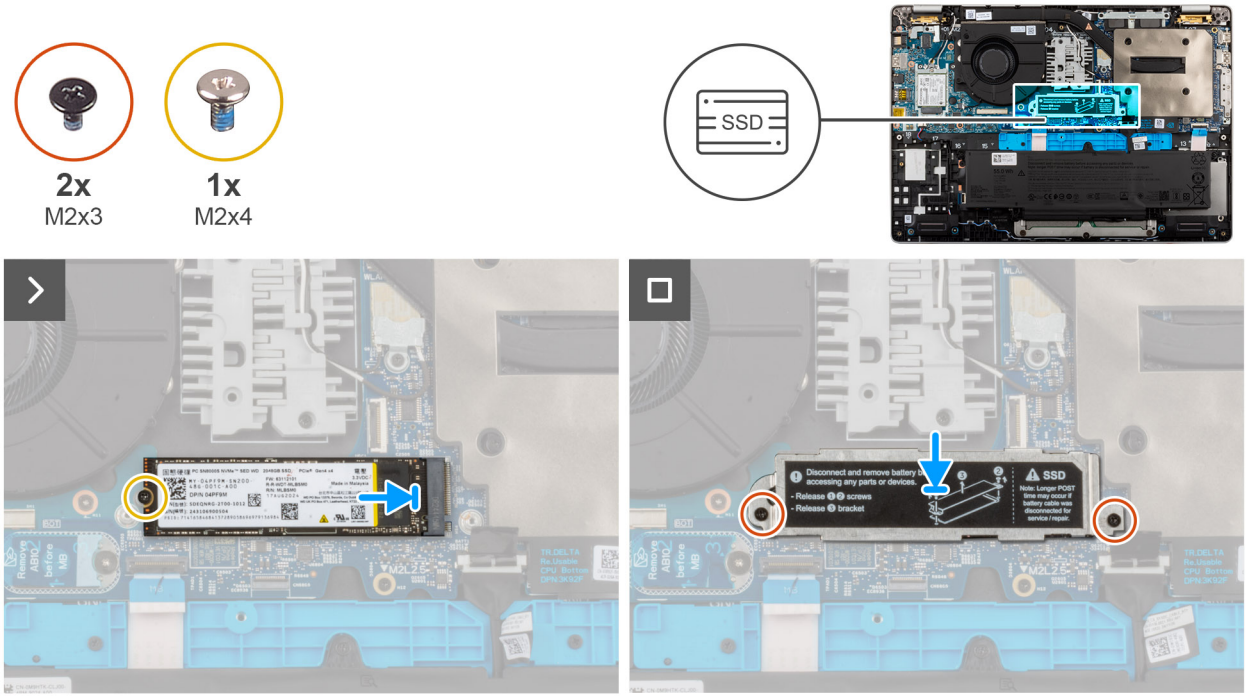
Prerequisites

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

About this task

The following images indicate the location of the M.2 2280 SSD and provide a visual representation of the installation procedure.

Figure 27. Installing the M.2 2280 SSD



Steps

1. Align the notch on the M.2 2280 SSD with the tab on the M.2 2280 SSD slot.
2. Slide the M.2 2280 SSD into the slot on the system board.
3. Replace the screw (M2x3) that secures the M.2 2280 SSD to the system board.
4. Align the screw holes on the SSD thermal shield with the screw holes on the system board.
5. Replace the two screws (M2x3) that secures the SSD thermal shield to the system board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the base cover.

Wireless Wide Area Network (WWAN) card

Removing the 4G WWAN card

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.

About this task

NOTE: The 4G WWAN card is available only on certain configurations. It is connected to the computer with two antenna cables.

The following images indicate the location of the 4G WWAN card and provide a visual representation of the removal procedure.

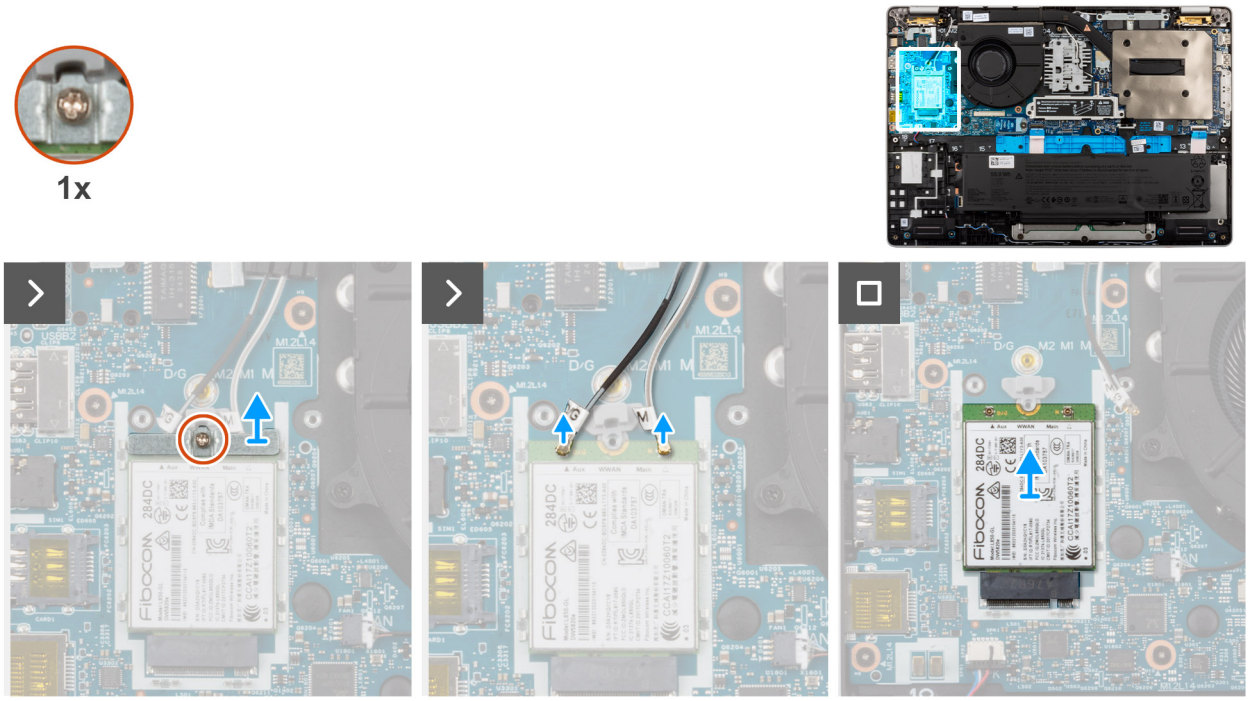


Figure 28. Removing the 4G WWAN card

Steps

1. Loosen the captive screw that secures the 4G WWAN-card bracket to the 4G WWAN card and palm-rest assembly.
2. Lift the 4G WWAN-card bracket off the 4G WWAN-card.
3. Disconnect the antenna cables from the 4G WWAN card.
4. Slide and remove the 4G WWAN card off the 4G WWAN-card slot on the I/O board.

Installing the 4G WWAN Card

Prerequisites

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

About this task

NOTE: The 4G WWAN card is available only on certain configurations. It is connected to the computer with two antenna cables.

The following images indicate the location of the 4G WWAN card and provide a visual representation of the installation procedure.

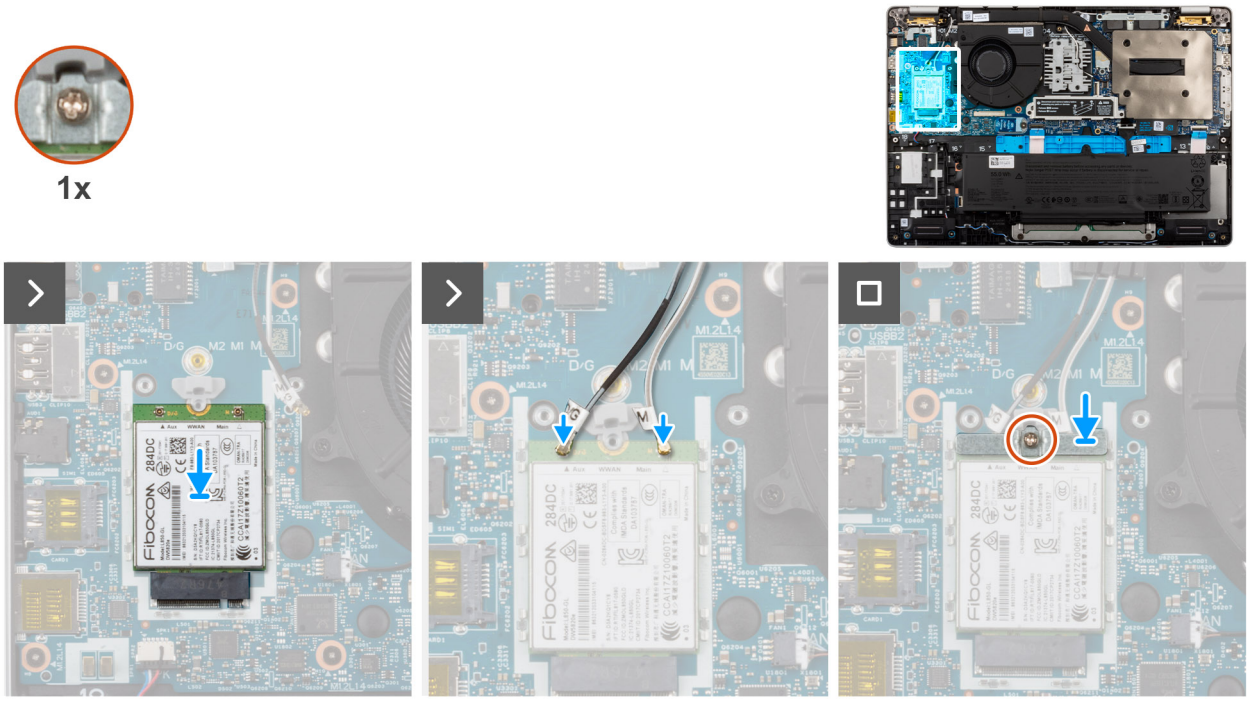


Figure 29. Installing the 4G WWAN card

Steps

1. Align the notch on the 4G WWAN card with the tab on the 4G WWAN-card slot.

   NOTE: If you are replacing the WWAN card, ensure that the thermal pad is in place.

   NOTE: If the thermal pad is damaged, peel the thermal pad from the system board and replace it with a new thermal pad. The thermal pad must be purchased separately.

2. Insert the 4G WWAN card at an angle into the 4G WWAN-card slot.
3. Connect the antenna cables to the 4G WWAN card.

   The following table provides the antenna-cable color scheme for the 4G WWAN card that is supported on your computer.

Table 35. Antenna-cable color scheme for 4G WWAN cards

Connectors on the WWAN card	Antenna-cable color	Silkscreen marking	
D/G	Black with a thin white stripe	ANT3 D/G	△ (white triangle)
M	White with a thin gray stripe	ANT0 M	△ (white triangle)

4. Align the captive screw hole on the 4G WWAN-card bracket with the screw hole on the 4G WWAN card and palm-rest assembly.
5. Tighten the screw that secures the 4G WWAN bracket to the palm-rest assembly.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM card tray (optional).
3. Install the base cover.

Speakers

Removing the speakers

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.

About this task

The following images indicate the location of the speakers and provide a visual representation of the removal procedure.

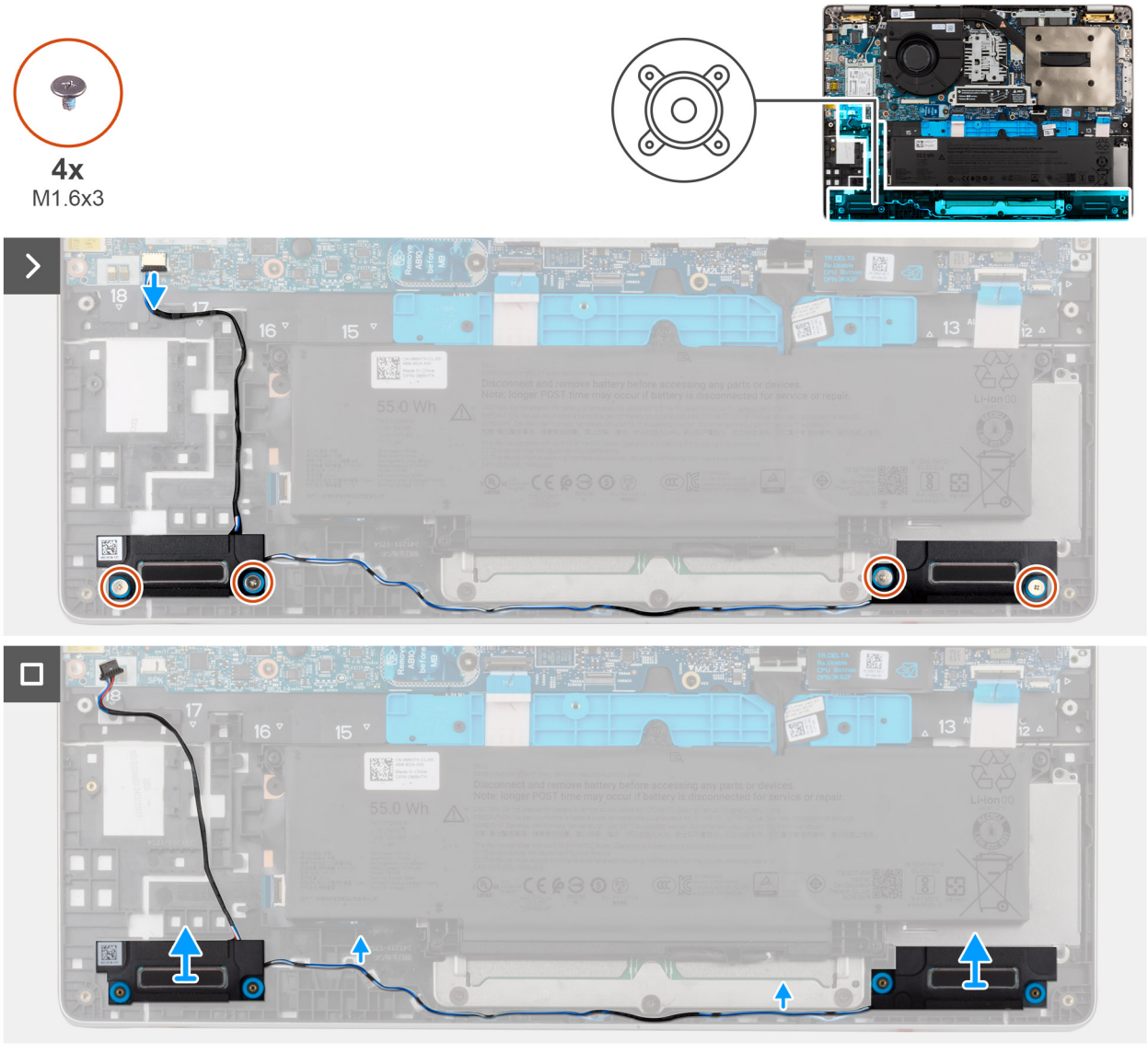


Figure 30. Removing the speakers

Steps

1. Disconnect the speaker cable from the speaker cable connector on the I/O board.
2. Remove the four screws (M1.6x3) that secure the speakers to the palm-rest assembly.

3. Remove the speaker cables from the routing guides on the palm-rest assembly.
4. Release the right and left speakers from the rubber grommets and lift the speakers along with the cable, off the palm-rest assembly.

Installing the speakers

Prerequisites

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

About this task

The following images indicate the location of the speakers and provide a visual representation of the installation procedure.

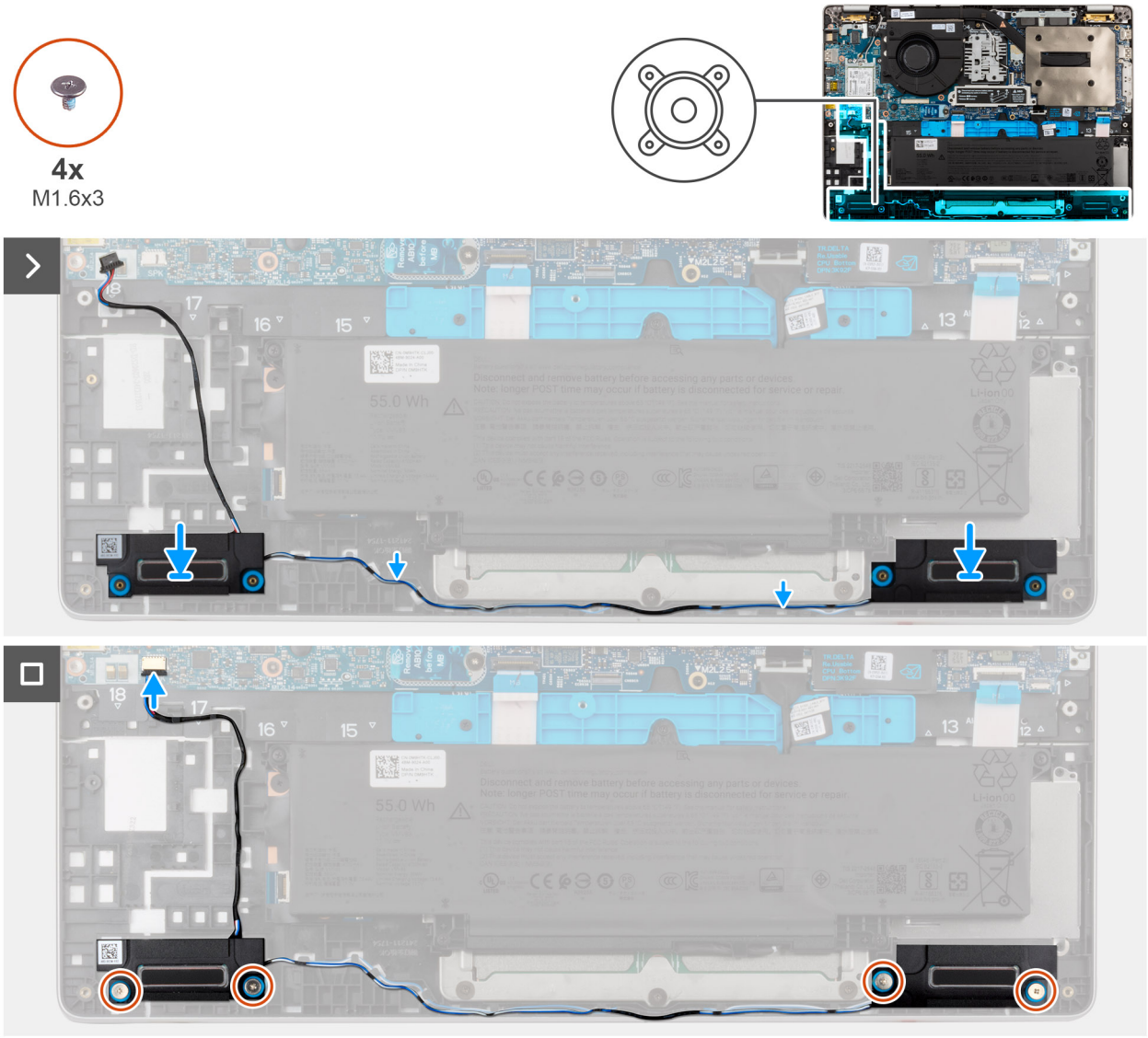


Figure 31. Installing the speakers

Steps

1. Using the alignment posts and rubber grommets, place the left and right speakers into their slots on the palm-rest assembly.

   NOTE: Ensure that the rubber grommets are seated into the slot and installed on the speakers properly.

2. Route the speaker cable through the routing guides on the palm-rest assembly.
3. Replace the four screws (M1.6x3) that secure the speakers to the palm-rest assembly.
4. Connect the speaker cable to the speaker cable connector on the I/O board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the base cover.

Fan

Removing the fan

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.

About this task

The following images indicate the location of the fan and provide a visual representation of the removal procedure.

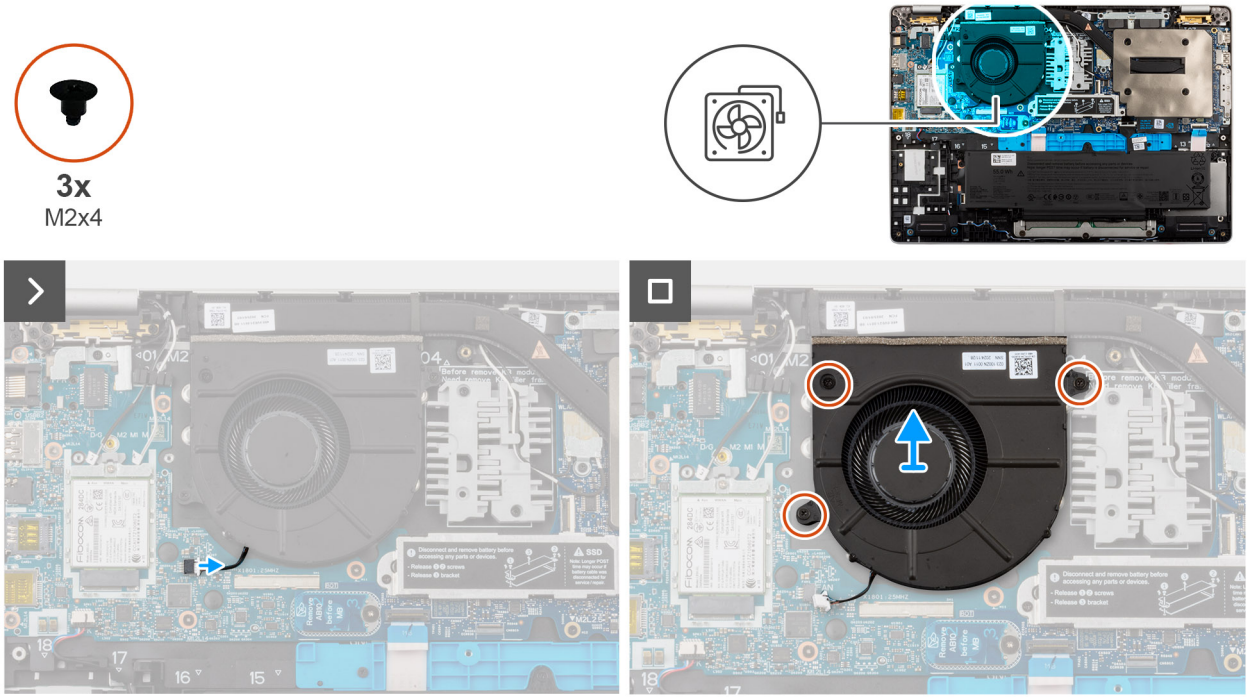


Figure 32. Removing the fan

Steps

1. Disconnect the fan cable from the fan-cable connector on the I/O board.
2. Remove the three screws (M2x4) that secure the fan to the palm-rest assembly.
3. Lift the fan off the palm-rest assembly.

Installing the fan

Prerequisites

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

About this task

The following images indicate the location of the fan and provide a visual representation of the installation procedure.

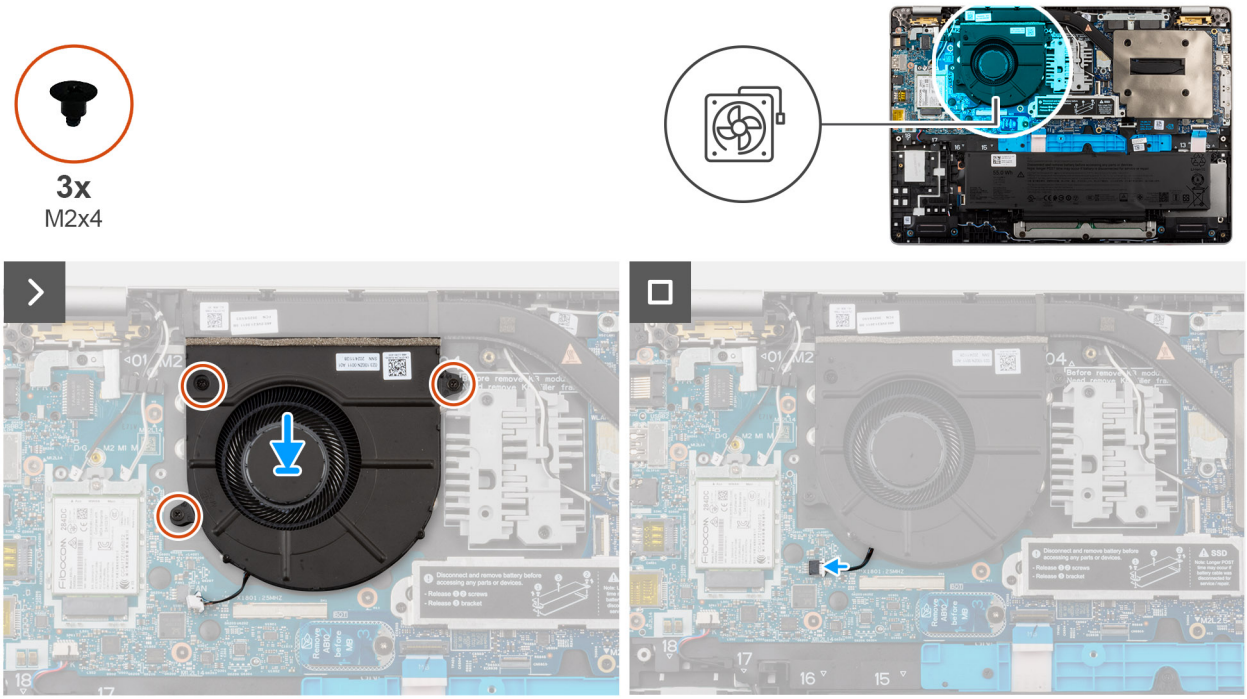


Figure 33. Installing the fan

Steps

1. Align the screw holes on the fan with the screw holes on the palm-rest assembly.
2. Replace the three screws (M2x4) that secure the fan to the palm-rest assembly.
3. Connect the fan cable to the fan-cable connector on the I/O board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the base cover.

6

Removing and installing Field Replaceable Units (FRUs)

The replaceable components in this chapter are Field Replaceable Units (FRUs).

CAUTION: The information in this section is intended for authorized service technicians only.

CAUTION: To avoid any potential damage to the component or loss of data, ensure that an authorized service technician replaces the Field Replaceable Units (FRUs).

CAUTION: Dell Technologies recommends that these procedures be performed by trained technical repair specialists.

CAUTION: Your warranty does not cover damages that may occur during FRU repairs that are not authorized by Dell Technologies.

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

USH board

Removing the USH board

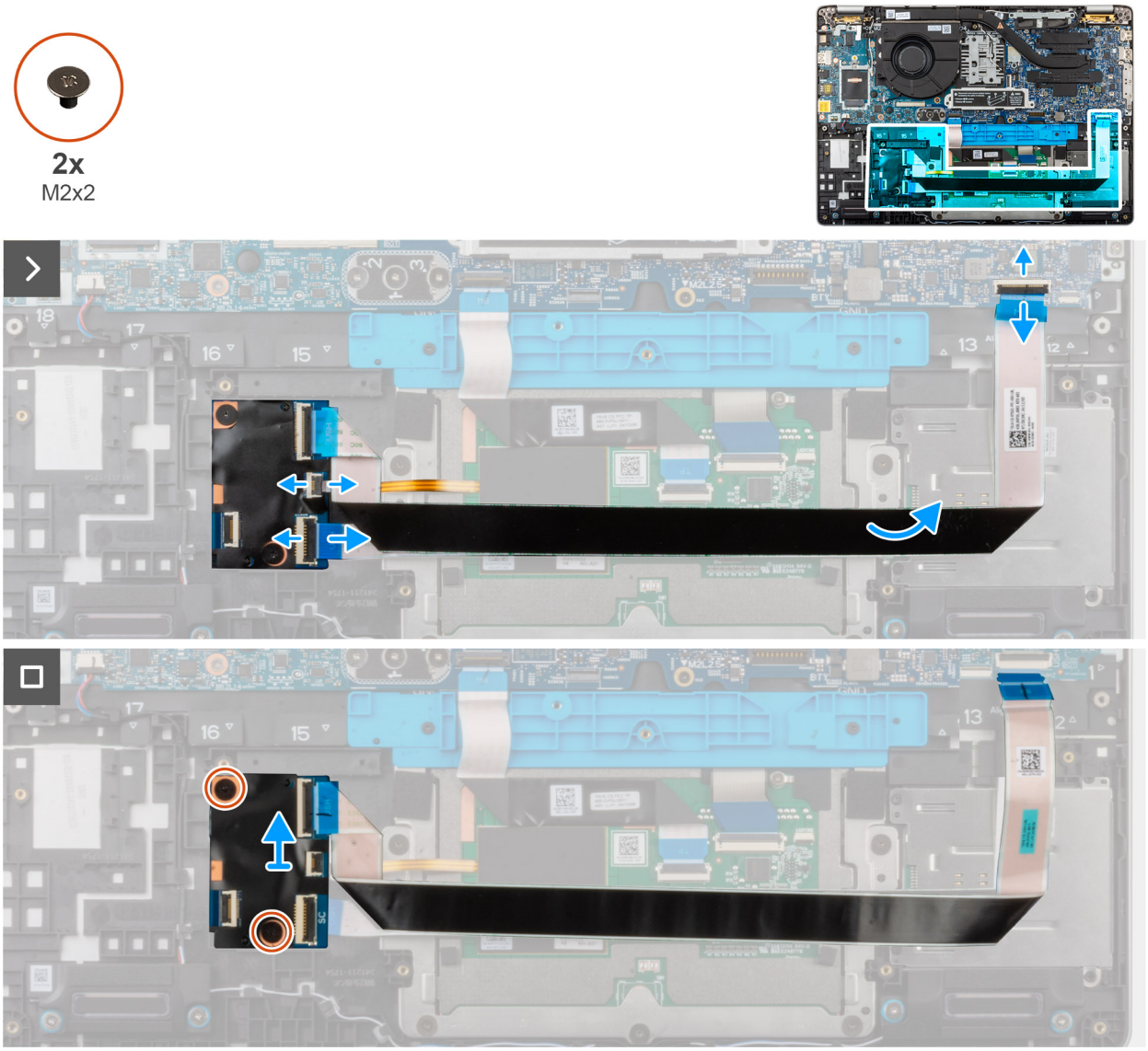
CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.

The following images indicate the location of the USH board and provide a visual representation of the removal procedure.

Figure 34. Removing the USH board



Steps

1. Open the latch and disconnect the smart card reader cable from the USH board.
2. Open the latch and disconnect the USH board cable from the system board.
3. Open the latch and disconnect the NFC cable from the USH board.
4. Gently peel off the USH board cable off the palm-rest assembly.
5. Remove the two screws (M2x2) that secure the USH board to the palm-rest assembly.
6. Lift the USH board off the palm-rest assembly.

Installing the USH board

CAUTION: The information in this installation section is intended for authorized service technicians only.

The following images indicate the location of the USH board and provide a visual representation of the installation procedure.

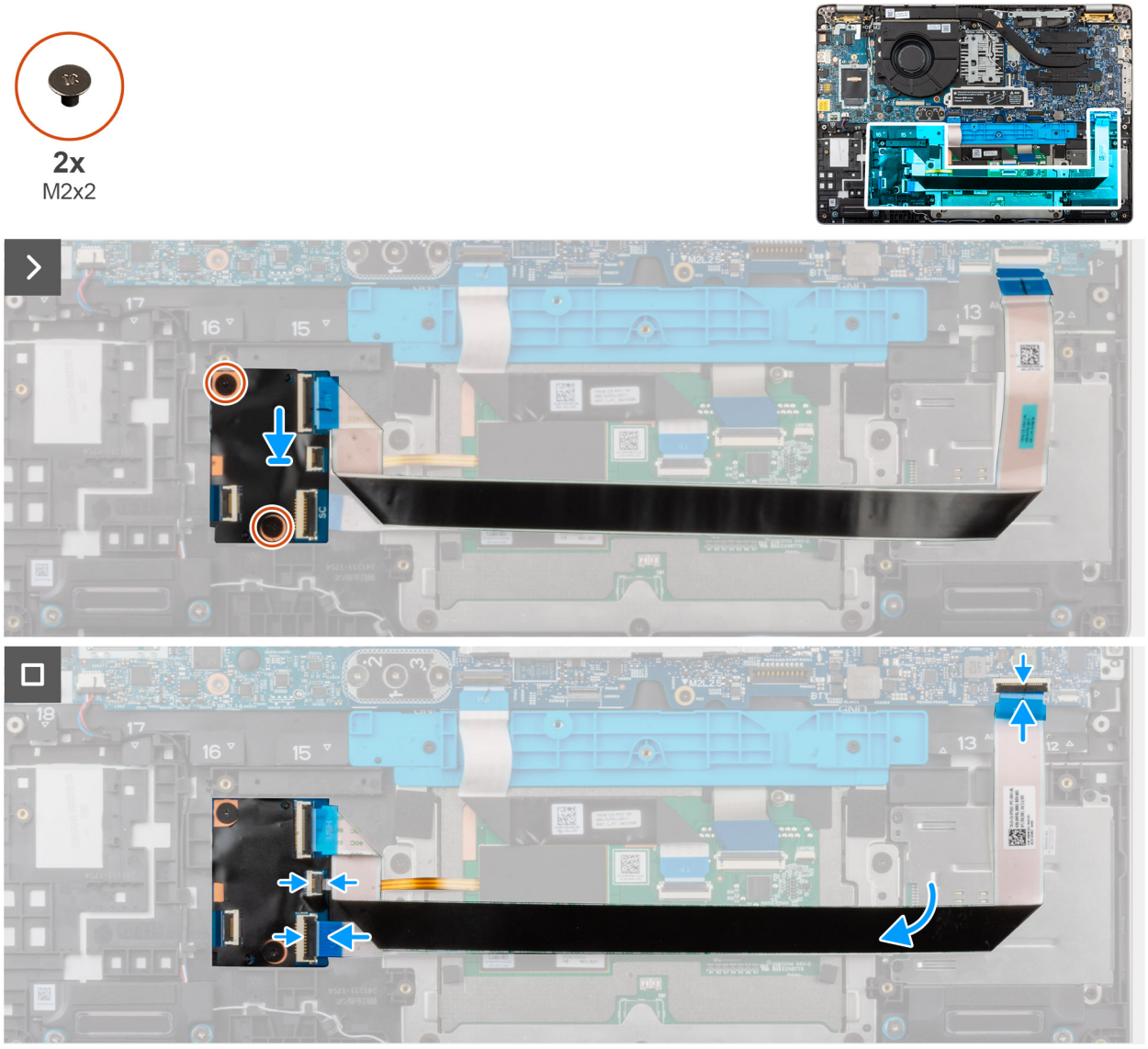


Figure 35. Installing the USH board

Steps

1. Align the screw holes on the USH board with the screw holes on the palm-rest assembly.
2. Replace the two screws (M2x2) that secure the USH board to the palm-rest assembly.
3. Connect the NFC cable to the connector on the USH board.
4. Connect the USH board cable to the connector on the system board.
5. Adhere the USH board cable to the palm-rest assembly.
6. Connect the smart card reader cable to the connector on the USH board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM card tray (optional).
3. Install the battery.

Smart card reader

Removing the Smart card reader (available only on select configurations)

CAUTION: The information in this removal section is intended for authorized service technicians only.

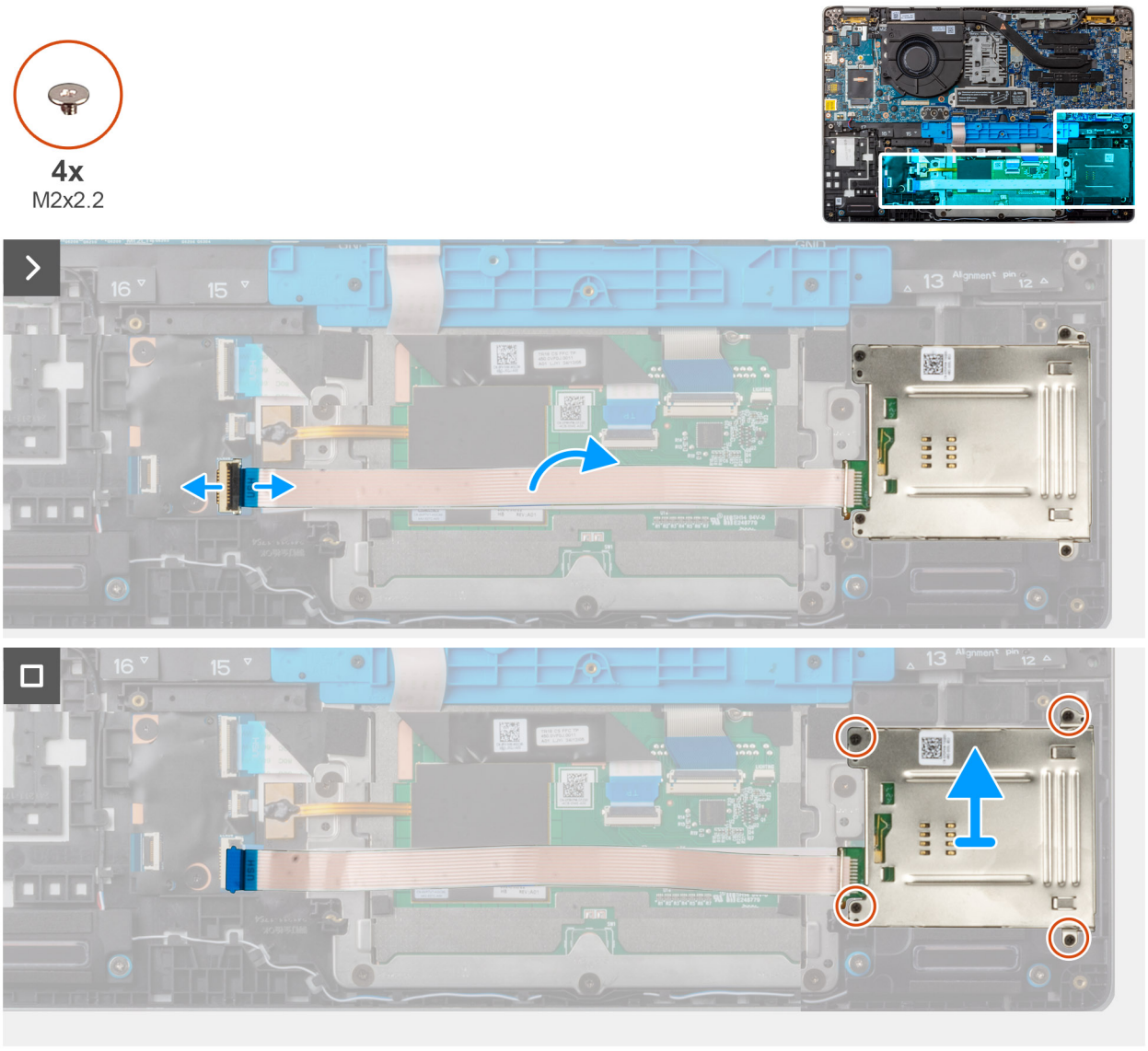
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.

About this task

The following images indicate the location of the smart card reader and provide a visual representation of the removal procedure.

Figure 36. Removing the Smart card reader



Steps

1. Open the latch and disconnect the smart card reader cable from the USH board.
2. Gently peel the smart card reader cable from the palm-rest assembly.
3. Remove the four screws (M2x2.2) that secure the smart card reader to the palm-rest assembly.
4. Lift the smart card reader off the palm-rest assembly.

Installing the Smart card reader (available only on select configurations)

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following images indicate the location of the smart card reader and provide a visual representation of the installation procedure.

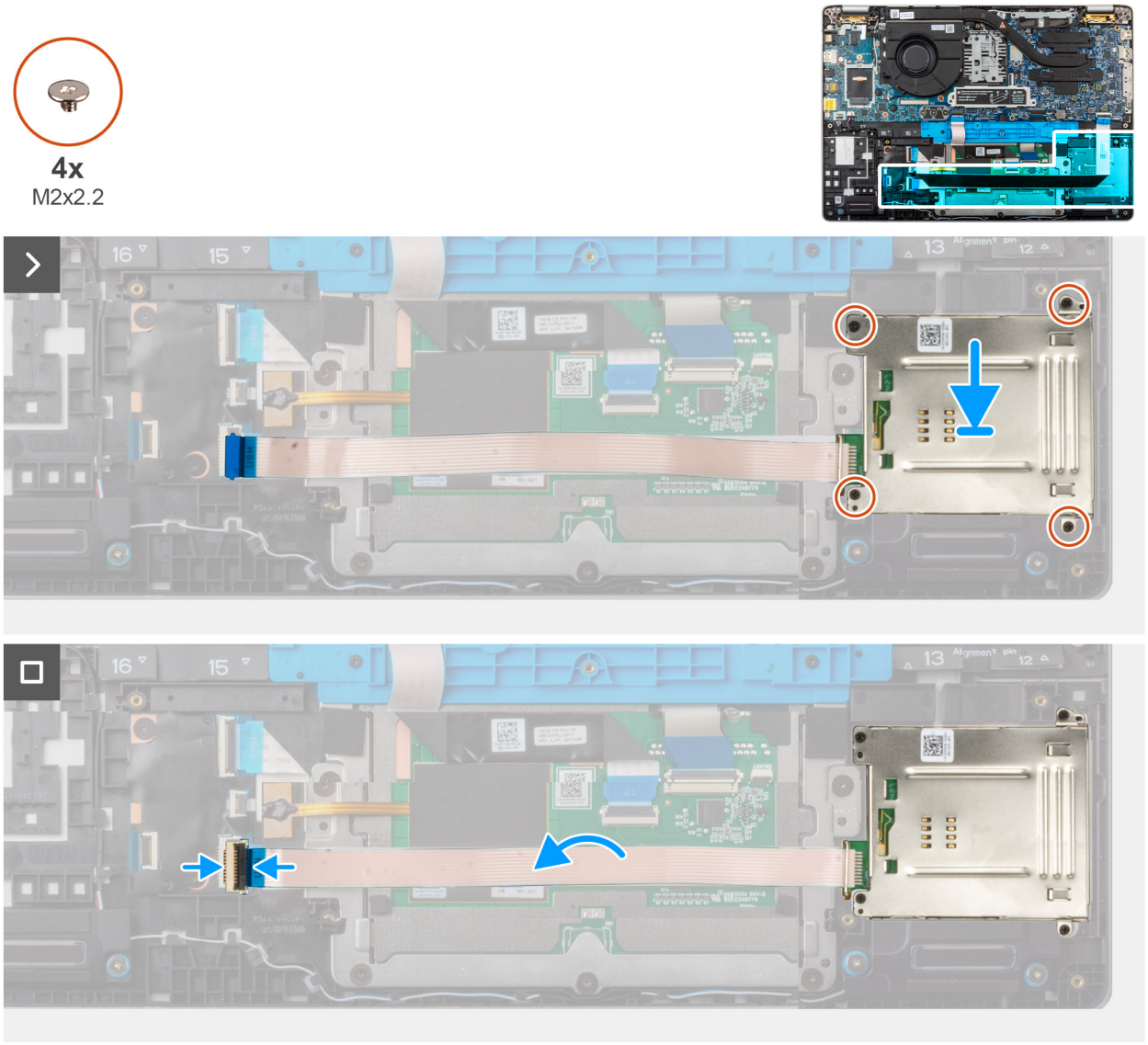


Figure 37. Installing the Smart card reader

Steps

1. Align and place the smart card reader on its slot on the palm-rest assembly.
2. Replace the four screws (M2x2.2) that secure the smart card reader to the palm-rest assembly.
3. Adhere the smart card reader cable to the palm-rest assembly.
4. Connect the smart card cable to the connector on the USH board and close the latch to secure the cable.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the battery.
4. Install the base cover.

Battery support bracket

Removing the battery support bracket

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.

About this task

The following images indicate the location of the battery support bracket and provide a visual representation of the removal procedure.

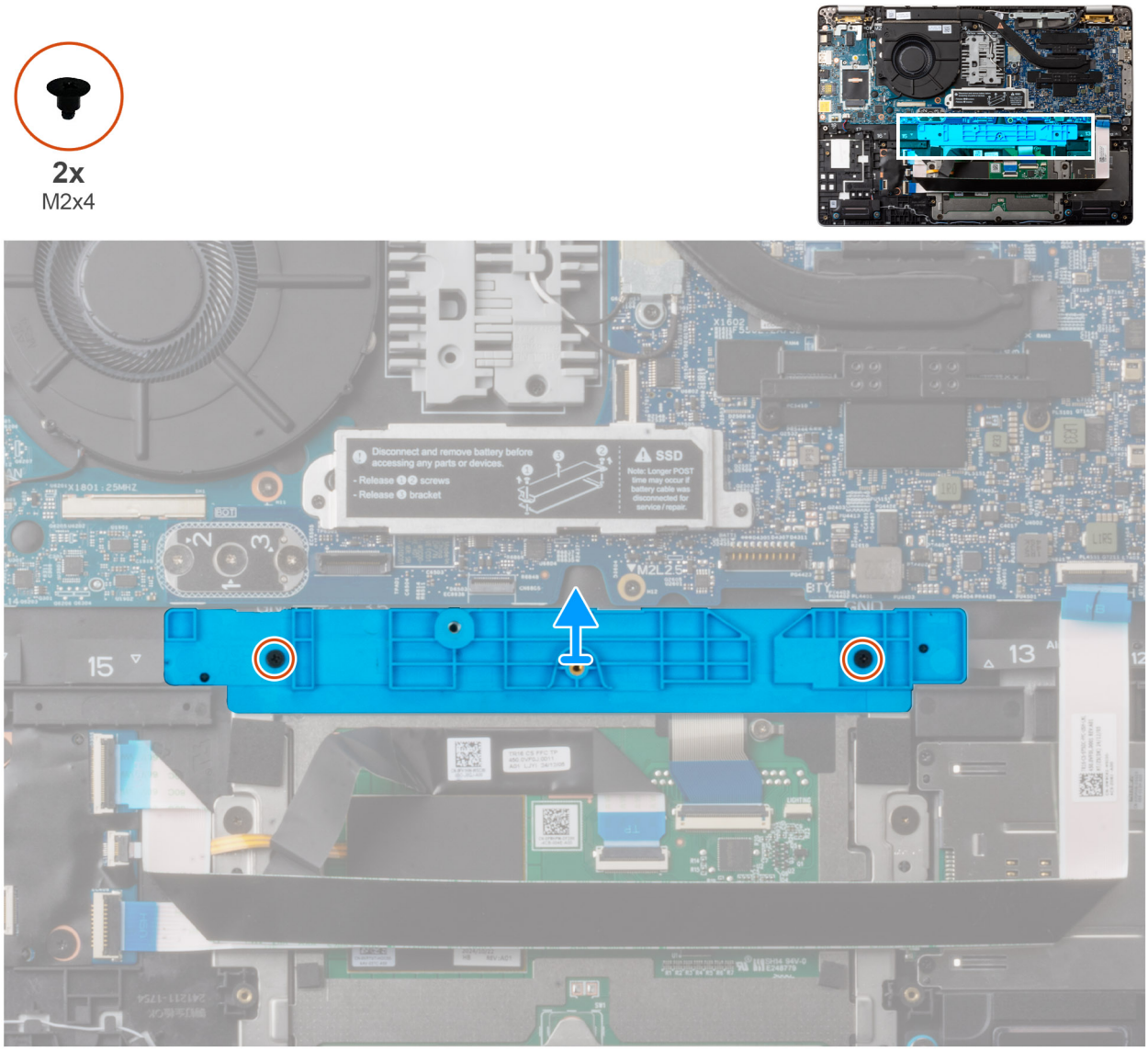


Figure 38. Removing the battery support bracket

Steps

1. Remove the two screws (M2x4) that secure the battery support bracket to the palm-rest assembly.
2. Lift the battery support bracket off the palm-rest assembly.

Installing the battery support bracket

Prerequisites

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

About this task

The following images indicate the location of the battery support bracket and provide a visual representation of the removal procedure.

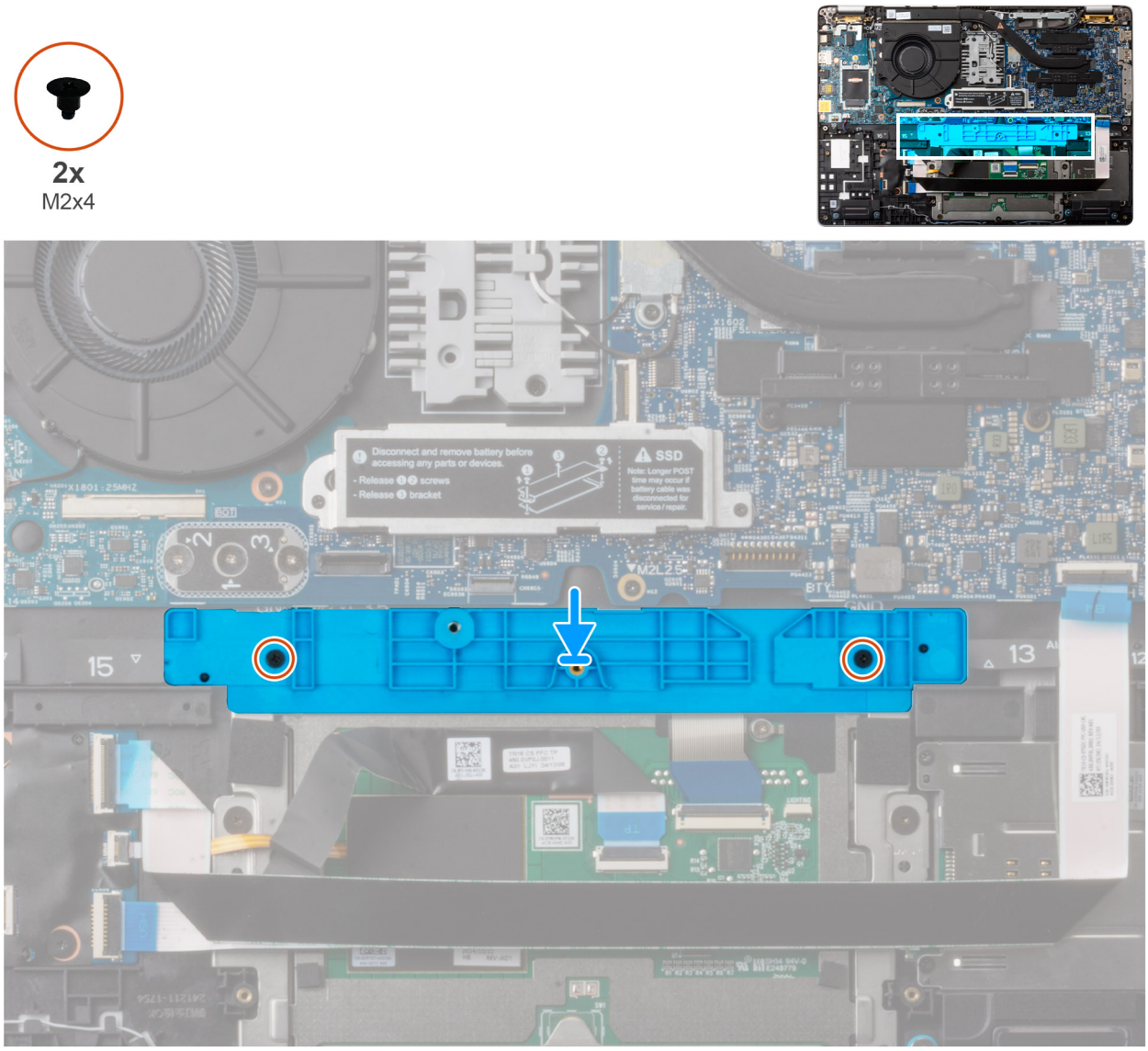


Figure 39. Installing the battery support bracket

Steps

1. Align and place the battery support bracket on its slot on the palm-rest assembly.
2. Replace the two screws (M2x4) that secure the battery support bracket to the palm-rest assembly.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the battery.
4. Install the base cover.

Heat sink

Removing the heat sink

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.
5. Remove the M.2 2230 or M.2.2280 SSD, as applicable.
6. Remove the display assembly.
7. Remove the system board.

About this task

NOTE: The heat sink may become hot during normal operation. Allow sufficient time for the heat sink to cool before you touch it.

NOTE: For maximum cooling of the processor, do not touch the heat transfer areas on the heat sink. The oils in your skin can reduce the heat transfer capability of the thermal grease.

The following images indicate the location of the heat sink and provide a visual representation of the removal procedure.

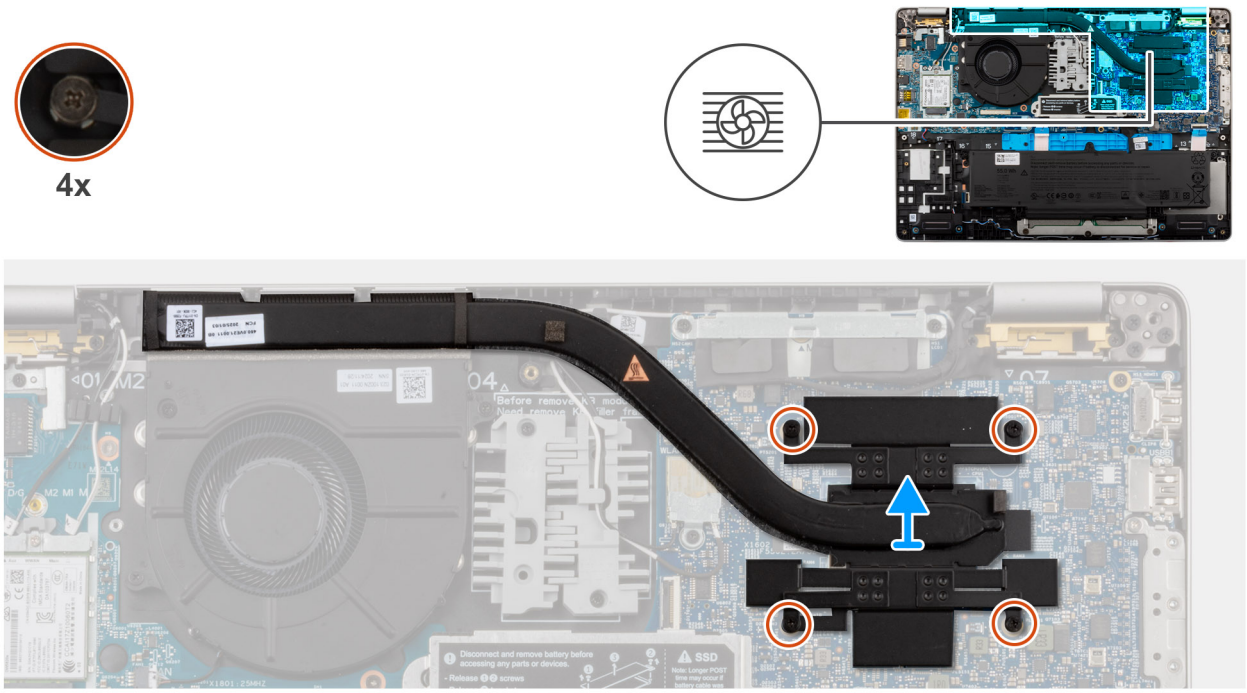


Figure 40. Removing the heat sink

Steps

1. Loosen the four captive screws that secure the heat sink to the system board.

   NOTE: Loosen the captive screws in the reverse sequential order mentioned on the heat sink [4 > 3 > 2 > 1].

2. Lift the heat sink off the system board.

Installing the heat sink

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following images indicate the location of the heat sink and provide a visual representation of the installation procedure.

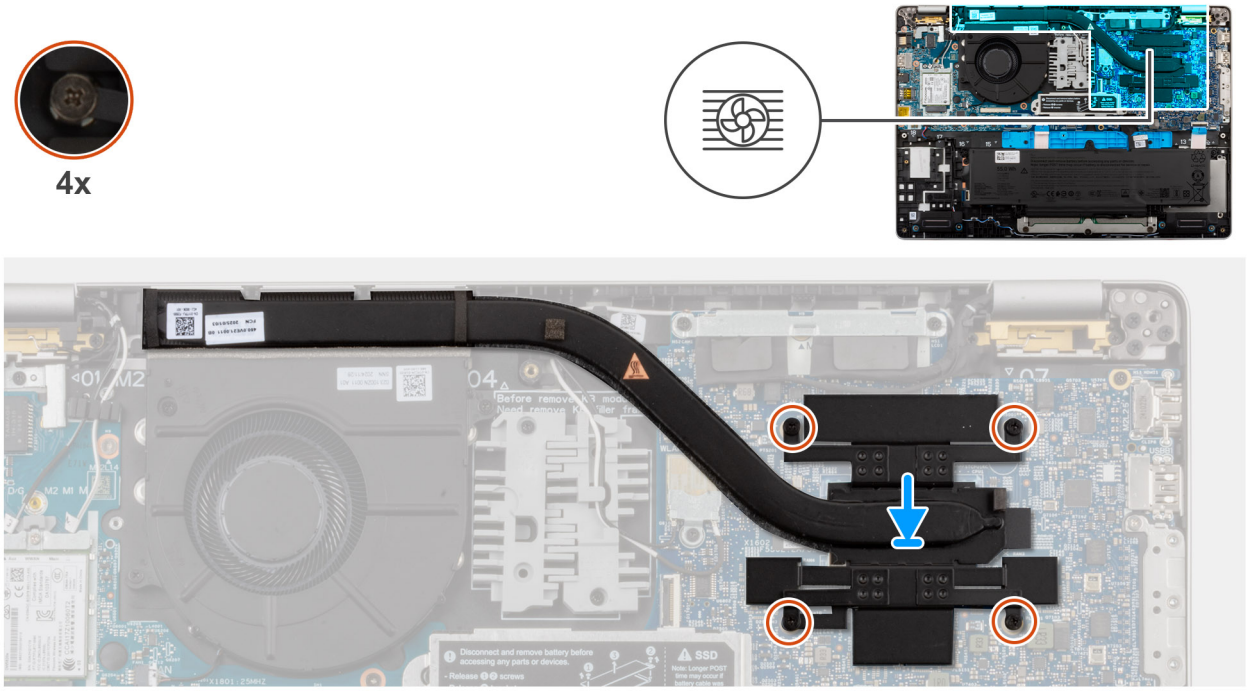


Figure 41. Installing the heat sink

Steps

1. Align and place the heat sink on the system board.
2. Tighten the four captive screws that secure the heat sink to the system board.

NOTE: Tighten the captive screws in the sequential order mentioned on the heat sink [1 > 2 > 3 > 4].

CAUTION: Incorrect alignment of the heat sink can damage the system board and processor.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the battery.
4. Install the base cover.
5. Install the M.2 2230 or M.2 2280 SSD, as applicable.
6. Install the display assembly.
7. Install the system board.

System board

Removing the system board

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

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

2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.
5. Remove the M.2 2230 or M.2.2280 SSD, as applicable.
6. Remove the display assembly.

About this task

The following image indicates the location of the connectors on the system board.

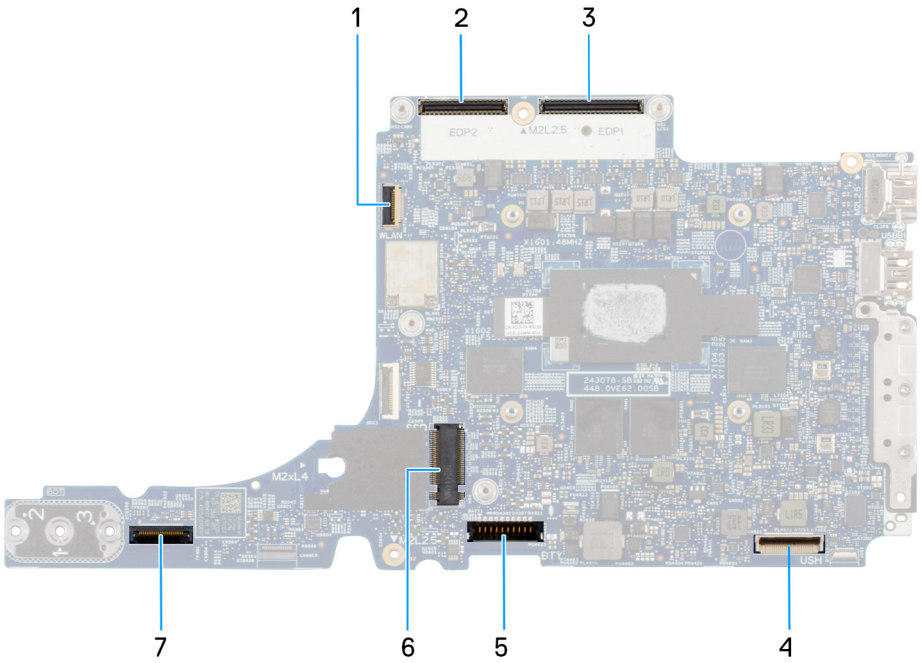
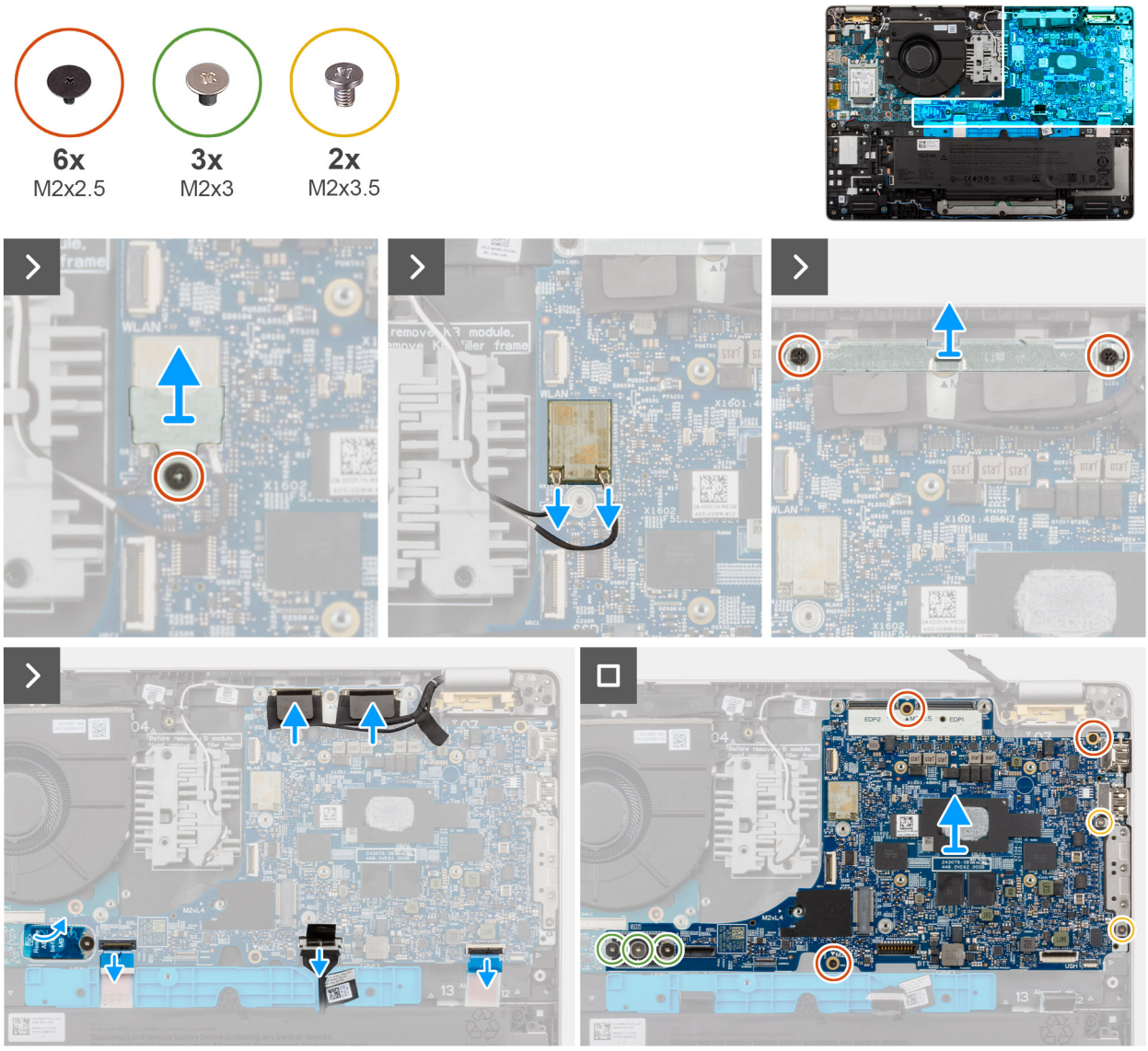


Figure 42. System board connectors

1. Wireless-card slot (WLAN)
2. Display-cable connector (LCD1)
3. Display-cable connector (LCD2)
4. Sensor board-cable connector
5. Battery-cable connector
6. Solid State Drive slot
7. USH cable connector

The following images indicate the location of the system board and provide a visual representation of the removal procedure.

Figure 43. Removing the system board



Steps

1. Remove the screw (M2x2.5) that secures the WLAN bracket to the system board.
2. Lift the WLAN bracket off the palm-rest assembly.
3. Disconnect the antenna cables from the WLAN card.
4. Remove the two screws (M2x2.5) that secure the display-cable bracket to the system board.
5. Lift the display-cable bracket off the palm-rest assembly.
6. Disconnect the camera cable from the connector on the system board.
7. Disconnect the display-cable from the display-cable connector (LCD1) on the system board.
8. Partly peel the mylar to access the screws on the middle bracket (AB10) that connects the I/O board and system board to the palm-rest assembly.
9. Disconnect the speaker cable from the I/O board.
10. Disconnect the battery cable from the system board.
11. Open the latch and disconnect the USH cable from the connector on the system board.
12. Remove the three screws (M2x3) that secures the system board and I/O board to the palm-rest assembly.
13. Remove the three screws (M2x2.5) that secure the system board to the palm-rest assembly.
14. Remove the two screws (M2x3.5) that secure the USB type-C module to the system-board assembly.
15. Lift the system board off the palm-rest assembly.

NOTE: The USB-C bracket is part of the system-board assembly. Do not remove the bracket from the system board.

NOTE: The USB-C connector module must be removed only while servicing the module. It must not be removed while removing the system board.

Installing the system board

CAUTION: The information in this installation section is intended for authorized service technicians only.

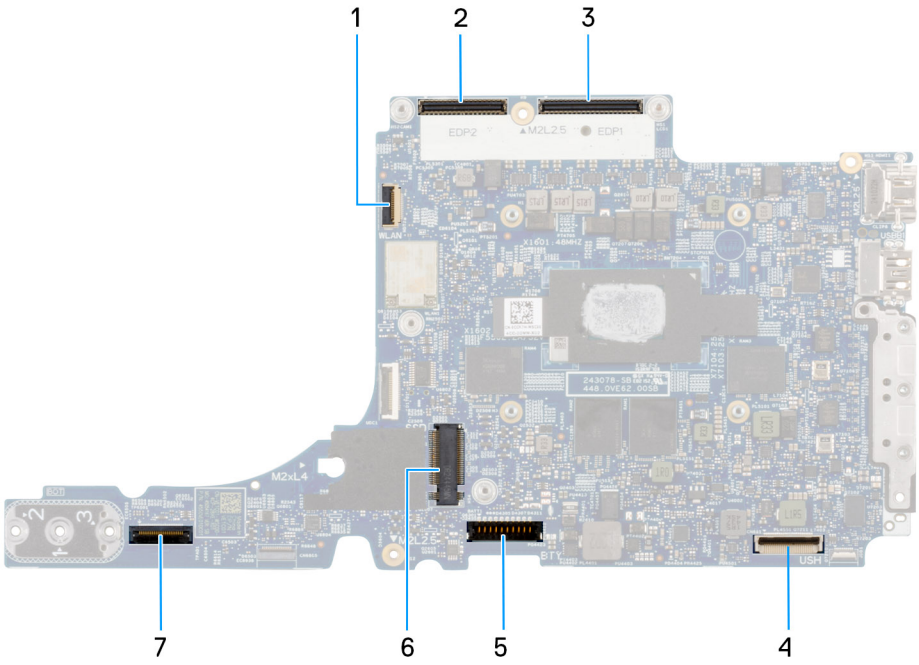
Prerequisites

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

About this task

The following image indicates the location of the connectors on the system board.

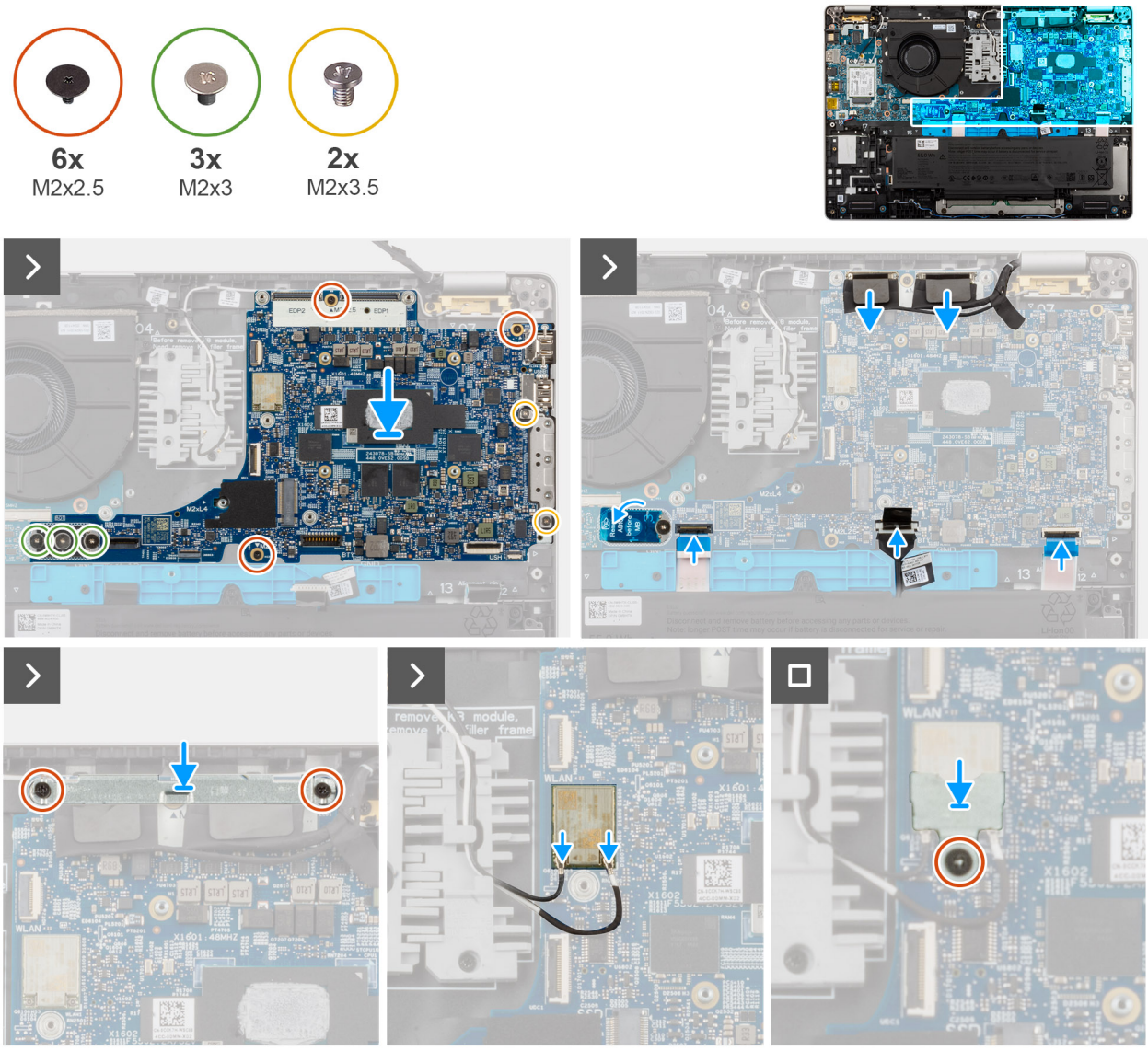
Figure 44. System board connectors



1. Wireless-card slot (WLAN)
2. Display-cable connector (LCD1)
3. Display-cable connector (LCD2)
4. Sensor board-cable connector
5. Battery-cable connector
6. Solid State Drive slot
7. USH cable connector

The following images indicate the location of the system board and provide a visual representation of the installation procedure.

Figure 45. Installing the system board



Steps

1. Align and place the system board on its slot on the palm-rest assembly.

   NOTE: The USB-C bracket is part of the system-board assembly. Do not remove the bracket from the system board.

   NOTE: The USB-C connector module must be removed only while servicing the module. It must not be removed while removing the system board.

2. Replace the two screws (M2x3.5) that secure the USB type-C module to the system-board assembly.
3. Replace the three screws (M2x2.5) that secure the system board to the palm-rest assembly.
4. Replace the three screws (M2x3) that secures the system board and I/O board to the palm-rest assembly.
5. Open the latch and Connect the USH cable from the connector on the system board.
6. Connect the battery cable from the system board.
7. Connect the speaker cable from the I/O board.
8. Partly place the mylar to access the screws on the middle bracket (AB10) that connects the I/O board and system board to the palm-rest assembly.
9. Connect the display-cable from the display-cable connector (LCD1) on the system board.
10. Connect the camera cable from the connector on the system board.

11. Lift and place the display-cable bracket on the palm-rest assembly.
12. Replace the two screws (M2x2.5) that secure the display-cable bracket to the system board.
13. Connect the antenna cables from the WLAN card.
14. Lift and place the WLAN bracket off the palm-rest assembly.
15. Replace the screw (M2x2.5) that secures the WLAN bracket to the system board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the battery.
4. Install the base cover.
5. Install the M.2 2230 or M.2 2280 SSD, as applicable.
6. Install the display assembly.

I/O board

Removing the I/O board

CAUTION: The information in this removal section is intended for authorized service technicians only.

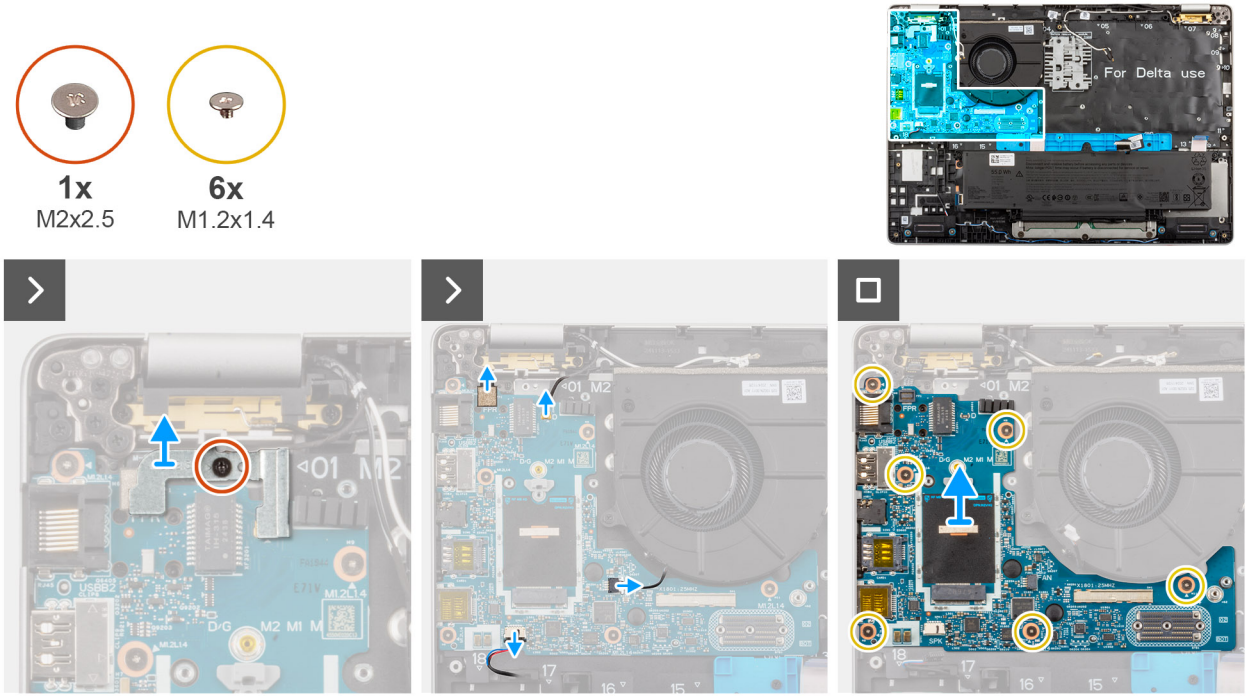
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.
5. Remove the M.2 2230 or M.2 2280 SSD, as applicable.
6. Remove the 4G WWAN card.
7. Remove the display assembly.
8. Remove the system board.

About this task

The following images indicate the location of the I/O board and provide a visual representation of the removal procedure.

Figure 46. Removing the I/O board



Steps

1. Remove the screw (M2x2.5) that secures the fingerprint reader bracket to the palm-rest assembly.
2. Lift the fingerprint reader bracket off the palm-rest assembly.
3. Disconnect the fingerprint reader cable (for models shipped with a fingerprint reader), Darwin cable, fan cable, and speaker cable from the I/O board.
4. Remove the six screws (M1.2x1.4) that secure the I/O board to the palm-rest assembly.
5. Lift the I/O board off the palm-rest assembly.

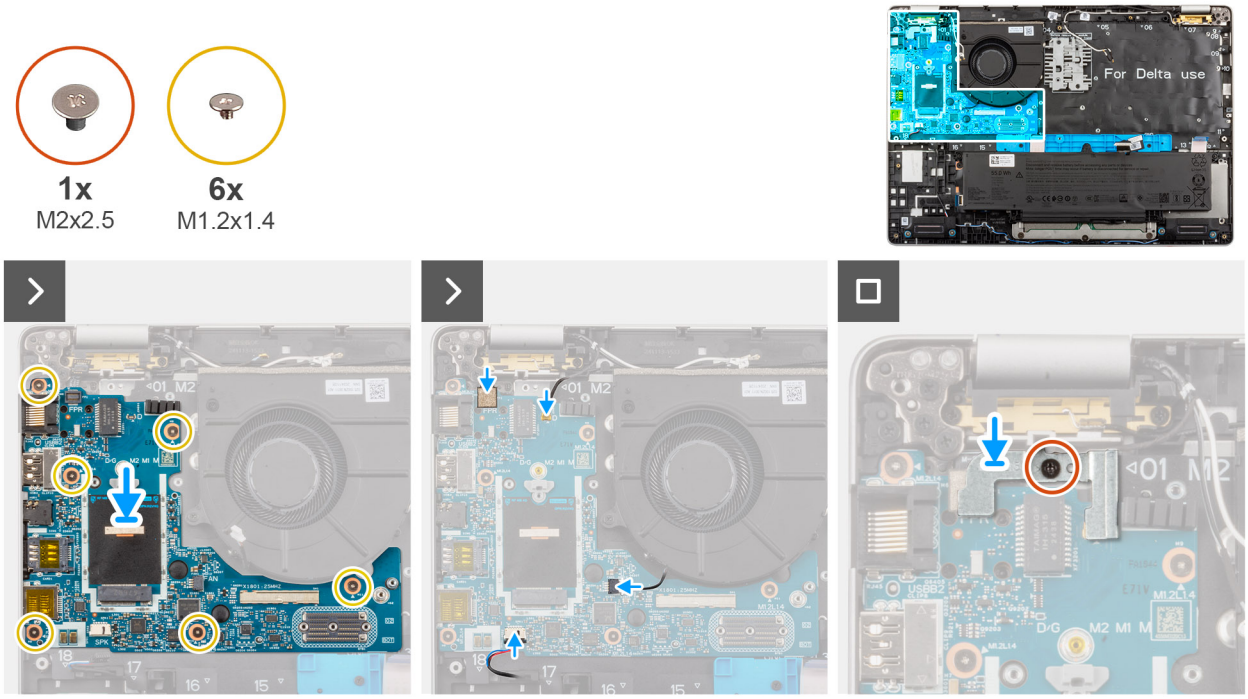
Installing the I/O board

CAUTION: The information in this installation section is intended for authorized service technicians only.

About this task

The following images indicate the location of the I/O board and provide a visual representation of the installation procedure.

Figure 47. Installing the I/O board



Steps

1. Align and place the I/O board on the palm-rest assembly.
2. Replace the six screws (M1.2x1.4) that secure the I/O board to the palm-rest assembly.
3. Connect the fingerprint reader cable (for models shipped with a fingerprint reader), Darwin cable, fan cable, and speaker cable from the I/O board.
4. Align and place the fingerprint reader bracket on to its slot on the palm-rest assembly.
5. Replace the screw (M2x2.5) that secures the fingerprint reader bracket to the palm-rest assembly.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the battery.
4. Install the M.2 2230 or M.2 2280 SSD, as applicable.
5. Install the 4G WWAN card.
6. Install the display assembly.
7. Install the system board.

USB Type-C connector module

Removing the USB Type-C connector module

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.
5. Remove the M2.2230 or M2.2280 SSD, as applicable.

6. Remove the display assembly.
7. Remove the system board.

About this task

The following images indicate the location of the USB Type-C connector module and provide a visual representation of the removal procedure.

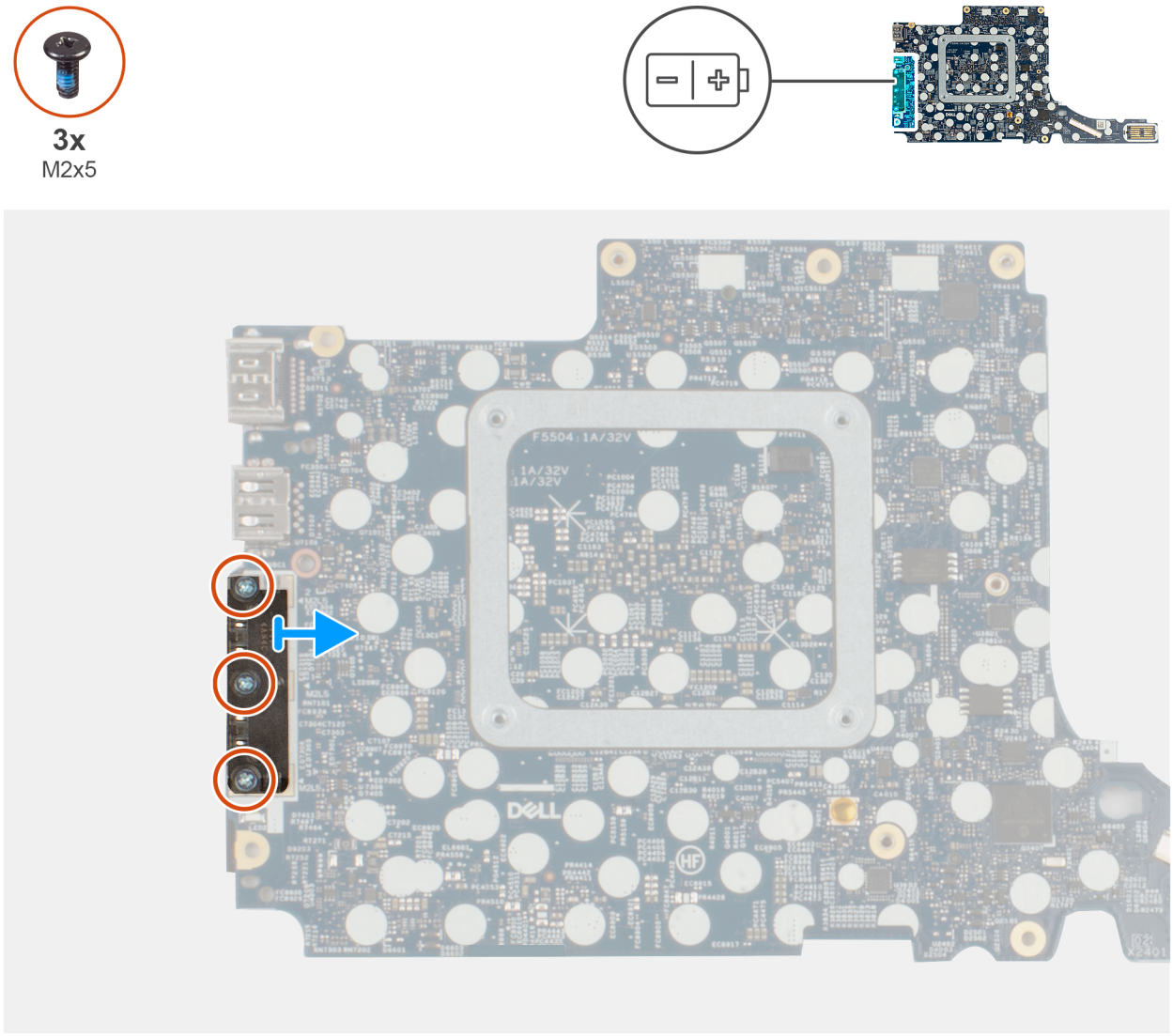


Figure 48. Removing the USB Type-C connector module

Steps

1. Gently turn the system board over.
2. Remove the three screws (M2x5) that secure the USB Type-C connector module to the system board.
3. Remove the USB Type-C connector module off the system board.

Installing the USB Type-C connector module

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following images indicate the location of the USB Type-C connector module and provide a visual representation of the installation procedure.

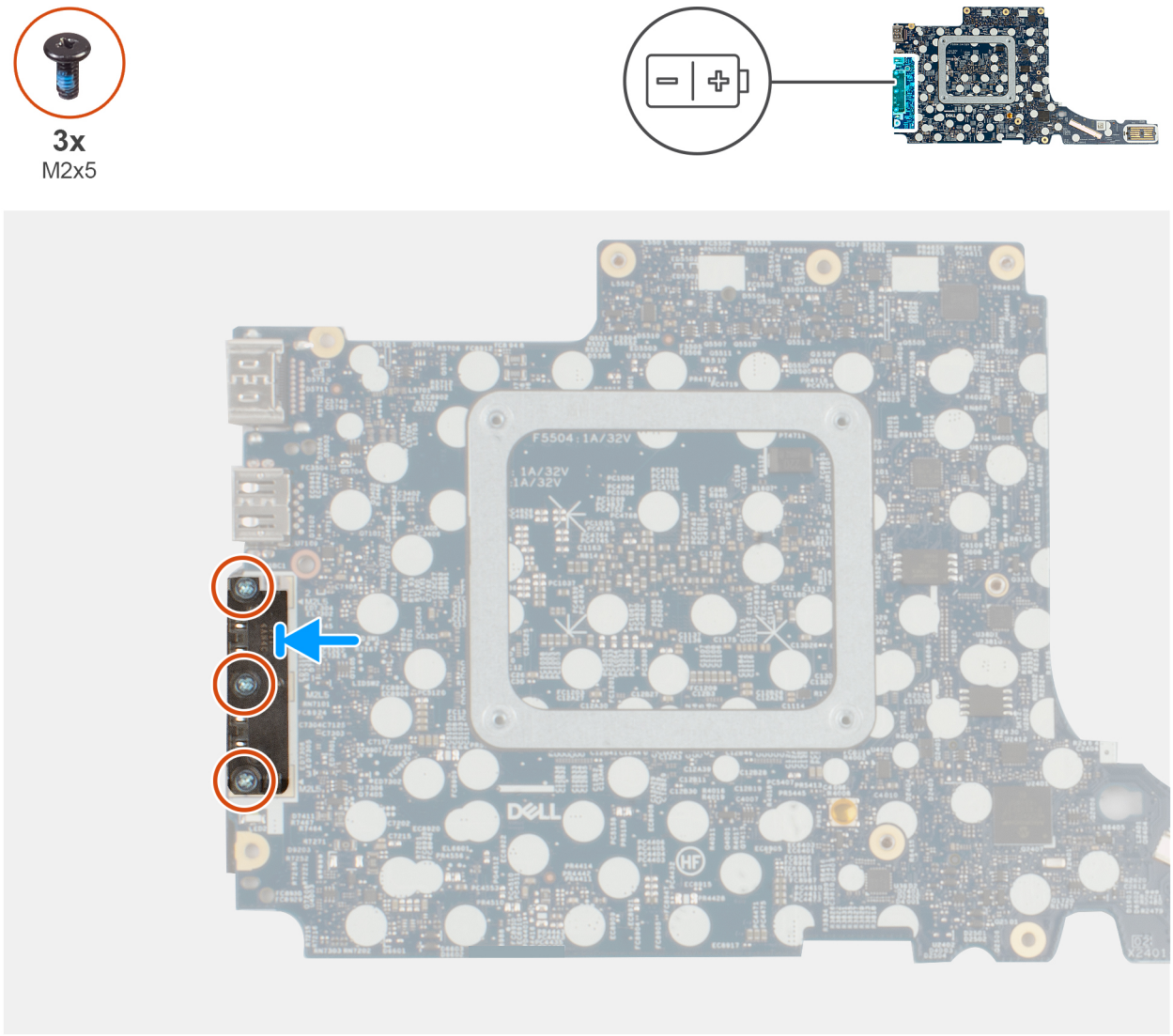


Figure 49. Installing the USB Type-C connector module

Steps

1. Align and place the USB Type-C connector module on to the slot on the bottom side of the system board.
2. Replace the three screws (M2x5) that secure the USB Type-C connector module to the bottom side of the system board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the M.2 2230 M.2 2280 SSD, as applicable.
4. Install the 4G WWAN card.
5. Install the fan.
6. Install the display assembly.

7. Install the base cover.

Power button with optional fingerprint reader

Removing the power button with optional fingerprint reader

CAUTION: The information in this removal section is intended for authorized service technicians only.

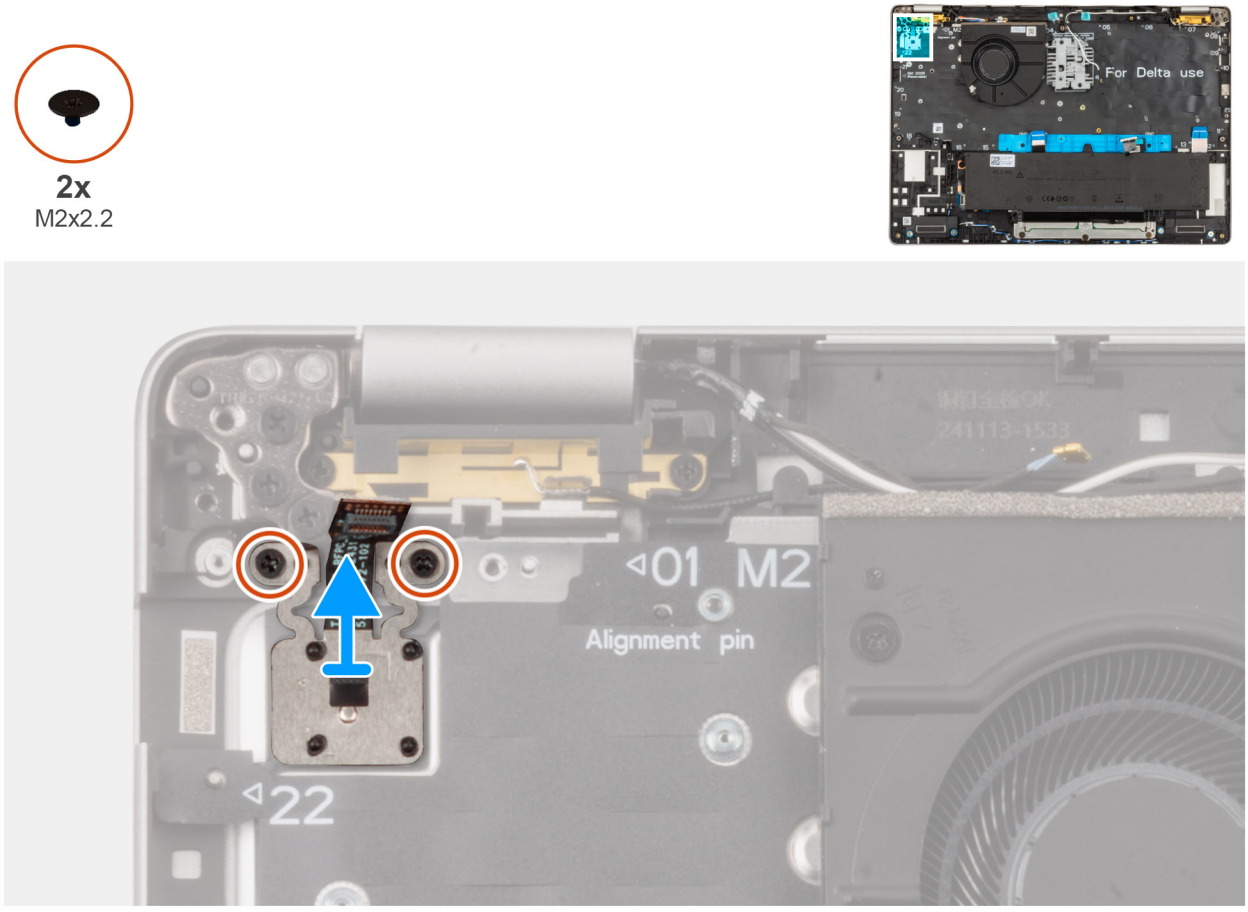
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.
5. Remove the M.2 2230 or M.2 2280 SSD, as applicable.
6. Remove the 4G WWAN card.
7. Remove the display assembly.
8. Remove the system board.
9. Remove the I/O board.

About this task

The following images indicate the location of the power button with optional fingerprint reader and provide a visual representation of the removal procedure.

Figure 50. Removing the power button with optional fingerprint reader



Steps

1. Remove the two screws (M2x2.2) that secure the power button to the palm-rest assembly.
2. Lift the power button off the palm-rest assembly.

Installing the power button with optional fingerprint reader

CAUTION: The information in this installation section is intended for authorized service technicians only.

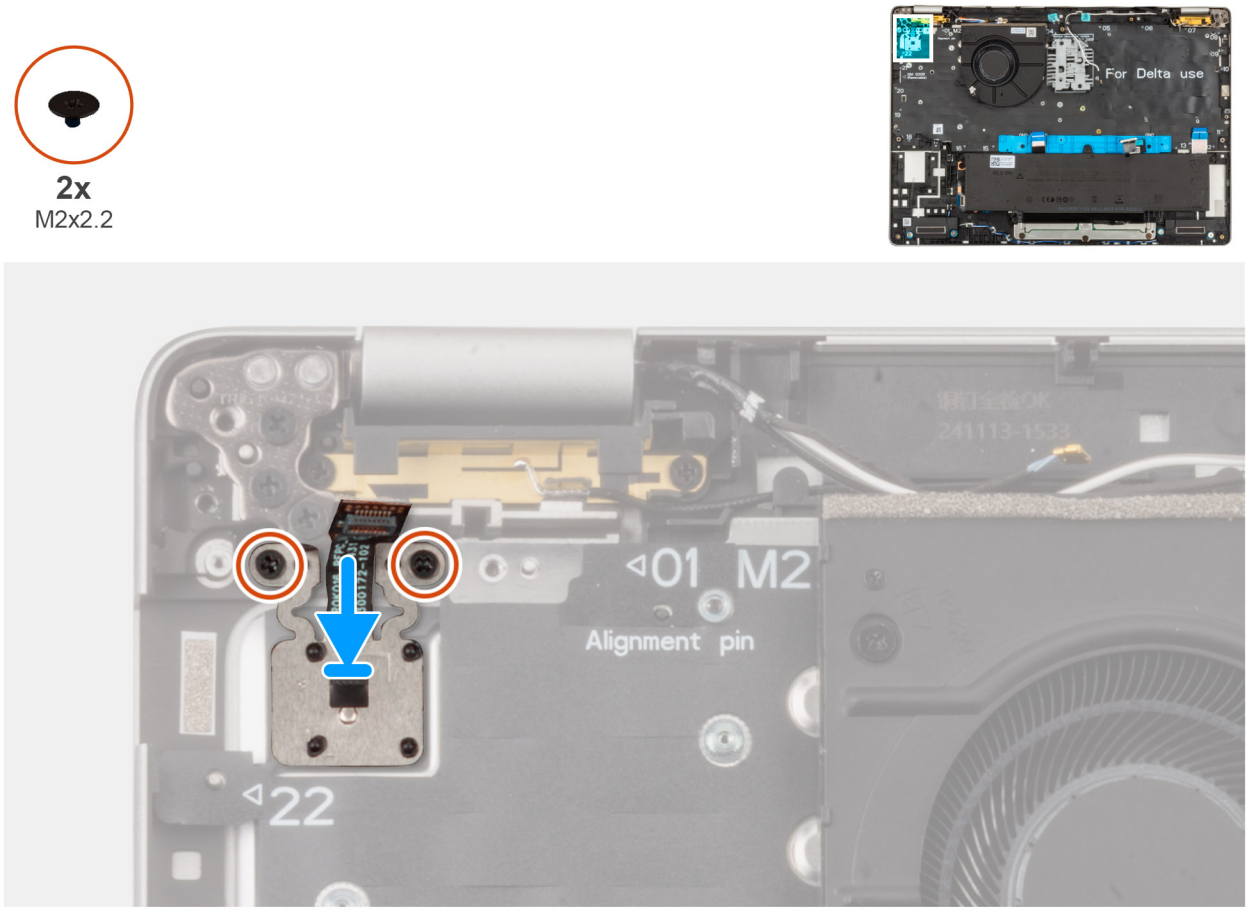
Prerequisites

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

About this task

The following images indicate the location of the power button with optional fingerprint reader and provide a visual representation of the installation procedure.

Figure 51. Installing the power button with optional fingerprint reader



Steps

1. Align and place the power button on the palm-rest assembly.
2. Replace the two screws (M2x2.2) that secure the power button to the palm-rest assembly.

Next steps

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

2. Install the SIM-card tray (optional).
3. Install the battery.
4. Install the M.2 2230 or M.2 2280 SSD, as applicable.
5. Install the 4G WWAN card.
6. Install the display assembly.
7. Install the system board.
8. Install the I/O board.
9. Install the base cover.

Display assembly

Removing the display assembly

CAUTION: The information in this removing section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery
5. Remove the 4G WWAN card.

About this task

The following images indicate the location of the display assembly and provide a visual representation of the removal procedure.

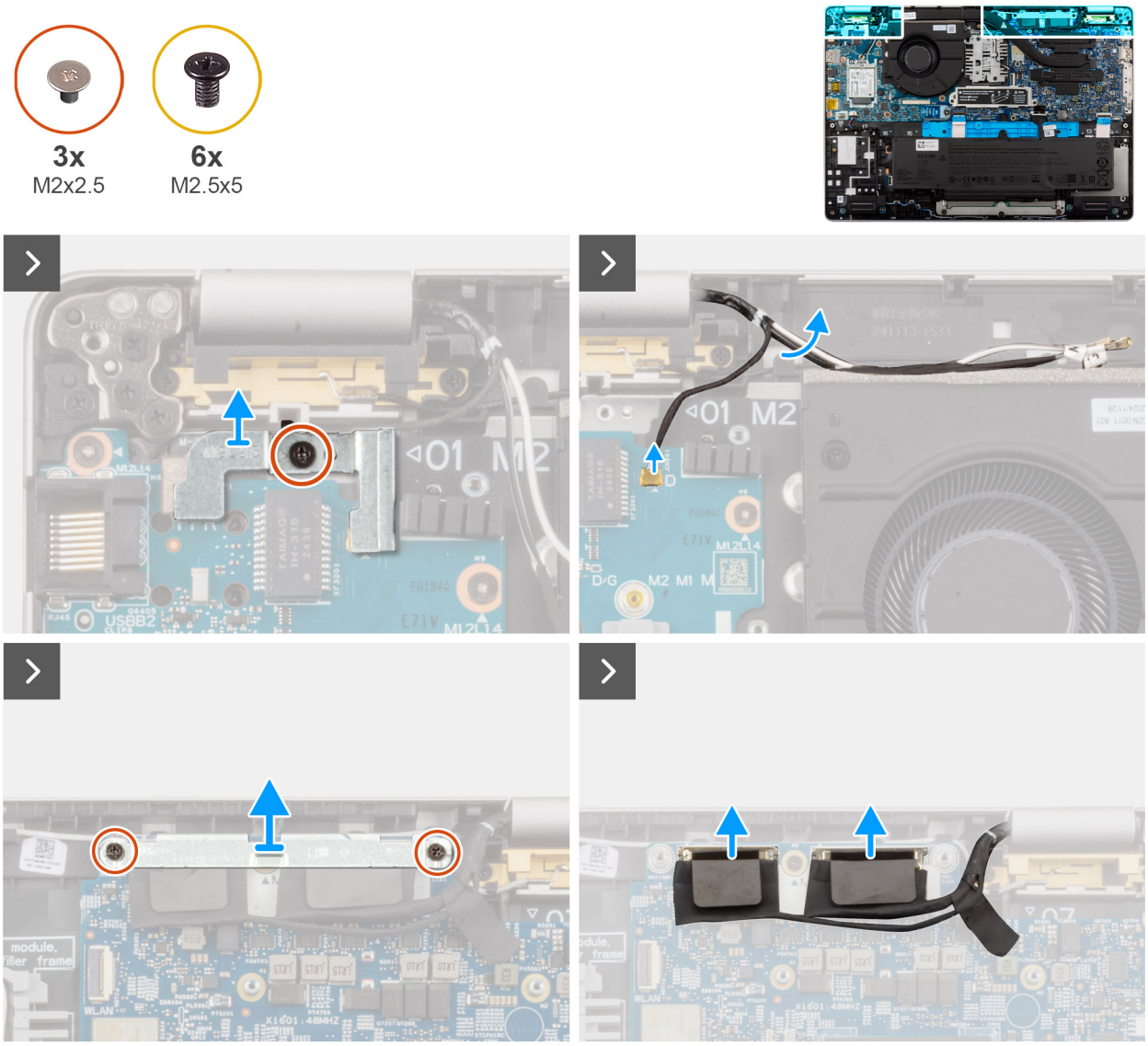


Figure 52. Removing the display assembly

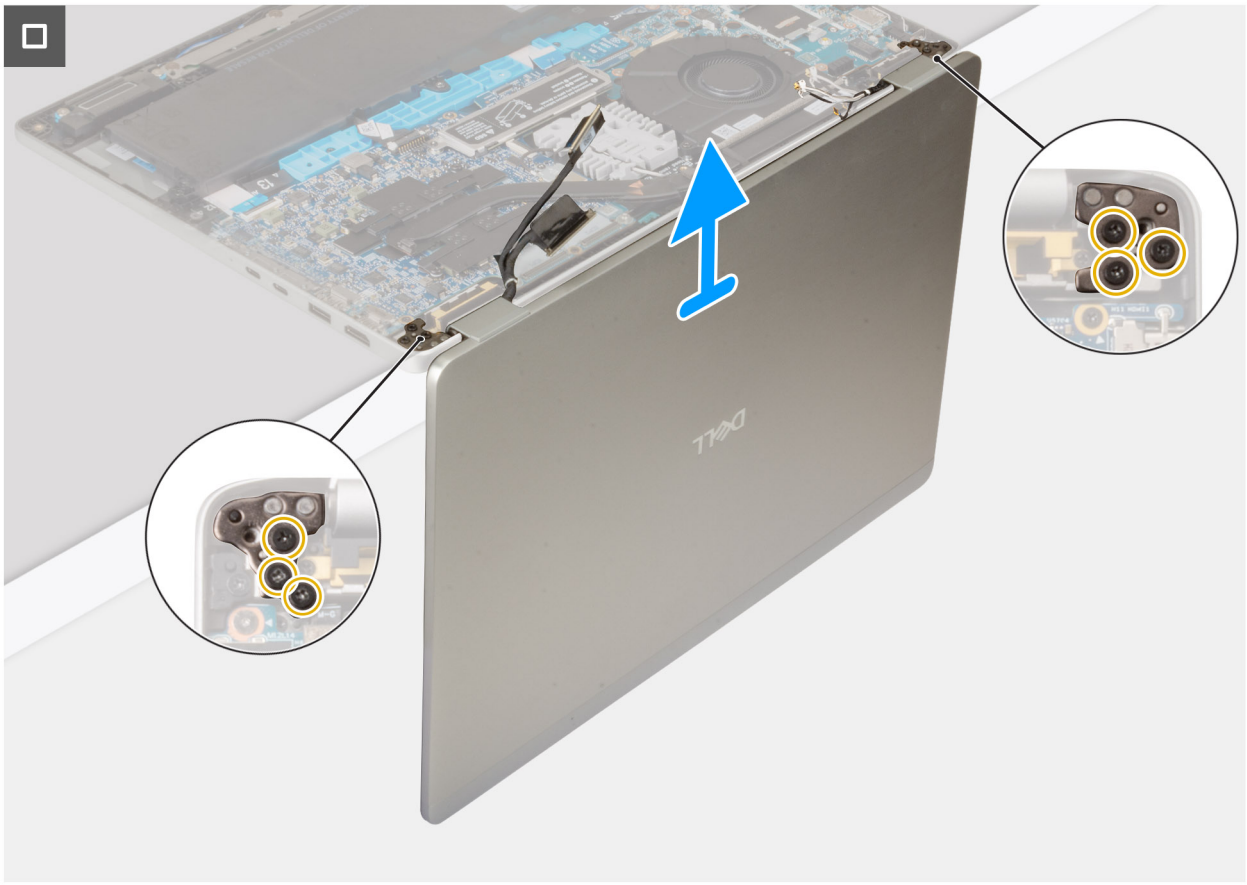


Figure 53. Removing the display assembly

Steps

1. Remove the screw (M2x2.5) that secures the fingerprint-reader bracket to the palm-rest assembly.
2. Lift the fingerprint-reader bracket off the palm-rest assembly.
3. Disconnect the Darwin cable connected to palm-rest assembly.
4. Remove the two screws (M2x2.5) that secure the display cable bracket to the palm-rest assembly.
5. Disconnect the display cable and camera cable (optional) from the display cable connector (LCD1) and (LCD2) on the system board.
6. Carefully place the display at the edge of the table at 90 degrees to ensure that the display is supported when removed.
7. Remove the six screws (M2.5x5) that secure the left and right display hinges to the palm-rest assembly.
8. Carefully lift the display assembly from the palm-rest assembly.
9. Carefully lift the display assembly and place it on a clean flat-surface.

Installing the display assembly

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following images indicate the location of the display assembly and provide a visual representation of the installation procedure.

Figure 54. Installing the display assembly

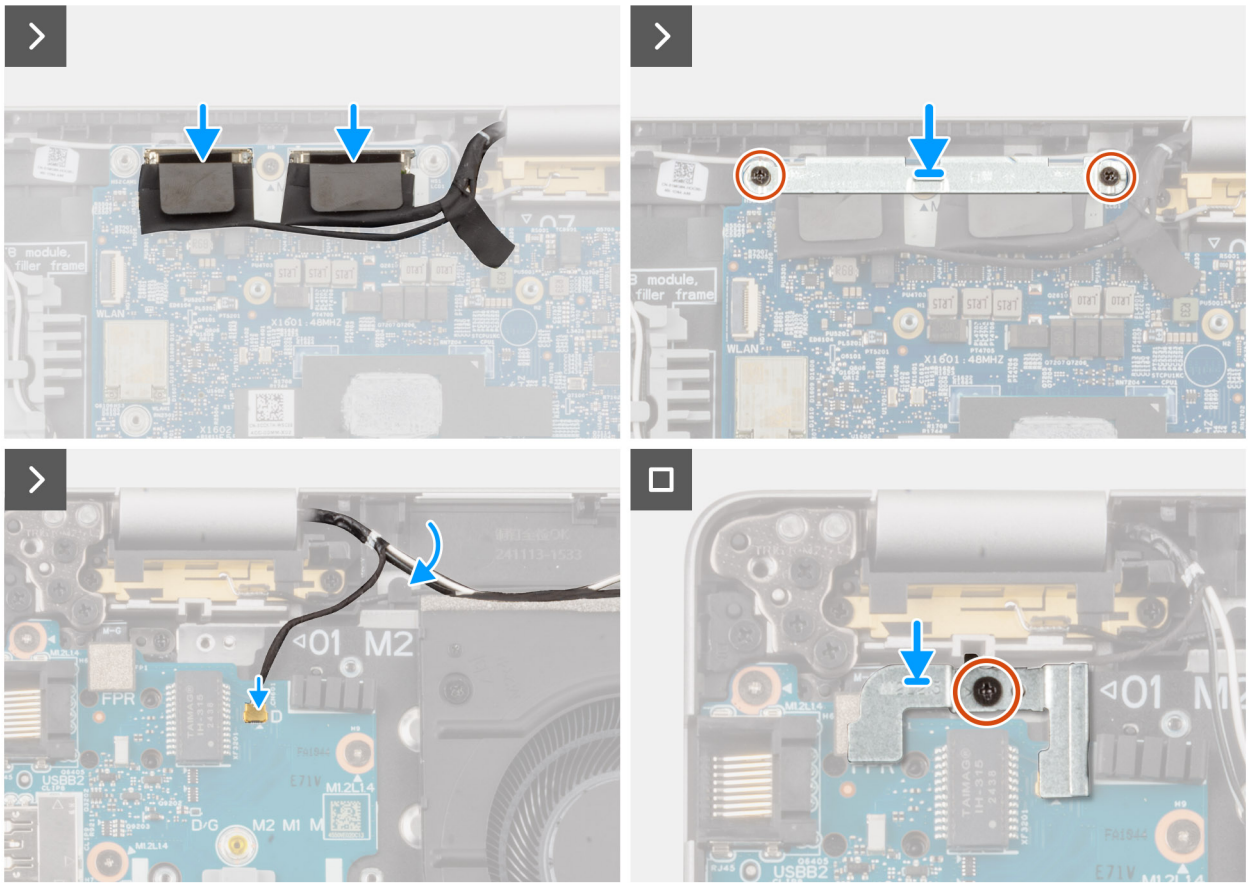


Figure 55. Installing the display assembly

Steps

1. Carefully place the display assembly and place it on a clean flat-surface.
2. Carefully place the display assembly on the palm-rest assembly.
3. Replace the six screws (M2.5x5) that secure the left and right display hinges to the palm-rest assembly.
4. Carefully place the display at the edge of the table at 90 degrees to ensure that the display is supported when replaced.
5. Connect the display cable and camera cable (optional) from the display cable connector (LCD1) and (LCD2) on the system board.
6. Replace the two screws (M2x2.5) that secure the display cable bracket to the palm-rest assembly.
7. Connect the Darwin cable connected to palm-rest assembly.
8. Align and place the fingerprint-reader bracket on the palm-rest assembly.
9. Replace the screw (M2x2.5) that secures the fingerprint-reader bracket to the palm-rest assembly.

Next steps

1. Install the base cover.
2. Install the 4G WWAN card.
3. Install the battery.
4. Install the SIM-card tray (optional).
5. Follow the procedure in After working inside your computer.

Display panel

Removing the display panel

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the 4G WWAN card.
5. Remove the display assembly.
6. Remove the display bezel.

About this task

The following images indicate the location of the display panel and provide a visual representation of the removal procedure.

Figure 56. Removing the display panel

Figure 57. Removing the display panel

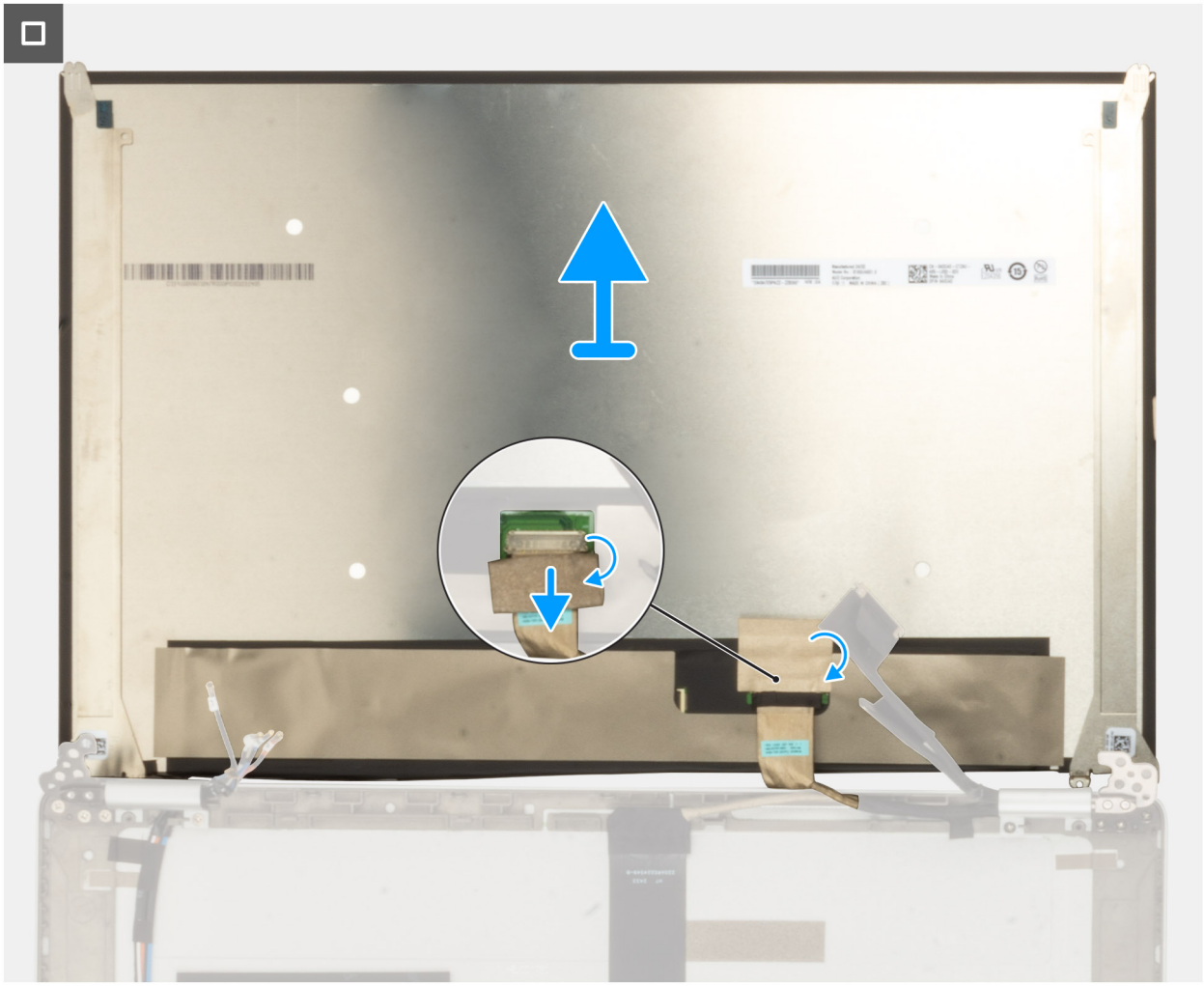


Figure 58. Removing display panel

Steps

1. Remove the two screws (M2x2) that secure the display panel to the display back cover.
2. Gently flip over the display panel and peel the tape securing the display cable to the back of the panel.
3. Disconnect the display cable from the connector on the display panel.
4. Lift the display panel off the display back cover.

Installing the display panel

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following images indicate the location of the display panel and provide a visual representation of the installation procedure.

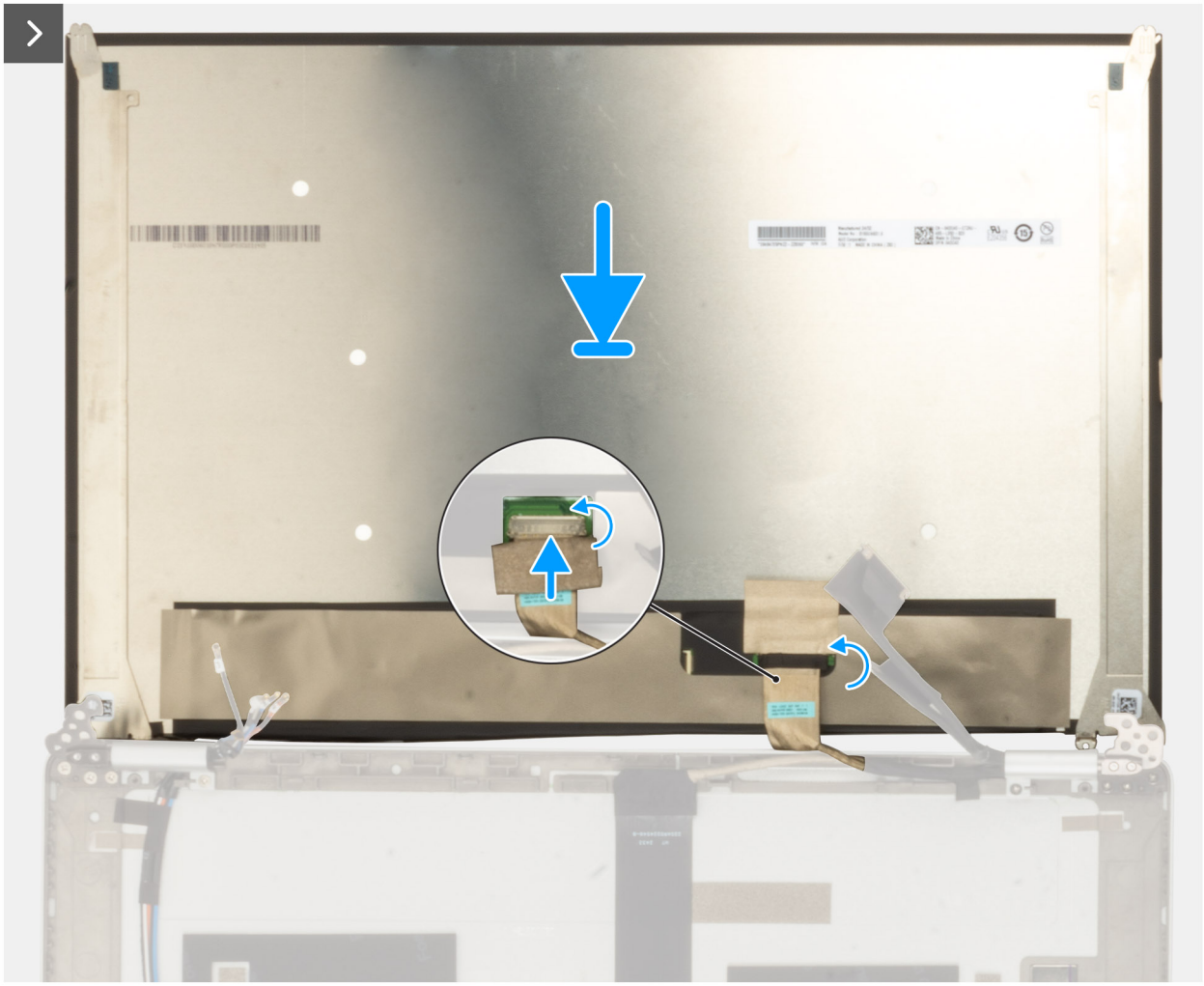


Figure 59. Installing the display panel

Figure 60. Installing the display panel

Steps

1. Align and place the display panel and display assembly on a clean and flat surface.
2. Connect the display cable to the connector on the display panel and close the latch to secure the cable.
3. Adhere the conductive tape to secure the display cable to the display panel.

   NOTE: Ensure that the display panel tabs are inserted into the slots on the display cover.

4. Replace the two screws (M2x2) to secure the display panel to the display back cover.
5. Gently turn the display panel over and place the display panel in the slot on the display back cover.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the 4G WWAN card.
4. Install the display assembly.

5. Install the display bezel.
6. Install the base cover.

Display bezel

Removing the display bezel

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the 4G WWAN card.
5. Remove the display assembly.

About this task

The following images indicate the location of the display bezel and provide a visual representation of the removal procedure.

Figure 61. Prying the plastic bezel

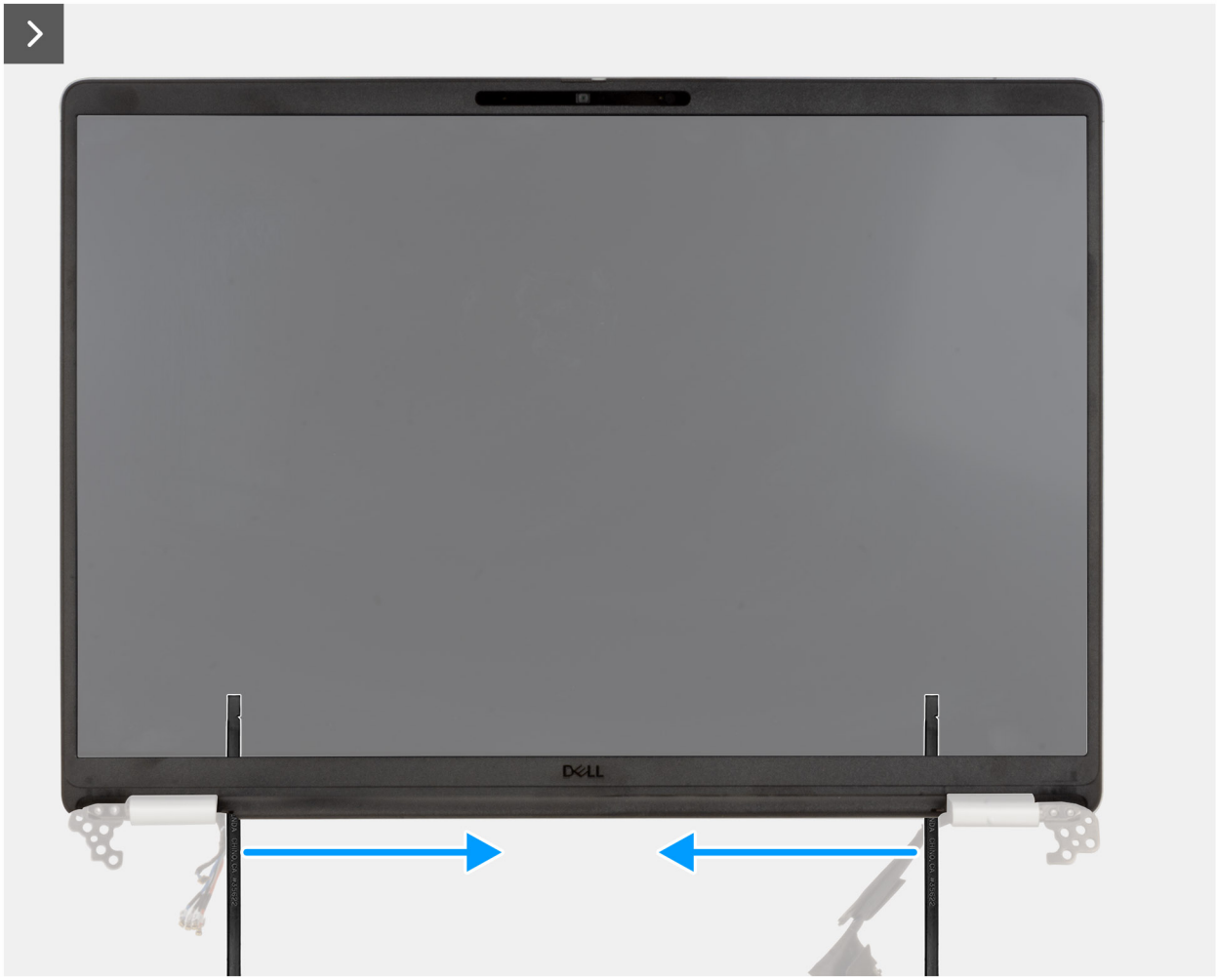


Figure 62. Prying the bezel along the sides

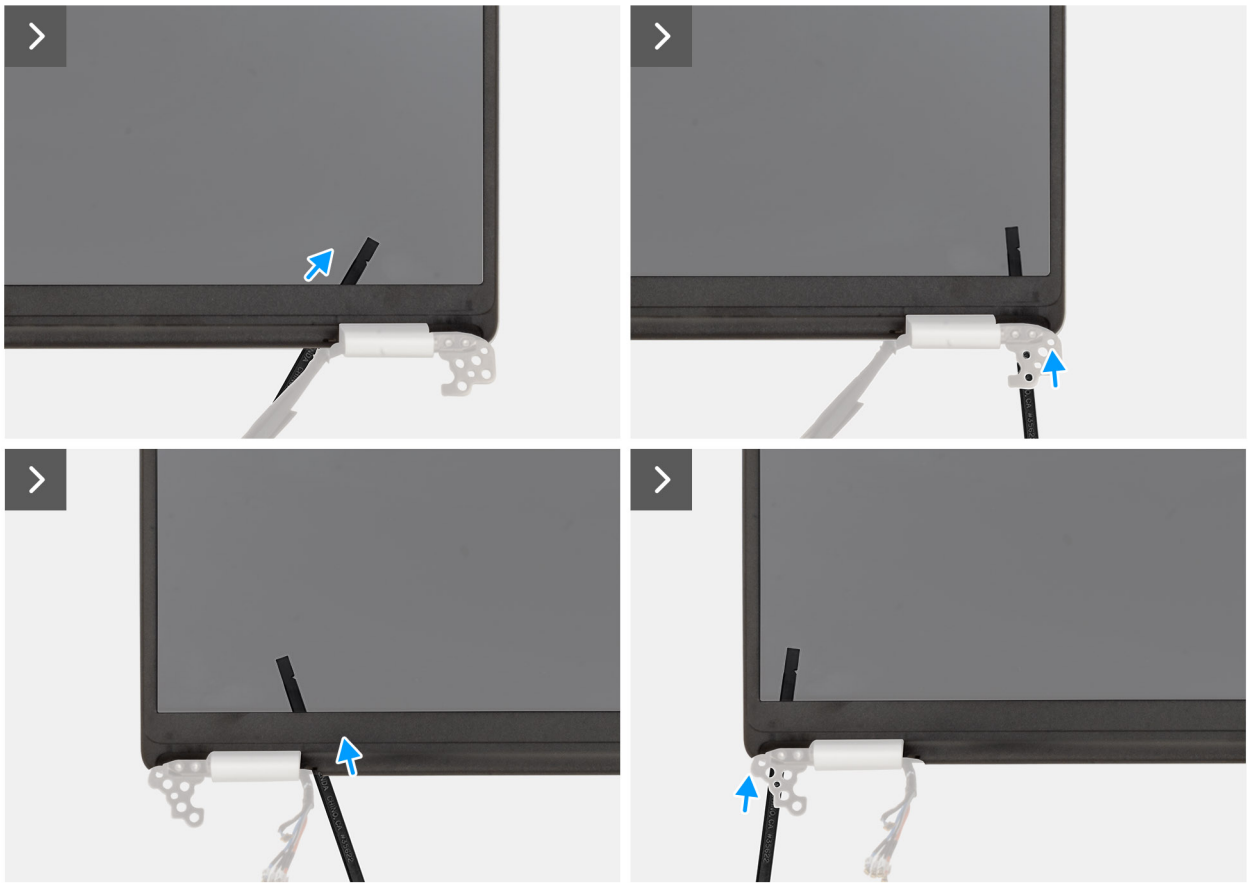


Figure 63. Removing the display bezel

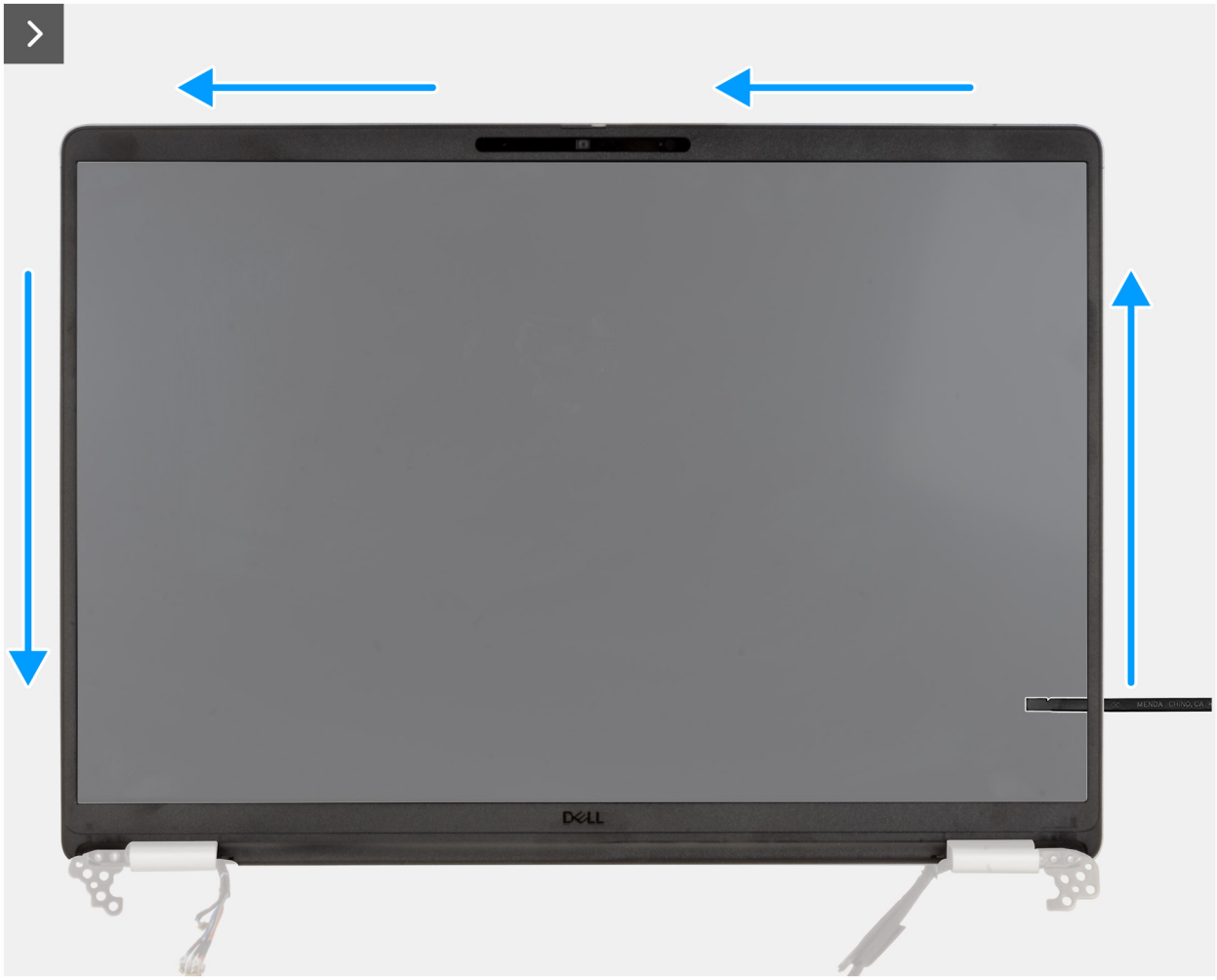


Figure 64. Removing the display bezel

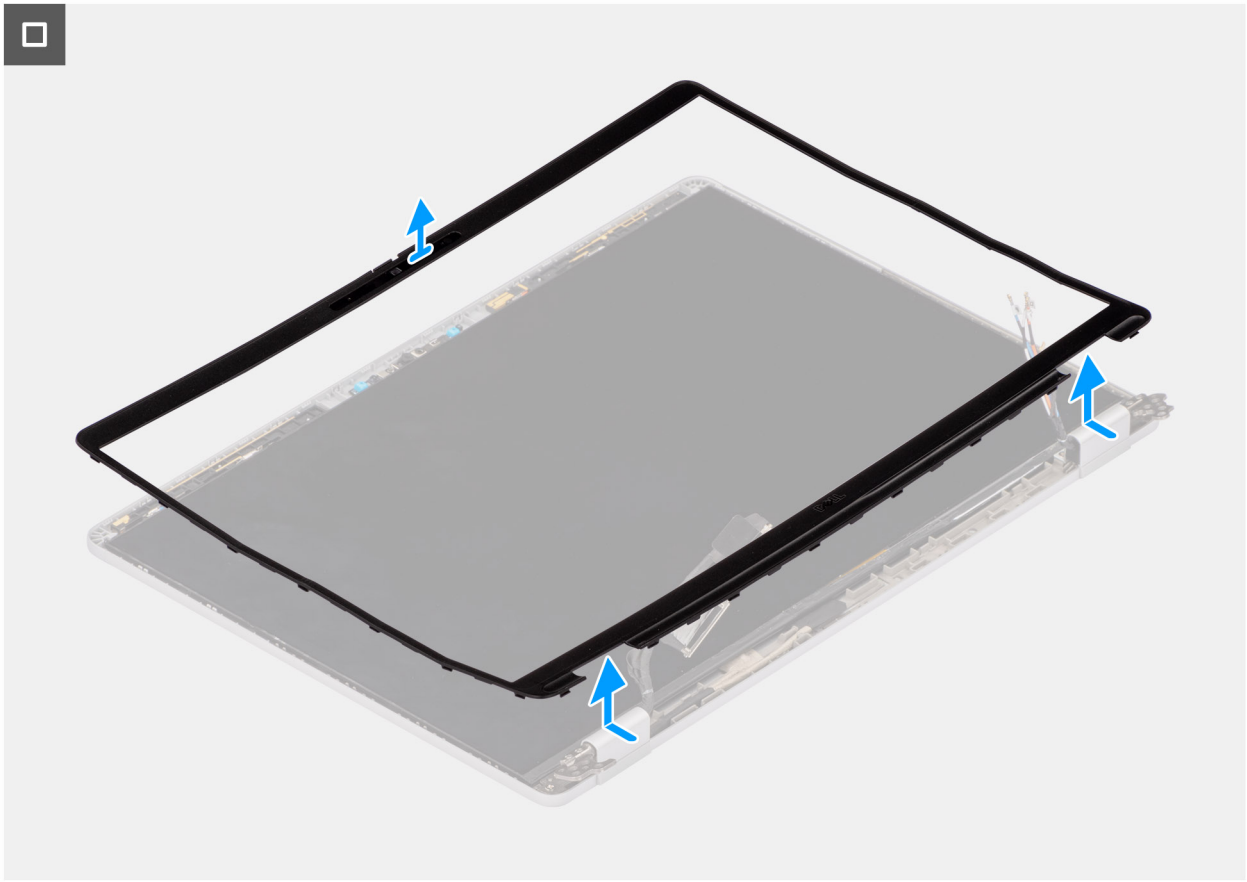


Figure 65. Removing the display bezel

Steps

1. Insert a flat-head slotted screwdrive (maximum width: 4 mm) into the recess on the display bezel near the hinges, and gently apply pressure to release the bezel at both ends, creating a gap.

   NOTE:

   The bezel may become deformed during this process. This is acceptable as the bezel is considered a consumable part and should be replaced with a new one.

2. Insert the flat end of the scribe into the gap created under the display bezel.

   CAUTION: When inserting the scribe into the bezel, keep it parallel to the display. Pressing it downward can damage the display. Do not use the flat head (slotted) screwdriver to release up the rest of the bezel. Switch to the plastic scribe to continue prying along the bezel.

3. Keeping the scribe parallel to the display, carefully slide it along the bottom edge of the bezel to release the adhesive and the lower side.

   CAUTION: Do NOT lift the scribe up vertically as that damages the LCD. Slide the scribe horizontally to release the adhesive and pry the bezel up.

4. Insert the scribe diagonally into the hinge section to carefully release up the portion of the bezel above the hinge.
5. Insert the scribe into the corner of the display bezel near the hinge. Keeping the scribe parallel to the display, carefully slide the scribe along the edges from one corner to the other (right to left or left to right). As you do this, use your fingers to help with releasing the bezel from the clips and adhesive.
6. Lift the display bezel off the display assembly.

Installing the display bezel

CAUTION: The information in this installation section is intended for authorized service technicians only.

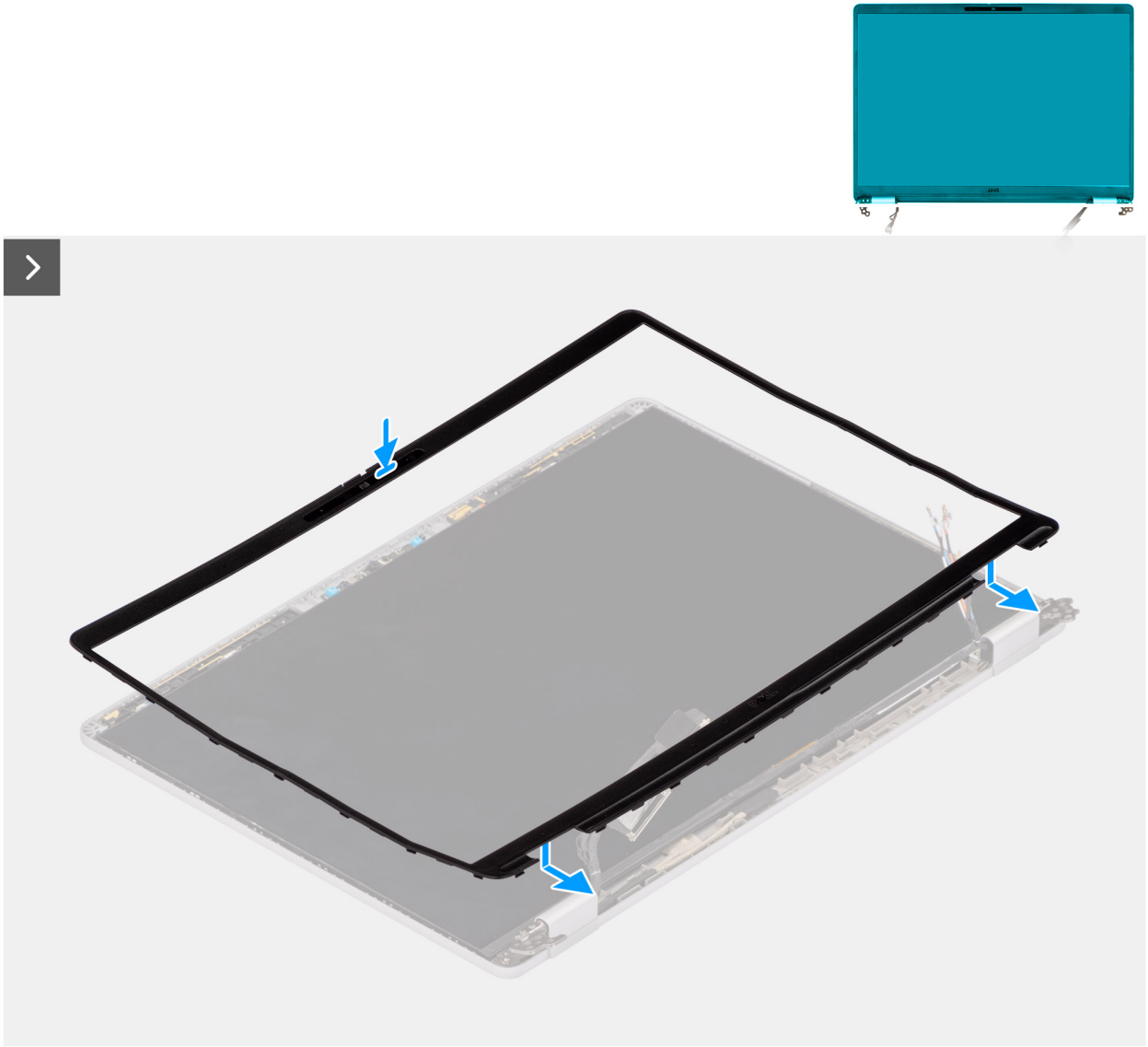
Prerequisites

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

About this task

The following images indicate the location of the display bezel and provide a visual representation of the installation procedure.

Figure 66. Installing the display bezel



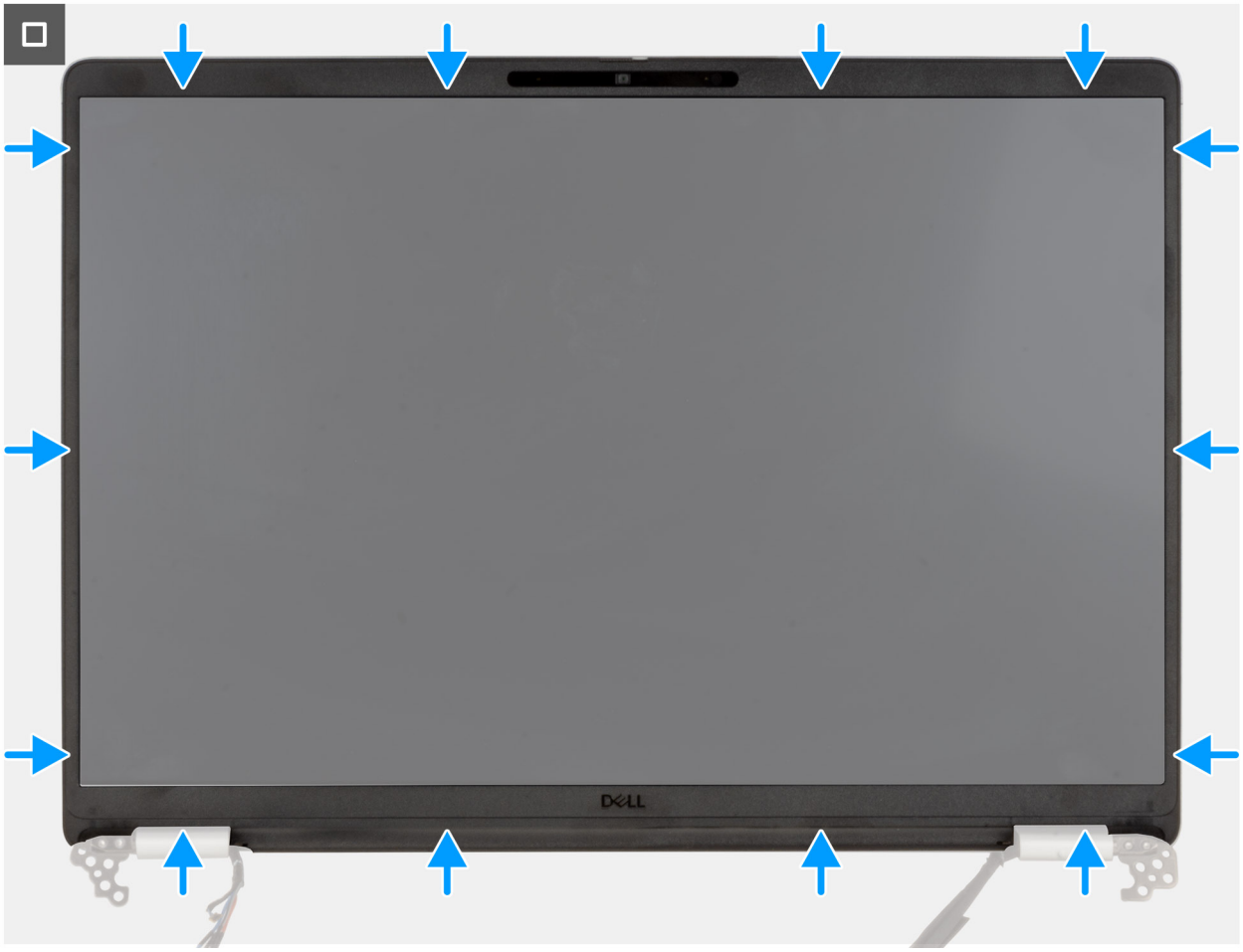


Figure 67. Installing display bezel

Steps

1. Align and place the display bezel on the display assembly.
2. Gently press along the edges of the display bezel to secure it with the clips on the display assembly.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. nstall the display assembly.
4. Install the 4G WWAN card.
5. Install the base cover.

Display hinge cap

Removing the display hinge cap

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.

4. Remove the 4G WWAN card.
5. Remove the display assembly.
6. Remove the display bezel.
7. Remove the display panel.

About this task

The following images indicate the location of the display hinge cap and provide a visual representation of the removal procedure.

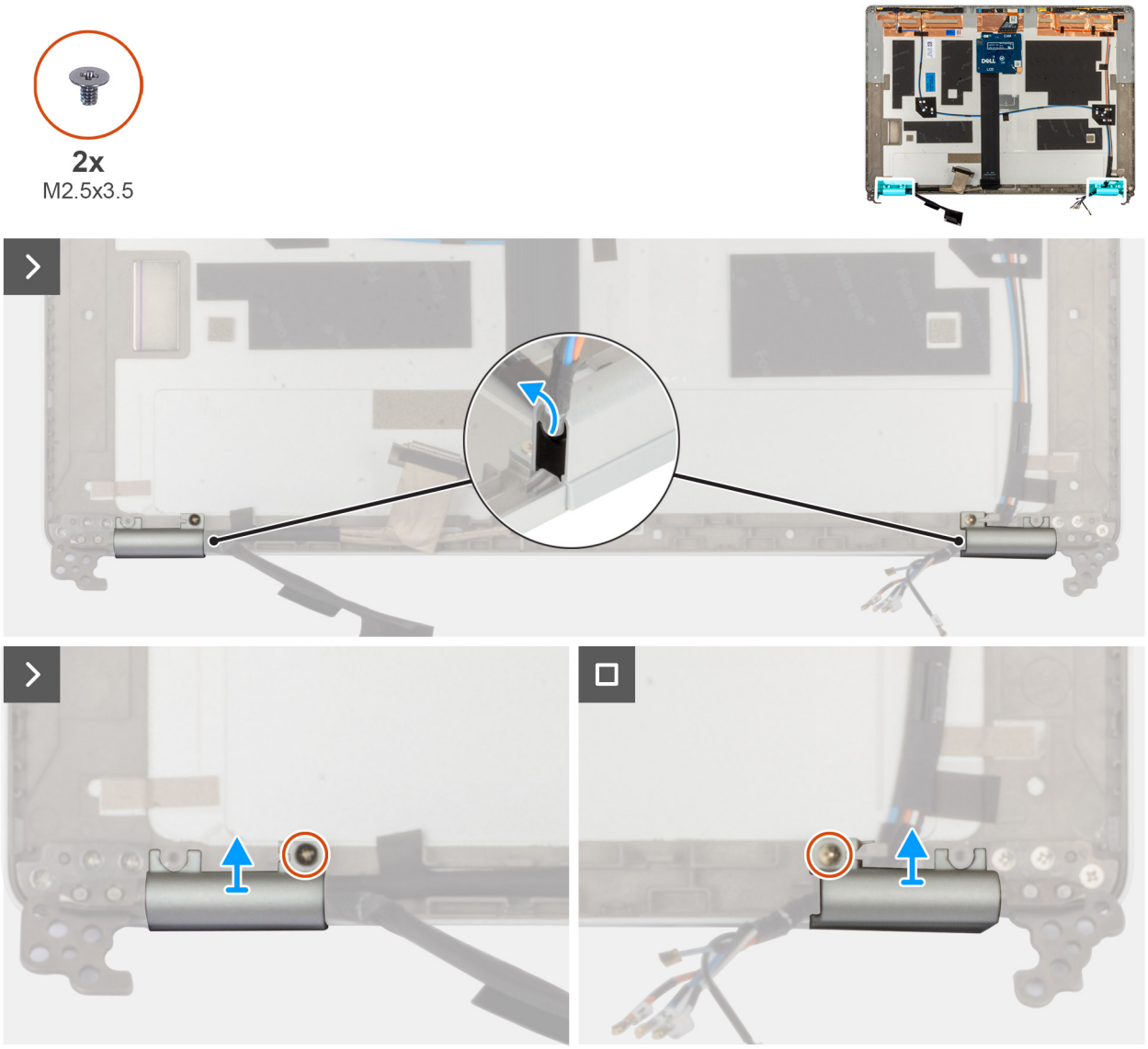


Figure 68. Removing the display hinge caps

Steps

1. Lift the hinge cap securing the hinges to the display back cover.
2. Remove the screw (M2.5x3.5) that secures the right hinge to the display back cover.
3. Lift the right hinge off the display back cover.
4. Remove the screw (M2.5x3.5) that secures the left hinge to the display back cover.
5. Lift the left hinge off the display back cover.

Installing the display hinge cap

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following images indicate the location of the display hinge cap and provide a visual representation of the installation procedure.

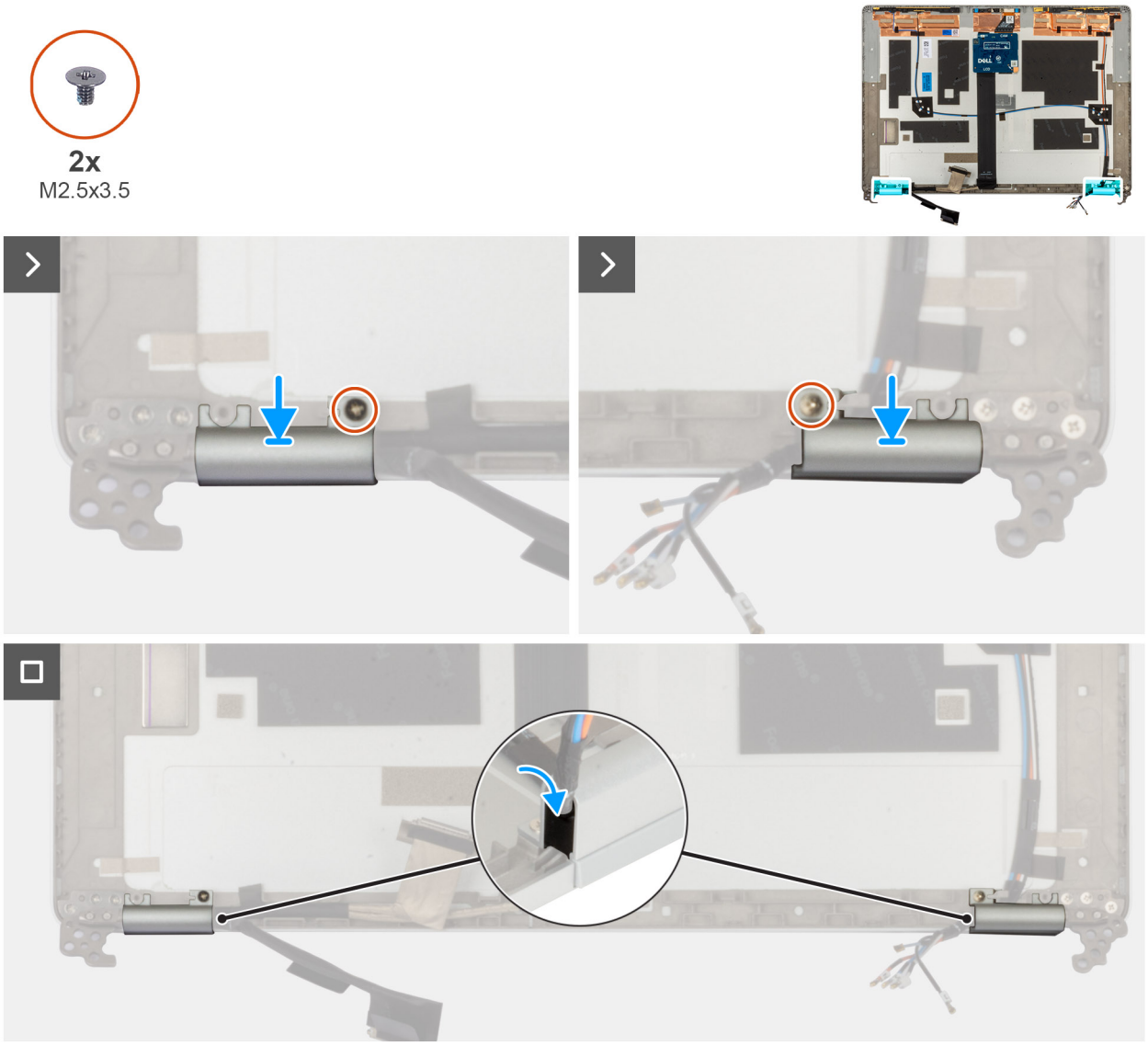


Figure 69. Installing the display hinge cap

Steps

1. Align the screw hole on the left hinge cap with the screw hole on the display back cover.
2. Replace the screw (M2.5x3.5) that secure the left hinge cap to the display back cover.
3. Align the screw hole on the right hinge cap with the screw hole on the display back cover.
4. Replace the screw (M2.5x3.5) that secure the right hinge cap to the display back cover.
5. Align and place the hinge cap securing the hinges on the display back cover.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the 4G WWAN card.
4. Install the display assembly.
5. Install the display bezel.
6. Install the display panel.
7. Install the base cover.

Display cable

Removing the display cable

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the 4G WWAN card.
5. Remove the display assembly.
6. Remove the display bezel.
7. Remove the display panel.
8. Remove the display hinge cap.

About this task

The following images indicate the location of the display cable and provide a visual representation of the removal procedure.

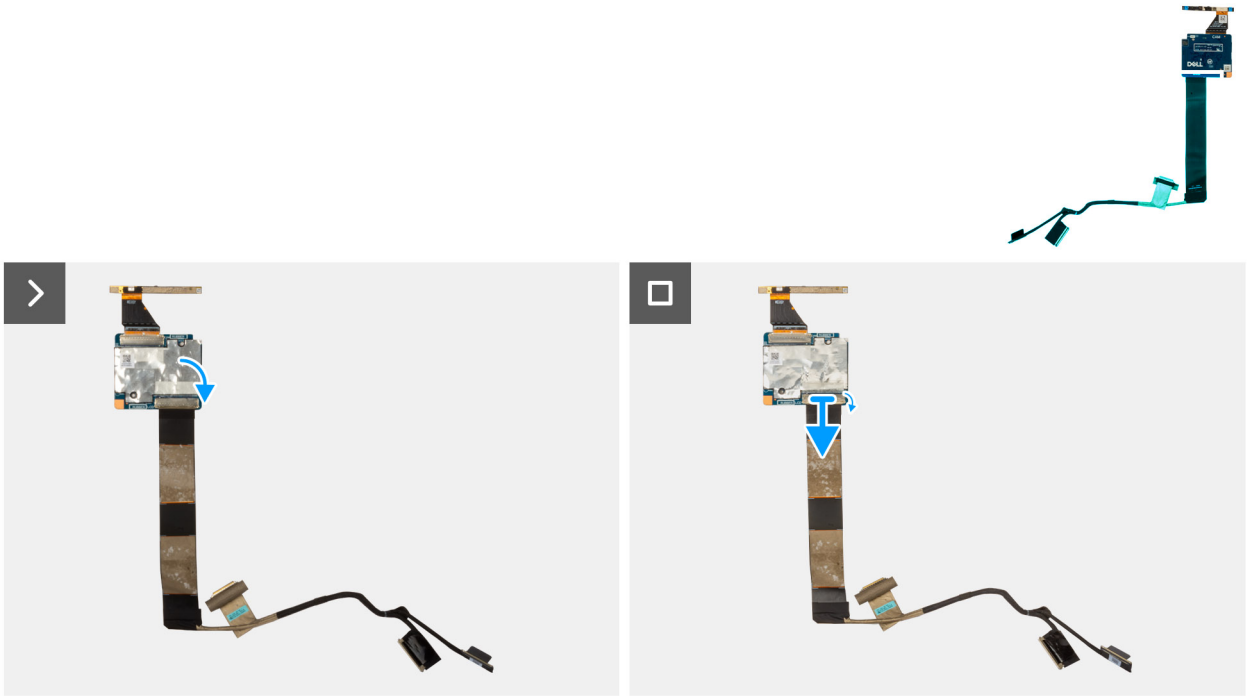


Figure 70. Removing the display cable

Steps

1. Peel the tape that secures the display cable to the camera module.
2. Disconnect the display cable from the connector on the camera module.
3. Release it from adhesive on the camera module and lift the display cable off the camera module.

Installing the display cable

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following images indicate the location of the display cable and provide a visual representation of the installation procedure.

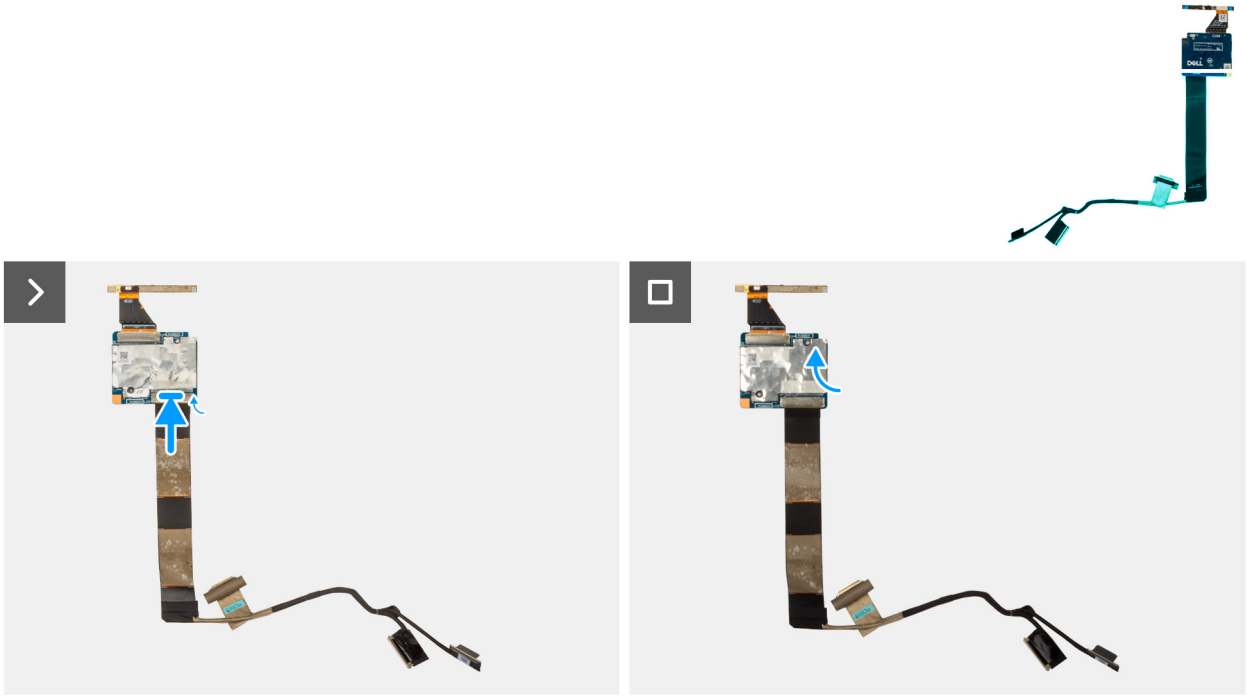


Figure 71. Installing the display cable

Steps

1. Connect the display cable to the adhesive on the camera module and press the display cable onto the camera module.
2. Connect the display cable from the connector on the camera module.
3. Adhere the tape that secures the display cable to the camera module.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the 4G WWAN card.
4. Install the display bezel.
5. Install the display assembly.
6. Install the display panel.
7. Install the display hinge cap.
8. Install the base cover.

Camera module

Removing the camera module

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the 4G WWAN card.
5. Remove the display assembly.
6. Remove the display bezel.
7. Remove the display panel.
8. Remove the display hinge cap.

About this task

The following images indicate the location of the camera module and provide a visual representation of the removal procedure.

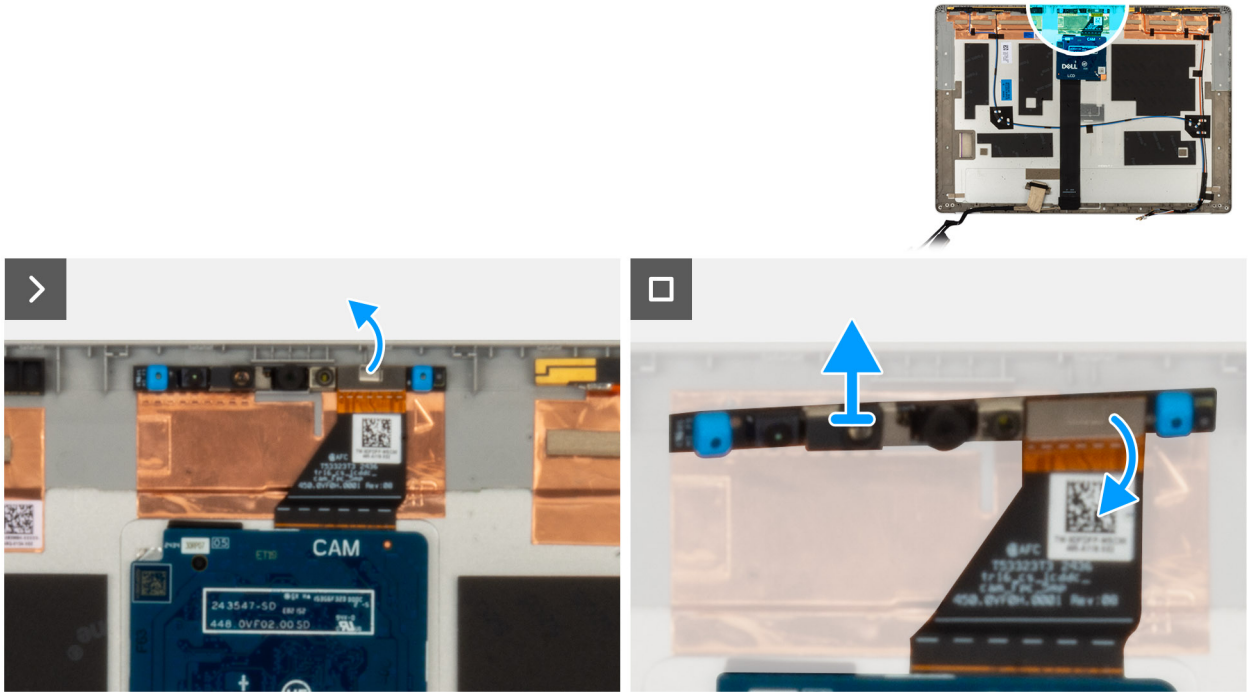


Figure 72. Removing the camera module

Steps

1. Peel the tape that secures the display cable and camera cable to the display back cover.
2. Disconnect the camera module from the connector on the camera module.
3. Pry the camera module from the prying point and lift the camera module off the display back cover.

Installing the camera module

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following images indicate the location of the camera module and provide a visual representation of the installation procedure.

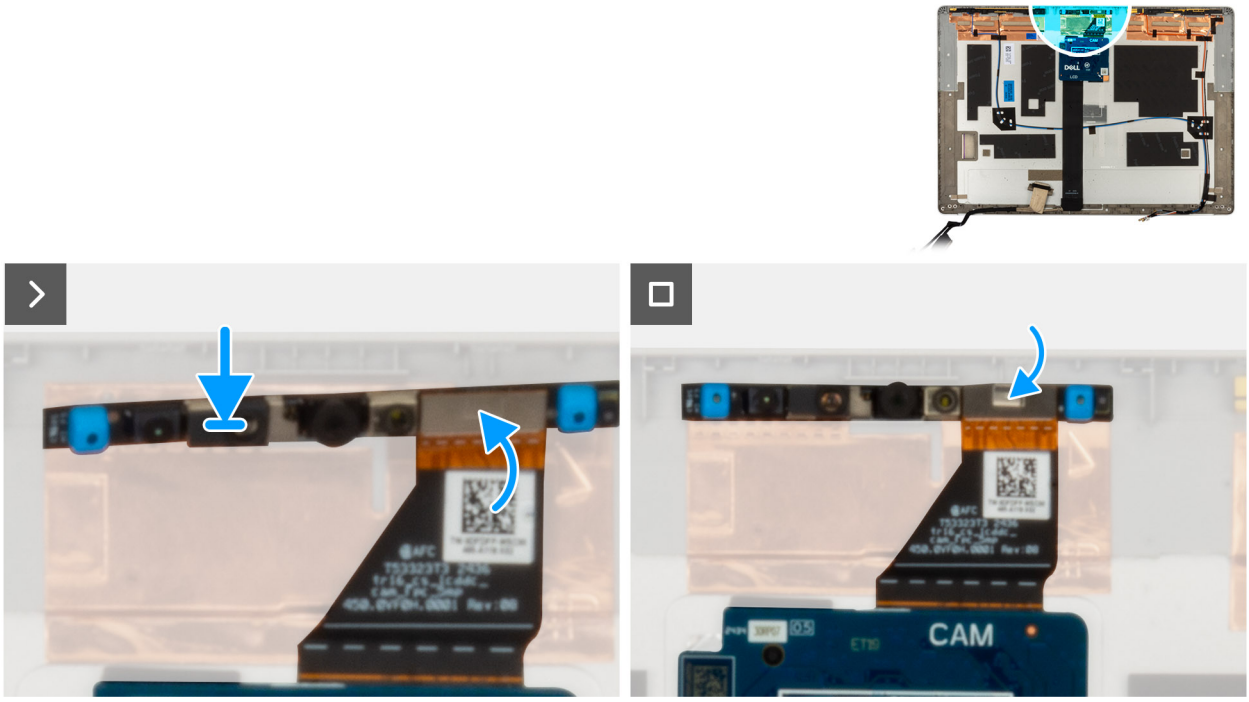


Figure 73. Installing the camera module

Steps

1. Align and place the camera module into the slot on the display back cover.
2. Connect the camera module cable to the connector on the camera module.
3. Adhere the tape that secures the display cable and camera module cable to the display back cover.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the 4G WWAN card.
4. Install the display assembly.
5. Install the display bezel.
6. Install the display panel.
7. Install the display hinge cap.
8. Install the base cover.

Display back cover

Removing the display back cover

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the 4G WWAN card.
5. Remove the display assembly.
6. Remove the display bezel.
7. Remove the display panel.
8. Remove the display hinge cap.
9. Remove the display cable.
10. Remove the camera module.

About this task

The following images indicate the location of the display back cover and provide a visual representation of the removal procedure.

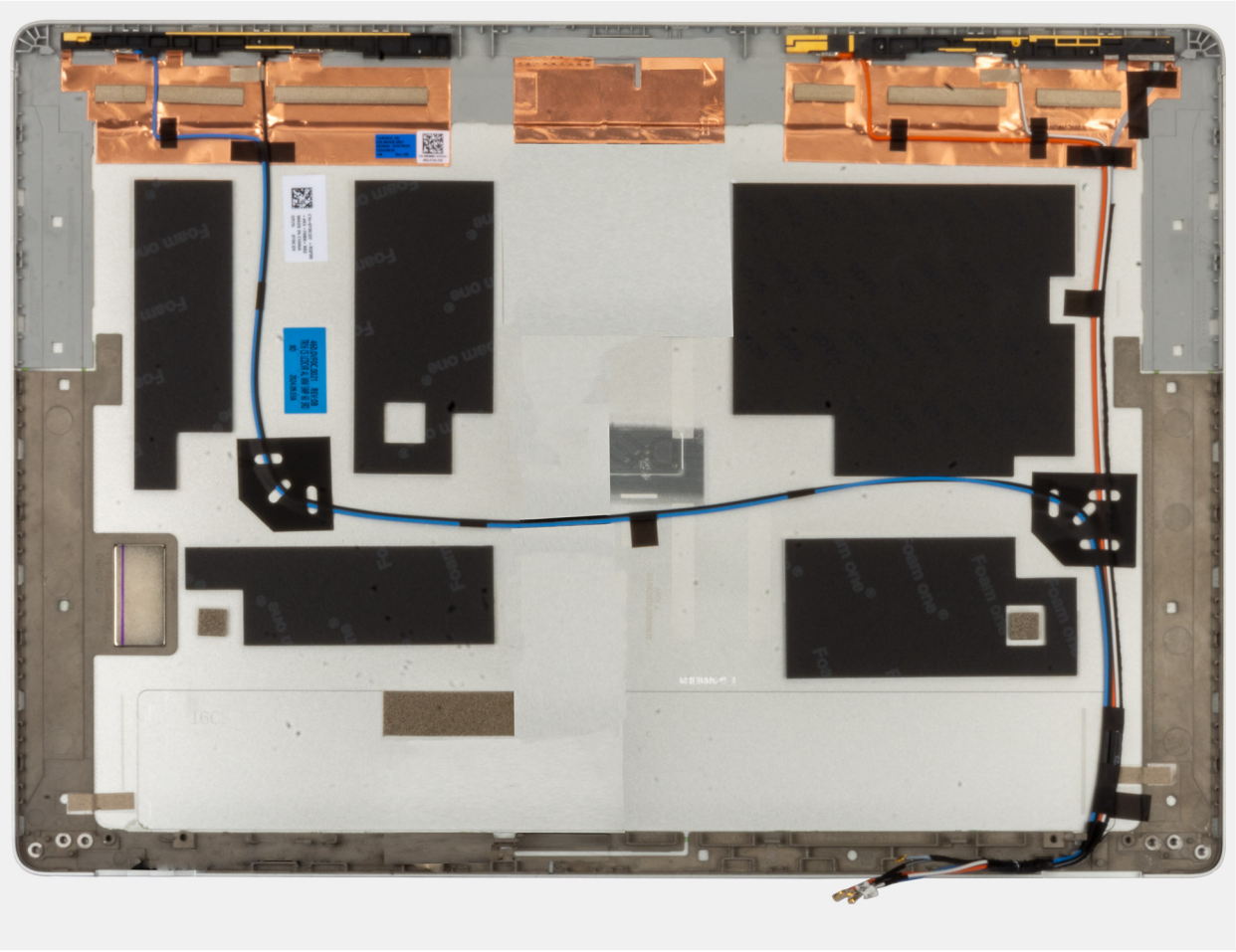


Figure 74. Removing the display back cover

Steps

Remove all the components mentioned in the pre-requisites to get the display back cover.

Installing the display back cover

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following images indicate the location of the display back cover and provide a visual representation of the installation procedure.

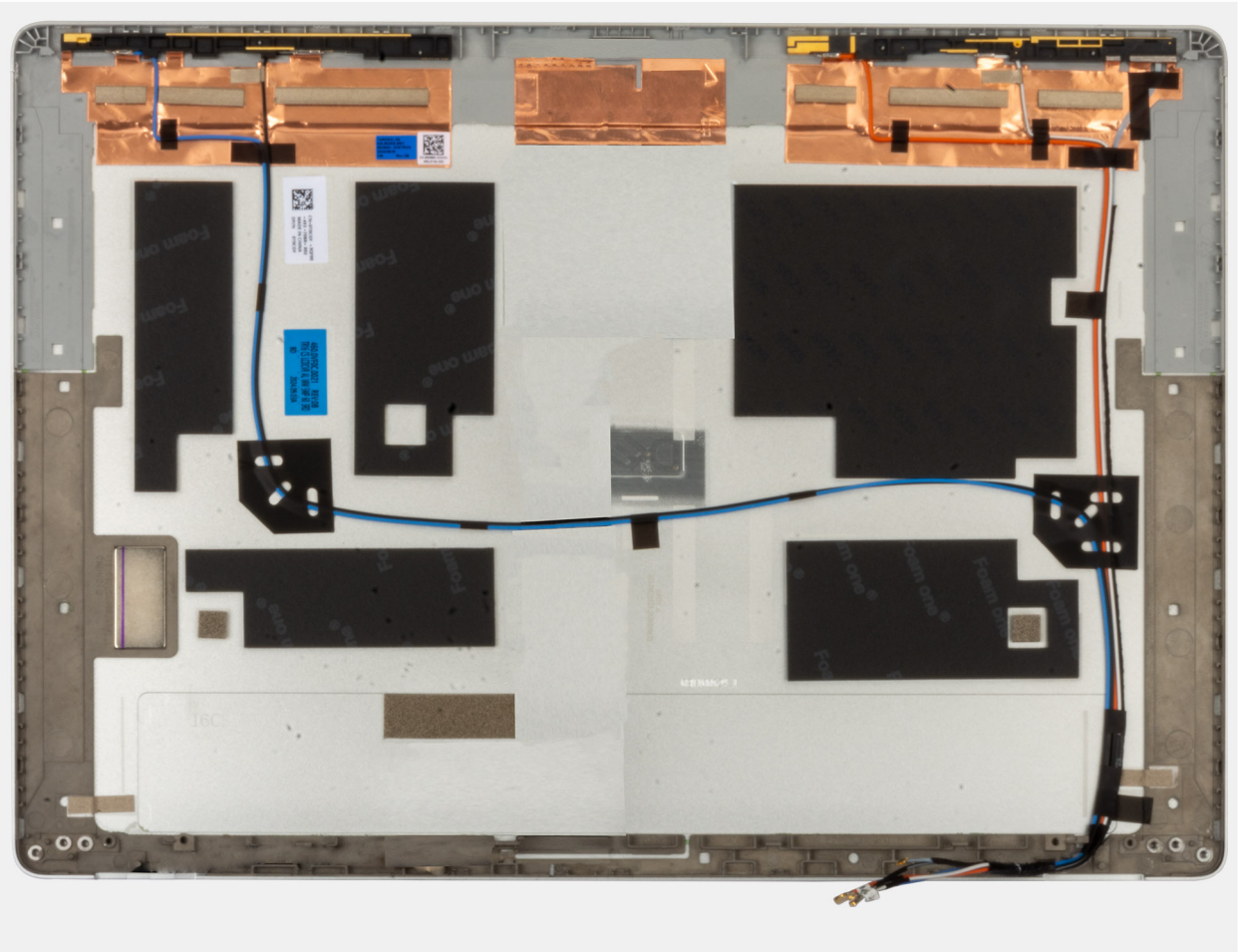


Figure 75. Installing the display back cover

Steps

Place the display back cover on a flat surface.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the 4G WWAN card.
4. Install the display assembly.
5. Install the display bezel.
6. Install the display panel.
7. Install the display hinge cap.
8. Install the display cable.
9. Install the camera module.
10. Install the base cover.

Wireless Local Area Network (WLAN) antenna module

Removing the WLAN antenna module

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.
5. Remove the M.2 2230 or M.2 2280 SSD, as applicable.
6. Remove the 4G WWAN.
7. Remove the display assembly.
8. Remove the system board.
9. Remove the I/O board.

About this task

The following image indicates the location of the WLAN antenna module and provides a visual representation of the removal procedure.

Figure 76. Removing the WLAN antenna module

Steps

1. Remove the four screws (M2x2.5) that secure the left and right antenna module to the palm-rest assembly.
2. Remove the antenna cables from the routing guides on the palm-rest assembly.
3. Lift the left and right WLAN antenna module, along with the cables, off the palm-rest assembly.

Installing the WLAN antenna module

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 WLAN antenna module and provides a visual representation of the installation procedure.

Figure 77. Installing the wireless antenna

Steps

1. Align and place the left and right WLAN antenna module, along with the cables, on the palm-rest assembly.
2. Route the antenna cables through the routing guides on the palm-rest assembly.
3. Replace the four screws (M2x2.5) that secure the left and right antenna module to the palm-rest assembly.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the battery.
4. Install the M.2 2230 or M.2 2280 SSD, as applicable.
5. Install the 4G WWAN.
6. Install the display assembly.
7. Install the system board.
8. Install the I/O board.
9. Install the base cover.

Keyboard

Removing the keyboard

CAUTION: The information in this removal section is intended for authorized service technicians only.

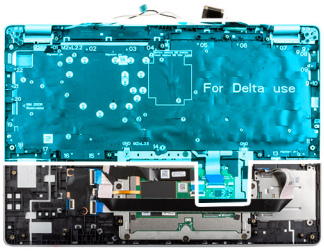
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.
5. Remove the M.2 2230 or M.2 2280 SSD, as applicable.
6. Remove the 4G WWAN card.
7. Remove the fan.
8. Remove the display assembly.
9. Remove the system board.
10. Remove the I/O board.

About this task

The following images indicate the location of the keyboard and provide a visual representation of the removal procedure.

31x
M2x2.2



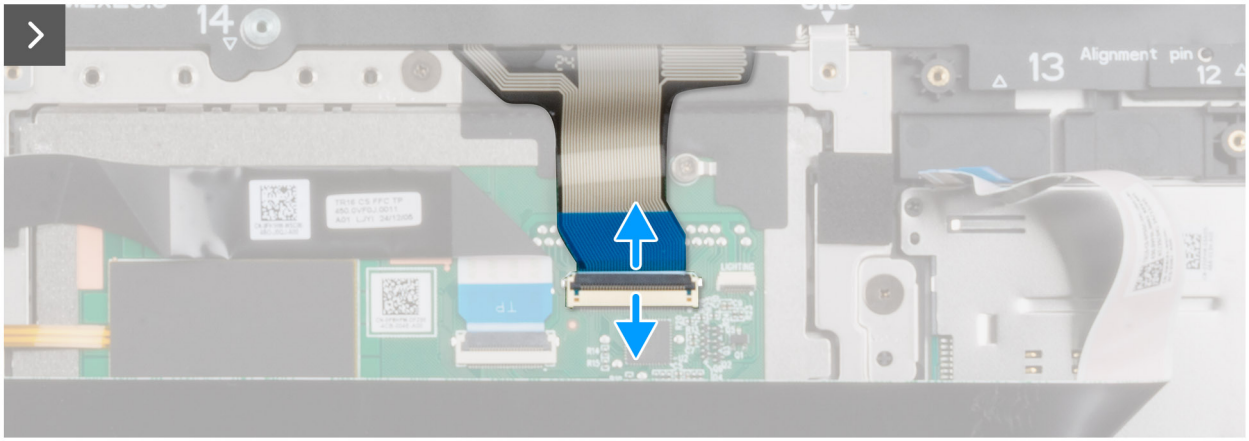


Figure 78. Removing the keyboard

Figure 79. Removing the keyboard

Steps

1. Open the latch and disconnect the keyboard cable from the touchpad.

   NOTE: For the keyboard, the latch is the "black" portion of the connector.

   NOTE: For the keyboard-backlight, the latch is the "white" portion of the connector.

2. Remove the 22 screws (M2x2.2) that secure the keyboard bracket to the palm-rest assembly.
3. Turn the keyboard bracket over.
4. Remove the 9 screws (M2x2.2) that secure the keyboard to the keyboard bracket.
5. Lift the keyboard off the keyboard bracket.

Installing the keyboard

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

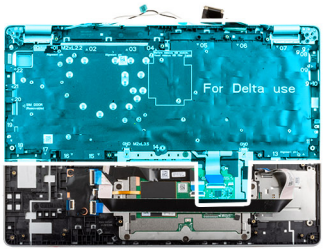
If you are replacing a component, remove the existing component before performing the installation process.

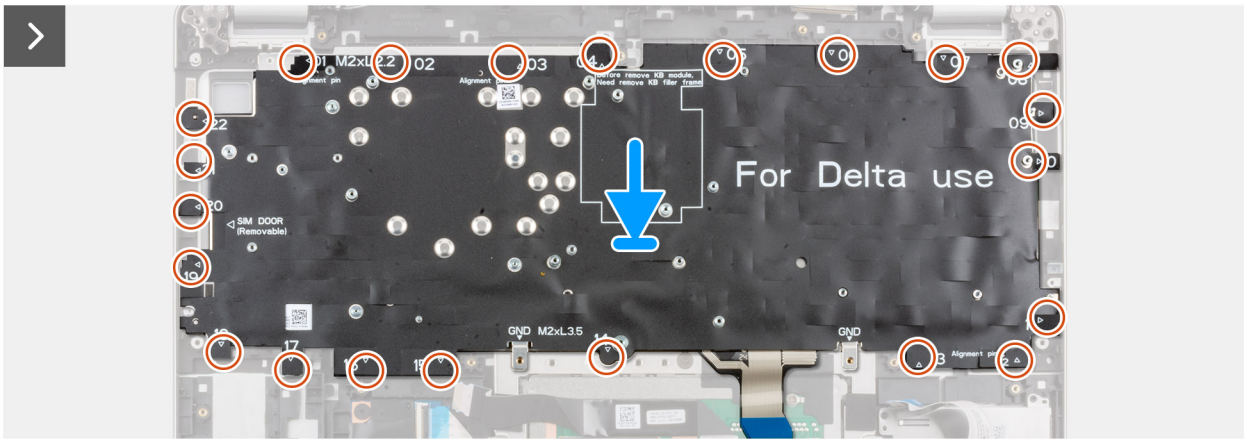
About this task

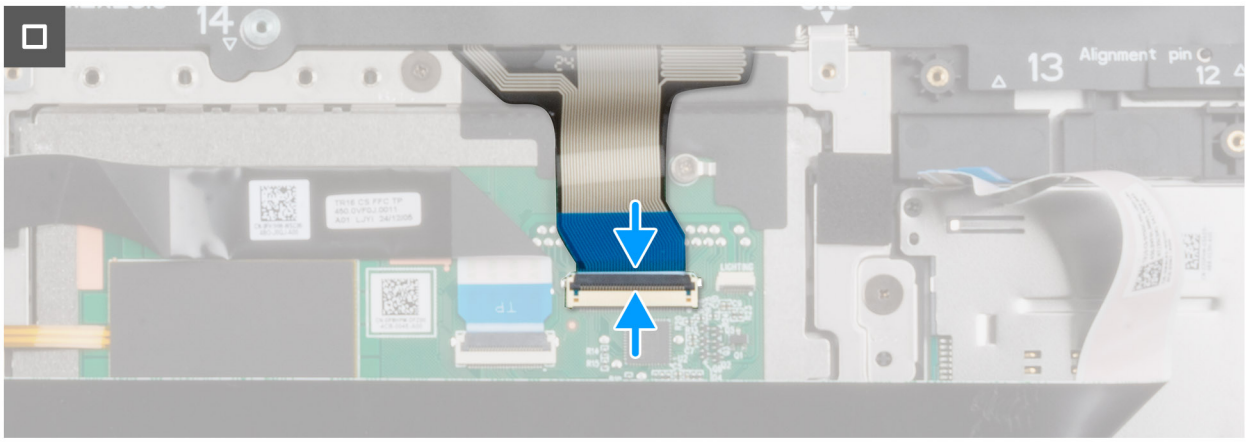
The following images indicate the location of the keyboard and provide a visual representation of the installation procedure.

Figure 80. Installing the keyboard

31x
M2x2.2







Steps

1. Align and place the keyboard on the keyboard bracket.

2. Replace the 9 screws (M2x2.2) that secure the keyboard to the keyboard bracket.
3. Turn the keyboard bracket over.
4. Replace the 22 screws (M2x2.2) that secure the keyboard bracket to the palm-rest assembly.
5. Open the latch and disconnect the keyboard cable from the touchpad.

   NOTE: For the keyboard-backlight, the latch is the "white" portion of the connector.

   NOTE: For the keyboard, the latch is the "black" portion of the connector.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the M.2 2230 M.2 2280 SSD, as applicable.
4. Install the 4G WWAN card.
5. Install the fan.
6. Install the display assembly.
7. Install the system board.
8. Install the I/O board.
9. Install the base cover.

Keyboard filler

Removing the keyboard filler

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.

About this task

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

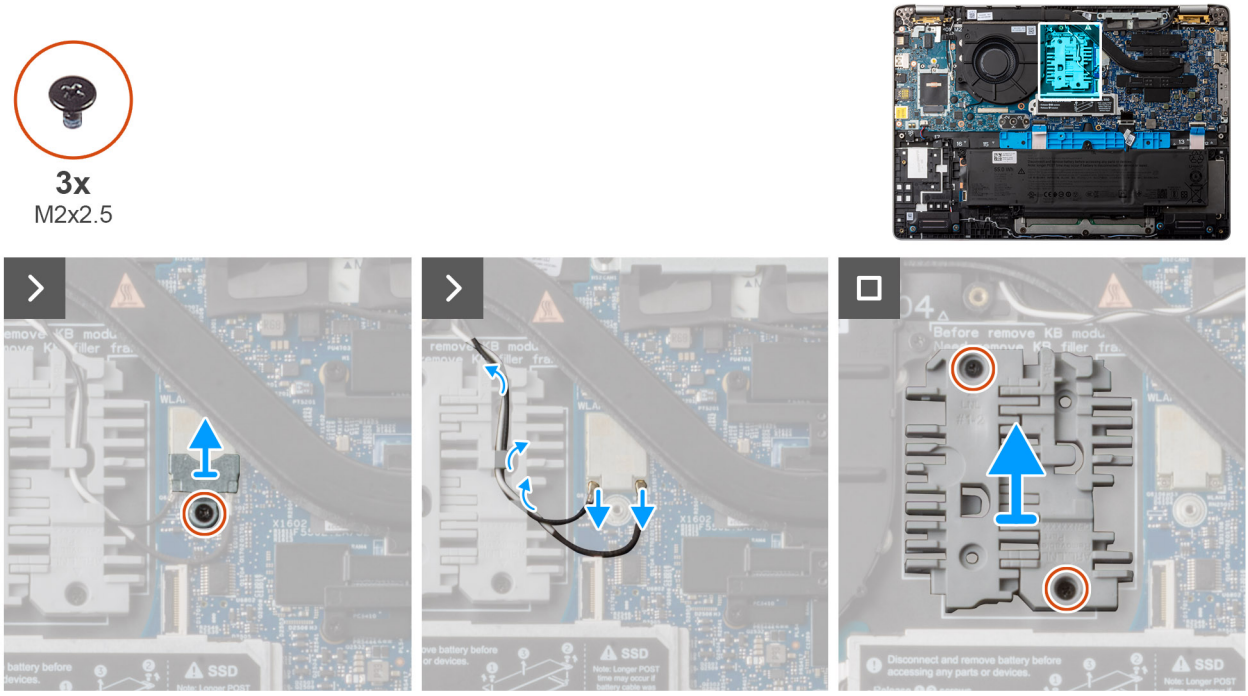


Figure 81. Removing the keyboard filler

Steps

1. Remove the screw (M2x2.5) that secures the WLAN bracket to the system board.
2. Disconnect the antenna cables from the WLAN card.
3. Remove the antenna cables from the routing guides on the keyboard filler.
4. Remove the two screws (M2x2.5) that secure the keyboard filler to the palm-rest assembly.
5. Lift the keyboard filler off the palm-rest assembly.

Installing the keyboard filler

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 keyboard filler and provides a visual representation of the installation procedure.

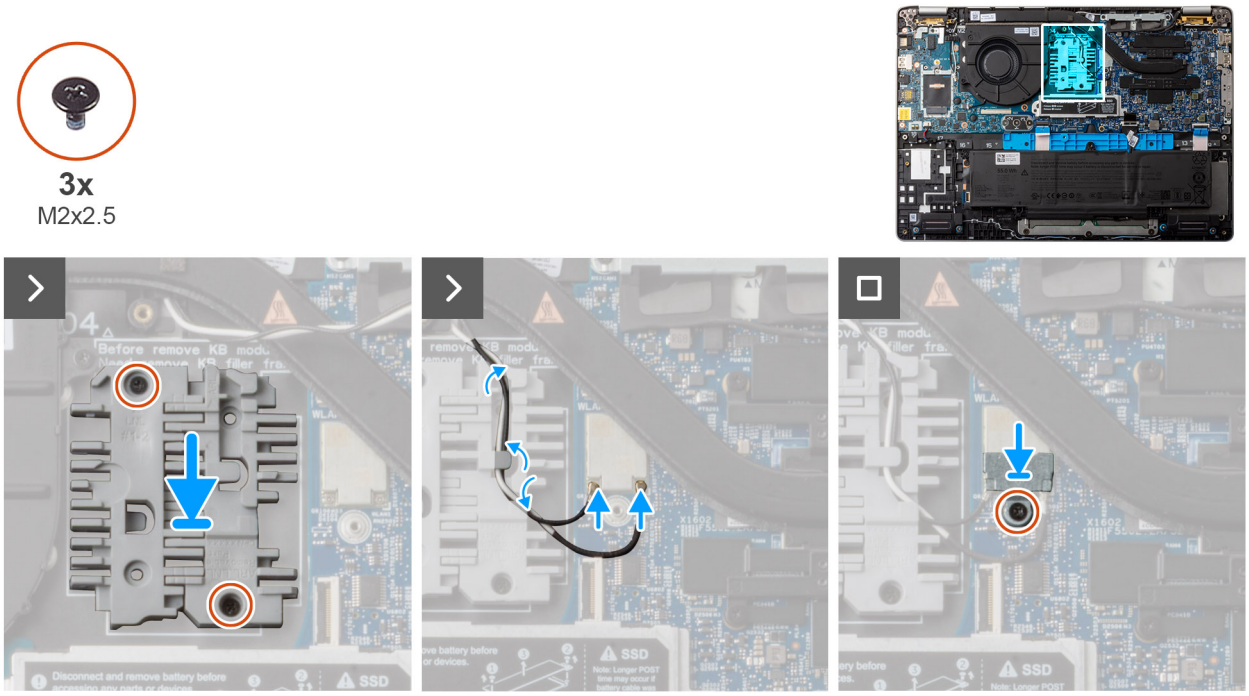


Figure 82. Installing the keyboard filler

Steps

1. Align and place the keyboard filler on the palm-rest assembly.
2. Replace the two screws (M2x2.5) that secures the keyboard filler to the palm-rest assembly.
3. Route the antenna cables through the routing guides on the keyboard filler.
4. Connect the antenna cables to the WLAN card.
5. Replace the screw (M2x2.5) that secures the WLAN bracket to the system board.
6. Align the screw hole on the WLAN bracket with the screw hole on the system board.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the base cover.

Palm-rest assembly

Removing the palm-rest assembly

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM-card tray (optional).
3. Remove the base cover.
4. Remove the battery.
5. Remove the M.2 2230 or M.2 2280 SSD, as applicable.
6. Remove the 4G WWAN card.
7. Remove the fan.
8. Remove the display assembly.

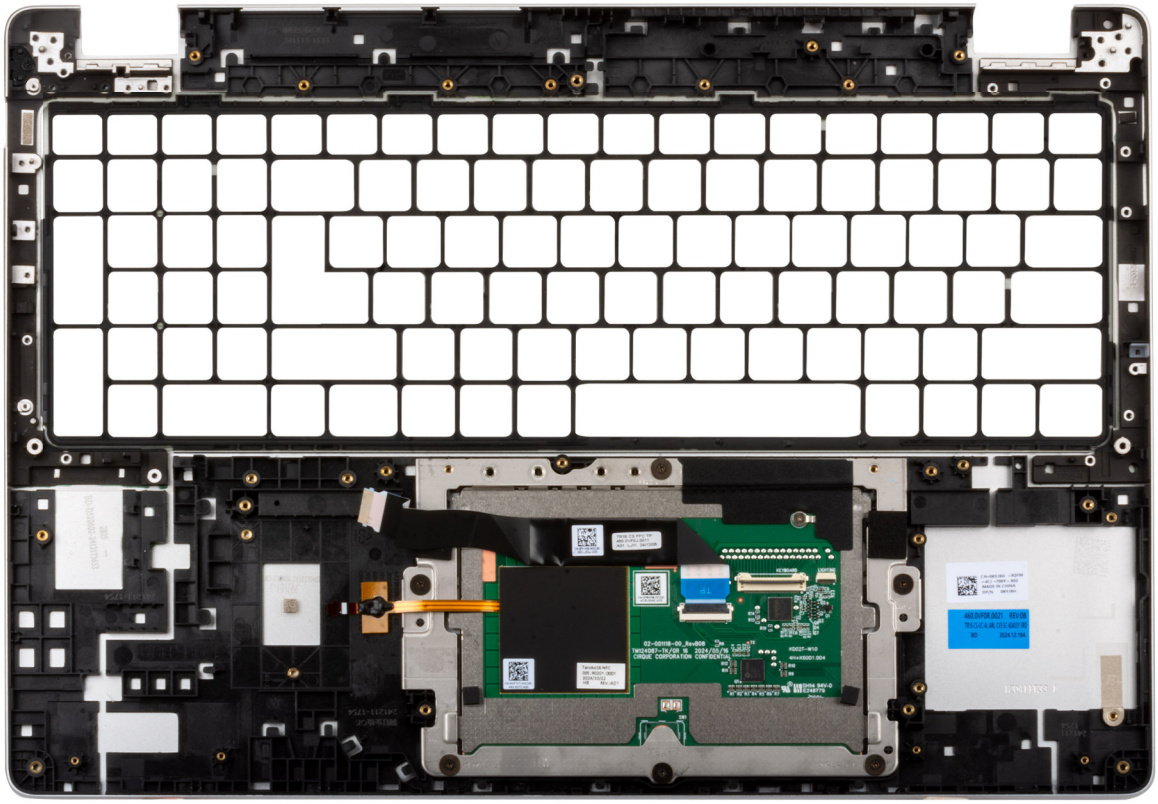
9. Remove the system board.
10. Remove the I/O board.

About this task

NOTE: When replacing the palm-rest assembly, transfer the dummy SIM filler to the new palm-rest assembly.

The following image indicates the location of the palm-rest assembly and provides a visual representation of the removal procedure.

Figure 83. Removing the palm-rest assembly



Steps

Remove all the components mentioned in the pre-requisites to get the palm-rest assembly.

NOTE: Do not remove the touchpad from the palm-rest assembly.

NOTE: The battery support bracket and the keyboard filler must be removed from the palm-rest assembly.

NOTE: Security-cable slot (wedge-shaped) is the part of the palm-rest assembly.

Installing the palm-rest assembly

CAUTION: The information in this installation section is intended for authorized service technicians only.

Prerequisites

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

About this task

The following image indicates the location of the palm-rest assembly and provides a visual representation of the installation procedure.

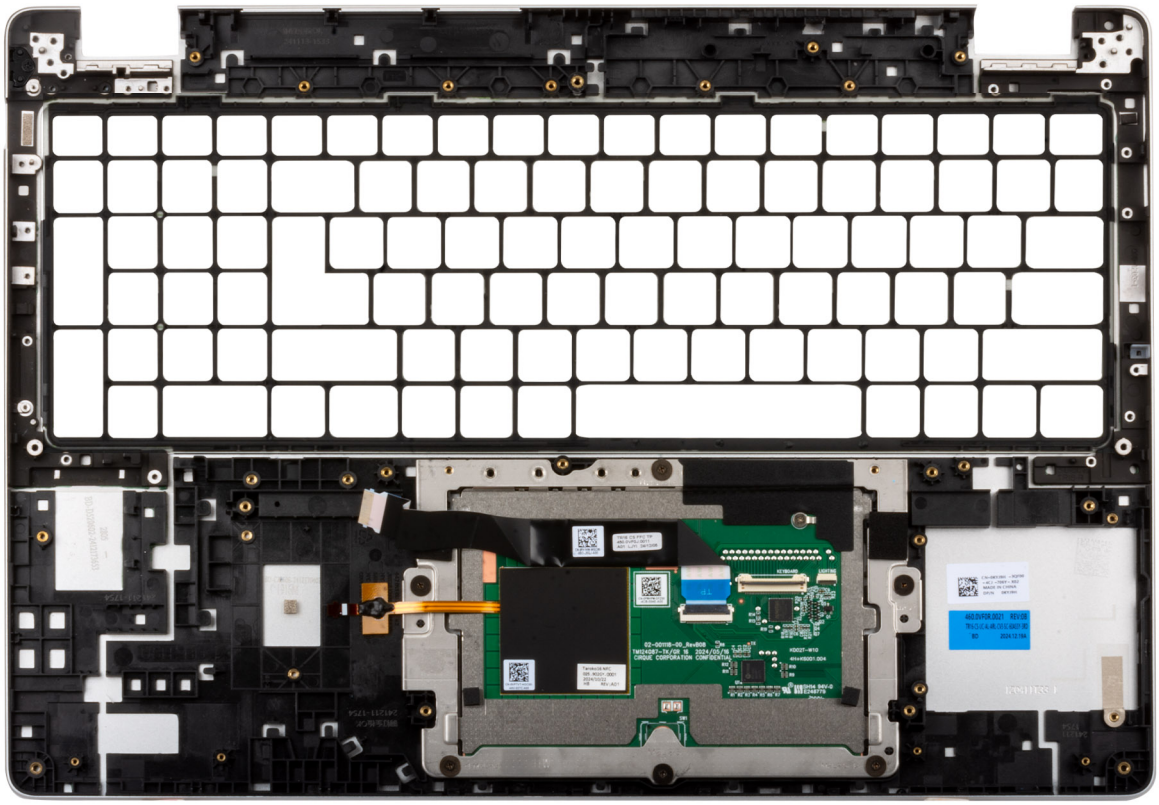


Figure 84. Installing the palm-rest assembly

Steps

Place the palm-rest assembly on a clean and flat surface.

NOTE: Do not remove the touchpad from the palm-rest assembly.

NOTE: The battery support bracket and the keyboard filler must be added to the replacement palm-rest assembly.

NOTE: Security-cable slot (wedge-shaped) is the part of the palm-rest assembly.

Next steps

1. Follow the procedure in After working inside your computer.
2. Install the SIM-card tray (optional).
3. Install the battery.
4. Install the M.2 2230 or M.2 2280 SSD, as applicable.
5. Install the 4G WWAN card.
6. Install the fan.
7. Install the display assembly.
8. Install the system board.
9. Install the I/O board.
10. Install the base cover.

7

Software

This chapter details the supported operating systems along with instructions on how to install the drivers.

Operating system

Your Dell Pro 16 Plus supports the following operating systems:

For computers shipped with AMD Ryzen 200 series processors:

- Windows 11 Home
- Windows 11 Pro
- Windows 10 Home
- Windows 10 Pro

NOTE: If you downgrade your computer from Windows 11 to Windows 10 22H2, Dell Technologies support follows the Microsoft Windows 10 End of Support plan.

NOTE: Windows 10 Home and Windows 10 Pro is supported only on computers shipped with AMD Ryzen 200 series processors.

For computers shipped with AMD Ryzen 300 series processors:

- Windows 11 Home
- Windows 11 Pro

Drivers and downloads

When troubleshooting, downloading, or installing drivers, it is recommended that you read the Dell Knowledge Base article Drivers and Downloads FAQs 000123347.

8

BIOS Setup

CAUTION: Certain changes can make your computer work incorrectly. Before you change the settings in BIOS Setup, it is recommended that you note down the original settings for future reference.

NOTE: Depending on the computer and the installed devices, the options that are listed in this section may differ.

Use BIOS Setup for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the capacity of the storage device.
- Change the system configuration information.
- Set or change user-selectable options such as the user password, enabling or disabling base devices, and configuring hard drive settings.

Entering BIOS Setup program

About this task

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

Navigation keys

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

Table 36. Navigation keys

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 follows 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 restart the computer.

F12 One Time Boot menu

To enter the One Time Boot menu, turn on or restart your computer, and then press F12 immediately.

NOTE: If you are unable to enter the One Time Boot menu, repeat the above action.

The One Time Boot menu displays the devices that you can boot from and also display the options to start diagnostics. 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 One Time Boot menu screen also displays the option to access BIOS Setup.

View Advanced Setup options

About this task

Some BIOS Setup options are only visible by enabling **Advanced Setup** mode, which is disabled by default.

NOTE: BIOS Setup options, including **Advanced Setup** options, are described in the **System setup options** option.

To enable Advanced Setup:

Steps

1. Enter BIOS Setup.
   The Overview menu appears.
2. Click the **Advanced Setup** option to move it to the **ON** mode.
   Advanced BIOS Setup options are displayed.

View Service options

About this task

Service options are hidden by default and only visible by entering a hotkey command.

NOTE: Service options are described in the **System setup options** section.

To view Service options:

Steps

1. Enter BIOS Setup.
   The Overview menu appears.
2. Enter the hotkey combination **Ctrl +Alt + s** to view the **Service** options.
   Service options are visible.

BIOS Setup options

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

Table 37. BIOS Setup options—Overview menu

Overview	
Dell Pro 16 Plus	
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.

Table 37. BIOS Setup options—Overview menu (continued)

Overview	
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.
Ownership Tag	Displays the Ownership Tag of the computer.
Signed Firmware Update	Displays whether the Signed Firmware Update is enabled on your computer. By default, the **Signed Firmware Update** option is enabled.
Battery Information	
Primary	Displays the primary battery of the computer.
Battery Level	Displays the battery level of the computer.
Battery State	Displays the battery state of the computer.
Health	Displays the battery health of the computer.
AC Adapter	Displays whether an AC adapter is connected. If connected, displays the type of AC adapter that is connected.
Battery Life Type	Displays the battery life type.
Processor Information	
Processor Type	Displays the processor type.
Maximum Clock Speed	Displays the maximum processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
Current Clock Speed	Displays the current processor clock speed.
Core Count	Displays the number of cores on the processor.
Processor ID	Displays the processor identification code.
Processor L2 Cache	Displays the processor L2 cache size.
Processor L3 Cache	Displays the processor L3 cache size.
Microcode Version	Displays the microcode version.
Simultaneous Multi-Threading Capable	Displays whether the processor is Multi-Threading (MT) capable.
64-Bit Technology	Displays whether 64-bit technology is used.
Memory Information	
Memory Installed	Displays the total memory that is installed on the computer.
Memory Available	Displays the total memory available on the computer.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology that is used for the memory.
DIMM 1 Size	Displays the total memory that is installed in DIMM Slot 1
DIMM 2 Size	Displays the total memory that is installed in DIMM Slot 2
Devices Information	
Panel Type	Displays the type of display panel available on the computer.
Panel Revision	Displays the panel revision of the computer.
Video Controller	Displays the type of video controller available on the computer.

Table 37. BIOS Setup options—Overview menu (continued)

Overview	
Video Memory	Displays the video memory information of the computer.
Native Resolution	Displays the native resolution of the computer.
Video BIOS Version	Displays the video BIOS version of the computer.
Audio Controller	Displays the audio controller information of the computer.
Bluetooth Device	Displays the Bluetooth device information of the computer.
LOM MAC Address	Displays the MAC address of the LOM (LAN on Motherboard) interface.
Pass Through MAC Address	Displays the MAC address of the video pass-through.
Cellular Device	Displays the Cellular Device if connected.

Table 38. BIOS Setup options—Boot Configuration menu

Boot Configuration	
Boot Sequence	
Boot Mode: UEFI only	Displays the boot mode of the computer.
Boot Sequence	Displays the boot sequence.
Enable PXE Boot Priority	Enables or disables the new PXE boot option. Allows loading an operating system over a network connection. By default, the **Enable PXE Boot Priority** option is disabled.
UEFI Network Boot Priority	This option is used to select IPv4 and IPv6 option boot order.
Extended IPv4 PXE Boot Timeout	Enter the Extended IPv4 PXE Boot Timeout value only if the IPv4 PXE Boot fails with standard timeouts.
Secure Boot	
Enable Secure Boot	Enables the computer to boot using only validated boot software. By default, the **Enable Secure Boot** option is disabled. For additional security, Dell Technologies recommends keeping the **Secure Boot** option is enabled to ensure that the UEFI firmware validates the operating system during the boot process. **NOTE:** For Secure Boot to be enabled, the computer is required to be in UEFI boot mode and the Enable Legacy Option ROMs option is required to be turned off.
Enable Microsoft UEFI CA	When disabled, the UEFI CA is removed from the BIOS UEFI Secure Boot database. **CAUTION: When disabled, the Microsoft UEFI CA can cause your system to not boot, computer graphics may not function, some devices may not function properly, and the computer could become unrecoverable.** By default, the **Enable Microsoft UEFI CA** option is disabled. For additional security, Dell Technologies recommends keeping the **Enable Microsoft UEFI CA** option is enabled to ensure the broadest compatibility with devices and operating systems.
Secure Boot Mode	Enables or disables the Secure Boot operation mode. By default, the **Deployed Mode** is selected. **NOTE: Deployed Mode** should be selected for normal operation of Secure Boot.
Expert Key Management	

Table 38. BIOS Setup options—Boot Configuration menu (continued)

Boot Configuration	
Enable Custom Mode	Enables or disables the ability to modify the keys in the PK, KEK, db, and dbx security key databases to be modified. By default, the **Enable Custom Mode** option is disabled.
Custom Mode Key Management	
Select Key Database	Selects the custom values for expert key management. By default, the **PK** option is selected.

Table 39. BIOS Setup options—Integrated Devices menu

Integrated Devices	
Date/Time	
Date	Sets the computer date in MM/DD/YYYY format. Changes to the date format take effect immediately.
Time	Sets the computer time in HH/MM/SS 24-hour format. You can switch between a 12-hour and 24-hour clock. Changes to the time format take effect immediately.
Camera	
Enable Camera	Enables the camera. By default, the **Enable Camera** option is enabled. **NOTE:** Depending on the configuration ordered, the camera setup option may not be available.
Audio	
Enable Audio	Enables all integrated audio controller. By default, all the options are enabled.
Enable Microphone	Enables the microphone. By default, the **Enable Microphone** option is enabled. **NOTE:** Depending on the configuration ordered, the microphone setup option may not be available.
Enable Internal Speaker	Enables the internal speaker. By default, the **Enable Intenal Speaker** option is enabled.
USB/Thunderbolt Configuration	
Enable External USB Ports	Enables the external USB ports. By default, the **Enable External USB Ports** option is enabled.
Enable USB Boot Support	Enables booting from USB mass storage devices that are connected to external USB ports. By default, the **Enable USB Boot Support** option is enabled.
Miscellaneous Devices	
Enable Fingerprint Reader Device	Enables the Fingerprint Reader Device option. By default, the **Enable Fingerprint Reader Device** option is enabled.
Microphone Mute Led	
Microphone Mute Led	Enable or disable the LED status of Microphone. By default, the **Microphone Mute Led** option is disabled.

Table 40. BIOS Setup options—Storage menu

Storage	
SATA/NVMe Operation	
SATA/NVMe Operation	Sets the operating mode of the integrated SATA hard drive controller. By default, the **AHCI/NVMe** option is selected. The storage device is configured for AHCI/NVMe mode.
Storage Interface	Displays the information of various onboard drives.
Port Enablement	Enables or disables the M.2 PCIe SSD option. By default, the **M.2 PCIe SSD** option is enabled.
Smart Reporting	
Enable Smart Reporting	Enables or disables the Smart reporting option. By default, the **Smart Reporting** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Drive Information	Displays the information of onboard drives.

Table 41. BIOS Setup options—Display menu

Display	
Full Screen Logo	Enables or disables the computer to display a full-screen logo, if the image matches screen resolution. By default, the **Full Screen Logo** option is disabled.

Table 42. BIOS Setup options—Connection menu

Connection	
Network Controller Configuration	
Integrated NIC	This option controls the on-board LAN Controller. By default, the **Enabled with PXE** option is enabled.
Wireless Device Enable	
WLAN	Enables or disables the internal WLAN device. By default, the **WLAN** option is enabled.
WWAN	Enables or disables the internal WWAN device. By default, the **WWAN** option is enabled.
Bluetooth	Enables or disables the internal Bluetooth device. By default, the **Bluetooth** option is enabled.
Contactless smartcard/NFC	Enables or disables theContactless smartcard/NFC. By default, the **Contactless smartcard/NFC** option is enabled.
Wireless Radio Control	
Control WLAN Radio	Enables to sense the connection of the computer to a wired network and then disables the selected wireless radios (WLAN). Upon disconnection from the wired network, the selected wireless radios are reenabled. By default, the **Control WLAN Radio** option is disabled.

Table 42. BIOS Setup options—Connection menu (continued)

Connection	
Control WWAN Radio	Enables to sense the connection of the computer to a wired network and then disables the selected wireless radios (WWAN). Upon disconnection from the wired network, the selected wireless radios are reenabled. By default, the **Control WWAN Radio** option is disabled.

Table 43. BIOS Setup options—Power menu

Power	
Battery Configuration	
Battery Configuration	Enables or disables the computer to run on battery during peak power usage hours. Use the table **Custom Charge Start** and **Custom Charge Stop**, to prevent AC power usage between certain times of each day. By default, the **Adaptive** option is selected. Battery settings are adaptively optimized based on your typical battery usage pattern.
Advanced Configuration	
Enable Advanced Battery Charge Configuration	Enables Advanced Battery Charge Configuration from the beginning of the day to a specified work period. When enabled, Advanced Battery Charged maximizes battery health while still supporting heavy use during the work day. By default, the **Enable Advanced Battery Charge Configuration** option is disabled.
Peak Shift	
Enable Peak Shift	Enables the computer to run on battery during peak power usage hours. By default, the **Enable Peak Shift** option is disabled.
USB PowerShare	
Enable USB PowerShare	Enables or disables the USB PowerShare on the computer. By default, the **Enable USB Powershare** option is disabled.
Thermal Management	
Thermal Management	Enables or disables cooling of fan and manages processor heat to adjust the computer performance, noise, and temperature. By default, the **Optimized** option is selected. Standard setting for balanced performance, noise, and temperature.
USB Wake Support	
Wake on Dell USB-C Dock	When enabled, connecting a Dell USB-C Dock wakes the computer from Standby, Hibernate, and Power Off. By default, the **Wake on Dell USB-C Dock** option is enabled.
Block Speed	
Block Speed	This options lets you to block enterning sleep mode. By default, the **Block Speed** option is enabled.
Lid Switch	
Enable Lid Switch	Enables or disables the Lid Switch. By default, the **Enable Lid Switch** option is enabled.

Table 44. BIOS Setup options—Security menu

Security	
TPM 2.0 Security On	Allows you to enable or disable TPM. By default, the **TPM 2.0 Security On** option is enabled. For additional security, Dell Technologies recommends keeping **TPM 2.0 Security On** enabled to allow these security technologies to fully function.
Attestation Enable	The **Attestation Enable** option controls the endorsement hierarchy of TPM. Disabling the **Attestation Enable** option prevents TPM from being used to digitally sign certificates. By default, the **Attestation Enable** option is enabled. For additional security, Dell Technologies recommends keeping the **Attestation Enable** option is enabled. **NOTE:** When disabled, this feature may cause compatibility issues or loss of functionality in some operating systems.
Key Storage Enable	The **Key Storage Enable** option controls the storage hierarchy of TPM, which is used to store digital keys. Disabling the **Key Storage Enable** option restricts the ability of TPM to store owner's data. By default, the **Key Storage Enable** option is enabled. For additional security, Dell Technologies recommends keeping the **Key Storage Enable** option is enabled. **NOTE:** When disabled, this feature may cause compatibility issues or loss of functionality in some operating systems.
SHA-256	When this option is checked the BIOS and the TPM will use the SHA-256 hash algorithm to extend measurements into the TPM PCRs during BIOS boot.
Physical Presence Interface (PPI) Bypass for Clear Commands	By default, the **PPI Bypass for Clear Commands** option is disabled. For additional security, Dell Technologies recommends keeping the **PPI Bypass for Clear Commands** option disabled.
Chassis intrusion	
Chassis Intrusion	The chassis intrusion detection enables a physical switch that triggers an event when the computer cover is opened. When set to **Enabled**, a notification is displayed on the next boot and the event is logged in the BIOS Events log. When set to **On-Silent**, the event is logged in the BIOS Events log, but no notification is displayed. When set to **Disabled**, no notification is displayed and no event is logged in the BIOS Events log. By default, the **Chassis Intrusion** option is enabled. For additional security, Dell Technologies recommends keeping the **Chassis Intrusion Detection** option is disabled.
SMM Security Mitigation	When this option enables and disables additional UEFI SMM Security Mitigation Protections.
AMD Memory Guard	
AMD Memory Guard	Enables or disables memory encryption. AMD Memory Guard encrypts the contents of RAM to provide enhanced protection against unauthorized access. While enabling this feature may make detecting RAM errors more difficult during testing, it will not produce false errors. Enabling AMD Memory Guard may have a small performance impact on memory. This feature is only available on CPUs with AMD Pro technology.

Table 44. BIOS Setup options—Security menu (continued)

Security	
	By default, the **AMD Memory Guard** option is disabled.
Data Wipe on Next Boot	
Start Data Wipe	Data Wipe is a secure wipe operation that deletes information from a storage device. **CAUTION: The secure Data Wipe operation deletes information in a way that it cannot be reconstructed.** Commands such as delete and format in the operating system may remove files from showing up in the file system. However, they can be reconstructed through forensic means as they are still represented on the physical media. Data Wipe prevents this reconstruction and the data can no longer be recovered. When enabled, the data wipe option provides prompts to wipe any storage devices that are connected to the computer on the next boot. By default, the **Start Data Wipe** option is disabled.
Absolute	
Absolute	Absolute Software provides various cyber security solutions, some requiring software preloaded on Dell computers and integrated into the BIOS. To use these features, you must enable the Absolute BIOS setting and contact Absolute for configuration and activation. By default, the **Absolute** option is enabled. For additional security, Dell Technologies recommends keeping the **Absolute** option is enabled. **NOTE:** When the Absolute features are activated, the Absolute integration cannot be disabled from the BIOS setup screen.
UEFI Boot Path Security	
UEFI Boot Path Security	Enables or disables the computer to prompt the user to enter the Administrator password (if set) when booting to a UEFI boot path device from the F12 boot menu. By default, the **Always Except Internal HDD** option is enabled.
Authenticated BIOS Interface	
Enable Authenticated BIOS Interface	Allows the administrator to control access to BIOS configuration through an authenticated interface. When enabled, this option ensures that BIOS configuration changes are secured by authentication. By default, the **Enable Authenticated BIOS Interface** option is disabled.
Legacy Manageability Interface Access	Allows the administrator to control the access to BIOS configuration through the Legacy Manageability Interface option. When enabled, this prevents the BIOS Administrator password-based manageability tools from running, prevents some Dell software applications from reading configuration settings, and/or prevents changes to the BIOS configuration settings. When enabled, this option only supports the Authenticated BIOS Manageability Interface (ABI) for managing the BIOS configuration changes. To support this feature, ABI must be enabled and provisioned. When set to **Enabled** , the Legacy Manageability Interface can be used to read and change BIOS configuration settings. When set to **Read-Only** , BIOS configuration settings can be read, but cannot be changed through the Legacy Manageability Interface. When set to **Disabled** , the Legacy Manageability Interface is disabled. BIOS configuration reads and writes are blocked.

Table 44. BIOS Setup options—Security menu (continued)

Security	
Firmware Device Tamper Detection	
Firmware Device Tamper Detection	Allows you to control the firmware device tamper detection feature. This feature notifies the user when the firmware device is tampered. When enabled, a screen warning messages are displayed on the computer and a tamper detection event is logged in the BIOS Events log. The computer fails to reboot until the event is cleared. By default, the **Silent** option is enabled. For additional security, Dell Technologies recommends keeping the **Firmware Device Tamper Detection** option is enabled.
Clear Firmware Device Tamper Detection	Allows you to clear the events that are logged when tampering of firmware device is detected. By default, the **Clear Firmware Device Tamper Detection** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Pluton Security Processor	
Pluton Security Processor	Enables or disables the utilization of the Pluton Security Processor by the operating system to provide security services such as Key Storage Provider functionality. By default, the **Pluton Security Processor** option is enabled. **NOTE:** For additional security, Dell Technologies recommends keeping the **Pluton Security Processor** option enabled.

Table 45. BIOS Setup options—Passwords menu

Passwords	
Admin Password	The Administrator Password prevents unauthorized access to the BIOS Setup options. Once the administrator password is set, the BIOS setup options can only be modified after providing the correct password. The following rules and dependencies apply to the Administrator Password - • The administrator password cannot be set if computer and/or internal storage passwords are previously set. • The administrator password can be used in place of the computer and/or internal storage passwords. • When set, the administrator password must be provided during a firmware update. • Clearing the administrator password also clears the computer password (if set). Dell Technologies recommends using an administrator password to prevent unauthorized changes to BIOS setup options.
System Password	The System Password prevents the computer from booting to an operating system without entering the correct password. The following rules and dependencies apply when the System Password is used - • The computer shuts down when idle for approximately 10 minutes at the computer password prompt. • The computer shuts down after three incorrect attempts to enter the computer password. • The computer shuts down when the **Esc** key is pressed at the System Password prompt. • The computer password is not prompted when the computer resumes from standby mode.

Table 45. BIOS Setup options—Passwords menu (continued)

Passwords	
	Dell Technologies recommends using the computer password in situations where it is likely that a computer may be lost or stolen.
M.2 PCIe SSD-0	The hard drive password can be set to prevent unauthorized access of the data stored on the solid-state drive. The computer prompts for the hard drive password during boot in order to unlock the drive. A password-secured hard drive stays locked even when removed from the computer or placed into another computer. It prevents an attacker from accessing data on the drive without authorization. The following rules and dependencies apply when the **Hard Drive Password** or **M.2 PCIe SSD-0 Password** option is used. ● The hard drive password option cannot be accessed when the hard drive is disabled in the BIOS Setup. ● The computer shuts down when idle for approximately 10 minutes at the hard drive password prompt. ● The computer shuts down after three incorrect attempts to enter the hard drive password and treats the hard drive as not available. ● The hard drive does not accept password unlock attempts after five incorrect attempts to enter the hard drive password from the BIOS Setup. The hard drive password must be reset for the new password unlock attempts. ● The computer treats the hard drive as not available when the **Esc** key is pressed at the hard drive password prompt. ● The hard drive password is not prompted when the computer resumes from standby mode. When the hard drive is unlocked by the user before the computer goes into standby mode, it remains unlocked after the computer resumes from standby mode. ● If the system and hard drive passwords are set to the same value, the hard drive unlocks after the correct system password is entered. Dell Technologies recommends using a hard drive password to protect unauthorized data access.
Password Configuration	The Password configuration page includes several options for changing the requirements of BIOS passwords. You can modify the minimum and maximum length of the passwords and require passwords to contain certain character classes (upper case, lower case, digit, special character). Dell Technologies recommends setting the minimum password length to at least eight characters.
Password Changes	
Allow Non-Admin Password Changes	The **Allow Non-Admin Password Changes** option in BIOS Setup allows an end user to set or change the system or hard drive passwords without entering the administrator password. This gives an administrator control over the BIOS settings but enables an end user to provide their own password. By default, the **Allow Non-Admin Password Changes** option is enabled. For additional security, Dell Technologies recommends keeping the **Allow Non-Admin Password Changes** option disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Admin Setup Lockout	The **Admin Setup Lockout** option prevents an end user from even viewing the BIOS setup configuration without first entering the administrator password (if set). By default, the **Admin Setup Lockout** option is disabled. For additional security, Dell Technologies recommends keeping the **Admin Setup Lockout** option disabled.

Table 45. BIOS Setup options—Passwords menu (continued)

Passwords	
Master Password Lockout	
Enable Master Password Lockout	The Master Password Lockout setting allows you to disable the Recovery Password feature. If the computer, administrator, or hard drive password is forgotten, the computer becomes unusable. **NOTE:** When the owner password is set, the Master Password Lockout option is not available. **NOTE:** When an internal hard drive password is set, it must first be cleared before Master Password Lockout can be changed. By default, the **Enable Master Password Lockout** option is disabled. Dell does not recommend enabling the **Master Password Lockout** unless you have implemented your own password recovery computer.
Allow Non-Admin PSID Revert	The **Allow Non-Admin PSID Revert** option allows a user to clear the hard drive password without entering the BIOS Admin Password. When an Admin Password is set, the ability to enter the PSID is protected by requiring authentication with the Admin Password. If this option is enabled, any user can clear the drive without entering the Admin Password. By default, the **Enable Allow Non-Admin PSID Revert** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 46. BIOS Setup options—Update, Recovery menu

Update, Recovery	
UEFI Capsule Firmware Updates	
BIOS Recovery from Hard Drive	Enables or disables the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key. By default, the **BIOS Recovery from Hard Drive** option is enabled. **NOTE:** BIOS Recovery from Hard Drive is not available for self-encrypting drives (SED). **NOTE:** BIOS recovery is designed to fix the main BIOS block and cannot work if the Boot Block is damaged. In addition, this feature cannot work in the event of EC corruption, ME corruption, or a hardware issue. The recovery image must exist on an unencrypted partition on the drive.
BIOS Downgrade	
Allow BIOS Downgrade	Controls flashing of the computer firmware to previous revisions. By default, the **Allow BIOS Downgrade** option is enabled.
SupportAssist OS Recovery	Enables or disables the boot flow for SupportAssist OS Recovery tool in the event of certain computer errors. By default, the **SupportAssist OS Recovery** option is enabled.
BIOSConnect	Enables or disables cloud Service operating system recovery if the main operating system fails to boot with the number of failures equal to or greater than the value specified by the Auto OS Recovery Threshold setup option and local Service operating system does not boot or is not installed. By default, the **BIOSConnect** option is enabled.
Dell Auto OS Recovery Threshold	Allows you to control the automatic boot flow for SupportAssist System Resolution Console and for Dell OS Recovery Tool. By default, the **Dell Auto OS Recovery Threshold** value is set to 2.

Table 47. BIOS Setup options—System Management menu

System Management	
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Creates a computer Asset Tag that can be used by an IT administrator to uniquely identify a particular computer. **NOTE:** Once set in BIOS, the Asset Tag cannot be changed.
AC Behavior	
Wake on AC	Enables or disables the computer to turn on and go to boot when AC power is supplied to the computer. By default, the **Wake on AC** option is disabled.
Wake on LAN	Enables or disables the computer to turn on by a special LAN signal. By default, the **Wake on LAN** option is disabled.
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. By default, the **Auto On Time** option is disabled.
Diagnostics	
OS Agent Requests	By default, the **OS Agent Requests** option is enabled.
Power-on-Self-Test Automatic Recovery	Enable or disable the automatic recovery of the computer from no power or no-POST failure by applying mitigation steps. By default, the **Power-On-Self-Test Automatic Recovery** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 48. BIOS Setup options—Keyboard menu

Keyboard	
Fn Lock Options	Enables or disables the Fn Lock option. By default, the **Fn Lock** option is enabled.
Lock Mode	By default, the **Lock Mode Secondary** option is enabled. With this option, the F1-F12 keys scan the code for their secondary functions.
Keyboard Illumination	Configures the operating mode of the keyboard illumination feature. By default, the **Dim** option is selected. Enables the keyboard illumination feature at 100% brightness level.
Keyboard Backlight Timeout on AC	Sets the timeout value for the keyboard backlight when an AC adapter is connected to the computer. By default, the **10 seconds** option is selected.
Keyboard Backlight Timeout on Battery	Sets the timeout value for the keyboard backlight when the computer is running only on the battery power. The keyboard backlight timeout value is only effective when the backlight is enabled. By default, the **10 seconds** option is selected.

Table 49. BIOS Setup options—Pre-boot Behavior menu

Preboot Behavior	
Adapter Warnings	

Table 49. BIOS Setup options—Pre-boot Behavior menu (continued)

Preboot Behavior	
Enable Adapter Warnings	Enables the warning messages during boot when the adapters with less power capacity are detected. By default, the **Enable Adapter Warnings** option is enabled.
Warnings and Errors	Enables or disables the action to be taken when a warning or error is encountered. By default, the **Prompt on Warnings and Errors** option is selected. **NOTE:** Errors deemed critical to the operation of the computer hardware stop the functioning of the computer.
Extend BIOS POST Time	Sets the BIOS POST (Power-On Self-Test) load time. By default, the **0 seconds** option is selected.
Sign of Life	
Early Keyboard Backlight	Keyboard Backlight Sign of Life. By default, the **Early Keyboard Backlight** option is enabled.

Table 50. BIOS Setup options—Virtualization menu

Virtualization	
AMD-V Technology	
Enable AMD-V Technology	By default, the **Enable AMD-V Technology** option is enabled.
AMD-Vi Technology	
Enable AMD-Vi Technology (IOMMU v2)	By default, the **Enable AMD-Vi Technology (IOMMU v2)** option is enabled.
DMA Protection	
Enable Pre-Boot DMA Support	Allows you to control the Pre-Boot DMA protection for both internal and external ports. This option does not directly enable DMA protection in the operating system. **NOTE:** This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the **Enable Pre-Boot DMA Support** option is enabled. For additional security, Dell Technologies recommends keeping the **Enable Pre-Boot DMA Support** option is enabled. **NOTE:** This option is provided only for compatibility purposes, since some older hardware is not DMA capable.
Enable OS Kernel DMA Support	Allows you to control the Kernel DMA protection for both internal and external ports. This option does not directly enable DMA protection in the operating system. For operating systems that support DMA protection, this setting indicates to the operating system that the BIOS supports the feature. **NOTE:** This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the **Enable OS Kernel DMA Support** option is enabled. **NOTE:** This option is provided only for compatibility purposes, since some older hardware is not DMA capable.
Internal Port DMA Compatability Mode	Allows you to control the boot compatibility for integrated PCIe peripherals by disabling PCIe DMA protection on internal PCIe ports. When enabled, BIOS will notify the operating system that the internal ports are not DMA capable. This option is to help with devices that have operating system

Table 50. BIOS Setup options—Virtualization menu (continued)

Virtualization	
	DMA compatibility issues. This option does not directly enable DMA protection in the operating system. **NOTE:** This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the **Internal Port DMA Compatibility Mode** option is enabled. **NOTE:** This option is provided only for compatibility purposes, since some older hardware is not DMA capable.

Table 51. BIOS Setup options—Performance menu

Performance	
C-State Control	
Enable C-State Control	Enables or disables the ability of the CPU to enter and exit low-power state. When disabled, it disables all C-states. When enabled, it enables all C-states that the chipset or platform allows. By default, the **Enable C-State Control** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
AMD Simultaneous Multithreading	
Enable AMD Simultaneous Multithreading	Enables or disables the AMD Simultaneous Multithreading mode of the processor. When enabled, the AMD Simultaneous Multithreading increases the efficiency of the processor resources when multiple threads run on each core. By default, the **Enable AMD Simultaneous Multithreading** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
AMD Core Performance Boost	
Enable AMD Core Performance Boost	By default, the **AMD Core Performance Boost** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
NUMA Nodes Per Socket	
NUMA Nodes Per Socket	Controls how system memory is distributed among processor cores. By default, the **Auto** option is selected.

Table 52. BIOS Setup options—System Logs menu

System Logs	
BIOS Event Log	
Clear BIOS Event Log	Allows you to select option to keep or clear BIOS events logs. By default, the **Keep Log** option is selected.
Thermal Event Log	
Clear Thermal Event Log	Allows you to select option to keep or clear thermal events logs. By default, the **Keep Log** option is selected.
Power Event Log	
Clear Power Event Log	Allows you to select option to keep or clear power events logs.

Table 52. BIOS Setup options—System Logs menu (continued)

System Logs	
	By default, the **Keep Log** option is selected.

Table 53. BIOS Setup options—System Manageability menu

System Logs	
Manageability	
Manageability	By default, the **Manageability** option is disabled.
Wireless Manageability	
Wireless Manageability	By default, the **Wireless Manageability** option is disabled.
KVM for Wired Manageability	
KVM for Wired Manageability	By default, the **KVM for Wired Manageability** option is disabled.
KVM for Wireless Manageability	
KVM for Wired Manageability	By default, the **KVM for Wireless Manageability** option is disabled.
Text Console for Wired Manageability	
Text Console for Wired Manageability	By default, the **Text Console for Wired Manageability** option is disabled.
Text Console for Wireless Manageability	
Text Console for Wireless Manageability	By default, the **Text Console for Wireless Manageability** option is disabled.
Un-provision	
Un-provision	By default, the **Un-provision** option is disabled.

Updating the BIOS

Updating the BIOS in Windows

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the BitLocker key is not recognized the next time you reboot the computer. You will then be prompted to enter the recovery key to proceed, and the computer displays a prompt for the recovery key on each reboot. Failure to provide the recovery key can result in data loss or an operating system reinstall. For more information, see the Knowledge Base Resource updating the BIOS on Dell systems with BitLocker enabled.

Steps

1. Go to Dell Support Site.
2. Go to **Identify your product or search support**. In the box, enter the product identifier, model, service request or describe what you are looking for, and then click **Search**.

   NOTE: If you do not have the Service Tag, use the SupportAssist to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.

5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
   For more information, search in the Knowledge Base Resource at Dell Support Site.

Updating the BIOS in Linux and Ubuntu

To update the system BIOS on a computer that is installed with Linux or Ubuntu, see the knowledge base article 000131486 at Dell Support Site.

Updating the BIOS using the USB drive in Windows

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the BitLocker key is not recognized the next time you reboot the computer. You will then be prompted to enter the recovery key to proceed, and the computer displays a prompt for the recovery key on each reboot. Failure to provide the recovery key can result in data loss or an operating system reinstall. For more information, see the Knowledge Base Resource updating the BIOS on Dell systems with BitLocker enabled.

Steps

1. Go to Dell Support Site.
2. Go to **Identify your product or search support**. In the box, enter the product identifier, model, service request or describe what you are looking for, and then click **Search**.

   NOTE: If you do not have the Service Tag, use the SupportAssist to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. Create a bootable USB drive. For more information, search in the Knowledge Base Resource at Dell Support Site.
8. Copy the BIOS setup program file to the bootable USB drive.
9. Connect the bootable USB drive to the computer that needs the BIOS update.
10. Restart the computer and press **F12**.
11. Select the USB drive from the **One Time Boot Menu**.
12. Type the BIOS setup program filename and press **Enter**.
    The **BIOS Update Utility** appears.
13. Follow the on-screen instructions to complete the BIOS update.

Updating the BIOS from the One-Time boot menu

You can run the BIOS flash update file from Windows using a bootable USB drive or you can also update the BIOS from the One-Time boot menu on the computer. To update your computers BIOS, copy the BIOS XXXX.exe file onto a USB drive formatted with the FAT32 file system. Then, restart your computer and boot from the USB drive using the One-Time Boot Menu.

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the computer it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress, and the computer will ask for this on each reboot. If the recovery key is not known this can result in data loss or an

unnecessary operating system reinstall. For more information about this subject, search in the Knowledge Base Resource at Dell Support Site.

BIOS Update

To confirm if the BIOS Flash Update is listed as a boot option, you can boot your computer to the **One Time Boot** Menu. If the option is listed, then the BIOS can be updated using this method.

To update your BIOS from the One-Time boot menu, you need the following:

- USB drive formatted to the FAT32 file system (the drive does not have to be bootable)
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB drive
- AC power adapter must be connected to the computer
- A functional computer battery to flash the BIOS

Perform the following steps to update the BIOS from the One-Time boot menu:

CAUTION: Do not turn off the computer during the BIOS flash update process. The computer may not boot if you turn off your computer.

Steps

1. Turn off the computer, insert the USB drive that contains the BIOS flash update file.
2. Turn on the computer and press **F12** to access the **One Time Boot** Menu. Select **BIOS Update** using the mouse or arrow keys then press Enter.
   The flash BIOS menu is displayed.
3. Click **Flash from file**.
4. Select the external USB device.
5. Select the file and double-click the flash target file, and then click **Submit**.
6. Click **Update BIOS**. The computer restarts to flash the BIOS.
7. The computer will restart after the BIOS flash update is completed.

System and setup password

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

CAUTION: Ensure that your computer is locked when it is not in use. Anyone can access the data that is stored on your computer, when left unattended.

Table 54. System and setup password

Password type	Description
System password	Password that you must enter to boot to your operating system.
Setup password	Password that you must enter to access and change the BIOS settings of your computer.

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

NOTE: The System and setup password feature is disabled by default.

Assigning a System Setup password

Prerequisites

You can assign a new System or Admin Password only when the status is set to **Not Set**. To enter BIOS System Setup, press F2 immediately after a power-on or reboot.

Steps

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
   The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to create the system password:
   - Password can be up to 32 characters.
   - Password must contain at least one special character: "(! " # $ % & ' * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | })"
   - The password can contain numbers from 0 to 9.
   - The password can contain alphabets A to Z and a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Y to save the changes.
   The computer restarts.

Deleting or changing an existing system password or setup password

Prerequisites

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

Steps

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
   The **System Security** screen is displayed.
2. In the **System Security** screen, verify that the **Password Status** is Unlocked.
3. Select **System Password**. Update or delete the existing system password, and press Enter or Tab.
4. Select **Setup Password**. Update or delete the existing setup password, and press Enter or Tab.

   NOTE: If you change the system password and/or setup password, reenter the new password when prompted. If you delete the system password and/or setup password, confirm the deletion when prompted.

5. Press Esc. A message prompts you to save the changes.
6. Press Y to save the changes and exit from **System Setup**.
   The computer restarts.

Clearing system and setup passwords

About this task

To clear the system or setup passwords, contact Dell technical support as described at Contact Support.

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

9

Troubleshooting

Handling swollen rechargeable Li-ion batteries

Like most laptops, Dell laptops use Lithium-ion batteries. One type of Lithium-ion battery is the rechargeable Li-ion battery. Rechargeable Li-ion batteries have increased in popularity in recent years and have become a standard in the electronics industry due to customer preferences for a slim form factor (especially with newer ultra-thin laptops) and long battery life. Inherent to rechargeable Li-ion battery technology is the potential for swelling of the battery cells.

A swollen battery may impact the performance of the laptop. To prevent possible further damage to the device enclosure or internal components leading to malfunction, discontinue the use of the laptop and discharge it by disconnecting the AC adapter and letting the battery drain.

Swollen batteries should not be used and must be replaced and disposed of properly. We recommend contacting Dell Support for options to replace a swollen battery under the terms of the applicable warranty or service contract, including options for replacement by a Dell authorized service technician.

The guidelines for handling and replacing rechargeable Li-ion batteries are as follows:

- Exercise caution when handling rechargeable Li-ion batteries.
- Discharge the battery before removing it from the laptop. To discharge the battery, unplug the AC adapter from the computer and operate the computer only on battery power. The battery is fully discharged when the computer no longer turns on when the power button is pressed.
- Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
- Do not expose the battery to high temperatures, or disassemble battery packs and cells.
- Do not apply pressure to the surface of the battery.
- Do not bend the battery.
- Do not use tools of any type to pry on or against the battery.
- If a battery gets stuck in a device as a result of swelling, do not try to free it as puncturing, bending, or crushing a battery can be dangerous.
- Do not attempt to reassemble a damaged or swollen battery into a laptop.
- Swollen batteries that are covered under warranty should be returned to Dell in an approved shipping container (provided by Dell)—this is to comply with transportation regulations. Swollen batteries that are not covered under warranty should be disposed of at an approved recycling center. Contact Dell Support at Dell Support Site for assistance and further instructions.
- Using a non-Dell or incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell that is designed to work with your Dell computer. Do not use a battery from other computers with your computer. Always purchase genuine batteries from Dell Site or otherwise directly from Dell.

Rechargeable Li-ion batteries can swell for various reasons such as age, number of charge cycles, or exposure to high heat. For more information about how to improve the performance and lifespan of the laptop battery and to minimize the possibility of occurrence of the issue, search Dell laptop battery in the Knowledge Base Resource at Dell Support Site.

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

Your Dell computer is uniquely identified with 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 Dell Support Site.

For more information about how to find the Service Tag for your computer, see Instructions on how to find your Service Tag or Serial Number.

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

SupportAssist diagnostics (also known as system diagnostics) performs a complete check of your hardware. The Dell SupportAssist Pre-boot System Performance Check diagnostics is embedded within the BIOS and launched by the BIOS internally. The embedded system diagnostics provides options for particular devices or device groups allowing you to:

- Run tests automatically or in an interactive mode.
- Repeat the tests.
- Display or save test results.
- Run thorough tests to add more options and obtain details about any failed devices.
- View status messages that inform you when the tests are completed successfully.
- View error messages that inform you of problems encountered during testing.

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

For more information, see the knowledge base article 000181163.

Running the SupportAssist Pre-Boot System Performance Check

Steps

1. Turn on your computer.
2. As the computer boots, press the F12 key.
3. On the boot menu screen, select **Diagnostics**.
   The diagnostic quick test begins.
   NOTE: For more information about running the SupportAssist Pre-Boot System Performance Check on a specific device, see Dell Support Site.
4. If there are any issues, error codes are displayed.
   Note the error code and validation number and contact Dell.

Built-in self-test (BIST)

(Motherboard Built-In Self-Test) M-BIST

M-BIST is the system board built-in self-test diagnostics tool that improves the diagnostics accuracy of system board Embedded Controller (EC) failures.

NOTE: M-BIST can be manually initiated before Power On Self-Test (POST).

How to run M-BIST

NOTE: Before initiating M-BIST, ensure that the computer is in a power-off state.

1. Press and hold both the **M** key and the power button to initiate M-BIST.
2. The battery indicator LED may exhibit two states:
   - Off: No fault was detected.
   - Amber and White: Indicates a problem with the system board.
3. If there is a failure with the system board, the battery status LED flashes one of the following error codes for 30 seconds:

Table 55. LED error codes

Blinking Pattern		Possible Problem
Amber	**White**	
2	1	CPU Failure
1	1	TPM Detection Failure
2	4	Memory/RAM failure

4. If there is no failure with the system board, the LCD cycles through the solid color screens (that are described in the LCD-BIST) for 30 seconds and then turn off.

Logic Built-in Self-test (L-BIST)

L-BIST is an enhancement to the single LED error code diagnostics and is automatically initiated during POST. L-BIST will check the LCD power rail. If there is no power being supplied to the LCD (that is if the L-BIST circuit fails), the battery status LED flashes either an error code [2,8] or an error code [2,7].

NOTE: If L-BIST fails, LCD-BIST cannot function as no power will be supplied to the LCD.

How to invoke the L-BIST

1. Turn on your computer.
2. If the computer does not start up normally, look at the battery status LED:
   - If the battery status LED flashes an error code [2,7], the display cable may not be connected properly.
   - If the battery status LED flashes an error code [2,8], there is a failure on the LCD power rail of the system board, hence there is no power that is supplied to the LCD.
3. For cases, when a [2,7] error code is shown, check to see if the display cable is properly connected.
4. For cases when a [2,8] error code is shown, replace the system board.

LCD Built-in Self-Test (LCD-BIST)

Dell laptops have a built-in diagnostic tool that helps you determine if the screen abnormality you are experiencing is an inherent problem with the LCD (screen) of the Dell laptop or with the video card (GPU) and computer settings.

When you notice screen abnormalities like flickering, distortion, clarity issues, fuzzy or blurry image, horizontal or vertical lines, color fade, it is always a good practice to isolate the LCD (screen) by running the LCD-BIST.

How to invoke the LCD-BIST

1. Turn off your computer.
2. Disconnect any peripherals that are connected to the computer. Connect only the AC adapter (charger) to the computer.
3. Ensure that the LCD (screen) is clean (no dust particles on the surface of the screen).
4. Press and hold the **D** key and press the power button to enter LCD-BIST mode. Continue to hold the **D** key until the computer boots up.
5. The screen displays solid colors and changes colors on the entire screen to white, black, red, green, and blue twice.
6. Then it displays the colors white, black, and red.
7. Carefully inspect the screen for abnormalities (any lines, fuzzy color, or distortion on the screen).
8. At the end of the last solid color (red), the computer shuts down.

NOTE: Dell SupportAssist Preboot diagnostics upon launch initiates an LCD-BIST first, expecting a user intervention to confirm functionality of the LCD.

System-diagnostic lights

This section lists the system-diagnostic lights of your Dell Pro 16 Plus.

The following table shows different Service LED blinking patterns and associated problems. The diagnostic light codes consist of a two-digit number, and the digits are separated by a comma. The number stands for a blinking pattern; the first digit shows the number of blinks in amber color, and the second digit shows the number of blinks in white color. The Service LED blinks in the following manner:

- The Service LED blinks the number of times equal to the value of the first digit and turns off with a short pause.
- After that, the Service LED blinks the number of times equal to the value of the second digit.
- The Service LED turns off again with a longer pause.
- After the second pause, the blinking pattern will be repeated.

Table 56. Diagnostic light codes

Diagnostic light codes (Amber, White)	Problem description	Recommended solutions
1,1	TPM Detection Failure	Replace the system board.
1,2	Unrecoverable SPI Flash Failure	Replace the system board.
1,4	Hinge Cable OCP	Replace LCM (cable and Panel)
1,5	EC unable to program i-Fuse	Replace the system board.
1,6	Generic catch-all for ungraceful EC code flow errors	Disconnect all power source (AC, coin cell) and drain flea power by pressing and holding down the power button.
1,7	Non-RPMC Flash on Boot Guard fused system	Flash latest BIOS version. If the problem persists, replace the system board.
1,8	Chipset “Catastrophic Error” signal has tripped	Replace the CPU.
2,1	CPU configuration or CPU failure	Replace the CPU.
2,2	System board: BIOS or Read-Only Memory (ROM) failure	Flash latest BIOS version. If the problem persists, replace the system board.
2,3	No memory or Random-Access Memory (RAM) detected	Reseat and swap memory modules among the slots. If the problem persists, replace the memory module.
2,4	Memory or Random-Access Memory (RAM) failure	Reseat and swap memory modules among the slots. If the problem persists, replace the memory module.
2,5	Invalid memory installed	Reseat and swap memory modules among the slots. If the problem persists, replace the memory module.
2,6	System board/Chipset Error	Replace the system board.
2,7	LCD failure SBIOS message	Replace the display.
3,1	RTC power failure	Perform the RTC reset. If the problem persists, replace the battery.
3,2	PCI of Video card/chip failure	Replace the system board.
3,3	Recovery image not found	Replace the system board.
3,4	Recovery image found but invalid	Replace the system board.
3,5	EC power-rail error	Replace the system board.
3,6	Flash corruption detected by SBIOS	Flash corruption is detected by SBIOS. If the problem persists, replace the system board.
4,1	Memory DIMM power rail failure	Replace the system board.

Table 56. Diagnostic light codes (continued)

Diagnostic light codes (Amber, White)	Problem description	Recommended solutions
4,2	CPU Power cable connection issue	• Perform the PSU BIST Test, reseat the cable. • If this does not work, replace the system board, power supply or cabling.
4,4	LCD Power Rail Failure	Replace motherboard

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 stand-alone tool that is preinstalled in Dell computers running the Windows 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, and 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 the 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 Serviceability Tools at the Dell Support Site. Click **SupportAssist** and then click **SupportAssist OS Recovery**.

NOTE: Windows 11 IoT Enterprise LTSC 2024 and Dell ThinOS 10 do not support Dell SupportAssist. For more information about recovering ThinOS 10, see Recovery mode using R-Key.

Real-Time Clock (RTC Reset)

The Real-Time Clock (RTC) reset function enables you or the service technician to recover Dell computers from No POST/No Power/No Boot situations.

Start the RTC reset with the computer powered off and connected to AC power. Press and hold the power button for twenty-five seconds. The computer RTC Reset occurs after you release the power button.

Backup media and recovery options

It is recommended to create a recovery drive to troubleshoot and fix problems that may occur with Windows. Dell provides multiple options for recovering the Windows operating system on your Dell computer. For more information, see Dell Windows Backup Media and Recovery Options.

Network power cycle

About this task

If your computer is unable to access the Internet due to network connectivity issues, reset your network devices by performing the following steps:

Steps

1. Turn off the computer.
2. Turn off the modem.
   NOTE: Some Internet service providers (ISPs) provide a modem and router combo device.
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 the computer.

Drain flea power (perform hard reset)

About this task

Flea power is the residual static electricity that remains in the computer even after it has been powered off and the battery is removed.

For your safety, and to protect the sensitive electronic components in your computer, you must drain residual flea power before removing or replacing any components in your computer.

Draining flea power, also known as a performing a "hard reset," is also a common troubleshooting step if your computer does not turn on or boot into the operating system.

Perform the following steps to drain the flea power:

Steps

1. Turn off the computer.
2. Disconnect the power adapter from the computer.
3. Remove the base cover.
4. Remove the battery.
5. Press and hold the power button for 20 seconds to drain the flea power.
6. Install the battery.
7. Install the base cover.
8. Connect the power adapter to the computer.
9. Turn on the computer.

NOTE: For more information about performing a hard reset, go to Dell Support Site. On the menu bar at the top of the Support page, select Support > Support Library. In the Search field on the Support Library page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles.

LAN connectivity issue with Dell Pro Smart Docks and Thunderbolt Docks

Issue Overview: When your computer is connected to a Dell Pro Smart Dock or Thunderbolt Dock, and the RJ45 ethernet cable is connected through the ethernet port on the dock, you may not receive LAN connectivity to your computer.

Table 57. Possible issues and solutions:

Possible issue	Solution
The external USB ports on your computer are disabled.	Go to the BIOS Setup menu>**Integrated Devices > USB Configuration**. Ensure that the **Enable External USB Ports** option is enabled.
Your computer is installed with software that restricts USB access. Some organizations may require enterprise users to install software that restricts access to USB ports on the computer, hence affecting the functionality of the computer.	If the dock does not provide LAN connectivity, connect the RJ45 ethernet cable to the ethernet port on your computer to restore LAN access. **NOTE:** If your laptop does not have an RJ45 ethernet port, connect to a wireless network.

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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 58. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	Dell Site
Tips	
Contact Support	In Windows search, type `Contact Support`, and press Enter.
Online help for operating system	Windows Support Site Linux Support Site
Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals, and documents.	Your Dell computer is uniquely identified using a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, enter the Service Tag or Express Service Code at Dell Support Site. For more information about how to find the Service Tag for your computer, see Locate the Service Tag on your computer.
Dell knowledge base articles	1. Go to Dell Support Site. 2. On the menu bar at the top of the Support page, select **Support** > **Support Library**. 3. In the Search field on the Support Library page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see Dell Support Site.

NOTE: Availability of the services may vary depending on the country or region, and product.

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