

Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1

PB13255/PB13255 2-in-1

Owner's Manual

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.

Chapter 1: Views of Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.....	7
Right.....	7
Left.....	7
Top.....	9
Front.....	10
Bottom.....	11
Service Tag.....	11
Modes.....	12
Battery-charge status light.....	14
Chapter 2: Set up your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.....	15
Chapter 3: Specifications of Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.....	17
Dimensions and weight.....	17
Processor.....	17
Chipset.....	18
Operating system.....	19
Memory.....	19
External ports and slots.....	19
Internal slots.....	20
Wireless module.....	20
WWAN module.....	21
Audio.....	22
Storage.....	22
Keyboard.....	22
Keyboard function keys of Dell Pro 16 Plus.....	23
Camera.....	25
Touchpad.....	25
Fingerprint reader (optional).....	25
Power adapter.....	26
Power adapter requirements (for computers that are shipped with a 3-cell, 45 Wh battery).....	27
Power adapter requirements (for computers that are shipped with a 3-cell, 55 Wh battery).....	27
Battery.....	28
Power requirements (for computers that are shipped with a 3-cell, 45 Wh battery)	29
Power requirements (for computers that are shipped with a 3-cell, 55 Wh battery)	30
Display.....	30
GPU—Integrated.....	31
Hardware security.....	32
Smart-card reader.....	32
Contactless smart-card reader.....	32
Contacted smart-card reader.....	34
Operating and storage environment.....	35
ComfortView Plus.....	35

Chapter 4: Working inside your computer.....	36
Safety instructions.....	36
Before working inside your computer.....	36
Safety precautions.....	37
Electrostatic discharge—ESD protection.....	37
ESD Field Service kit	38
Transporting sensitive components.....	39
After working inside your computer.....	39
BitLocker.....	39
Recommended tools.....	39
Screw list.....	40
Major components of Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.....	41
 Chapter 5: Removing and installing Customer Replaceable Units (CRUs).....	 44
SIM-card tray (optional).....	44
Removing the SIM-card tray (optional).....	44
Installing the SIM-card tray (optional).....	45
Base cover.....	46
Removing the base cover.....	46
Installing the base cover.....	48
Battery.....	51
Rechargeable Li-ion battery precautions.....	51
Removing the battery.....	51
Installing the battery.....	52
Battery cable.....	53
Removing the battery cable.....	53
Installing the battery cable.....	54
Wireless Wide Area Network (WWAN) card.....	55
Removing the 4G WWAN card.....	55
Installing the 4G WWAN card.....	56
Solid State Drive (SSD).....	58
Removing the M.2 2230 SSD.....	58
Installing the M.2 2230 SSD.....	59
Speakers.....	60
Removing the speakers.....	60
Installing the speakers.....	61
Fan.....	62
Removing the fan.....	62
Installing the fan.....	64
 Chapter 6: Removing and installing Field Replaceable Units (FRUs).....	 66
USH daughterboard.....	66
Removing the USH daughterboard.....	66
Installing the USH daughterboard	67
Smart-card reader.....	69
Removing the smart-card reader (available only on select configurations).....	69
Installing the smart-card reader (available only on select configurations).....	70
System board.....	72

Removing the system board.....	72
Installing the system board.....	74
Wireless Local Area Network (WLAN) antenna module.....	76
Removing the WLAN antenna module.....	76
Installing the WLAN antenna module.....	77
Heat sink.....	79
Removing heat sink.....	79
Installing the heat sink.....	80
I/O board.....	82
Removing the I/O board.....	82
Installing the I/O board.....	83
Power button with optional fingerprint reader.....	84
Removing the power button with optional fingerprint reader.....	84
Installing the power button with optional fingerprint reader.....	85
USB Type-C connector module.....	87
Removing the USB Type- C connector module.....	87
Installing the USB Type-C connector module.....	88
Keyboard.....	89
Removing the keyboard.....	89
Installing the keyboard.....	91
Palm-rest assembly.....	93
Removing the palm-rest assembly.....	93
Installing the palm-rest assembly.....	94
Display assembly.....	96
Removing the display assembly.....	96
Installing the display assembly.....	97
Display bezel.....	99
Removing the display bezel	99
Installing the display bezel.....	105
Display panel.....	107
Removing the display panel.....	107
Installing the display panel.....	109
Display hinges.....	112
Removing the display hinges.....	112
Installing the display hinges.....	113
Camera module.....	115
Removing the camera module.....	115
Installing the camera module.....	115
Display cable.....	116
Removing the display cable.....	116
Installing the display cable.....	119
Display back cover.....	121
Removing the display back cover.....	121
Installing the display back cover.....	122
Chapter 7: Software.....	124
Operating system.....	124
Drivers and downloads.....	124

Chapter 8: BIOS Setup.....	125
Entering BIOS Setup program.....	125
Navigation keys.....	125
F12 One Time Boot menu.....	125
View Advanced Setup options.....	126
View Service options.....	126
BIOS Setup options.....	126
Updating the BIOS.....	141
Updating the BIOS in Windows.....	141
Updating the BIOS in Linux and Ubuntu.....	141
Updating the BIOS using the USB drive in Windows.....	141
Updating the BIOS from the One-Time boot menu.....	142
System and setup password.....	142
Assigning a System Setup password.....	143
Deleting or changing an existing system password or setup password.....	143
Clearing system and setup passwords.....	144
Chapter 9: Troubleshooting.....	145
Handling swollen rechargeable Li-ion batteries.....	145
Locating the Service Tag or Express Service Code of your Dell computer	145
Dell SupportAssist Pre-boot System Performance Check diagnostics.....	146
Running the SupportAssist Pre-Boot System Performance Check.....	146
Built-in self-test (BIST).....	146
(Motherboard Built-In Self-Test) M-BIST.....	146
Logic Built-in Self-test (L-BIST).....	147
LCD Built-in Self-Test (LCD-BIST).....	147
System-diagnostic lights.....	148
Recovering the operating system.....	149
Real-Time Clock (RTC Reset).....	149
Backup media and recovery options.....	149
Network power cycle.....	149
Drain flea power (perform hard reset).....	150
Chapter 10: Getting help and contacting Dell.....	151

Views of Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1

Right



Figure 1. Right view

1. Nano-SIM card slot (optional)

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

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

2. Global headset jack

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

3. 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.

4. Security-cable slot (wedge-shaped)

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

Left

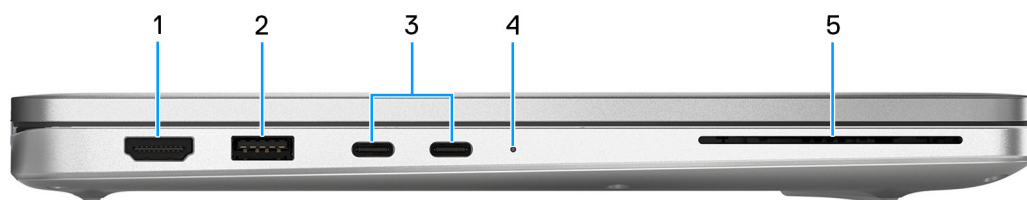


Figure 2. Left view

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. It provides data transfer speeds 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.

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.

Top

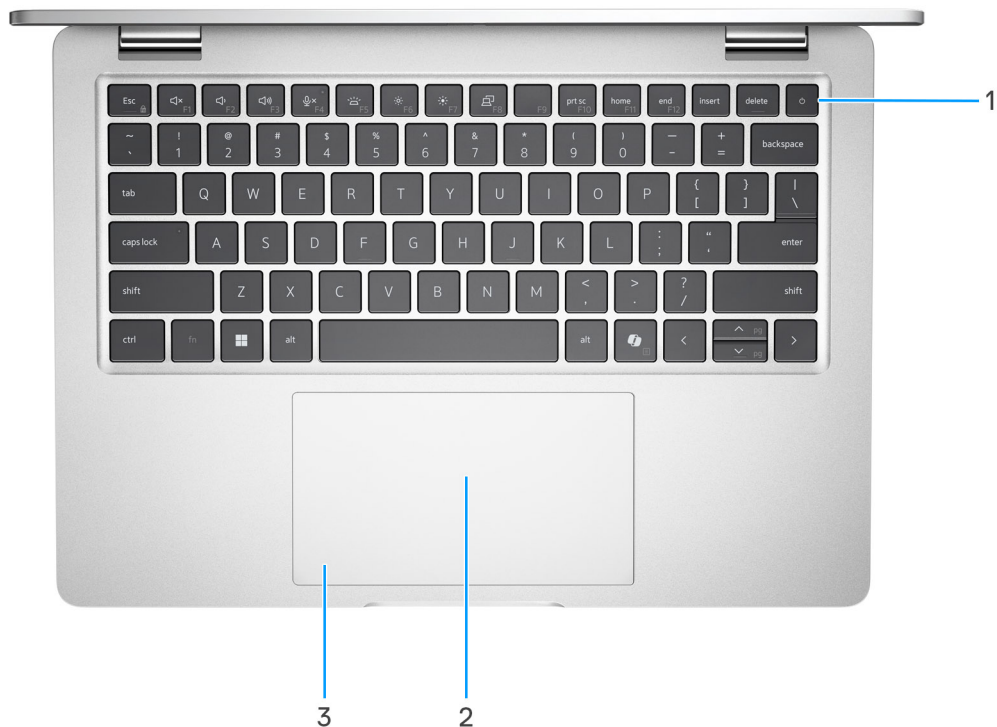


Figure 3. Top view

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.

If the power button has a fingerprint reader, place your finger on the power button steadily to log in.

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

2. NFC/Contactless smart card reader (optional)

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

3. Touchpad

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

Front

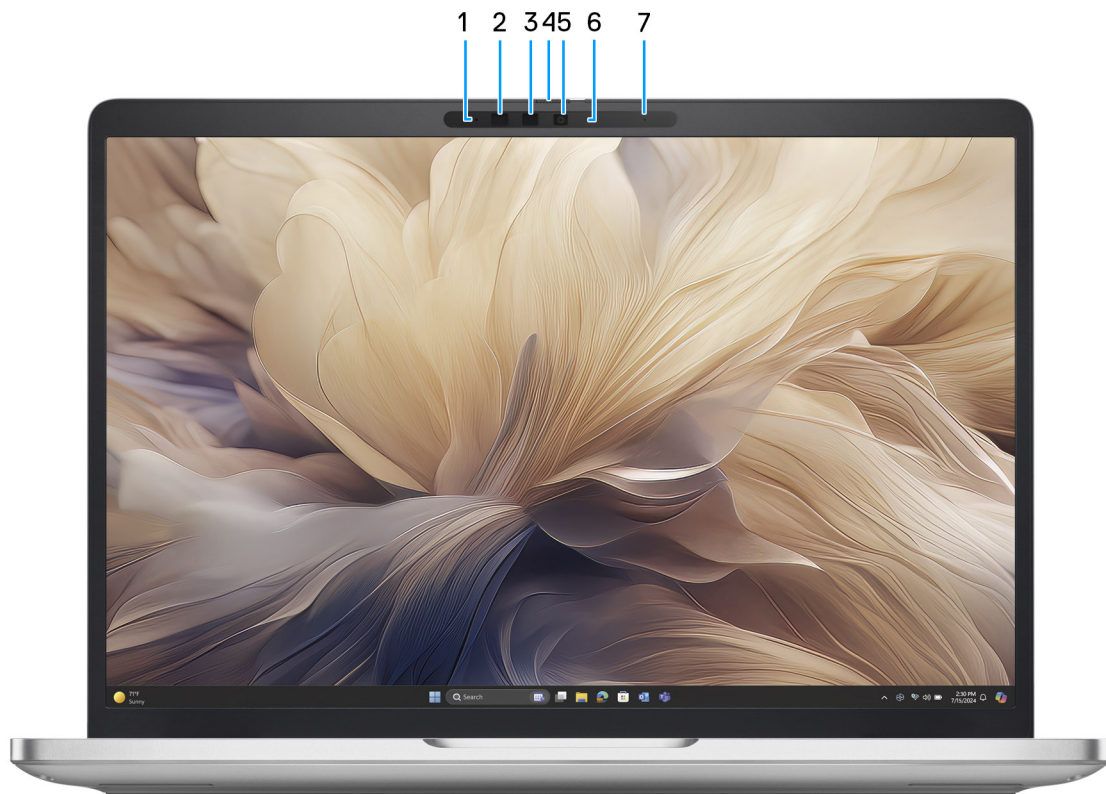


Figure 4. Front view

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)

The infrared emitter 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.

Bottom

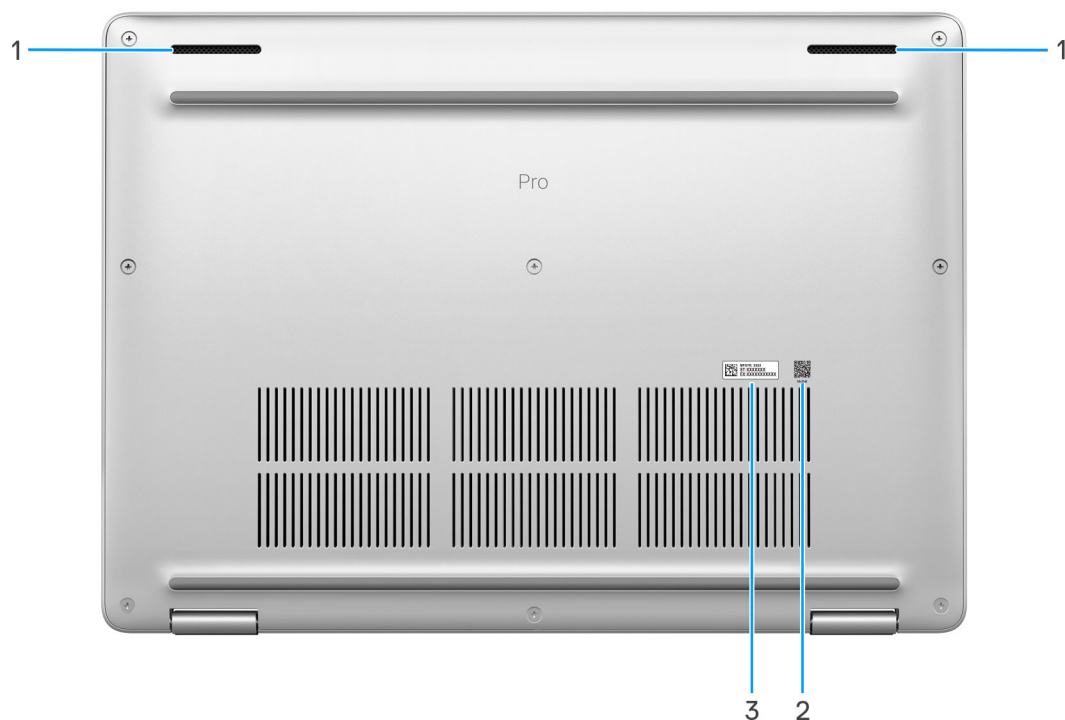


Figure 5. Bottom view

1. **Speakers (2)**

Provide audio output.

2. **MyDell QR Code**

MyDell is your hub for content personalized to your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1, 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.

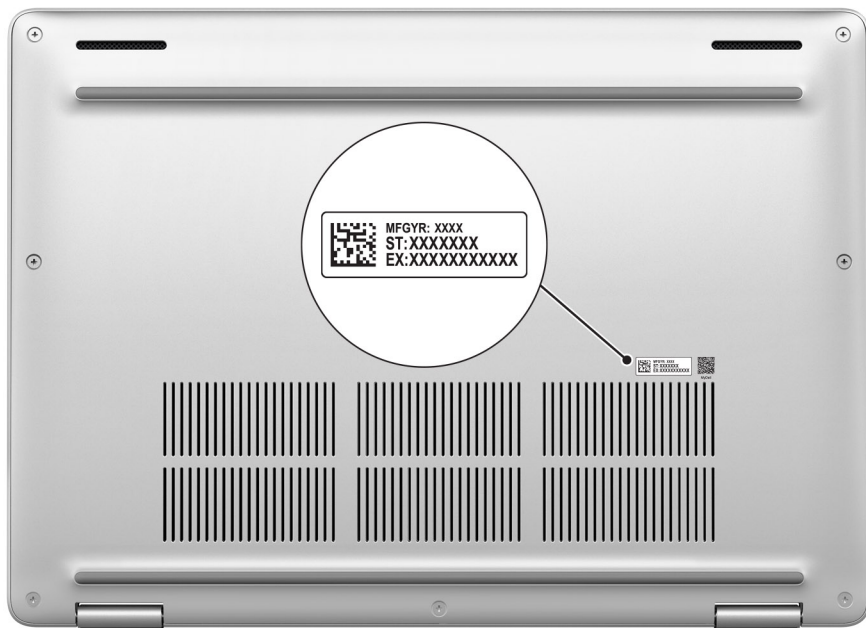


Figure 6. Service Tag location

Modes

The following modes are supported only on Dell Pro 13 Plus 2-in-1 configuration.

Notebook



Figure 7. Notebook mode

Tablet

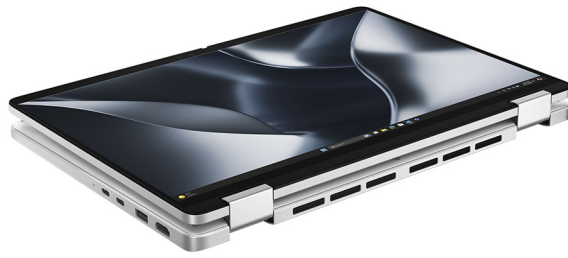


Figure 8. Tablet Mode

Stand



Figure 9. Stand mode

Tent



Figure 10. Tent mode

Battery-charge status light

The following table lists the battery-charge status light of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 1. Battery charge and 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 amber (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.

Set up your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1

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.



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:

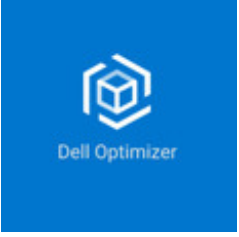




- Connect to a network for Windows updates.

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
	<p>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.</p> <p>For more information, see Dell Optimizer User's Guide at Dell Support Site.</p>
	<p>Dell Product Registration</p> <p>Register your computer with Dell.</p>
	<p>Dell Help & Support</p> <p>Access help and support for your computer.</p>
	<p>SupportAssist</p> <p>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.</p> <p>For more information, see SupportAssist documentation at Dell Support Site.</p> <p> NOTE: In SupportAssist, click the warranty expiry date to renew or upgrade your warranty.</p>

Specifications of Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1

Dimensions and weight

The following table lists the height, width, depth, and weight of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 3. Dimensions and weight

Description		300 nits FHD+ non-touchscreen laptop	300 nits FHD+ touchscreen laptop	400 nits FHD+ non-touchscreen laptop	300 nits FHD+ touchscreen 2-in-1
Height:					
	Front height	19.79 mm (0.78 in.)	19.78 mm (0.78 in.)	19.78 mm (0.78 in.)	19.76 mm (0.78 in.)
	Rear height	19.79 mm (0.78 in.)	19.78 mm (0.78 in.)	19.78 mm (0.78 in.)	20.43 mm (0.80 in.)
Width		300.00 mm (11.81 in.)	300.00 mm (11.81 in.)	300.00 mm (11.81 in.)	300.00 mm (11.81 in.)
Depth		215.00 mm (8.46 in.)	215.00 mm (8.46 in.)	215.00 mm (8.46 in.)	215.00 mm (8.46 in.)
Starting weight		1.37 kg (3.02 lb)	1.26 kg (2.78 lb)	1.26 kg (2.78 lb)	1.46 kg (3.22 lb)
 NOTE: The weight of your computer depends on the configuration that is offered.					

Processor

The following table lists the details of the processors that are supported in your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

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

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

Description	Option one	Option two	Option three
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 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 6. Chipset

Description	Values
Chipset	Integrated in the processor
Processor	<ul style="list-style-type: none"> • 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 13 Plus/Dell Pro 13 Plus 2-in-1 supports the following operating systems:

- Windows 11 Home
- Windows 11 Pro
- Windows 10 Home
- Windows 10 Pro
- Ubuntu Linux 24.04 LTS

NOTE: Ubuntu is supported only on Dell Pro 13 Plus.

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.

Memory

The following table lists the memory specifications of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

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	<ul style="list-style-type: none">• 16 GB: LPDDR5X, 7500 MT/s• 32 GB: LPDDR5X, 7500 MT/s• 64 GB: LPDDR5X, 7500 MT/s

External ports and slots

The following table lists the external ports and slots on your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1 PB13255.

Table 8. External ports and slots

Description	Values
USB ports	<ul style="list-style-type: none">• Two USB Type-C ports with Display port Alt Mode/Power Delivery

Table 8. External ports and slots (continued)

Description	Values
	<p>NOTE: You can connect a Dell Docking Station to these ports. For more information, search in the Knowledge Base Resources at Dell Support Site.</p> <ul style="list-style-type: none"> One USB 3.2 Gen 1 port with Power Share One USB 3.2 Gen 1 port
Audio port	One Global headset jack
Video port	One HDMI 2.1 TMDS port
Media-card reader	One smart-card reader slot (optional)
Power-adaptor port	USB Type-C power input
Security-cable slot	One security-cable slot (wedge-shaped)
Sim-card Slot	Nano SIM-card slot (optional)

Internal slots

The following table lists the internal slots of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 9. Internal slots

Description	Values
M.2	<ul style="list-style-type: none"> One M.2 2230 solid state drive slot One M.2 3042 for 4G WWAN slot (optional) <p>NOTE: To learn more about the features of different types of M.2 cards, search in the Knowledge Base Resource at Dell Support Site.</p>

Wireless module

The following table lists the Wireless Local Area Network (WLAN) module that is supported on your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 10. Wireless module specifications

Description	Values
Model number	MediaTek MT7925
Transfer rate	Up to 2882 Mbps
Frequency bands supported	2.4 GHz/5 GHz/6 GHz
Wireless standards	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 128-bit AES-CCMP 256-bit AES-GCMP 256-GMAC

Table 10. Wireless module specifications (continued)

Description	Values
Bluetooth wireless card	Bluetooth 5.4 wireless card

WWAN module

The following table lists the Wireless Wide Area Network (WWAN) module that is supported in your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.






-  **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 11. 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	<ul style="list-style-type: none"> • LTE FDD/TDD • WCDMA • GPS/BDS/GLONASS/Galileo/BeiDou/QZSS
Transfer data rate	<ul style="list-style-type: none"> • Up to 600 Mbps DL (CAT12) • Up to 150 Mbps UL
Operating frequency bands	<ul style="list-style-type: none"> • 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
eSIM with dual SIM (DSSA)	Supported  NOTE: The availability of eSIM functionality embedded on the module is dependent on the region and specific carrier requirements.
Antenna diversity	Supported
Radio on/off	Supported
Wake On Wireless	Supported
Temperature	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 12. 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 13 Plus/Dell Pro 13 Plus 2-in-1.

Your computer supports one of the following solid state drives.

Table 13. Storage specifications

Storage type	Interface type	Capacity
M.2 2230 solid state drive, self-encrypting drive	PCIe Gen4 NVMe, up to 64 Gbps	512 GB
M.2 2230 solid state drive	PCIe Gen4 NVMe, up to 64 Gbps	Up to 1 TB



Keyboard

The following table lists the keyboard specifications of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 14. Keyboard specifications

Description	Values
Keyboard type	<ul style="list-style-type: none">Standard backlit keyboardStandard non-backlit keyboard
Keyboard layout	QWERTY

Table 14. Keyboard specifications (continued)

Description	Values
Number of keys	<ul style="list-style-type: none"> Arabic, Canada (Bilingual) (MUI), Chinese (Traditional), English International, English US, French (Canadian), Greek, Hebrew, Korean, Thai, Ukrainian, and Russian: 79 keys Belgian, Bulgarian, Czech/Slovak (MUI), Danish, English UK, Estonian, French European, German, Hungarian, Icelandic, Italian, Nordic (MUI), Norwegian, Portuguese, Slovenian, Spanish (Castilian), Spanish (Latin America), Swedish/Finnish, Swiss/European (MUI), Turkish and Turkish (F): 80 keys Japanese: 83 keys Portuguese (Brazil) and French (Canadian) ACNOR: 81 keys
Key pitch	<p>X=18.05 mm key pitch</p> <p>Y=18.05 mm key pitch</p>
Keyboard shortcuts	<p>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.</p> <p> NOTE: You can define the primary behavior of the function keys (F1–F12) changing Function Key Behavior in the BIOS setup program.</p> <p> 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.</p>

Keyboard function keys of Dell Pro 16 Plus

The F1-F12 keys at the top of the keyboard are function keys. By default, these keys are used to perform specific functions defined by the software application in use.

Table 15. List of function keys





Function key	Primary behavior
F1	Mute audio
F2	Decrease volume
F3	Increase volume
F4	Mute microphone
F5	<p>Turn on or turn off backlit keyboard (optional).</p> <p> NOTE: Non-backlit keyboards have the F10 function key without the backlit icon and do not support the toggle backlit keyboard function.</p> <p> NOTE: Toggle the backlit keyboard status through off, low, and high.</p>
F6	Decrease brightness
F7	Increase brightness
F8	Switch to external display

Table 15. List of function keys (continued)

Function key	Primary behavior
F10	Print screen
F11	Home
F12	End
Copilot	Launch Copilot in Windows <div>  NOTE: If Copilot in Windows is not available on your computer, the Copilot key launches Windows Search. For more information about Copilot in Windows, search in the Knowledge Base Resource at Dell Support Site. </div>

You can run the secondary tasks that are indicated by the symbols on the function keys by pressing the function key with **fn**, for example, **fn** and **F1**. See the table below for the list of secondary tasks and the key combinations to run them.

 **NOTE:** Keyboard characters may differ depending on the keyboard language configuration. Keys that are used for tasks remain the same, regardless of the keyboard language.


 **NOTE:** You can define the primary behavior of function keys in the **Function Key Behavior** menu of the BIOS setup program.

Table 16. Secondary tasks of keyboard keys

Key combination for task	What the task does
fn and F1	Operating system and application-specific F1 behavior
fn and F2	Operating system and application-specific F2 behavior
fn and F3	Operating system and application-specific F3 behavior
fn and F4	Operating system and application-specific F4 behavior
fn and F5	Operating system and application-specific F5 behavior
fn and F6	Operating system and application-specific F6 behavior
fn and F7	Operating system and application-specific F7 behavior
fn and F8	Operating system and application-specific F8 behavior
fn and F10	Operating system and application-specific F10 behavior
fn and F11	Operating system and application-specific F11 behavior
fn and F12	Operating system and application-specific F12 behavior
fn and Copilot	Context menu behavior
fn and esc	Toggle Function key lock
fn and PgUp (cursor up)	Scroll up the document or page
fn and PgDn (cursor down)	Scroll down the document or page

Keys with alternate characters

There are other keys on your keyboard with alternate characters. The symbols that are shown at the bottom of these keys are the main characters that are displayed when the key is pressed; the symbols that are shown at the top of these keys are displayed when the key is pressed with the shift key. For example, if you press **2**, **2** is displayed; if you press **Shift** and **2**, **@** is displayed.

Camera

The following table lists the camera specifications of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 17. 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	80.20 degrees	80.20 degrees
	Infrared camera	Not applicable	86.60 degrees

Touchpad

The following table lists the touchpad specifications of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 18. Touchpad specifications

Description		Values
Touchpad resolution:		>=300dpi
Touchpad dimensions:		
	Horizontal	125 mm (4.92 in.)
	Vertical	71 mm (2.80 in.)
Touchpad gestures		For more information about the touchpad gestures that are available on: <ul style="list-style-type: none">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 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 19. Fingerprint reader specifications

Description	Values
Sensor technology	Capacitive sensing


Table 19. Fingerprint reader specifications (continued)

Description	Values
Sensor resolution	500 dpi
Sensor pixel size	108 mm x 88 mm

Power adapter

The following table lists the power adapter specifications of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 20. 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 Type-C, 2-pin (Japan)
Power-adapter dimensions:				
Height	22 mm (0.86 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)	<ul style="list-style-type: none"> 20 V/3 A (continuous) 15 V/3 A (continuous) 9 V/3 A (continuous) 5 V/3 A (continuous) 	<ul style="list-style-type: none"> 20 V/3.25 A (continuous) 15 V/3 A (continuous) 9 V/3 A (continuous) 5 V/3 A (continuous) 	<ul style="list-style-type: none"> 20 V/5 A (continuous) 15 V/3 A (continuous) 9 V/3 A (continuous) 5 V/3 A (continuous) 	<ul style="list-style-type: none"> 20 V/3 A (continuous) 15 V/3 A (continuous) 9 V/3 A (continuous) 5 V/3 A (continuous)
Rated output voltage	<ul style="list-style-type: none"> 20 VDC 15 VDC 9 VDC 5 VDC 	<ul style="list-style-type: none"> 20 VDC 15 VDC 9 VDC 5 VDC 	<ul style="list-style-type: none"> 20 VDC 15 VDC 9 VDC 5 VDC 	<ul style="list-style-type: none"> 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 40°C (32°F to 104°F)
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 (-4°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 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 21. Power adapter requirements for Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1

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 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 22. Power adapter requirements of Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1

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

Table 22. Power adapter requirements of Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1 (continued)

Description	Value
USB Power Delivery (PD) fast charging	Supported
ExpressCharge mode	Supported <i>i</i> NOTE: Ensure that the computer with 55 Wh battery is connected to a 100 W power adapter for this feature to be supported. <i>i</i> 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 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 23. 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.)
	Width	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.)
Temperature range:				
	Operating	<ul style="list-style-type: none"> Charge: 0°C to 45°C (32°F to 113°F) Discharge: 0°C to 70°C (32°F to 158°F) 	<ul style="list-style-type: none"> Charge: 0°C to 45°C (32°F to 113°F) Discharge: 0°C to 70°C (32°F to 158°F) 	<ul style="list-style-type: none"> 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)
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)	Standard charge/ Predominately AC	Standard charge/ Predominately AC	Standard charge/ Predominately AC	Standard charge/ Predominately AC

Table 23. Battery specifications (continued)

Description	Option one	Option two	Option three	Option four
<p>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.</p>	<p>User Charge Method:</p> <ul style="list-style-type: none"> 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 <p>Express Charge Method:</p> <ul style="list-style-type: none"> 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 <p>Express Charge Boost charge Method:</p> <ul style="list-style-type: none"> 16°C to 45°C maximum allowable charge time from 0% to 35% RSOC is 20 min 	<p>User Charge Method:</p> <ul style="list-style-type: none"> 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 <p>Express Charge Method:</p> <ul style="list-style-type: none"> 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 <p>Express Charge Boost charge Method:</p> <ul style="list-style-type: none"> 16°C to 45°C maximum allowable charge time from 0% to 35% RSOC is 20 min 	<p>User Charge Method:</p> <ul style="list-style-type: none"> 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 <p>Express Charge Method:</p> <ul style="list-style-type: none"> 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 <p>Express Charge Boost charge Method:</p> <ul style="list-style-type: none"> 16°C to 45°C maximum allowable charge time from 0% to 35% RSOC is 20 min 	<p>User Charge Method:</p> <ul style="list-style-type: none"> 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 <p>Express Charge Method:</p> <ul style="list-style-type: none"> 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 <p>Express Charge Boost charge Method:</p> <ul style="list-style-type: none"> 16°C to 45°C maximum allowable charge time from 0% to 35% RSOC is 20 min
Coin-cell battery	No	No	No	No
<p>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.</p> <p>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.</p>				

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.

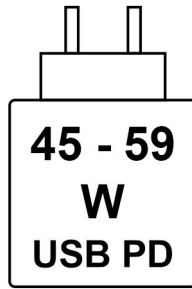


Figure 11. Pictogram for power charging requirements

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.

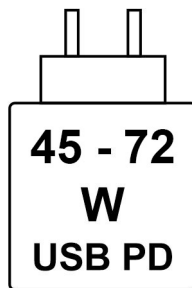


Figure 12. Pictogram for power charging requirements

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 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 24. Display specifications

Description	Option one	Option two	Option three	Option four
Display type	13.3-inch Full High Definition Plus (FHD+)	13.3-inch Full High Definition Plus (FHD+)	13.3-inch Full High Definition Plus (FHD+), ComfortView Plus	13.3-inch Full High Definition Plus (FHD+)
Display-panel technology	In-Plane Switching (IPS), White Light Emitting Diode (WLED)	13.3-inch Full High Definition Plus (FHD+), ComfortView Plus	In-Plane Switching (IPS), White Light Emitting Diode (WLED)	In-Plane Switching (IPS), White Light Emitting Diode (WLED)

Table 24. Display specifications (continued)

Description		Option one	Option two	Option three	Option four
Display-panel dimensions (active area):					
	Height	178.78 mm (7.04 in.)	178.78 mm (7.04 in.)	178.78 mm (7.04 in.)	178.78 mm (7.04 in.)
	Width	286.04 mm (11.26 in.)	286.04 mm (11.26 in.)	286.04 mm (11.26 in.)	286.04 mm (11.26 in.)
	Diagonal	337.31 mm (13.20 in.)	337.31 mm (13.20 in.)	337.31 mm (13.20 in.)	337.31 mm (13.20 in.)
Display-panel native resolution		1920 x 1200	1920 x 1200	1920 x 1200	1920 x 1200
Luminance (typical)		300 nits	300 nits	400 nits	300 nits
Megapixels		2.304	2.304	2.304	2.304
Color gamut		45% NTSC	100% sRGB	100% sRGB	100% sRGB
Pixels Per Inch (PPI)		170 ppi	170 ppi	170 ppi	170 ppi
Contrast ratio (typical)		800:1	900:1	1200:1	1000:1
Response time (maximum)		35 ms	35 ms	35 ms	35 ms
Refresh rate		60 Hz	60 Hz	30 Hz - 60 Hz	60 Hz
Horizontal view angle		+/- 80 degrees (min)	+/- 80 degrees (min)	+/- 80 degrees (min)	+/- 80 degrees (min)
Vertical view angle		+/- 80 degrees (min)	+/- 80 degrees (min)	+/- 80 degrees (min)	+/- 80 degrees (min)
Pixel pitch		0.149 mm x 0.149 mm	0.149 mm x 0.149 mm	0.149 mm x 0.149 mm	0.090 mm x 0.090 mm
Power consumption (maximum)		3.77 W	3.50 W	2.45 W	4.20 W
Anti-glare vs glossy finish		Anti-glare	Anti-glare	Anti-glare	Glossy
Touch options		No	Yes	No	Yes

GPU—Integrated

The following table lists the specifications of the integrated Graphics Processing Unit (GPU) supported by your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 25. 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

Table 25. GPU—Integrated (continued)

Controller	Memory size	Processor
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
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 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 26. Hardware security

Hardware security
Trusted Platform Module (TPM) 2.0 discrete
FIPS 140-2 certification for TPM
TCG Certification for TPM (Trusted Computing Group)
Fingerprint reader in powerbutton with ControlVault 3+
Contacted Smart card and ControlVault 3+
Contactless Smart card, NFC, and ControlVault 3+
SED SSD NVMe, SSD and HDD (Opal and non-Opal) per SDL
Chassis Intrusion Detection
BIOS - TPM clear and/or system boot lock after chassis intrusion detection

Smart-card reader

Contactless smart-card reader

This section lists the contactless smart-card reader specifications of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1. This module is only available in computers that are shipped with Smart-card readers.

Table 27. 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

Table 27. Contactless smart-card reader specifications (continued)

Title	Description	Dell controlVault 3 Plus contactless smart-card reader with NFC
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
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

Table 28. Supported cards

Manufacturer	Card
HID	jcop readertest3 A card (14443a)
	1430 1L
	MIFARE DESFire D8H
	iClass (Legacy)
	iClass SEOS
NXP/Mifare	Mifare MIFARE DESFire 8K White PVC Cards
	MIFARE Classic 1K White PVC Cards
	NXP MIFARE Classic S50 ISO Card
G&D	idOnDemand - SCE3.2 144K
	SCE6.0 FIPS 80K Dual+ 1 K Mifare
	SCE6.0 nonFIPS 80K Dual+ 1 K Mifare

Table 28. Supported cards (continued)

Manufacturer	Card
	SCE6.0 FIPS 144K Dual + 1K Mifare
	SCE6.0 nonFIPS 144K Dual + 1 K Mifare
	SCE7.0 FIPS 144K
Oberthur	idOnDemand - OCS5.2 80K
	ID-One Cosmo 64 RSA D V5.4 T = 0 card

Contacted smart-card reader

The following table lists the contacted smart-card reader specifications of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

Table 29. Contacted smart-card reader specifications

Standards	Description	Dell controlVault 3 smart-card reader
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
ISO/IEC 18092	Reader and software capable of supporting ISO/IEC 18092 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

Table 29. Contacted smart-card reader specifications (continued)


Standards	Description	Dell controlVault 3 smart-card reader
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

Operating and storage environment

This table lists the operating and storage specifications of your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.

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

Table 30. 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.

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.
-  **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. See the safety instructions that are shipped with the product or at [Dell Regulatory Compliance Home Page](#).
-  **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

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 instructions.
3. Turn off all the attached peripherals.
4. Disconnect your computer from the electrical outlet.
5. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.
6. Remove any media card and optical drive from your computer, if applicable.
7. To clean the air vents, use a soft brush and move vertically.


 **NOTE:** Do not remove the base cover or use any blower to clean the vents.

8. Enter the Service Mode.

Service Mode

Service Mode is used to cut off power without disconnecting the battery cable from the system board before conducting repairs in the computer.

 **CAUTION:** If you are unable to turn on the computer to put it into Service Mode, proceed to disconnect the battery cable. To disconnect the battery cable, follow the steps in [Removing the battery](#).

 **NOTE:** Ensure that your computer is shut down and the power adapter is disconnected.

- a. Press and hold the B key and the power button for 3 seconds or until the Dell logo appears on the screen.
- b. Press any key to continue.
- c. If the power adapter is not disconnected, a message prompting you to disconnect the power adapter appears on the screen. Disconnect the power adapter and then press any key to enter into the Service Mode. The Service Mode process automatically skips the following step if the **Owner Tag** of the computer is not set up in advance by the user.
- d. When the **ready-to-proceed** message appears on the screen, press any key to proceed. The computer emits three short beeps and shuts down immediately.
The computer shuts down and enters the Service Mode.

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.
- Wear shoes with nonconductive rubber soles to reduce the chance of getting electrocuted.
- Press and hold the power button for 15 seconds to discharge the residual power in the system board.

Standby power

Dell products with standby power must be unplugged before you open the back cover. Systems that are equipped with standby power are powered while turned off. The internal power enables the computer to be remotely turned on (Wake-on-LAN) and suspended into a sleep mode and has other advanced power management features.

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 slotted 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 31. Screw list
























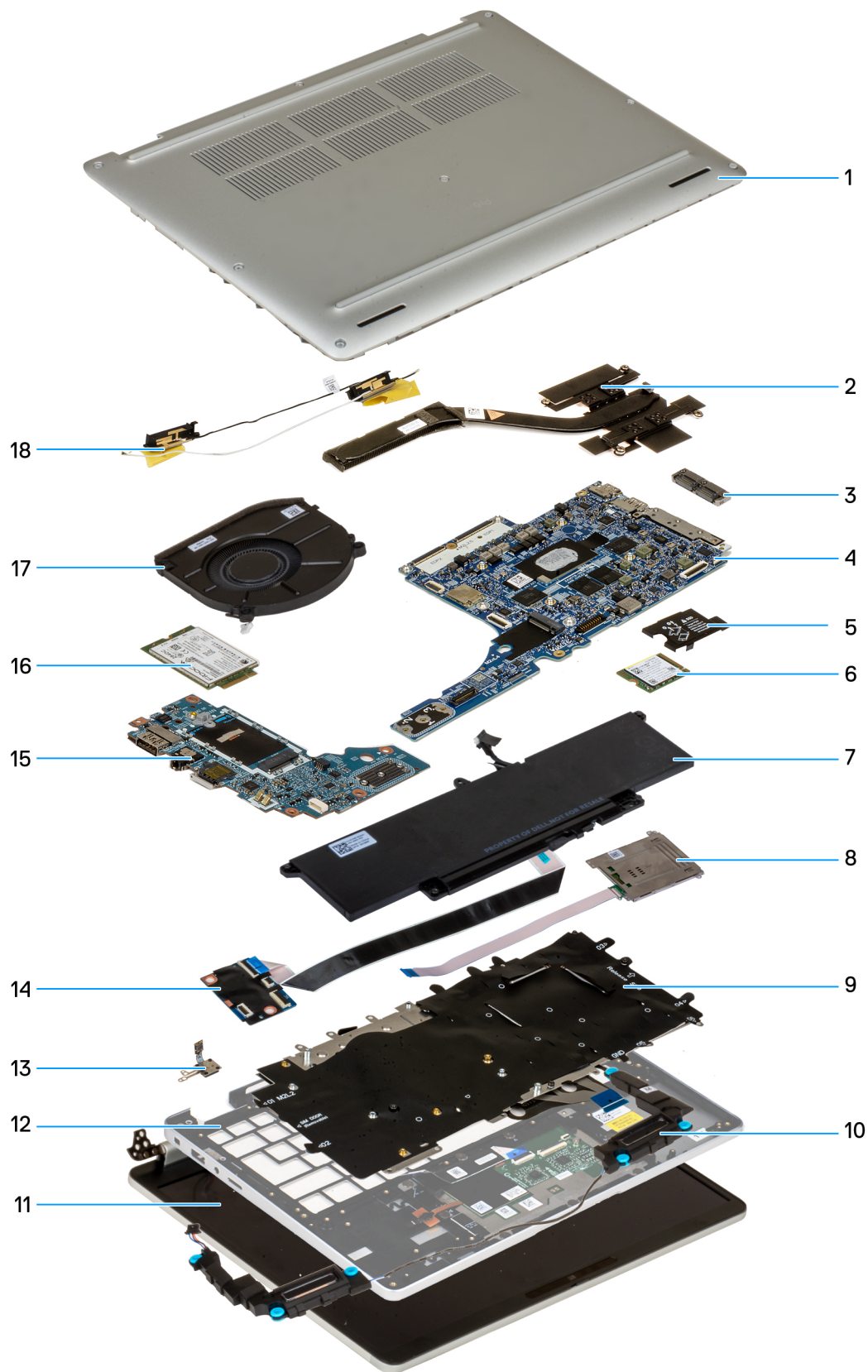
Component	Screw type	Quantity	Screw image
Base cover	Captive screws	8	
Battery	Captive screws	4	
Wireless card bracket	M2x2.5	1	
4G WWAN-card cable Shield	M2x4	2	
4G WWAN-card bracket	Captive Screw	1	
Solid state drive bracket	M2x3	1	
M.2 2230 Solid state drive	M2x4	1	
Fan	M2x4 M2x2.5	2 1	 
Speaker	M1.6x3	6	
Heat sink	captive screws	4	
Display-cable bracket	M2x2.5	2	
System board	M2x2.5 M2x3	5 3	 
Type-C bracket	M2x3.5	32	

Table 31. Screw list (continued)

Component	Screw type	Quantity	Screw image
Power button i NOTE: Applicable to computer shipped both with and without a fingerprint reader	M2x2	2	
I/O Board	M1.2x1.4 M2x4	3 1	
Keyboard bracket Keyboard	M2x2 M2x2.5	16 1	
Smart-card reader	M2x2	4	
Display panel	M2x2.5	2	
Display hinges	M2.5x3.5	6	
Hinge cap	M2x2.5	2	
USH board	M2x2	2	
WLAN Antennas	M2x2.5	4	

Major components of Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1


The following image shows the major components of Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1.



1. Base cover
3. USB Type-C connector
5. M.2 2230 SSD shield bracket
7. Battery

2. Heat sink
4. System board
6. M.2 2230 SSD
8. Smart-card reader


- | | |
|---|--------------------------|
| 9. Keyboard | 10. Speaker |
| 11. Display assembly | 12. Palm-rest assembly |
| 13. Power button with optional fingerprint reader | 14. USH daughter board |
| 15. I/O board | 16. WWAN card |
| 17. Fan | 18. WLAN antenna modules |

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

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 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.

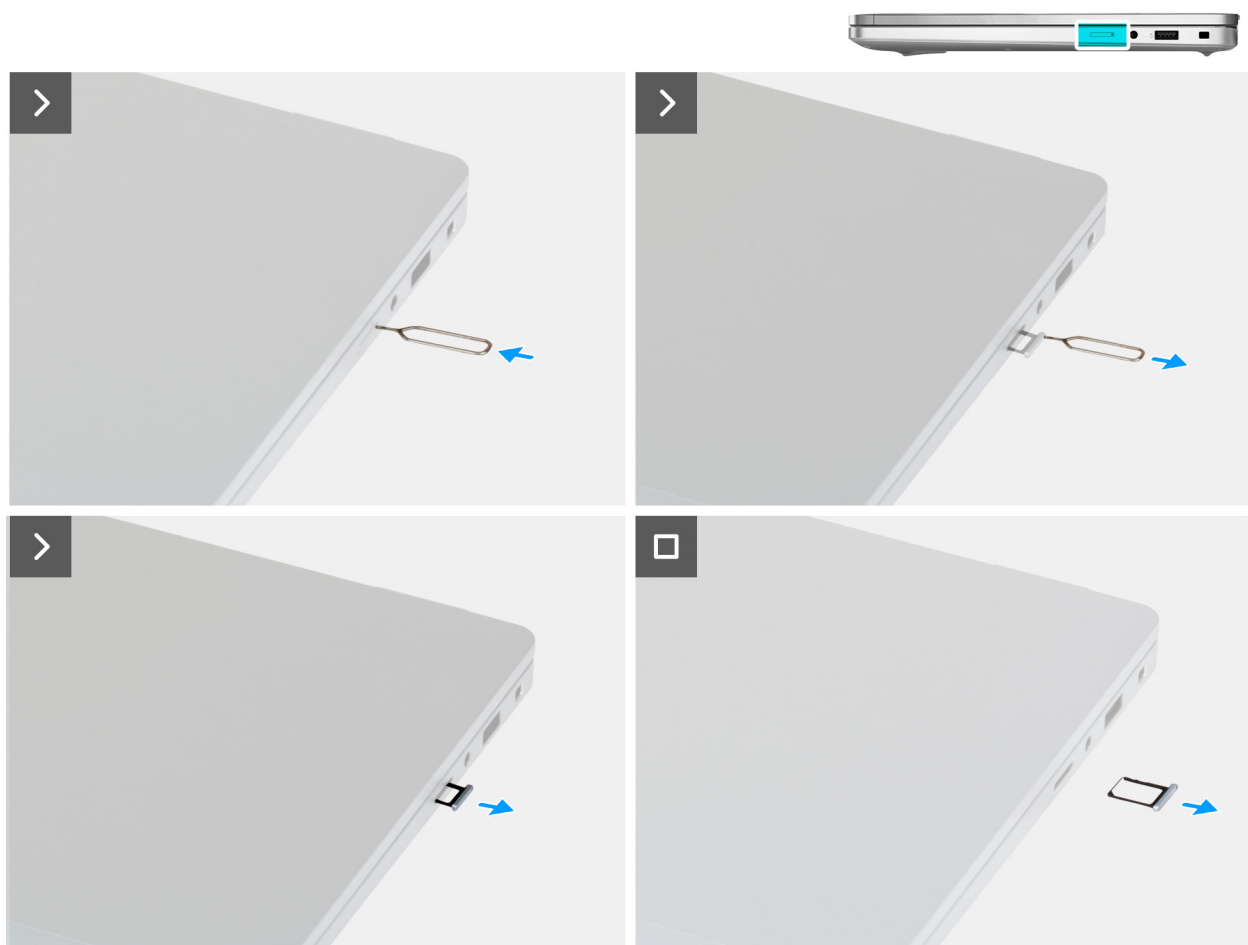


Figure 13. Removing the SIM-card tray

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.

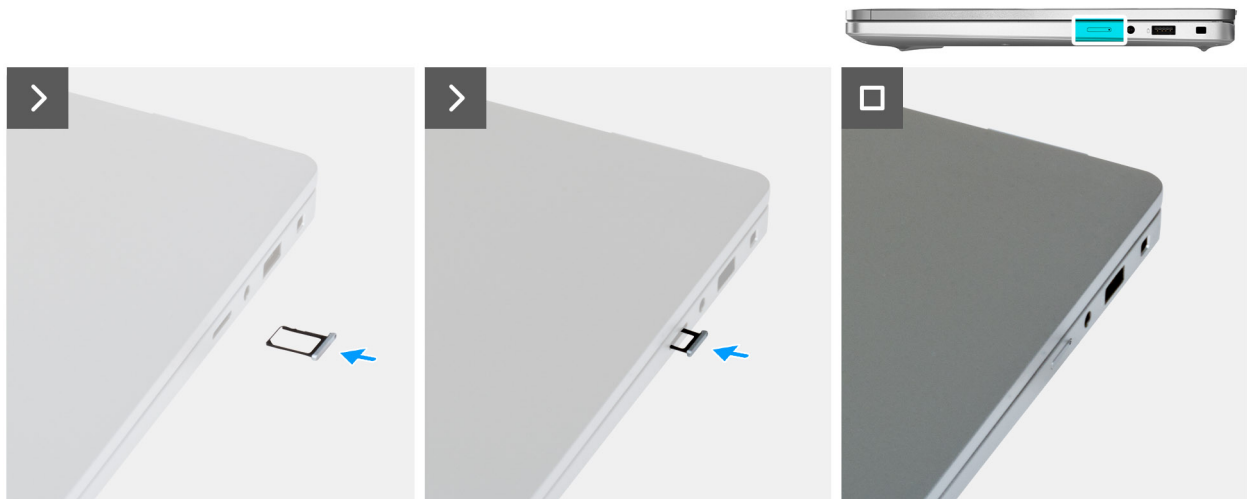


Figure 14. Installing the SIM-card tray

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

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



8x

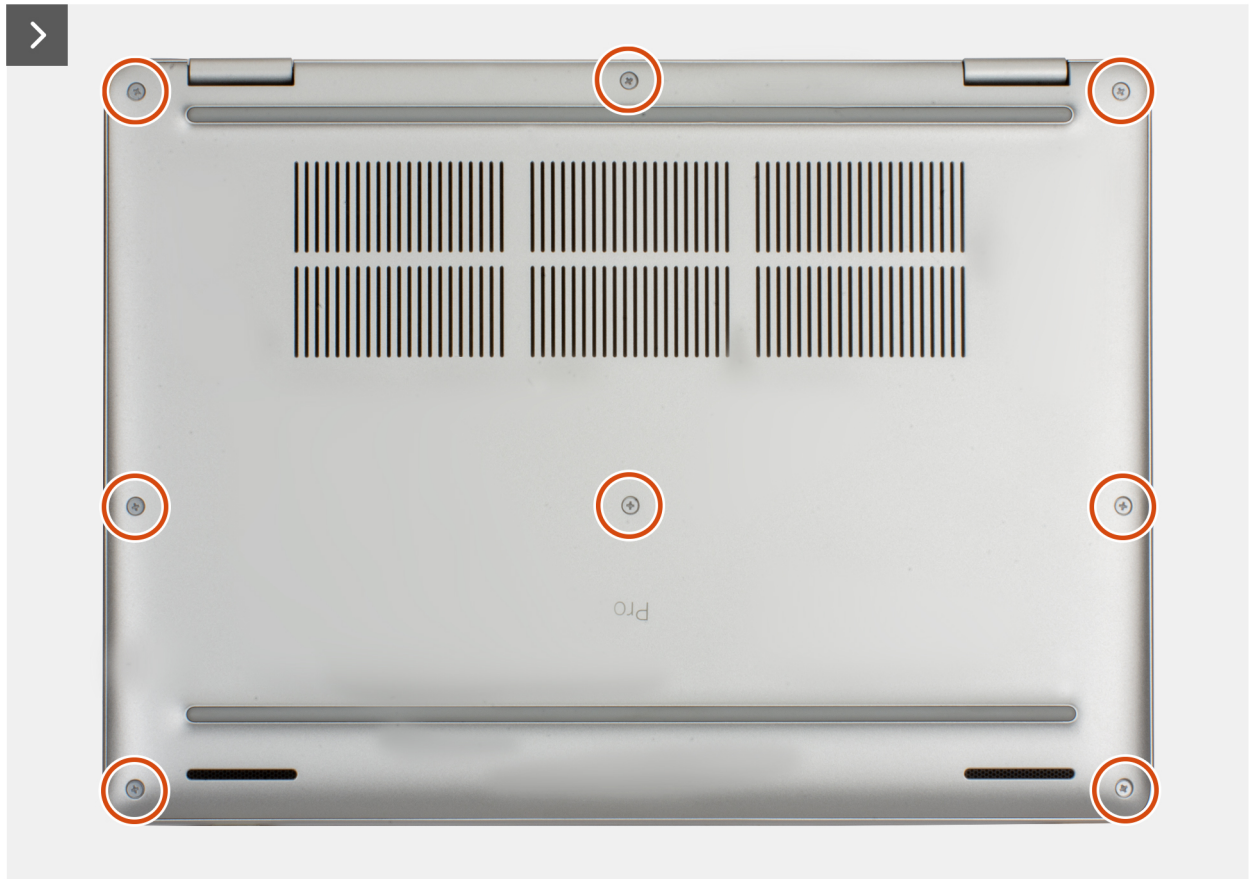


Figure 15. Removing the base cover

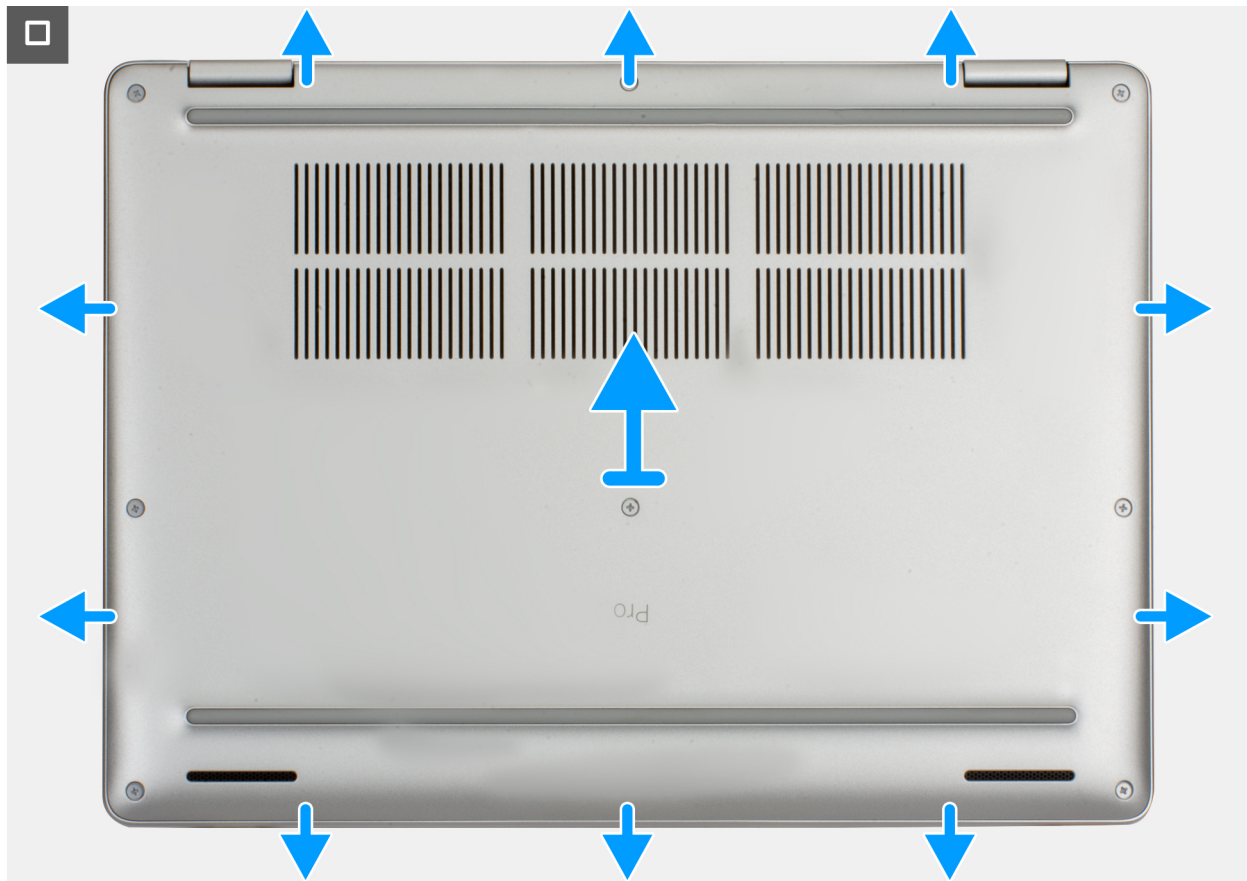


Figure 16. Removing the base cover

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, disconnect the battery cable from the system board. To disconnect the battery cable, follow steps 4
4. Press and hold the power button for five seconds to 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 installation procedure.

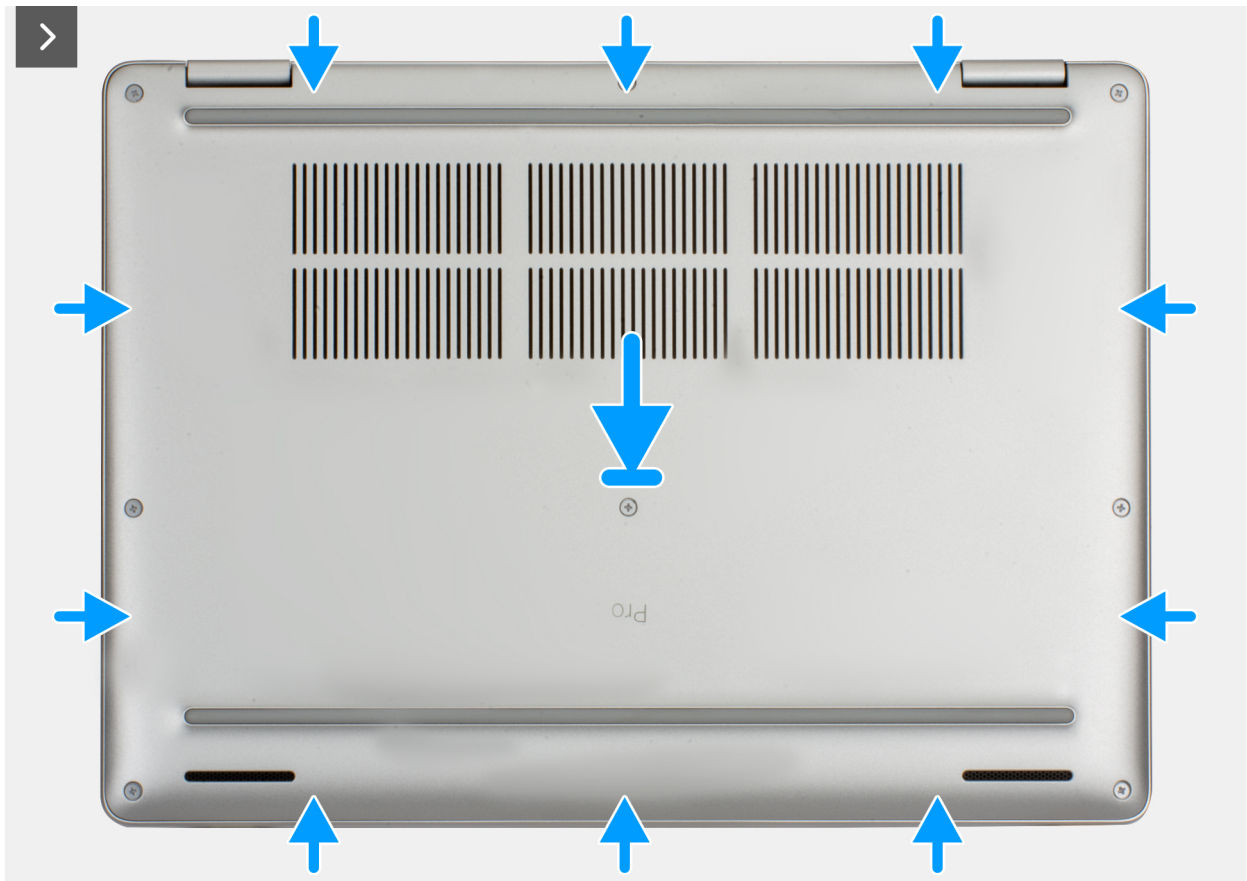


Figure 17. Installing the base cover



Figure 18. Installing the base cover

i NOTE: If the battery is not a pre-requisite and 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. Align the screw holes on the base cover with the screw holes on the palm-rest assembly, and then snap the base cover into place.
2. Tighten the eight captive screws that secure the base cover to the palm-rest assembly.

Next steps

1. Install the [SIM-card tray](#) (optional).
2. Follow the procedure in [After working inside your computer](#).

i NOTE: Ensure that your computer is in Service Mode. For more information, see [Before working inside your computer](#).

Battery

Rechargeable Li-ion battery precautions

CAUTION:


- 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 this product.
- If the battery gets stuck inside your computer due to swelling, do not try to release it as, puncturing, bending, or crushing a rechargeable Li-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See [Contact Support at Dell Support Site](#).
- 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. Lift the battery off the palm-rest assembly.
4. 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.

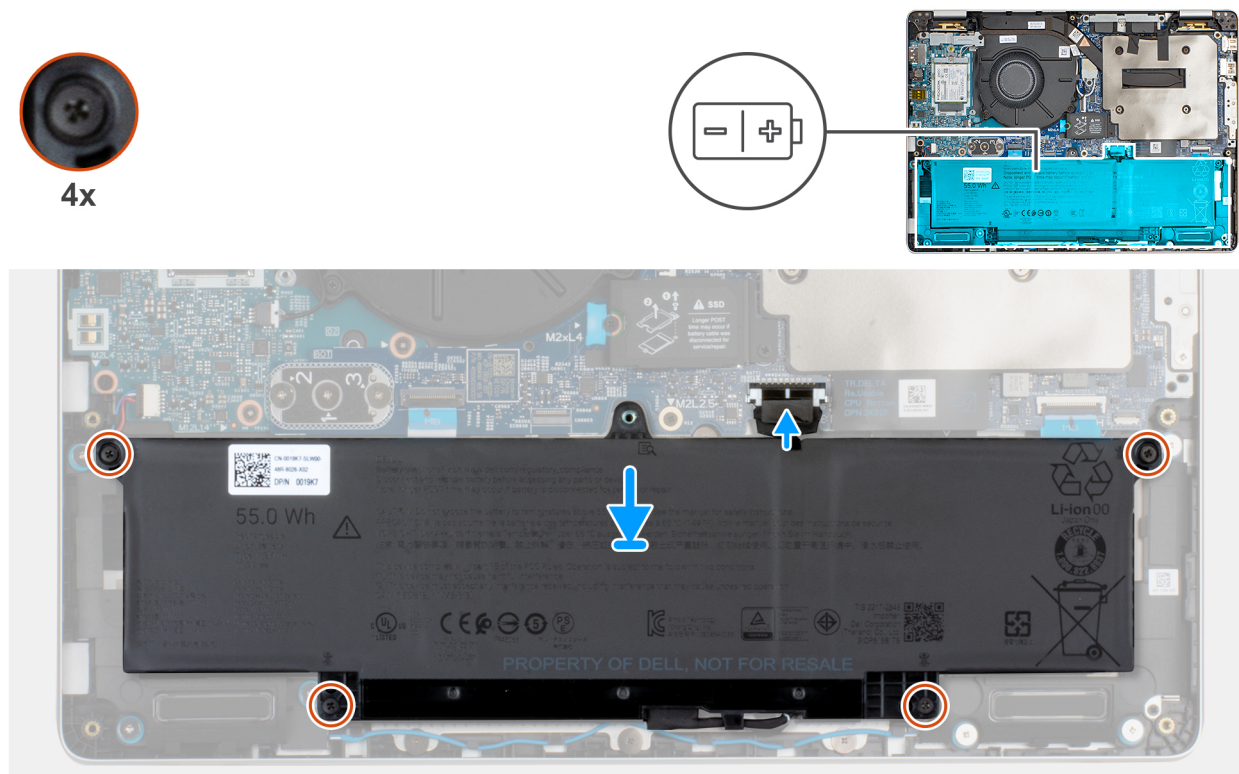


Figure 20. Installing the battery

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 hole on the battery with the screw hole on the palm-rest assembly.
3. Tighten the four captive screws that secure the battery to the palm-rest assembly.
4. Connect the battery-cable to the battery-cable connector (BATT1) on the system board.

Next steps

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

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.

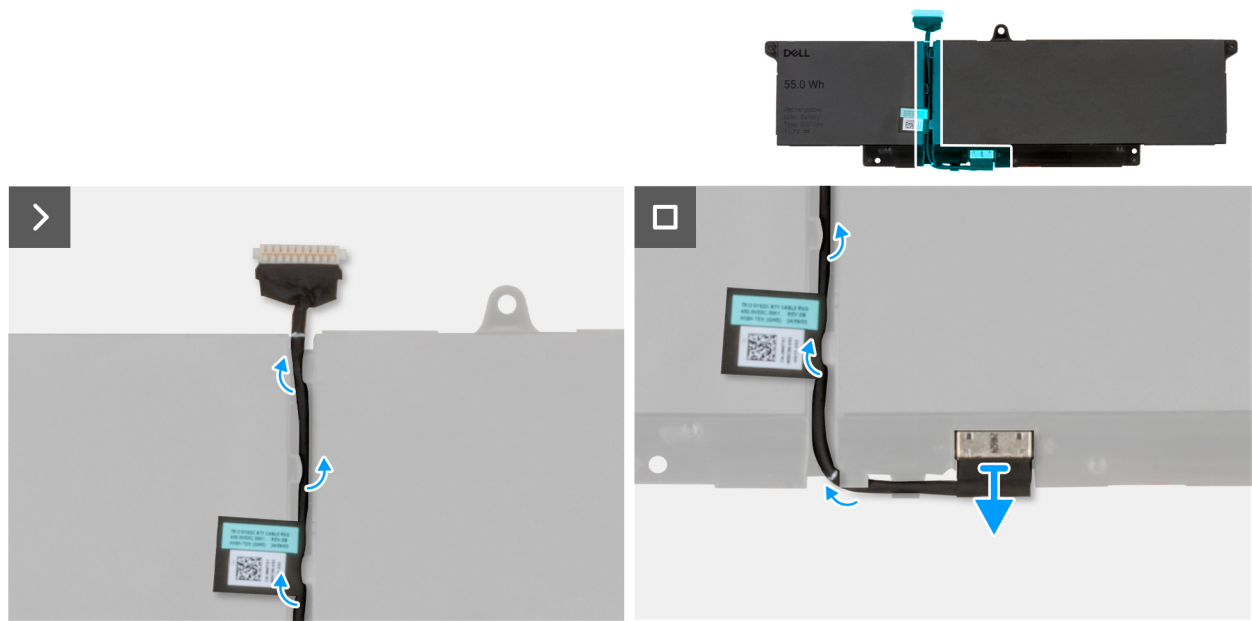


Figure 21. Removing battery cable

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.

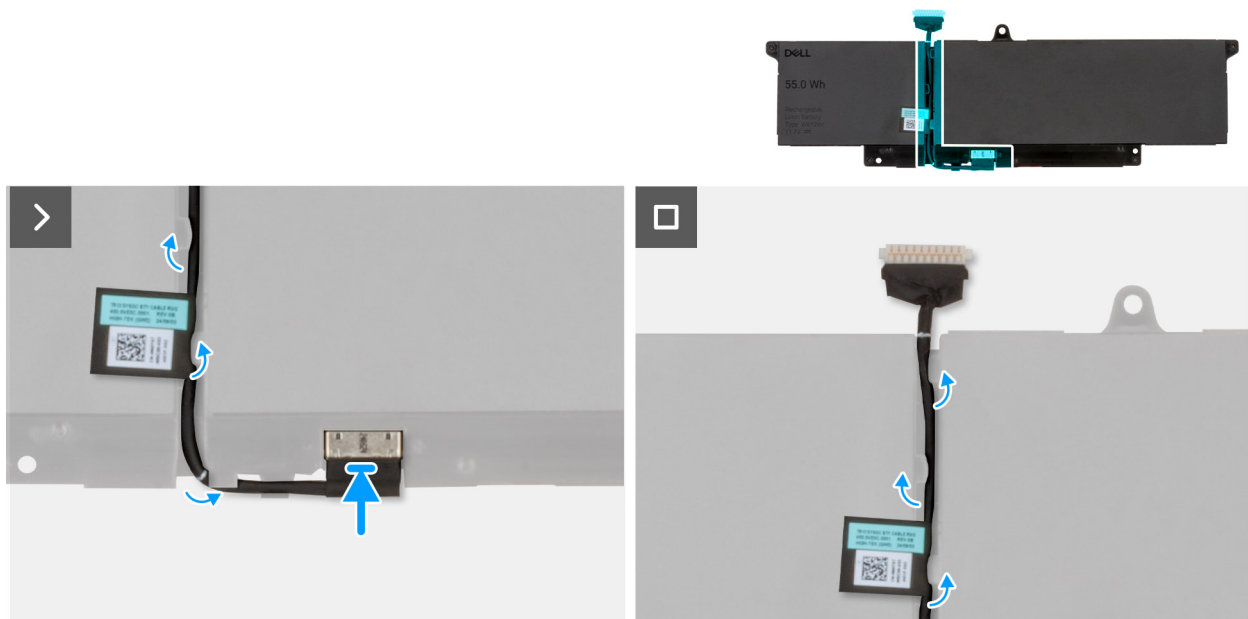


Figure 22. Installing battery cable

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

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 four antenna cables.

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

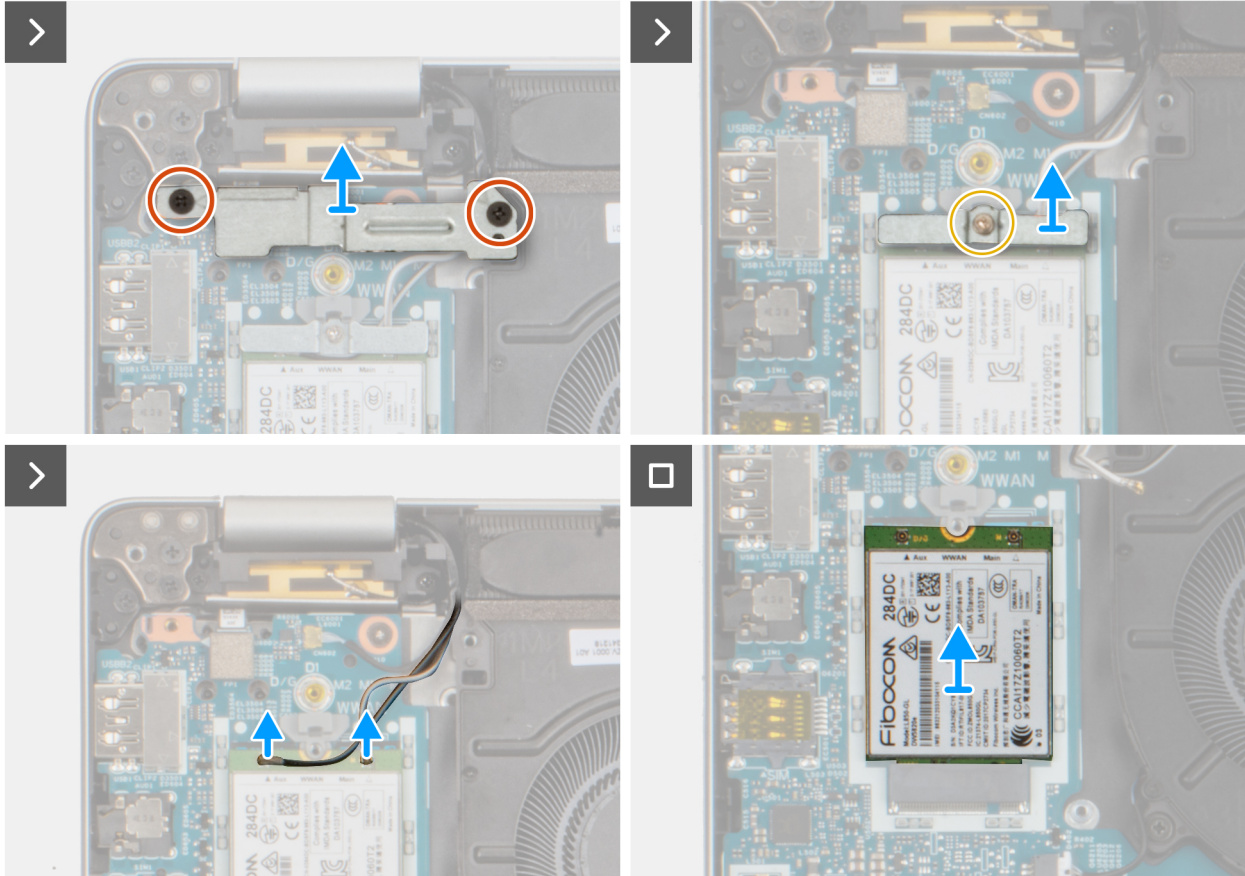
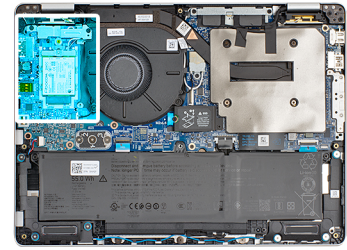


Figure 23. Removing the 4G WWAN card

Steps

1. Remove the two screws (M2x4) that secures the 4G WWAN-card shield to the 4G WWAN card and palm-rest assembly.
2. Lift the 4G WWAN-card shield off the 4G WWAN card and palm-rest assembly.
3. Remove the captive screw that secures the 4G WWAN-card bracket to the 4G WWAN card.
4. Lift the 4G WWAN-card bracket off the 4G WWAN card and palm-rest assembly.
5. Disconnect the antenna cables from the 4G WWAN card.
6. Slide and remove the 4G WWAN card off the 4G WWAN-card slot on the system board.

NOTE: If you are replacing the 4G WWAN card, ensure that the thermal pad is in place.

NOTE: If you are replacing the system board, ensure to peel the thermal pad from the old system board to the new system 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 four antenna cables.

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

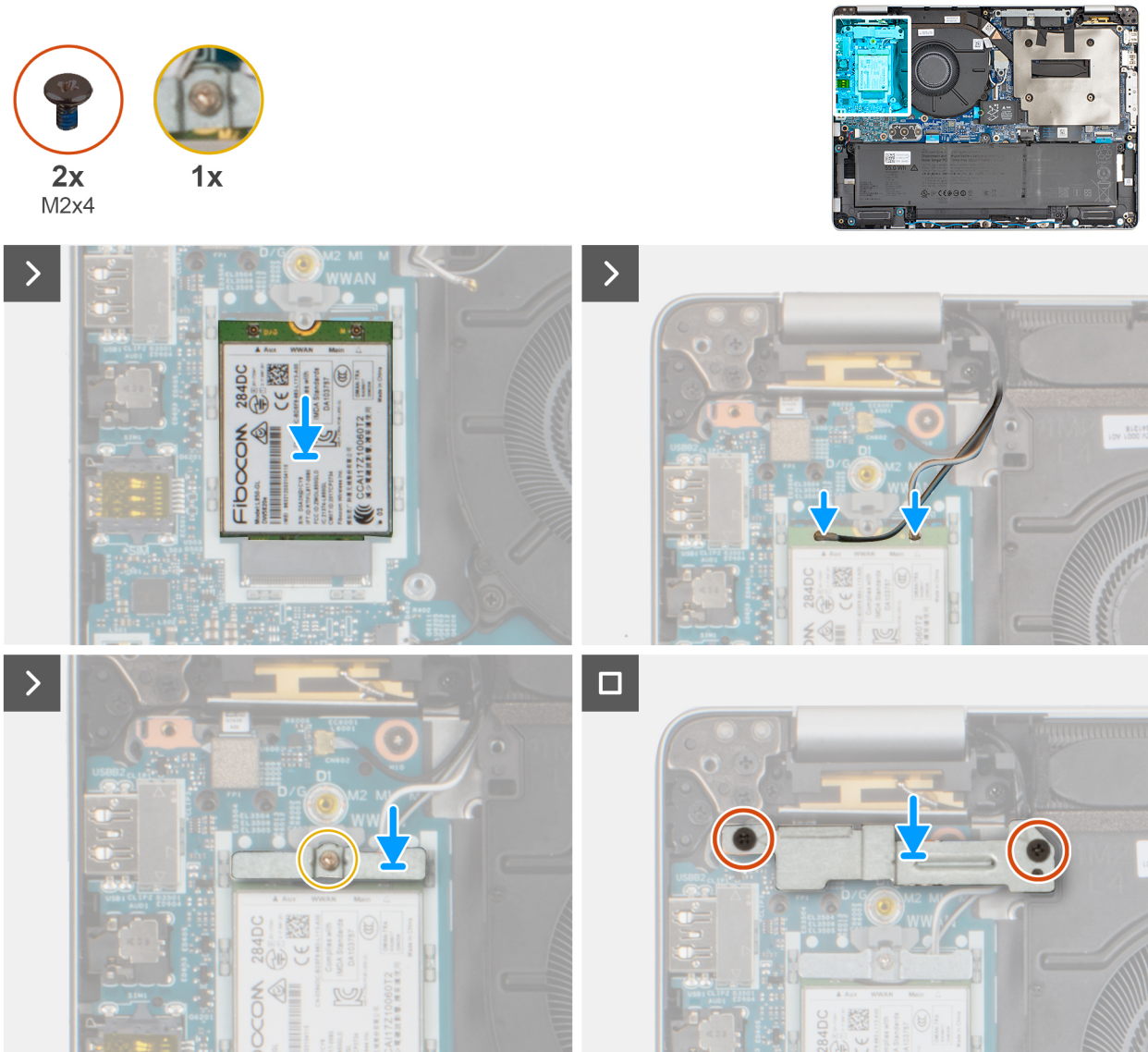


Figure 24. Installing the 4G WWAN card

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 4G WWAN card, ensure that the thermal pad is in place.

NOTE: If you are replacing the system board, ensure to peel the thermal pad from the old system board to the new system board.

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 32. 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 captive screw that secures the 4G WWAN-card bracket to the palm-rest assembly.
6. Align the screw hole on the 4G WWAN-card shield with the screw hole on the 4G WWAN card and palm-rest assembly.
7. Replace the two screws (M2x4) that secure the WWAN-card shield to the WWAN card.

Next steps

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

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.

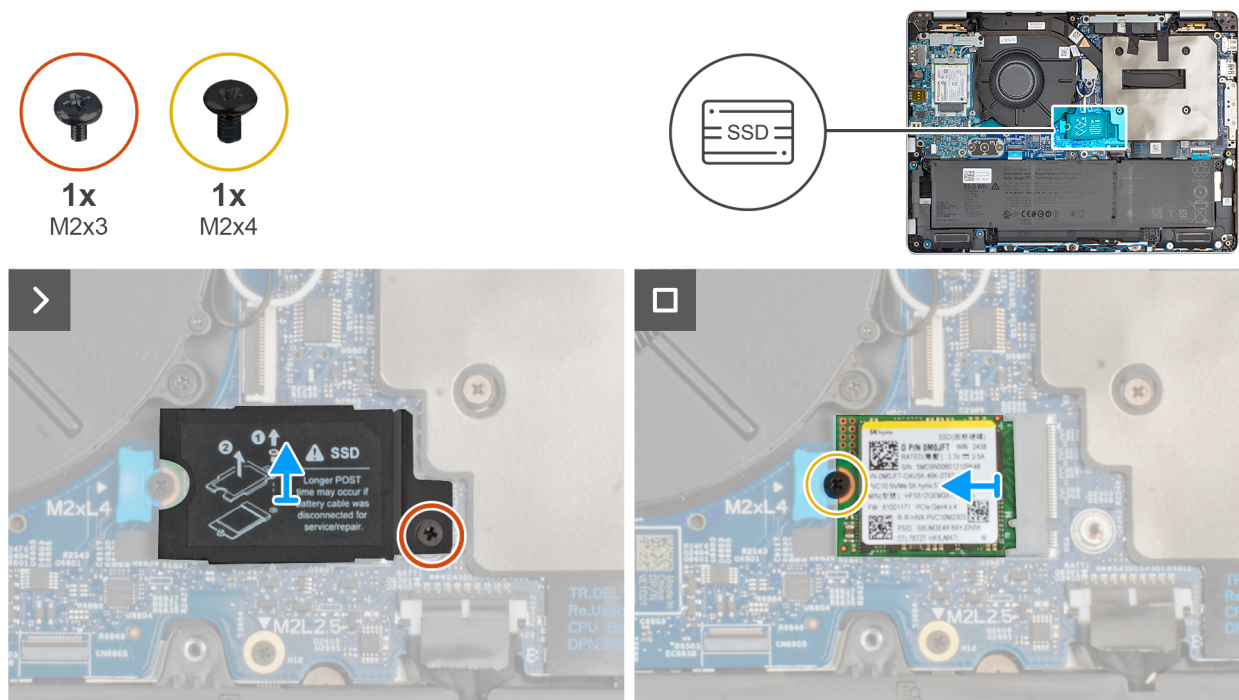


Figure 25. Removing the M.2 2230 SSD

Steps

1. Remove the screw (M2x3) that secures the SSD thermal shield to the palm-rest assembly.
2. Remove the SSD thermal shield off the SSD.
3. Remove the screw (M2x4) that secures the M.2230 SSD to the system board.
4. Slide and remove the M.2 2230 SSD off the SSD slot.

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.

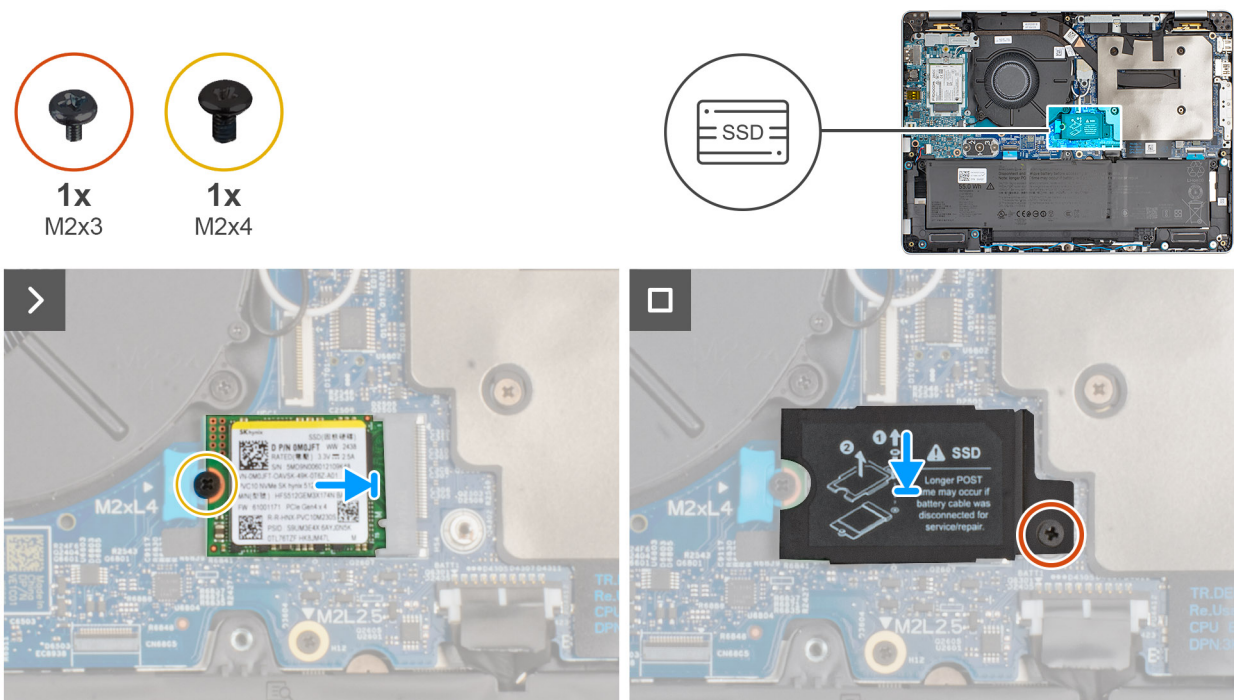


Figure 26. Installing the M.2 2230 SSD

Steps

1. Align the notch on the M.2 2230 SSD with the tab on the M.2 2230 SSD slot.
2. Slide the M.2 2230 SSD on to its slot on the system board.
3. Replace the screw (M2x4) that secures the M.2 2230 SSD to the system board.
4. Align and place the SSD thermal shield on top of the SSD slot so that it holds the SSD in place.
5. Replace the screw (M2x3) that secures the SSD thermal shield to the palm-rest assembly.

Next steps

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

Speakers

Removing the speakers

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

Prerequisites

1. Follow the procedure in [Before working inside the 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.

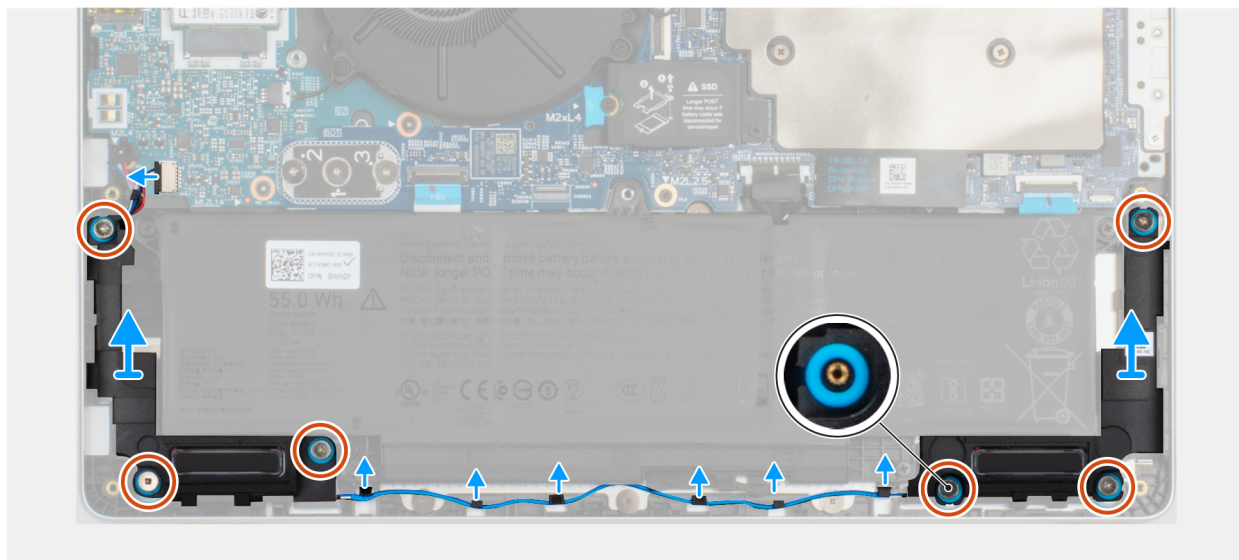
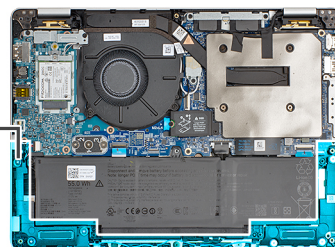
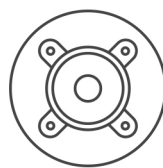


Figure 27. Removing the speakers

Steps

1. Disconnect the speaker cable from the connector on the I/O board.
2. Remove the six 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.

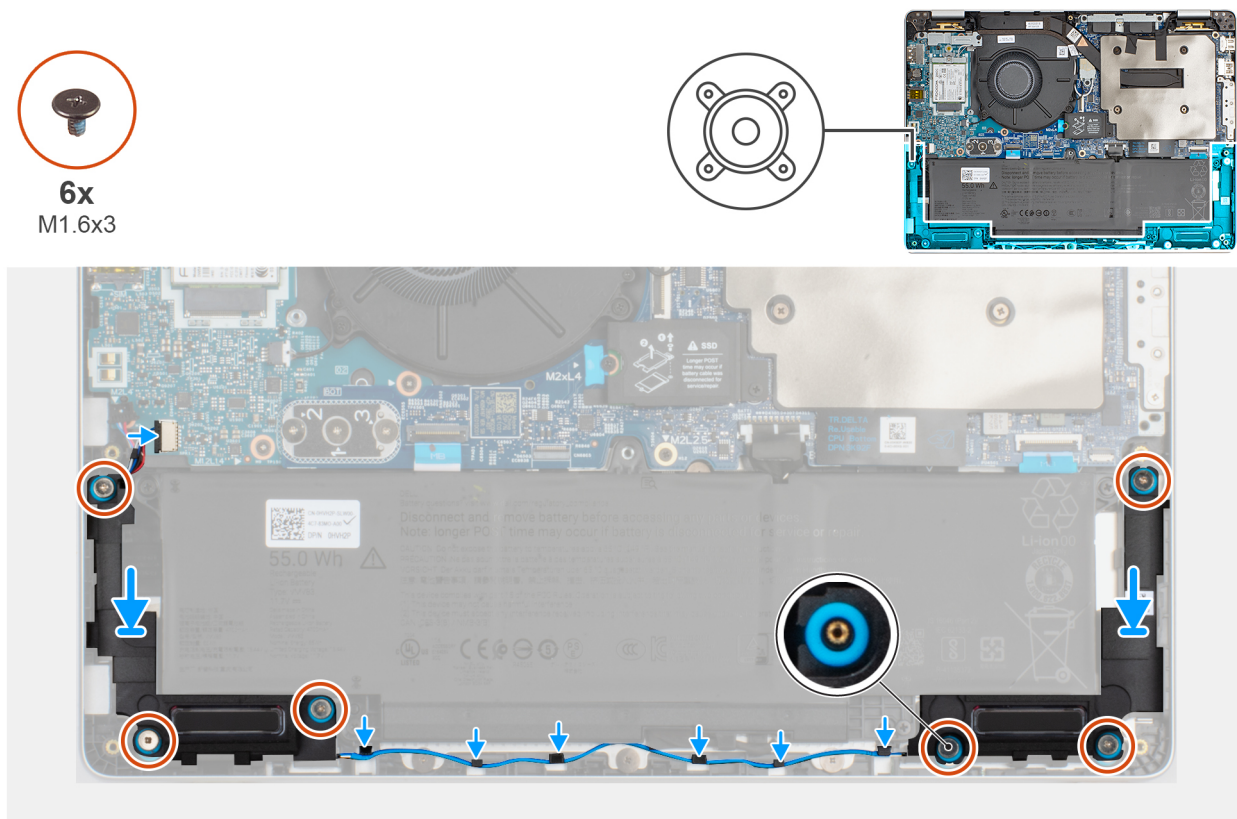


Figure 28. Installing the speakers

Steps

1. Using the alignment posts and rubber grommets, place the left and right speakers into their slots on the palm-rest assembly.
i **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 six 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. Install the [base cover](#).
2. Install the [SIM-card tray](#) (optional).
3. Follow the procedure in [After working inside your computer](#).

Fan

Removing the fan

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [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.

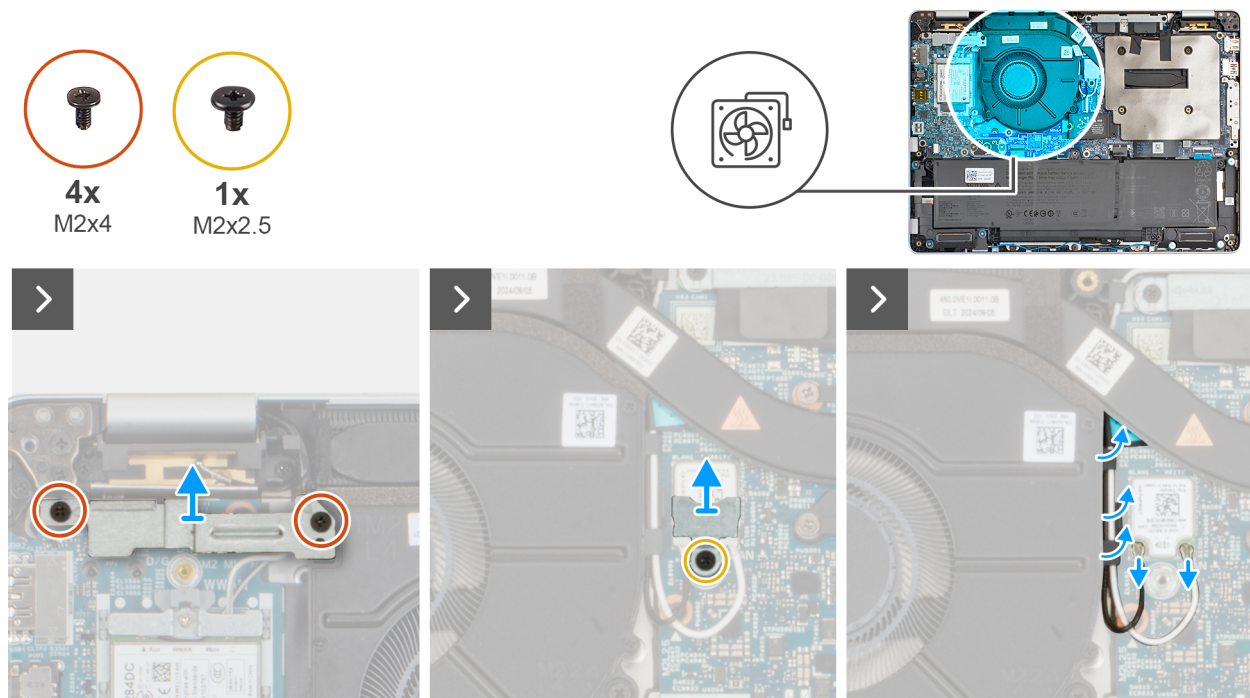


Figure 29. Removing the fan

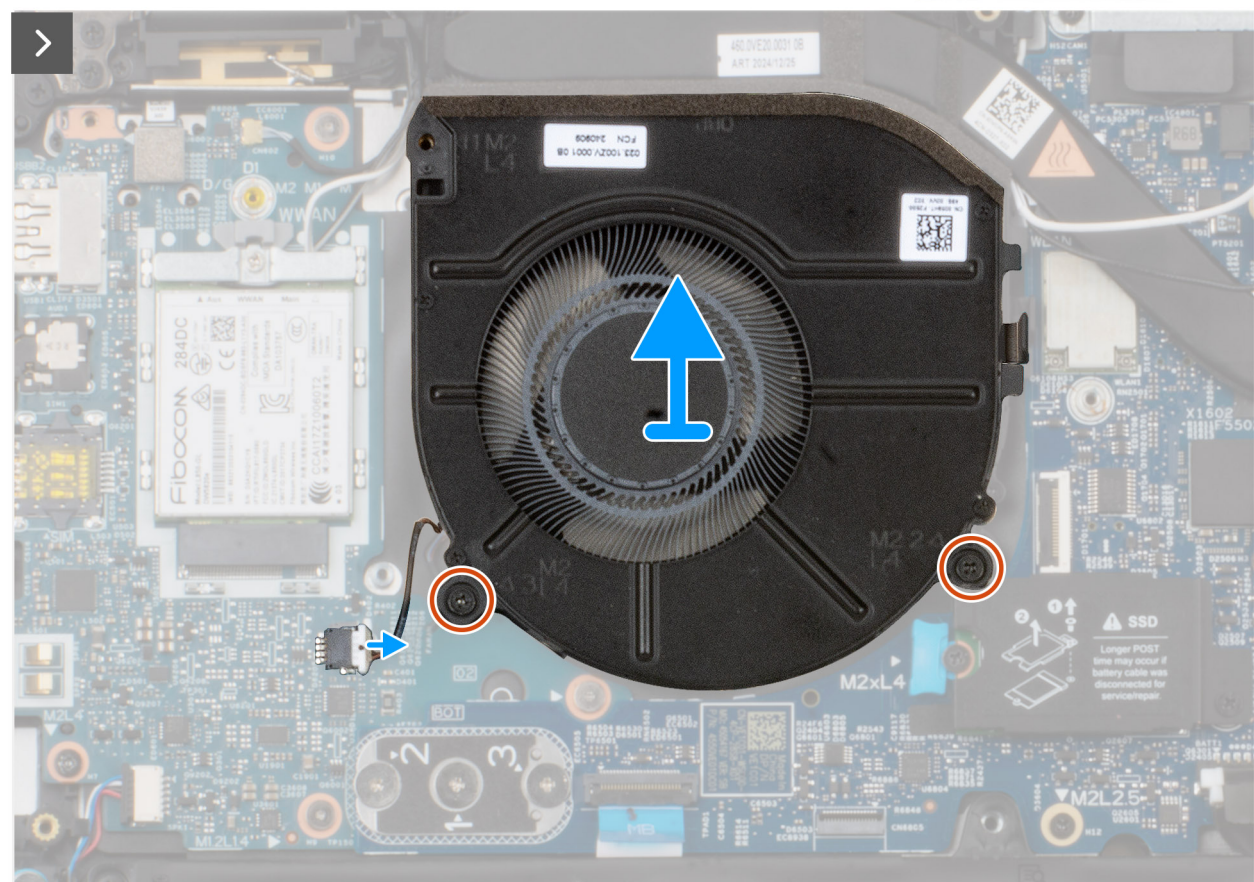


Figure 30. Removing the fan

Steps

1. Remove the two screws (M2x4) that secures the 4G WWAN-card shield to the palm-rest assembly.
2. Remove the screw (M2x2.5) that secures the WLAN-card bracket to the palm-rest assembly.
3. Remove the antenna cables from the routing guides on the palm-rest assembly.
4. Remove the two screws (M2x4) that secure the fan on the palm-rest assembly.
5. Disconnect the fan cable from the fan-cable connector on the I/O board.
6. 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.

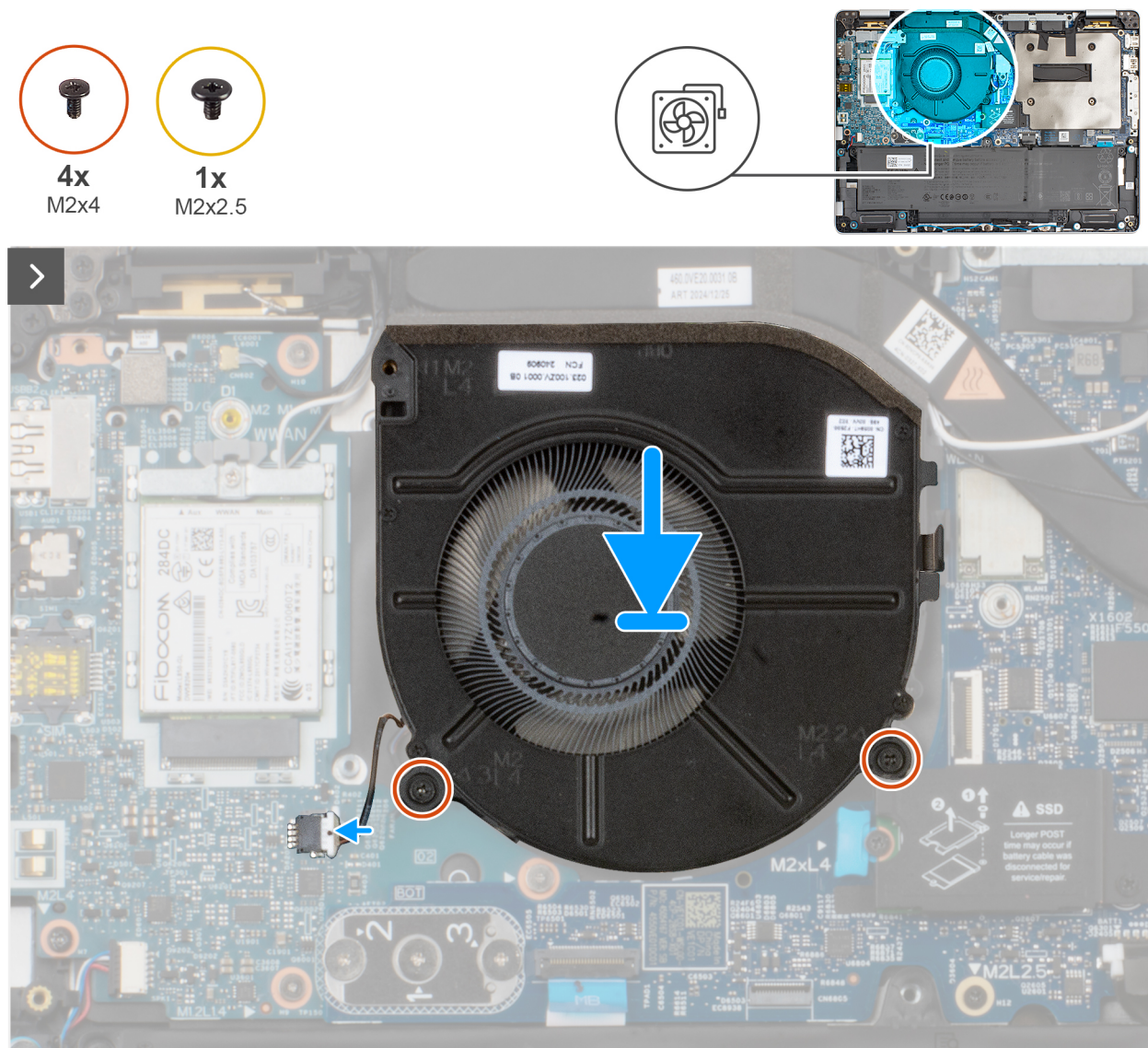


Figure 31. Installing the fan

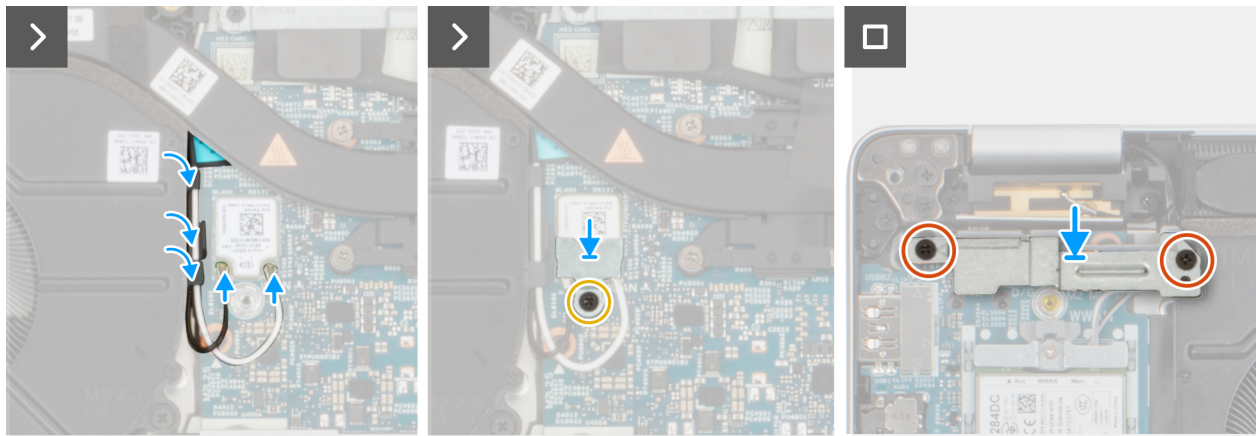


Figure 32. Installing the fan

Steps

1. Align the screw holes on the fan with the screw holes on the palm-rest assembly.
2. Connect the fan cable to the fan-cable connector on the system board.
3. Replace the two screws (M2x4) that secure the fan to the palm-rest assembly.
4. Route the antenna cables through the routing guides on the palm-rest assembly.
5. Align the screw hole on the WLAN bracket with the screw hole on the palm-rest assembly.
6. Replace the two screws (M2x4) that secure the 4G WWAN-card shield to the palm-rest assembly.


Next steps

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


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 daughterboard

Removing the USH daughterboard

 **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 daughterboard and provide a visual representation of the removal procedure



2x
M2.0x2.0

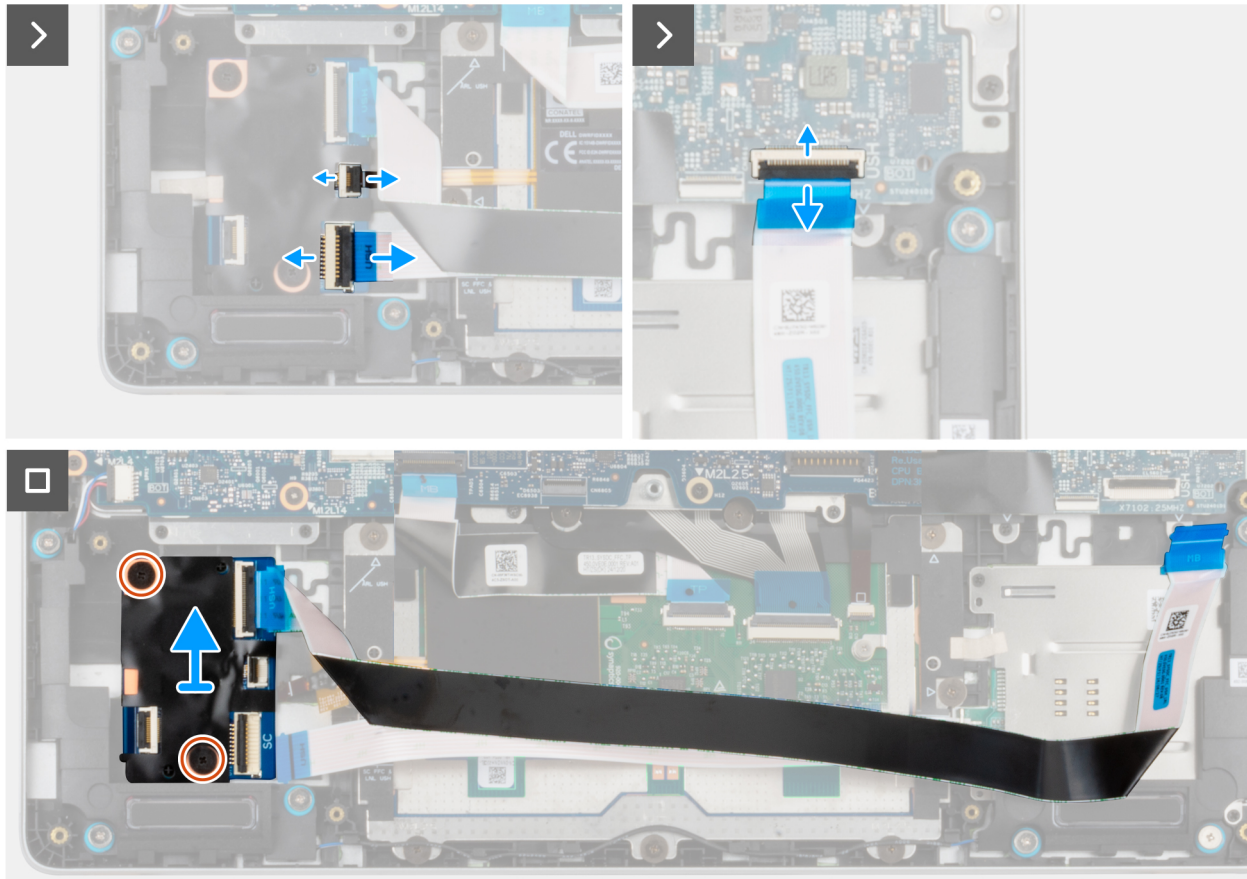
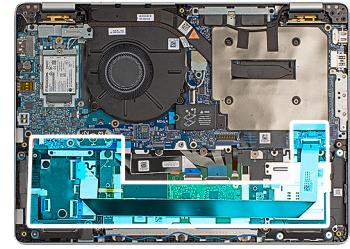


Figure 33. Removing the USH daughterboard

Steps

1. Open the latch and disconnect the smart-card reader from the USH daughterboard.
2. Open the latch and disconnect the USH-daughterboard cable from the system board.
3. Open the latch and disconnect the NFC cable from the USH daughterboard.
4. Remove the two screws (M2.0x2.0) that secure the USH daughterboard to the palm-rest assembly.
5. Lift the USH daughterboard off the palm-rest assembly.

Installing the USH daughterboard

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

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



2x
M2.0x2.0

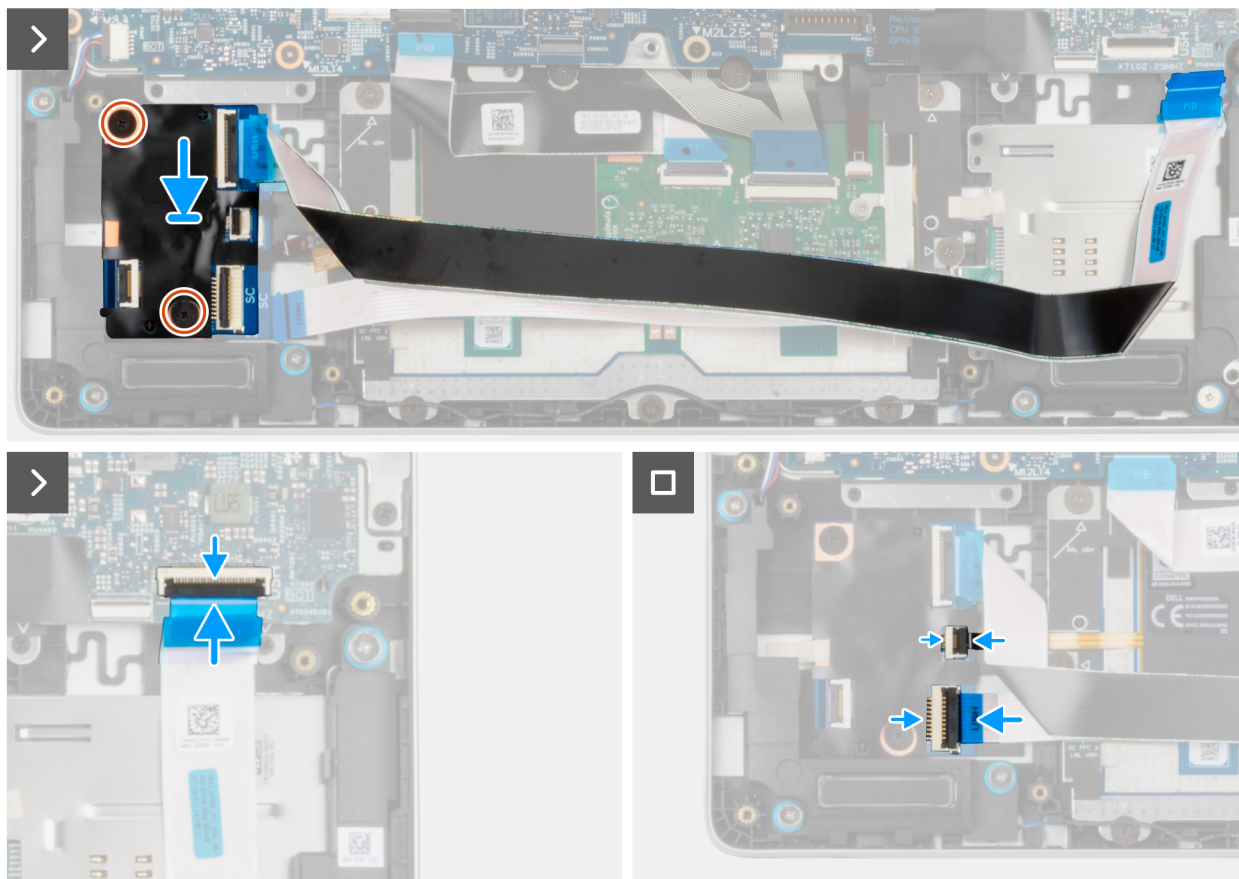
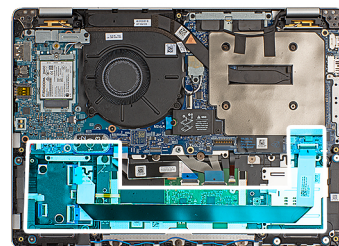


Figure 34. Installing the USH daughterboard

Steps

1. Align the screw hole on the USH daughterboard with the screw hole on the palm-rest assembly.
2. Replace the two screws (M2.0x2.0) that secure the USH daughterboard to the palm-rest assembly.
3. Connect the USH-daughterboard cable to the connector on the system board and close the latch to secure the cable..
4. Adhere the USH-daughterboard cable to the system board.
5. Connect the smart-card reader cable to the connector on the USH daughterboard and close the latch to secure the cable.
6. Connect the NFC cable to the connector on the USH daughterboard and close the latch to secure the cable.

Next steps

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

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](#).
5. Remove the [speaker](#).

About this task

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



4x
M2x2

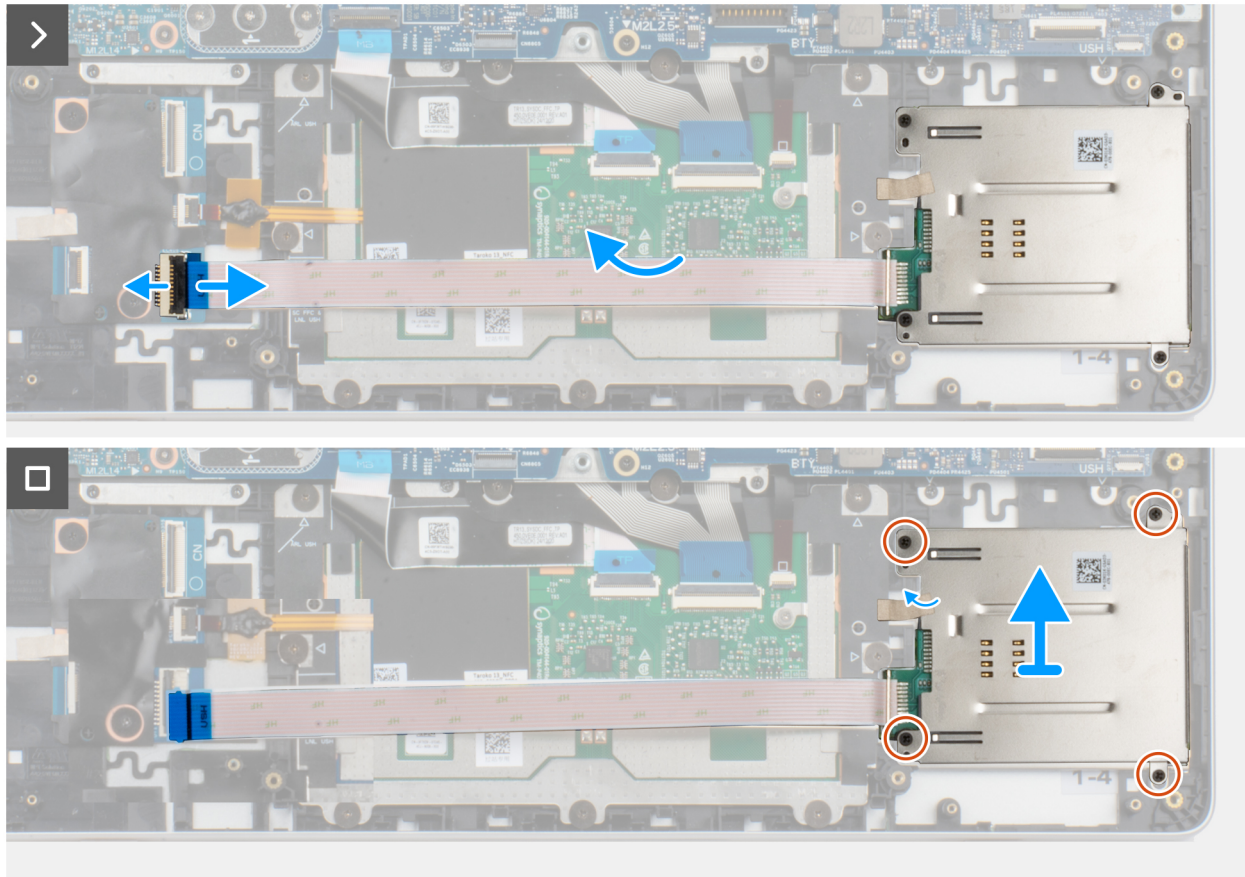
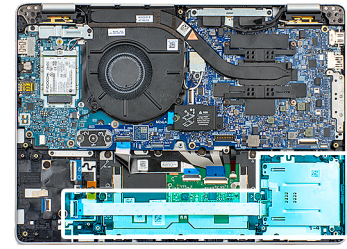


Figure 35. Removing the smart-card reader

Steps

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

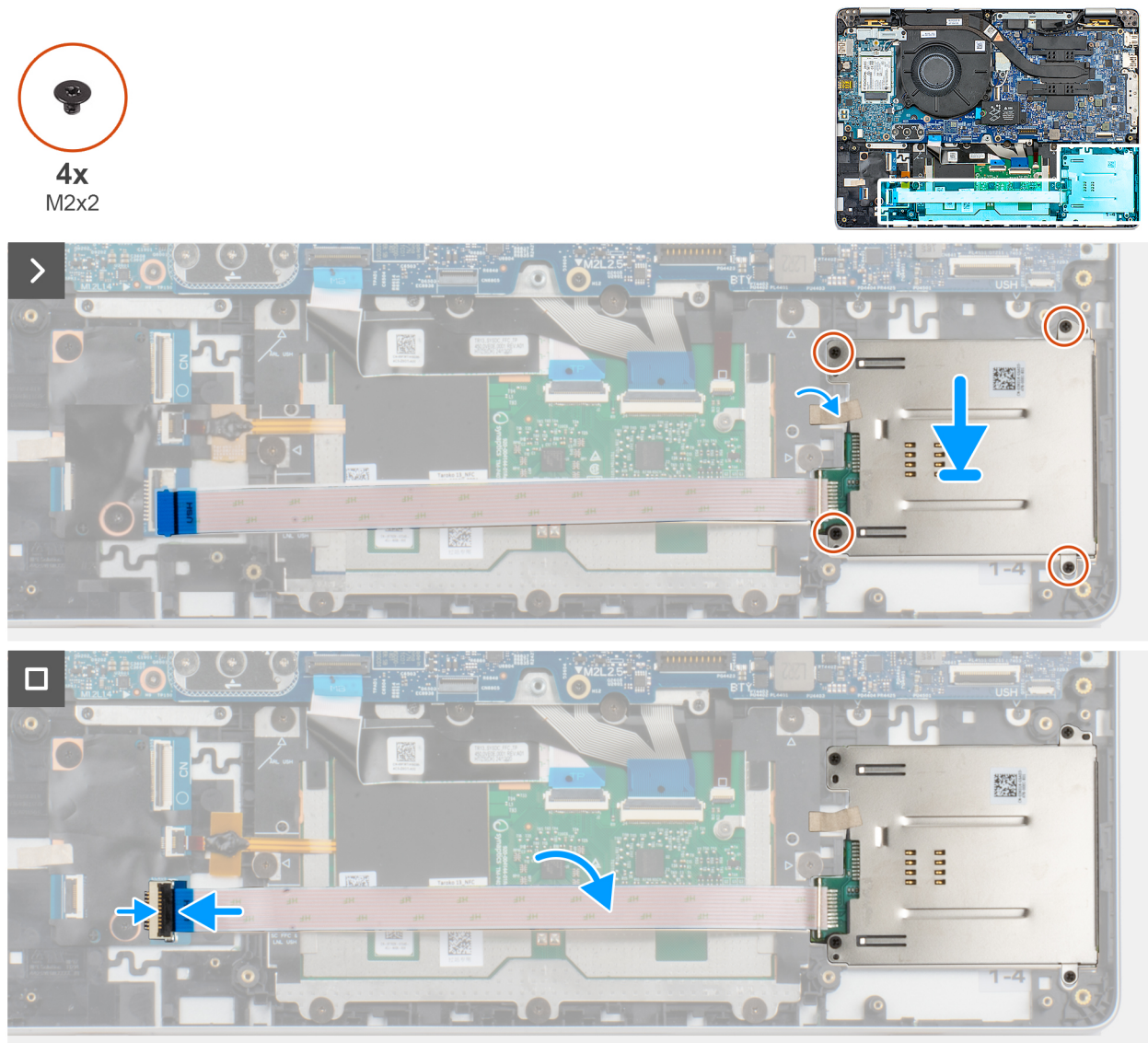


Figure 36. Installing the smart-card reader

Steps

1. Align and place the smart-card reader on its slot on the palm-rest assembly.
2. Replace the four screws (M2x2) that secure the smart-card reader to the palm-rest and keyboard 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.

Next steps

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

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 [M2.2230 SSD](#).
5. Remove the [4G WWAN card](#).
6. Remove the [fan](#).
7. Remove the [display assembly](#).

About this task

The following images indicate the system board connectors.

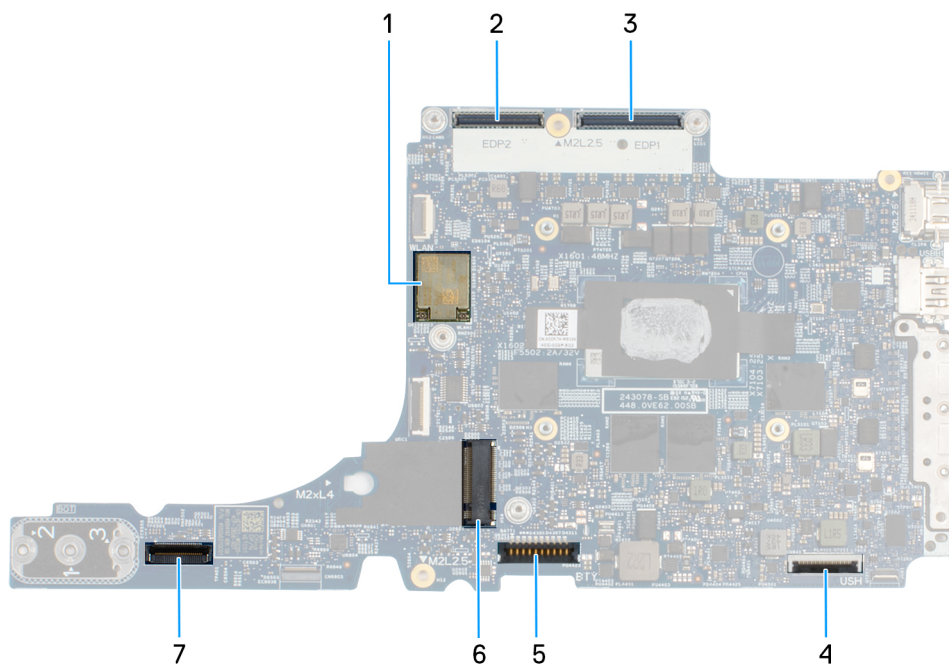


Figure 37. System board connectors

- | | |
|-----------------------------------|--------------------------------|
| 1. Wireless-card (WLAN) | 2. MIPI camera cable connector |
| 3. Display-cable connector (LCD1) | 4. USB cable connector |
| 5. Battery connector | 6. Solid State Drive slot |
| 7. Touchpad connector | |

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

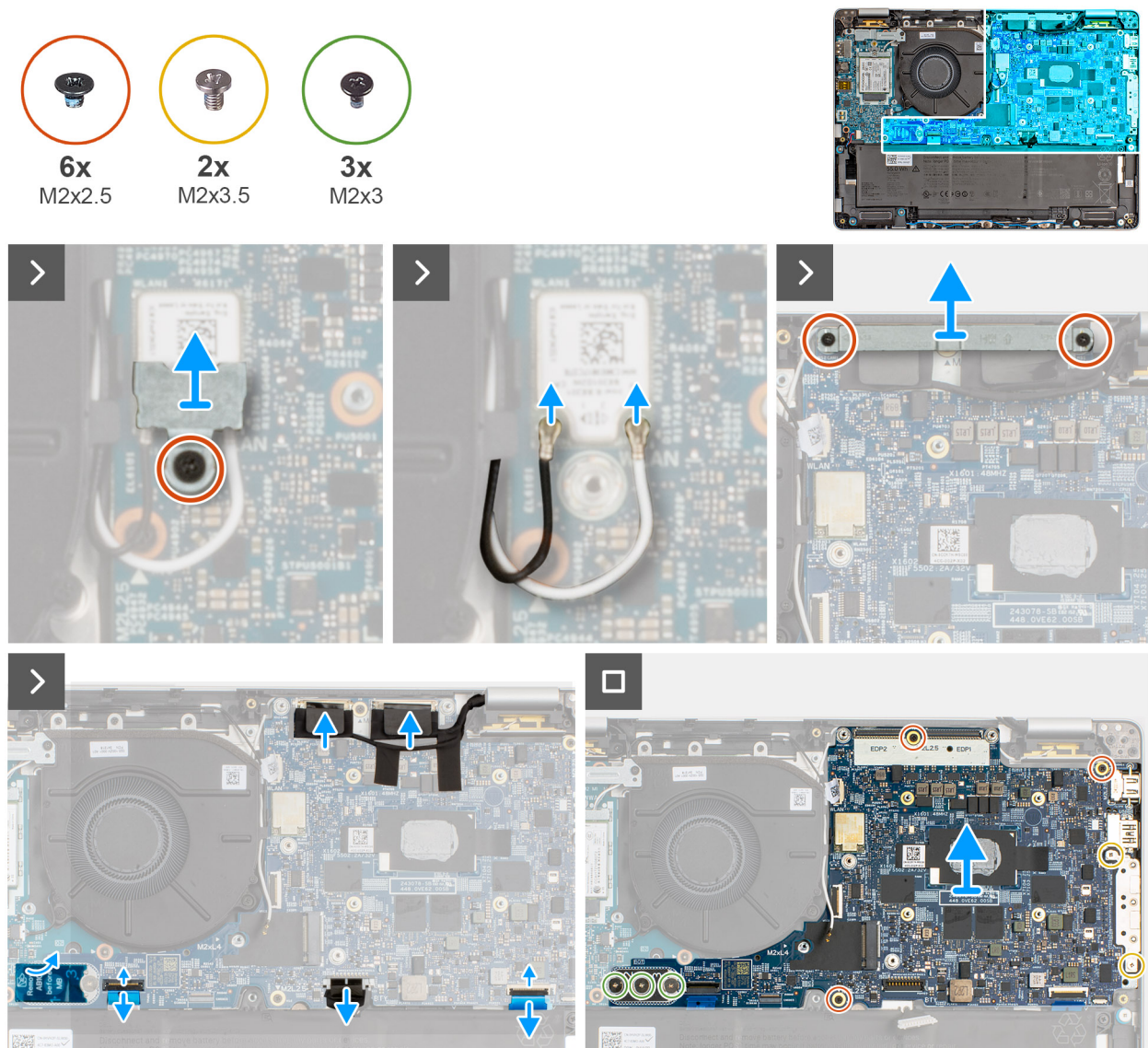


Figure 38. Removing the system board

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 wireless card.
4. 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.
5. Remove the two screws (M2x2.5) that secure the display-cable bracket to the system board.
6. Lift the display-cable bracket off the palm-rest assembly.
7. Disconnect the camera cable from the connector on the system board.
8. Disconnect the display-cable from the display-cable connector (LCD1) on the system board.
9. Disconnect the speaker cable from the I/O board.
10. Open the latch and disconnect the USB cable from the connector on the system board.
11. Open the latch and disconnect the Touchpad 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 six (M2x4) screws that secure the system board to the palm-rest assembly.
14. 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 images indicate the system board connector.

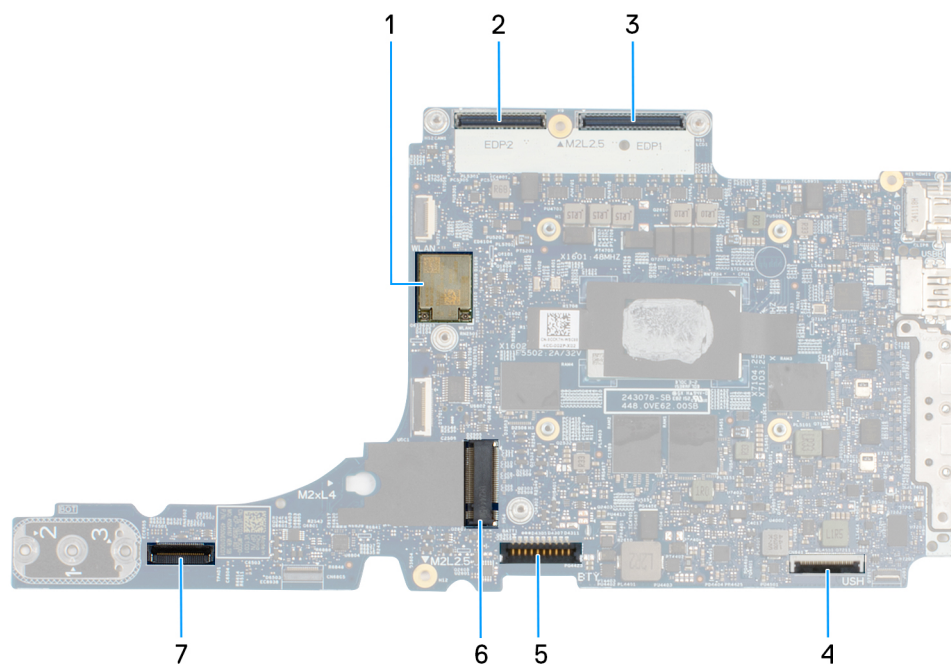
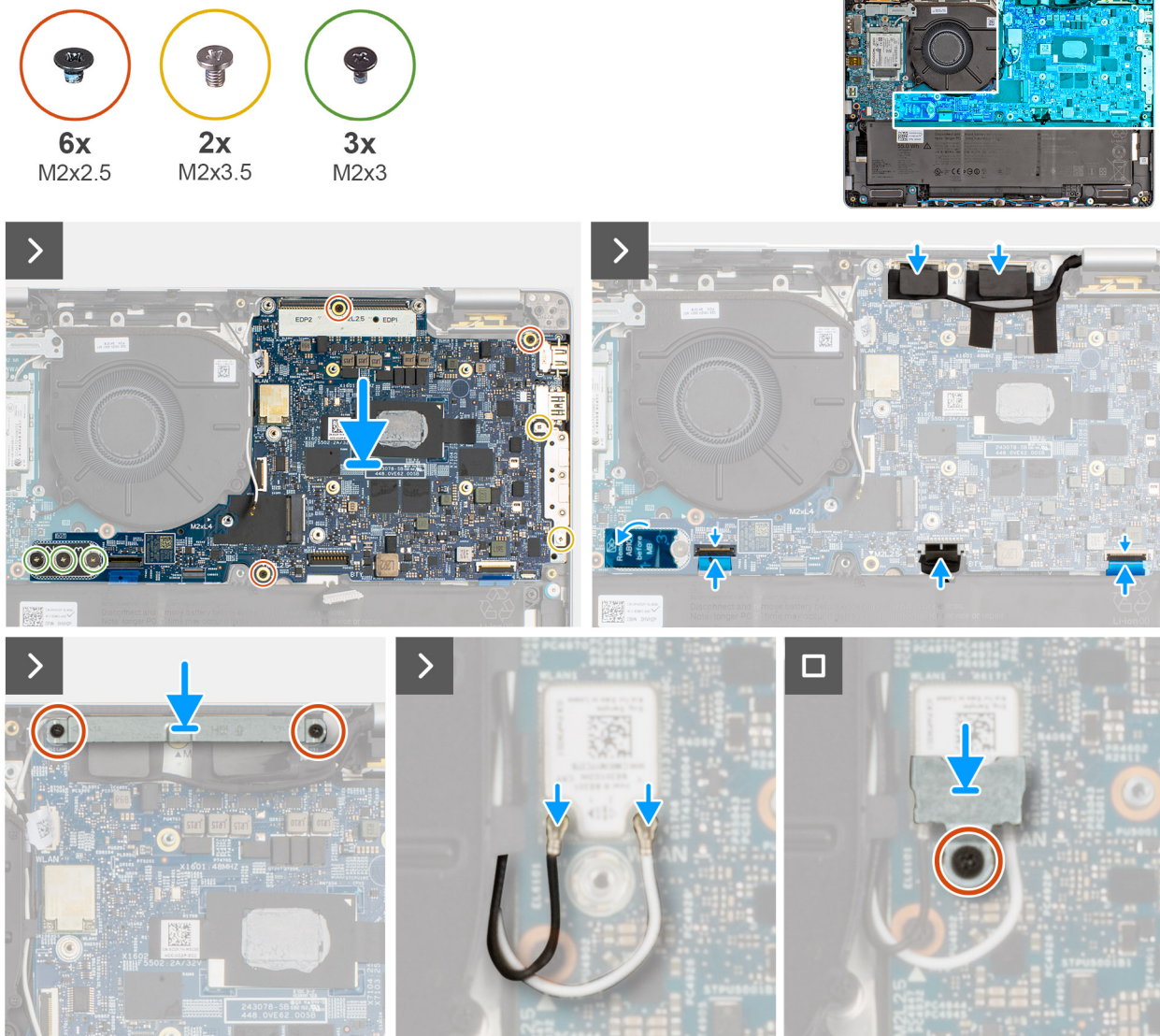


Figure 39. System board connectors

- | | |
|-----------------------------------|--------------------------------|
| 1. Wireless-card (WLAN) | 2. MIPI camera cable connector |
| 3. Display-cable connector (LCD1) | 4. USB cable connector |
| 5. Battery connector | 6. Solid State Drive slot |
| 7. Touchpad connector | |


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

Figure 40. Installing the system board



Steps

1. Align and place the system board on its slot on the palm-rest assembly.
2. Replace the three screws (M2x2.5) that secure the system board to the palm-rest assembly.
3. Adhere the mylar to the screws on the middle bracket (AB10) that connects the I/O board and system board to the palm-rest assembly.
4. Replace the three screws (M2x3) that secure the system board and the I/O board to the palm-rest assembly.
5. Connect the Touchpad cable from the connector on the system board.
6. Connect the USH cable to the connector on the system board and close the latch to secure the cable.
7. Connect the speaker cable to the I/O board.
8. Connect the display-cable to the display-cable connector (LCD1) on the system board.
9. Connect the camera cable to the connector on the system board.
10. Align and place the display-cable bracket on the palm-rest assembly.
11. Replace the screw (M2x2.5) that secures the display-cable bracket to the system board.
12. Connect the antenna cables to the wireless card.
13. Align and place the WLAN bracket on the palm-rest assembly.
14. Replace the screw (M2x2.5) that secures the WLAN bracket to the system board.

 **NOTE:** USB-C connector module is part of the replacement system board but can also be replaced independently. See the USB-C Connector Module section for more information.

Next steps


1. Install the [display assembly](#).
2. Install the [fan](#).
3. Install the [4G WWAN card](#).
4. Install the [M.2 2230 SSD](#).
5. Install the [base cover](#).
6. Install the [SIM-card tray](#) (optional).
7. Follow the procedure in [After working inside your computer](#).

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 [M2.2230 SSD](#).
5. Remove the [4G WWAN card](#).
6. Remove the [fan](#).
7. Remove the [display assembly](#).
8. Remove the [system board](#).

 **NOTE:** The system board can be removed and installed with the heat sink to preserve the thermal bond.

About this task

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



4x
M2x2.5

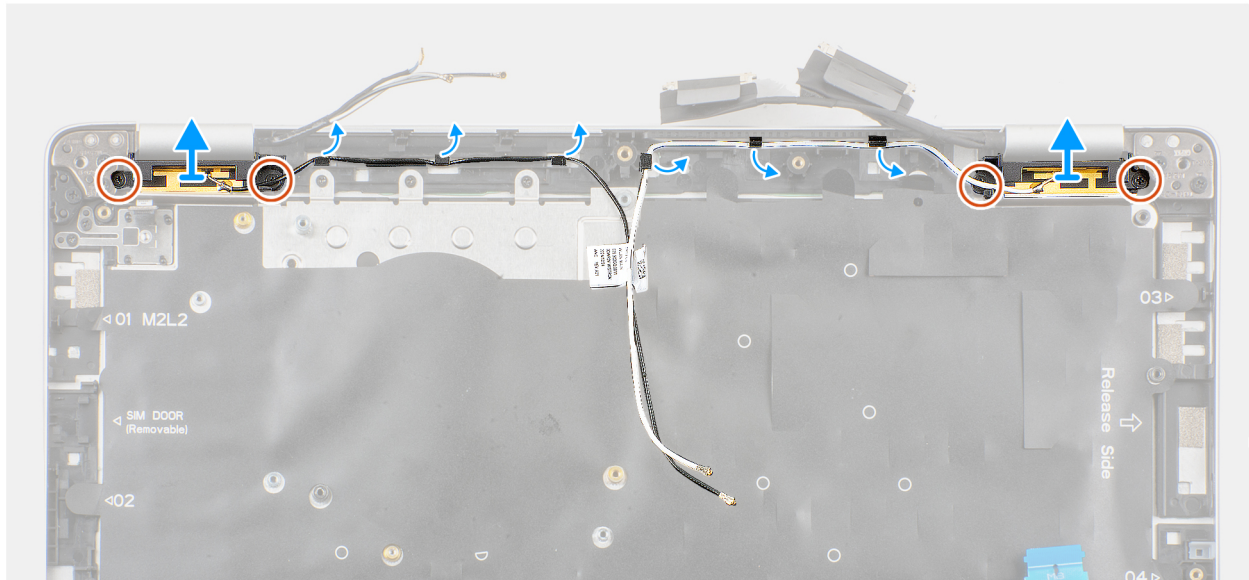
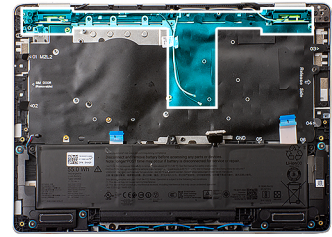


Figure 41. Removing the WLAN antenna module

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.

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 removal procedure.



4x
M2x2.5

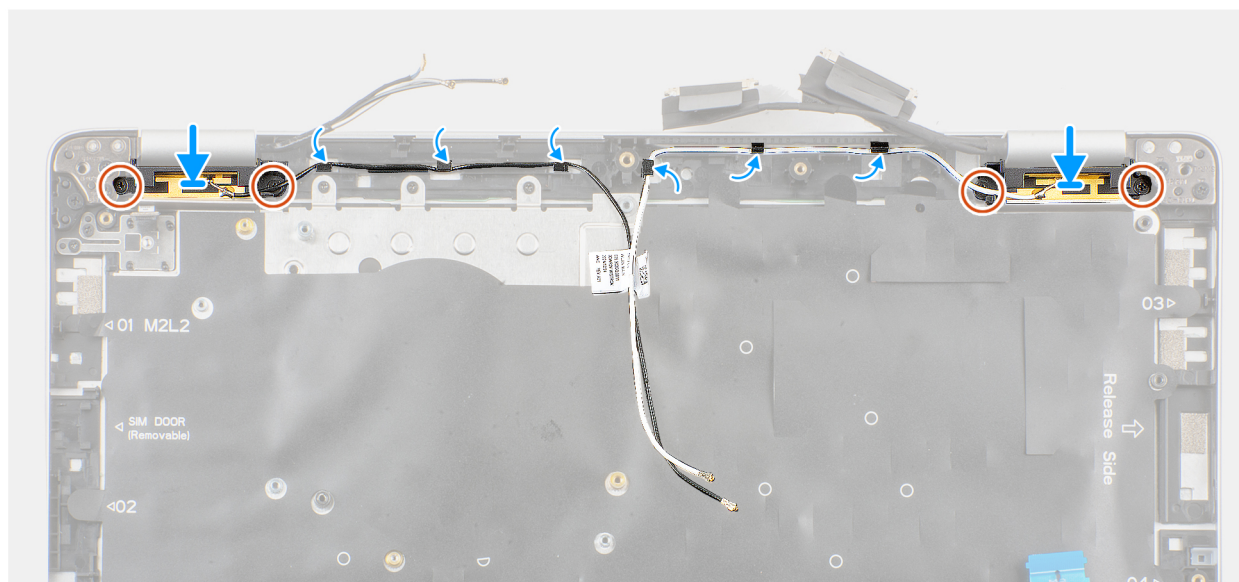
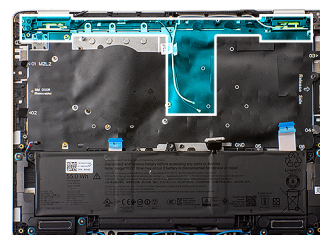


Figure 42. Installing the WLAN antenna module

Steps

1. Connect the WLAN antenna cables from the wireless card as per the routing guide shown in the image above.

Table 33. WLAN-antenna cable color scheme

Connectors on the wireless card	Antenna-cable color
Main - White triangle (△)	White cable
Auxiliary - Solid triangle (▲)	Black cable

2. Replace the screw four (M2x2.5) securing the WLAN antenna bracket in place.
3. Connect the WLAN-antenna cables to the respective connectors on the wireless card.

Next steps

1. Install the [system board](#).

NOTE: The system board can be removed and installed with the heat sink to preserve the thermal bond.

2. Install the [display assembly](#).
3. Install the [fan](#).
4. Install the [4G WWAN card](#).
5. Install the [M.2 2230 SSD](#).
6. Install the [base cover](#).
7. Install the [SIM card tray](#) (optional).
8. Follow the procedure in [After working inside your computer](#).


Heat sink

Removing 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 [M2.2230 SSD](#).
5. Remove the [4G WWAN card](#).
6. Remove the [fan](#).
7. Remove the [display assembly](#).
8. Remove the [system board](#).

 **NOTE:** The system board can be removed and installed with the heat sink to preserve the thermal bond.

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.

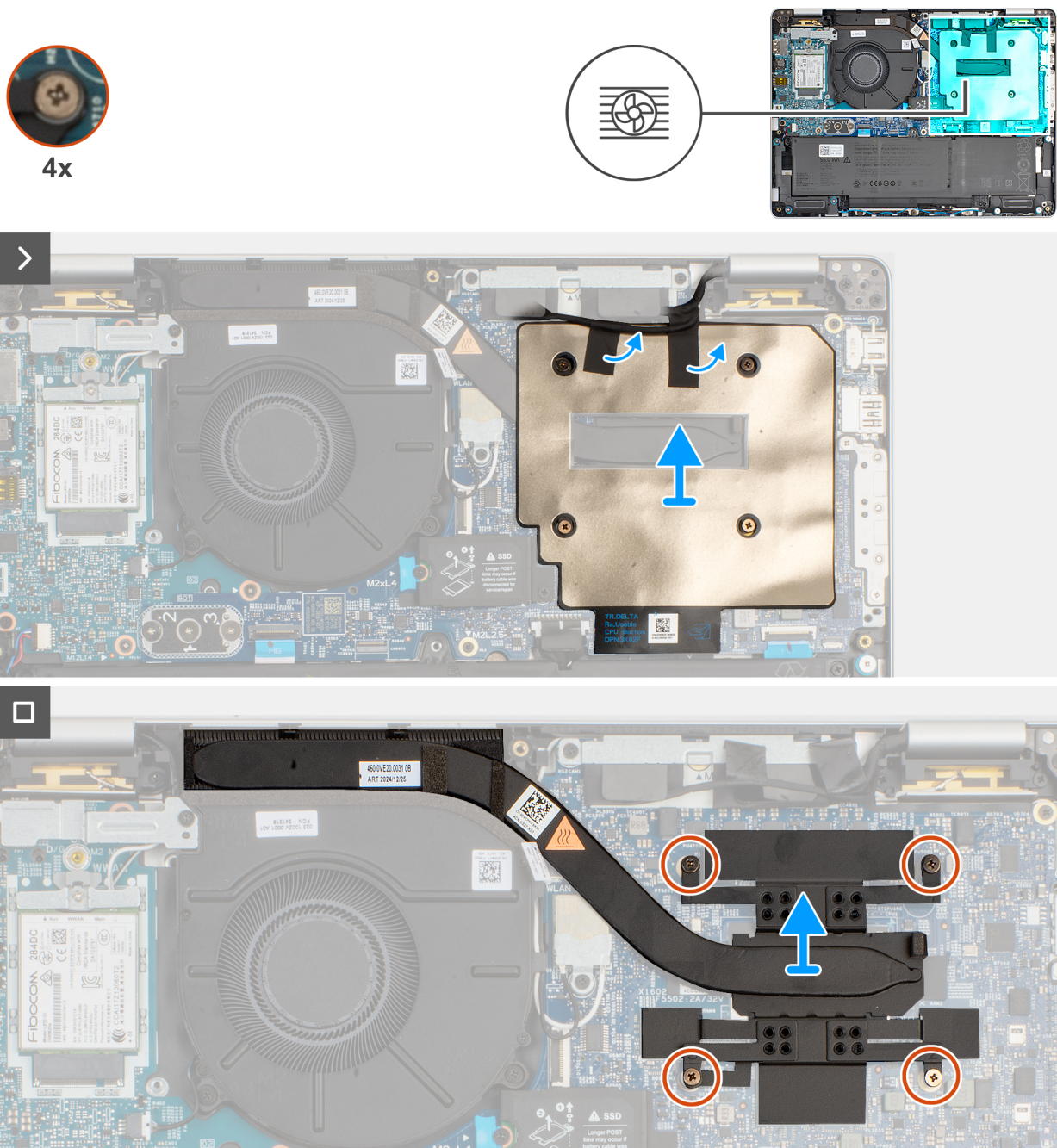


Figure 43. Removing the heat sink

Steps

1. Peel the tape that secures the heat-sink thermal shield to the palm-rest assembly.
2. Lift the heat-sink thermal shield off the heat sink.
3. 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].

4. 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

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

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

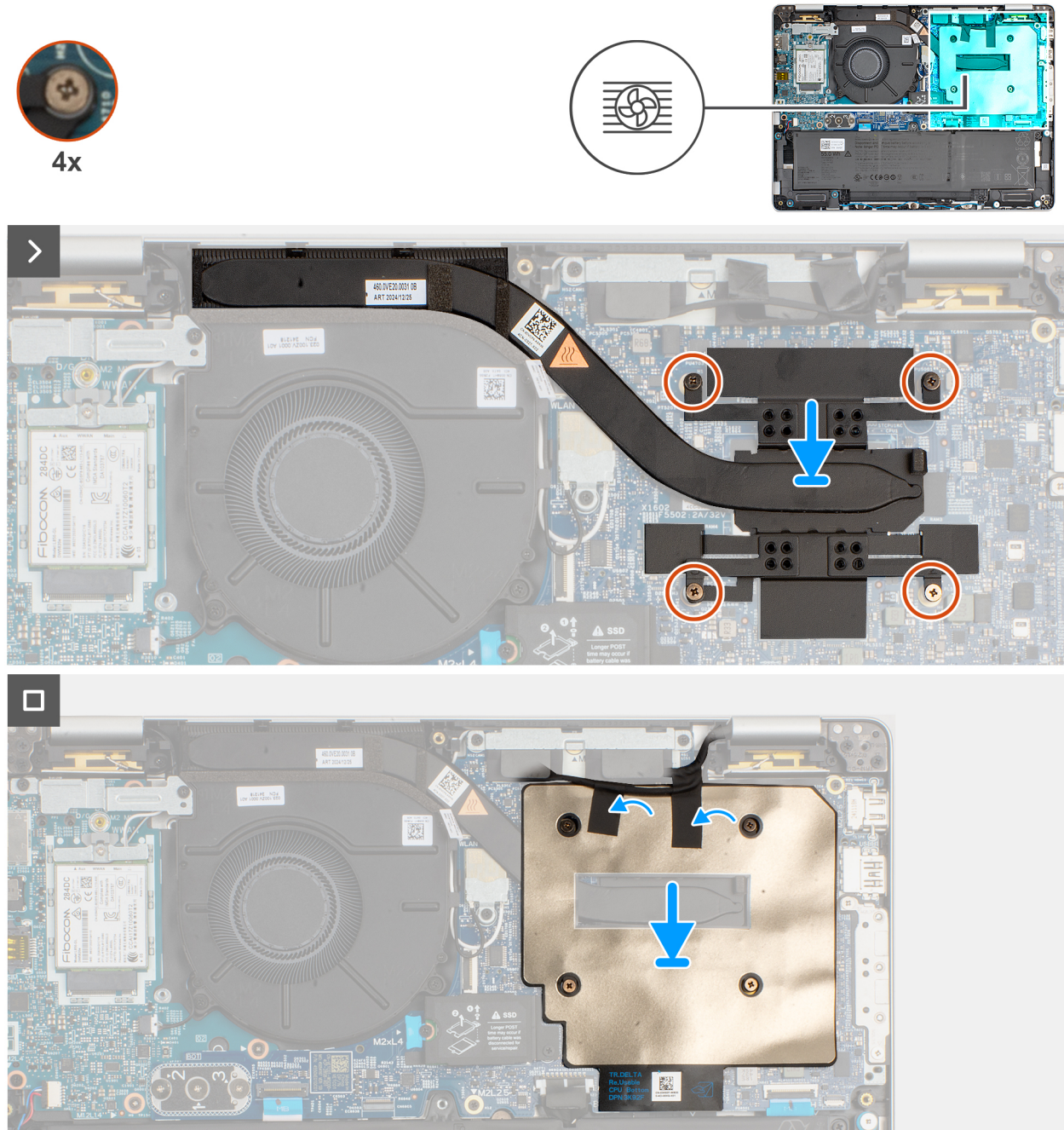



Figure 44. Installing the heat sink

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.

3. Align and place the heat-sink thermal shield on the heat sink.
4. Adhere the tapes that secure heat-sink thermal shield to the palm-rest assembly.

Next steps

1. Install the [system board](#).

 **NOTE:** The system board can be removed and installed with the heat sink to preserve the thermal bond.

2. Install the [display assembly](#).
3. Install the [fan](#).
4. Install the [4G WWAN card](#).
5. Install the [M.2 2230 SSD](#).
6. Install the [base cover](#).
7. Install the [SIM-card tray](#) (optional).
8. Follow the procedure in [After working inside your computer](#).


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 [M2.2230 SSD](#).
5. Remove the [4G WWAN card](#).
6. Remove the [fan](#).
7. Remove the [display assembly](#).
8. Remove the [system board](#).

 **NOTE:** The system board can be removed and installed with the heat sink to preserve the thermal bond.

About this task

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

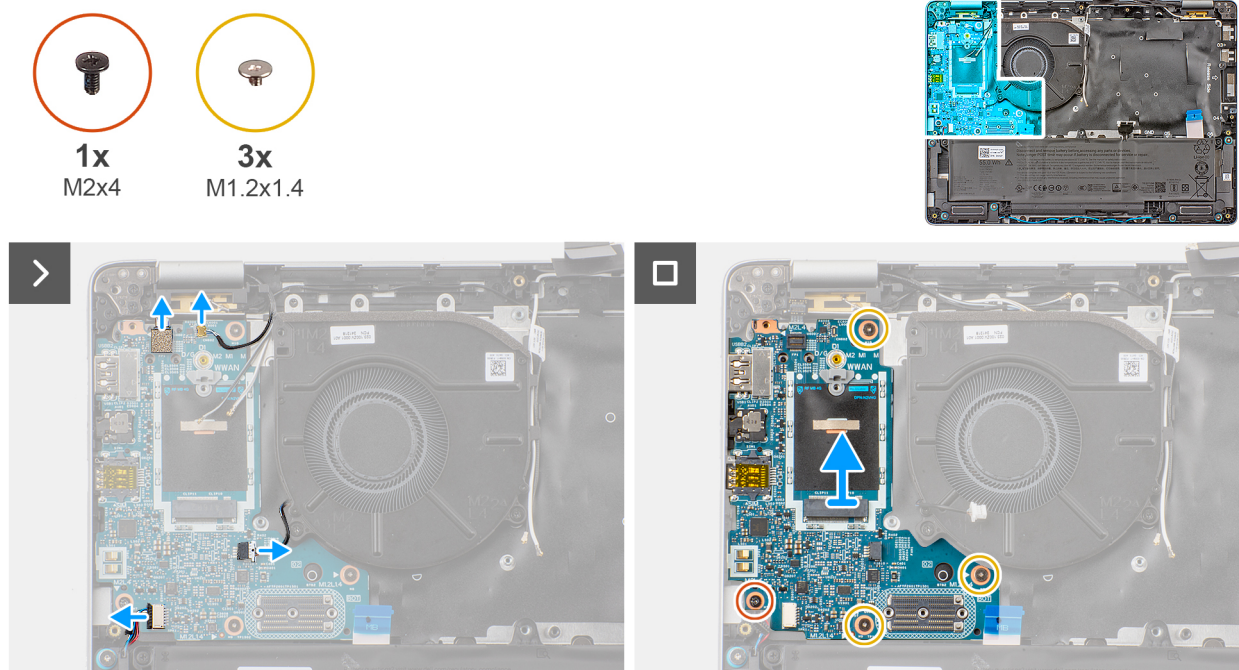


Figure 45. Removing the I/O board

Steps

1. Disconnect the fingerprint reader cable (for models shipped with a fingerprint reader), Darwin cable, fan cable, FFC, and speaker cable from the I/O board.
2. Remove the screw (M2x4) that secures the I/O board to the palm-rest assembly.
3. Remove the three screws (M1.2x1.4) that secure the I/O board to the palm-rest assembly.
4. 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.

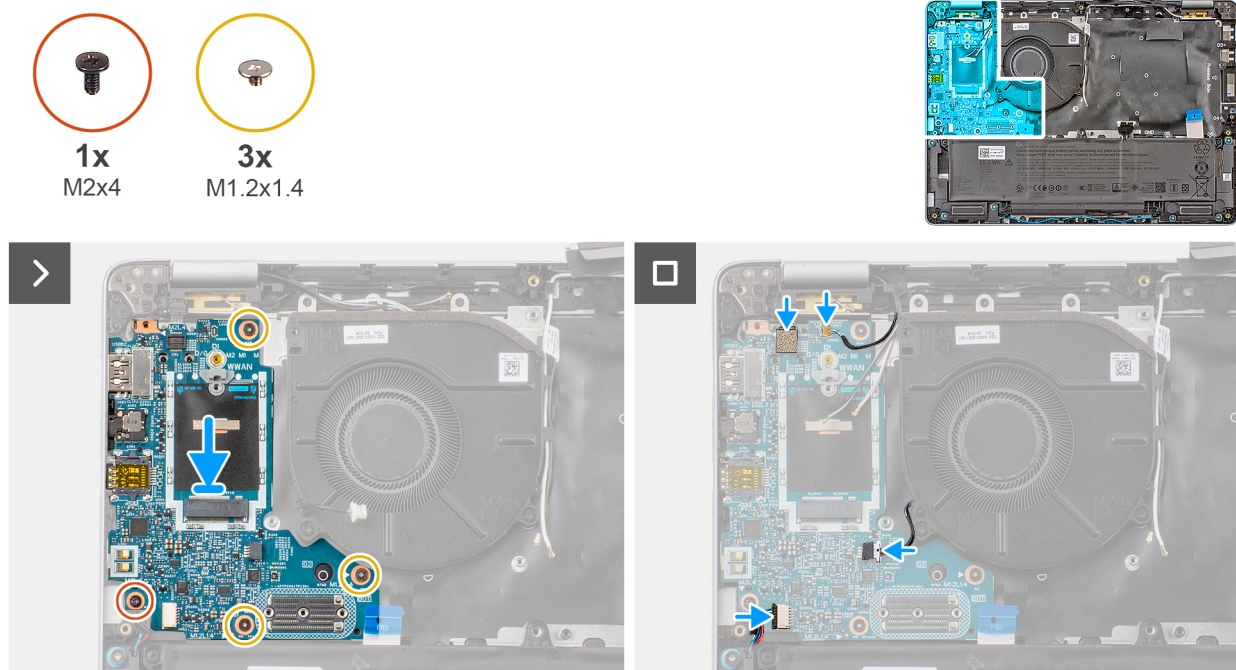


Figure 46. Installing the I/O board

Steps

1. Align and place the I/O board on the palm-rest assembly.
2. Replace the three screws (M1.2x1.4) that secure the I/O board to the palm-rest assembly.
3. Replace the screw (M2x4) that secures the I/O board to the palm-rest assembly.
4. Connect the fingerprint reader cable (for models shipped with a fingerprint reader), Darwin cable, fan cable, speaker cable to the respective connectors on the I/O board.

Next steps

1. Install the [system board](#).

NOTE: The system board can be removed and installed with the heat sink to preserve the thermal bond.

2. Install the [display assembly](#).
3. Install the [fan](#).
4. Install the [4G WWAN card](#).
5. Install the [M.2 2230 SSD](#).
6. Install the [base cover](#).
7. Install the [SIM card tray](#) (optional).
8. Follow the procedure in [After working inside your computer](#).

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 [M2.2230 SSD](#).
5. Remove the [4G WWAN card](#).
6. Remove the [fan](#).
7. Remove the [display assembly](#).
8. Remove the [system board](#).

 **NOTE:** The system board can be removed and installed with the heat sink to preserve the thermal bond.

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.

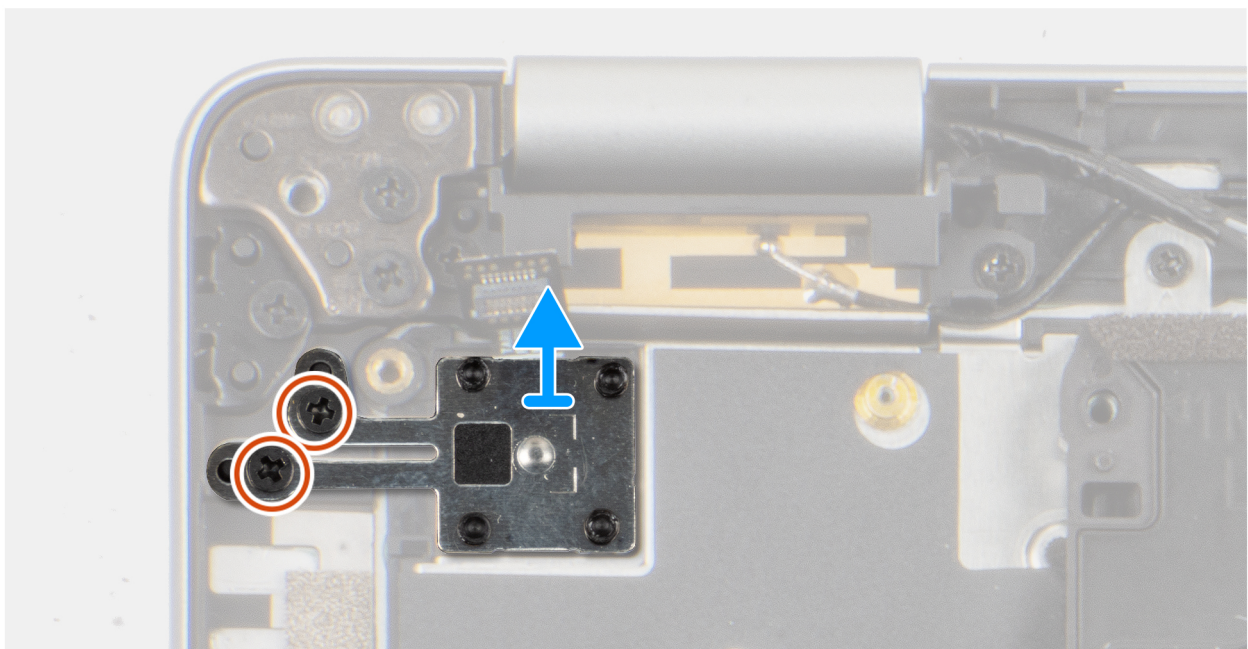
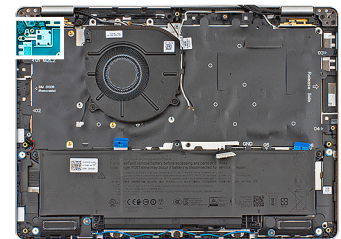


Figure 47. Removing the power button with optional fingerprint reader

Steps

1. Remove the two screws (M2x2) 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.

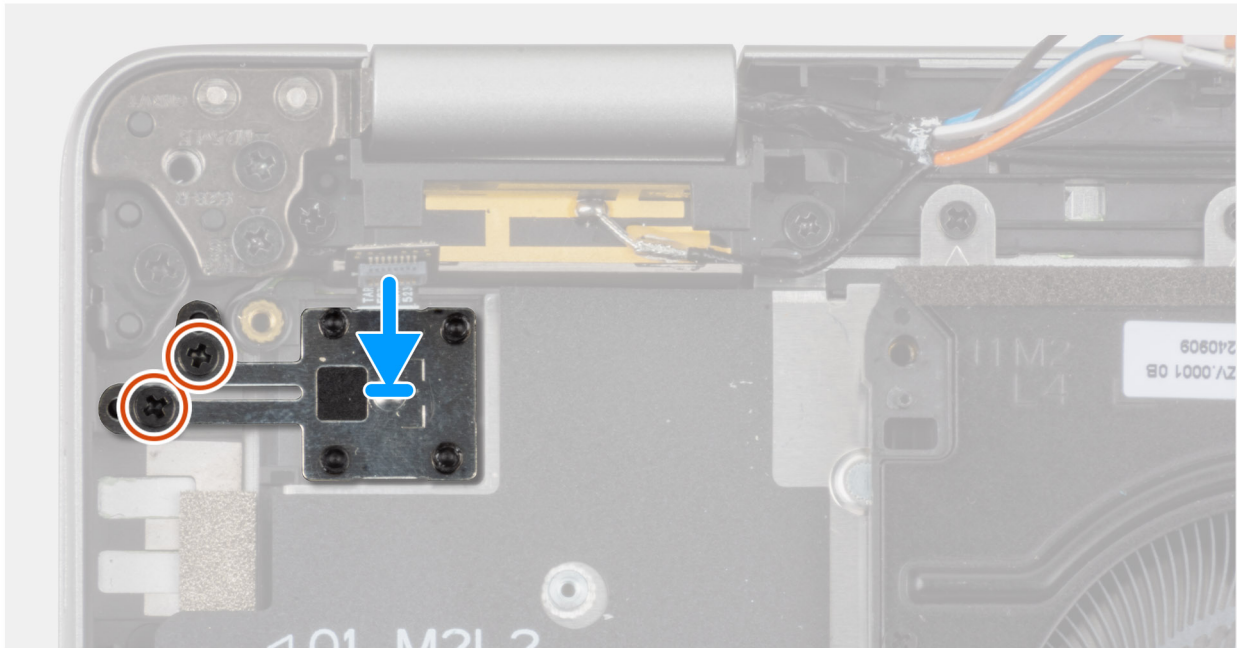
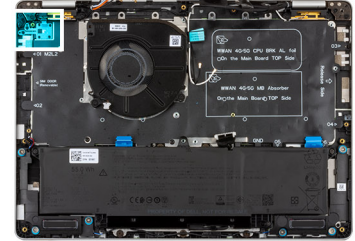


Figure 48. Installing the power button with optional fingerprint reader

Steps

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

Next steps

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

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 [M.2 2230 SSD](#).
6. Remove the [4G WWAN card](#).
7. Remove the [fan](#).
8. Remove the [display assembly](#).
9. Remove the [speaker](#).
10. Remove the [heat sink](#).

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.

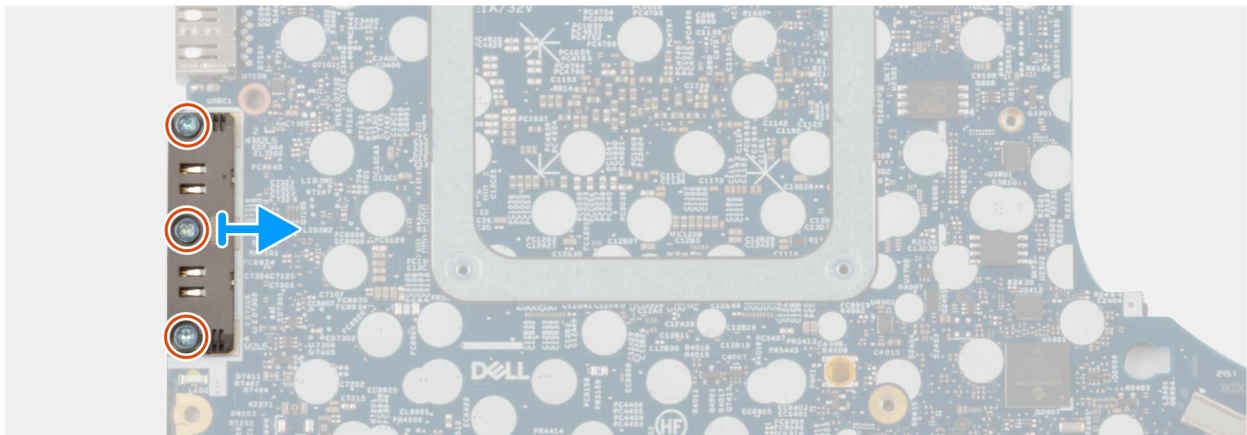
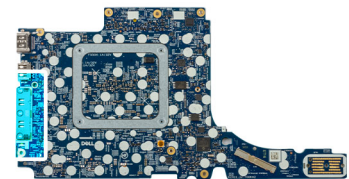



Figure 49. Removing the USB Type-C Connector Module

Steps

1. Remove the three screws (M2x5) that secure the USB Type-C connector module to the bottom side of the system board.
2. Remove the USB Type-C connector module off the system board.

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

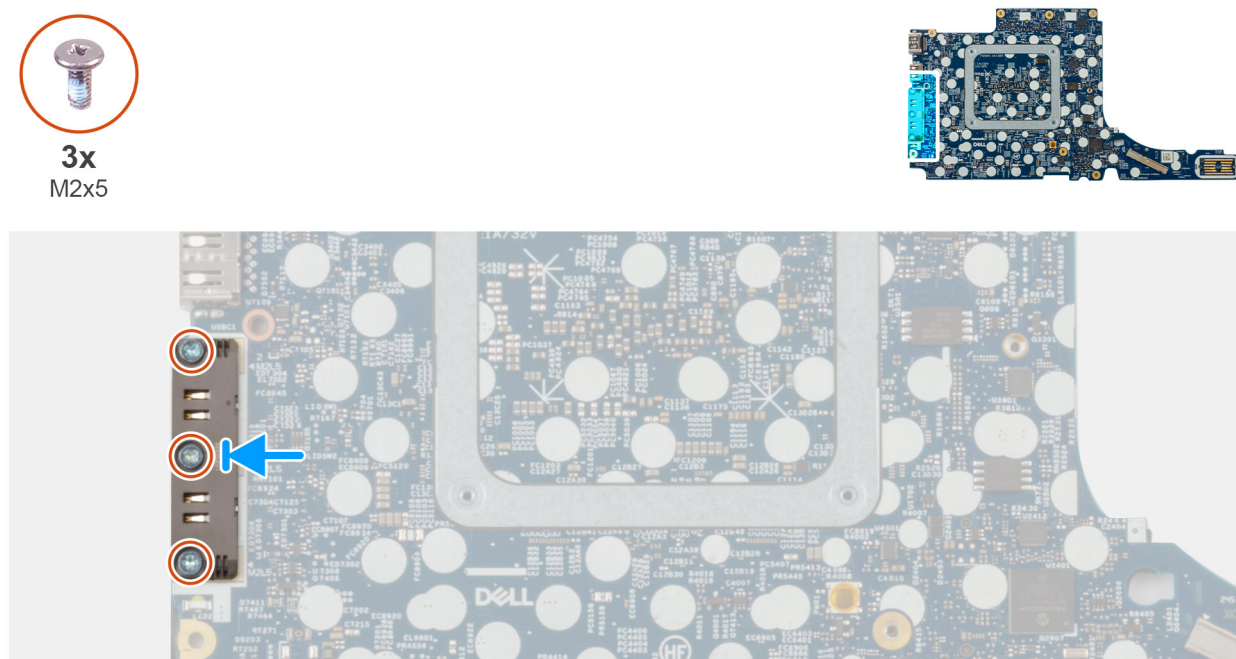


Figure 50. Installing the USB Type-C connector module

Steps

1. Align and place the USB Type-C connector module 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.
3. Gently turn the system board over.

Next steps

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


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 [M2.2230 SSD](#).
5. Remove the [4G WWAN card](#).
6. Remove the [fan](#).
7. Remove the [display assembly](#).
8. Remove the [system board](#).

 **NOTE:** The system board can be removed and installed with the heat sink to preserve the thermal bond.

9. 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.

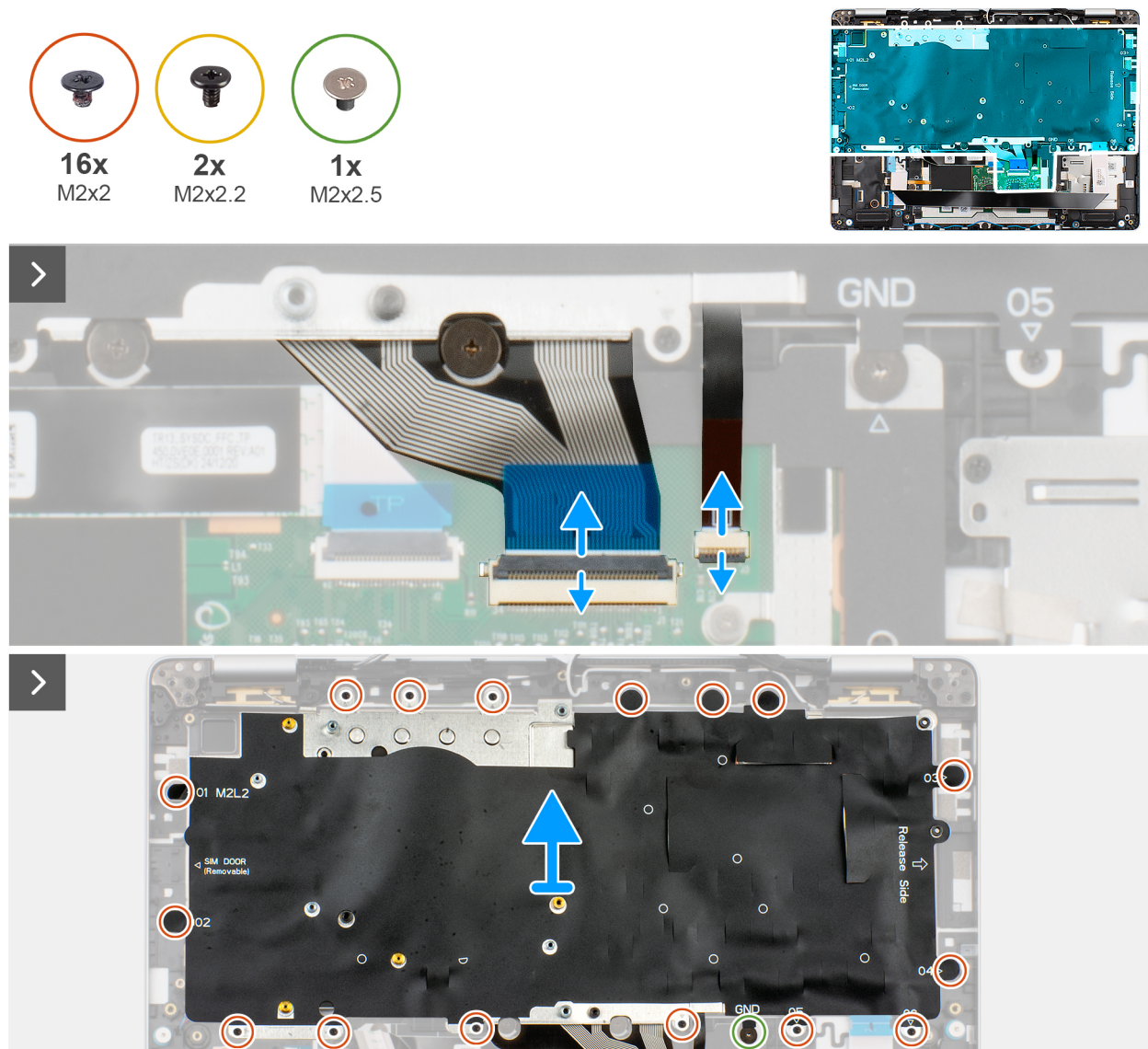



Figure 51. Removing the keyboard




Figure 52. 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.

2. Open the latch and disconnect the keyboard-backlight cable from the touchpad.

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

3. Remove the 16 screws (M2x2) that secure the keyboard bracket to the palm-rest assembly.
4. Remove the screw (M2x2.5) that secures the keyboard bracket to the palm-rest assembly.
5. Lift the keyboard bracket off the palm-rest assembly.
6. Turn the keyboard bracket over.
7. Remove the two screws (M2x2.2) that secure the keyboard to the keyboard bracket.
8. 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 53. Installing the keyboard


Steps

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

2. Replace the two screws (M2x2.2) that secure the keyboard to the keyboard bracket.
3. Turn the keyboard bracket over.
4. Align and place the keyboard bracket on the palm-rest assembly.
5. Replace the 16 screws (M2x2) that secure the keyboard bracket to the palm-rest assembly.
6. Replace the screw (M2x2.5) that secures the keyboard bracket to the palm-rest assembly.
7. Connect the keyboard-backlight cable to the connector on the touchpad and close the latch to secure the cable.

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

8. Connect the keyboard cable to the connector on the touchpad and close the latch to secure the cable.

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

Next steps

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


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 [M2.2230 SSD](#).
5. Remove the [4G WWAN card](#).
6. Remove the [speaker](#).
7. Remove the [fan](#).
8. Remove the [display assembly](#).
9. Remove the [USH daughter board](#).
10. Remove the [smart-card reader](#).
11. Remove the [system board](#).

 **NOTE:** The system board can be removed and installed with the heat sink to preserve the thermal bond.

12. Remove the [I/O board](#).
13. Remove the [power button with optional fingerprint reader](#).
14. Remove the [keyboard](#).

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.

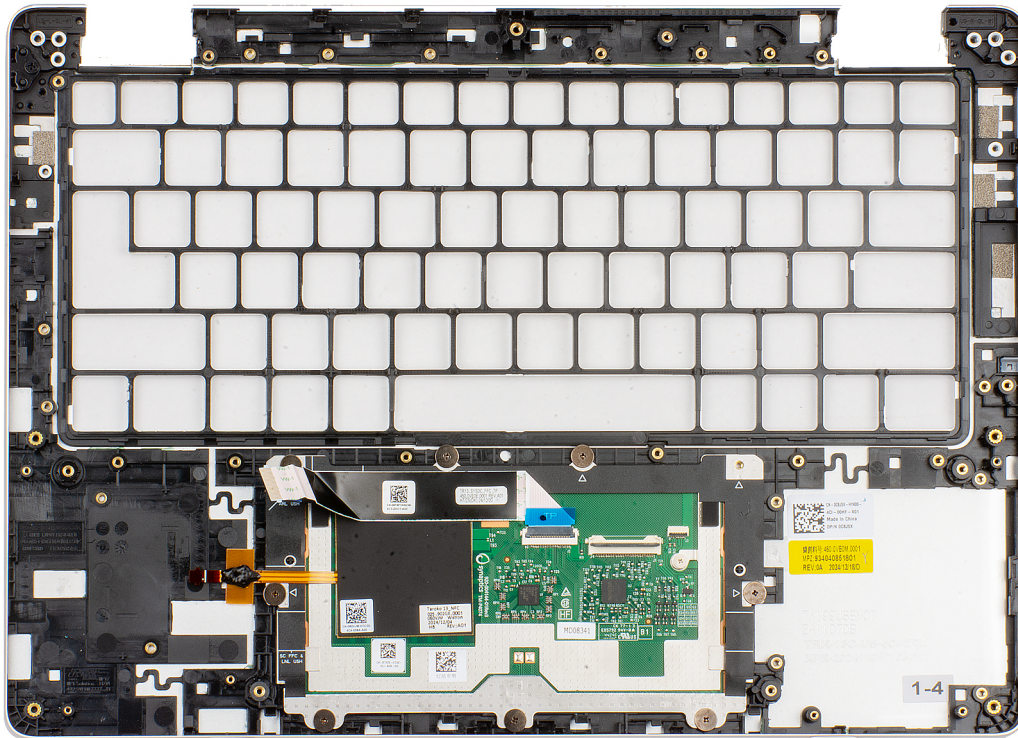


Figure 54. Removing the palm-rest assembly

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 frame 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.

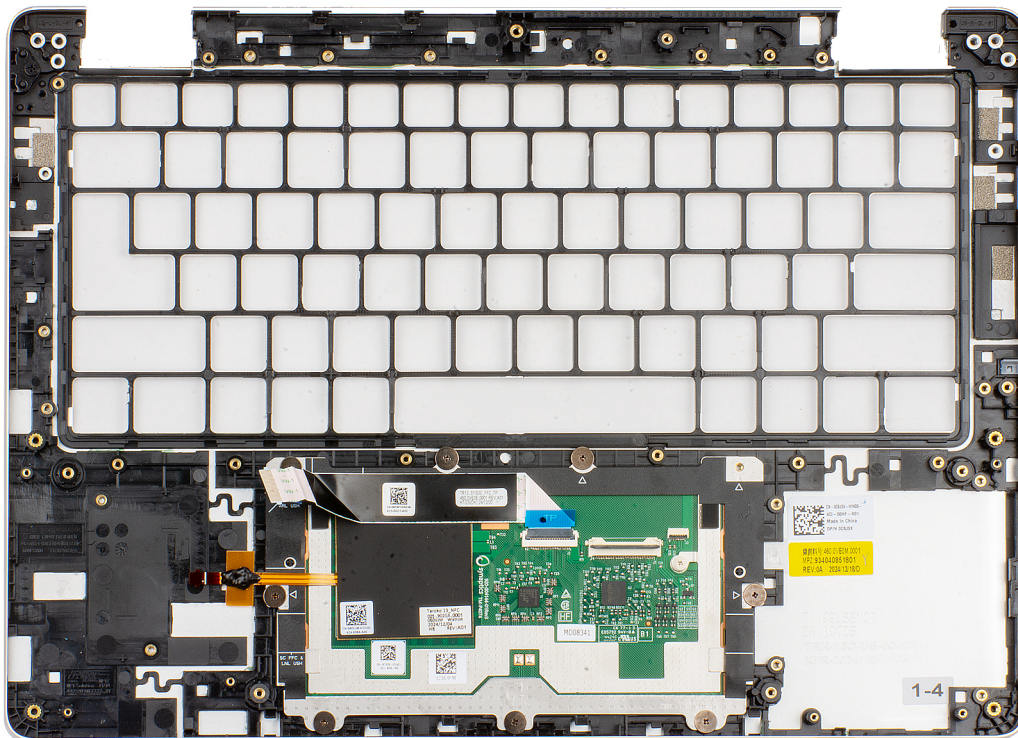


Figure 55. Installing the palm-rest assembly

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 frame 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. Install the [I/O board](#).
2. Install the [keyboard](#).
3. Install the [power button with optional fingerprint reader](#).
4. Install the [system board](#).
5. Install the [smart-card reader](#).
6. Install the [USH daughter board](#).
7. Install the [display assembly](#).
8. Install the [fan](#).
9. Install the [M.2 2230 SSD](#).
10. Install the [4G WWAN card](#).
11. Install the [battery](#).
12. Install the [base cover](#).
13. Install the [SIM-card tray](#) (optional).
14. Follow the procedure in [After working inside your computer](#).

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 [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.

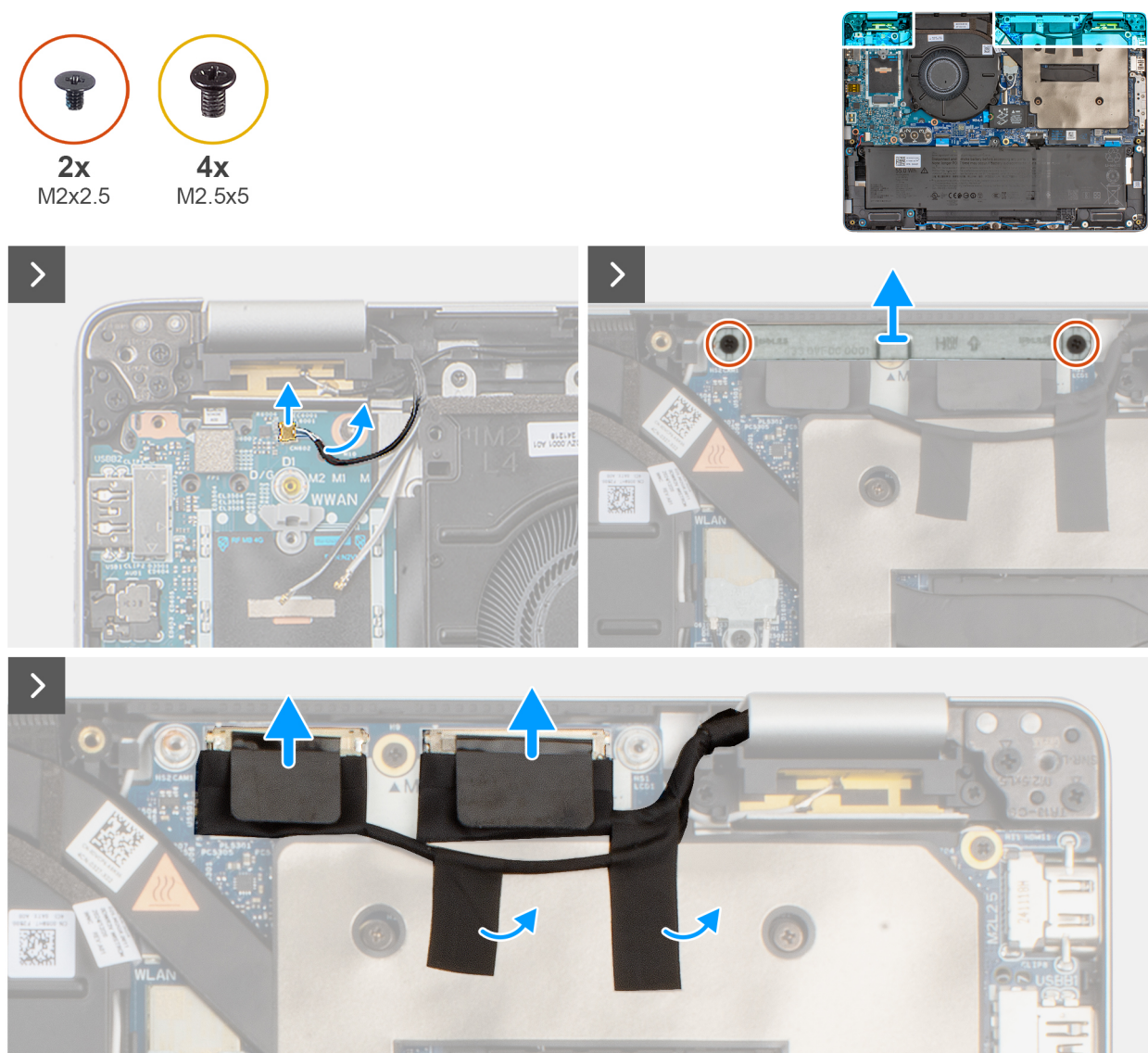


Figure 56. Removing the display assembly

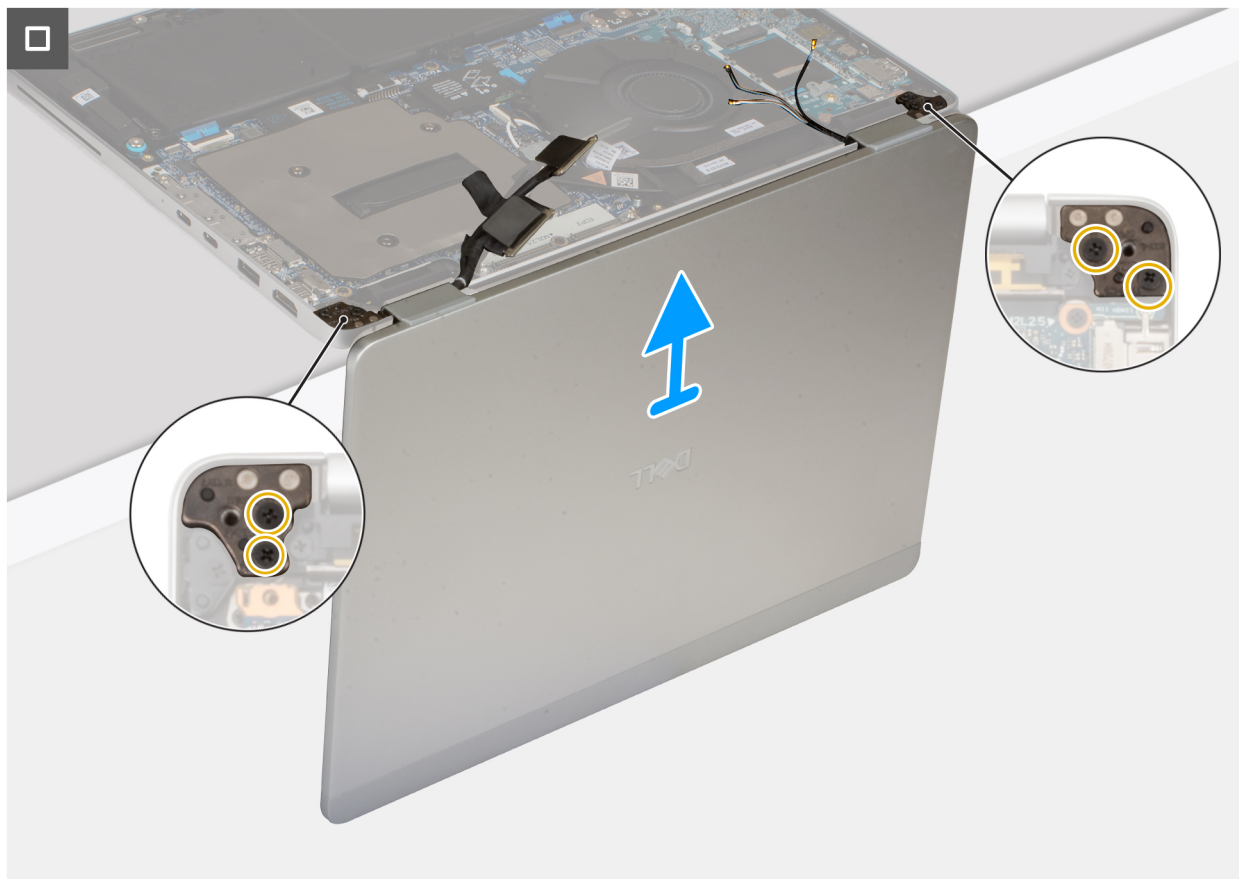


Figure 57. Removing the display assembly

Steps

1. Disconnect the Darwin cable off the I/O board.
2. Remove the two screws (M2x2.5) that secure the display-cable bracket to the palm-rest assembly.
3. Remove the display-cable bracket off the system board.
4. Disconnect the display cable and camera cable (optional) from the display cable connector (LCD1) and (LCD2) on the system board.

NOTE: The display is placed at the edge of the table at 90 degrees.

5. Peel the tape that secures the display cable and camera cable (optional) to the heat-sink thermal shield.
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 four 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 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.

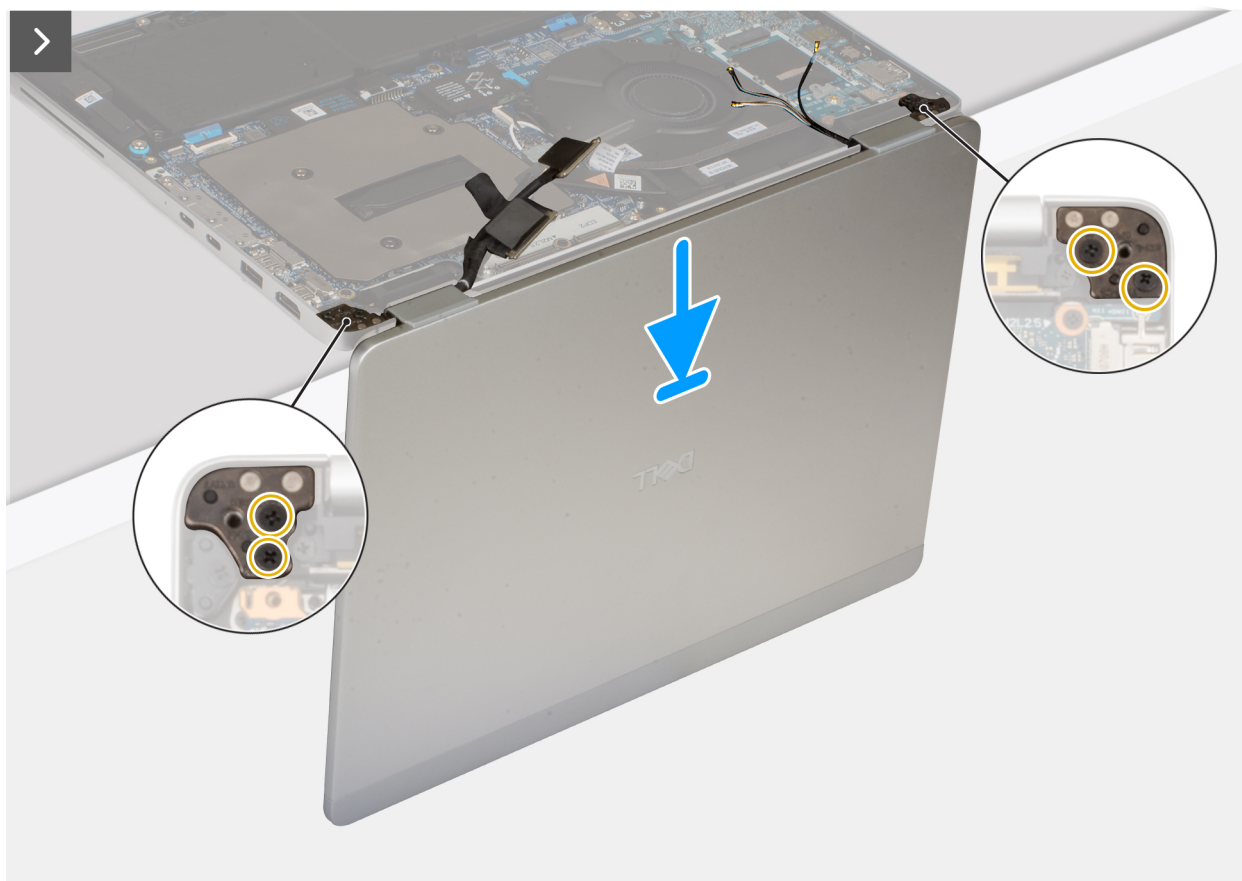
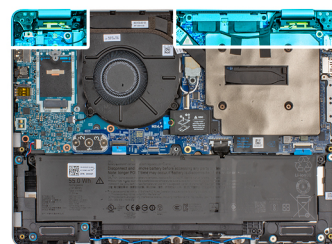
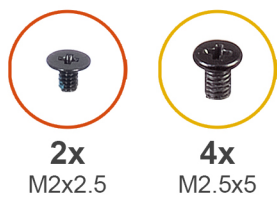


Figure 58. Installing the display assembly

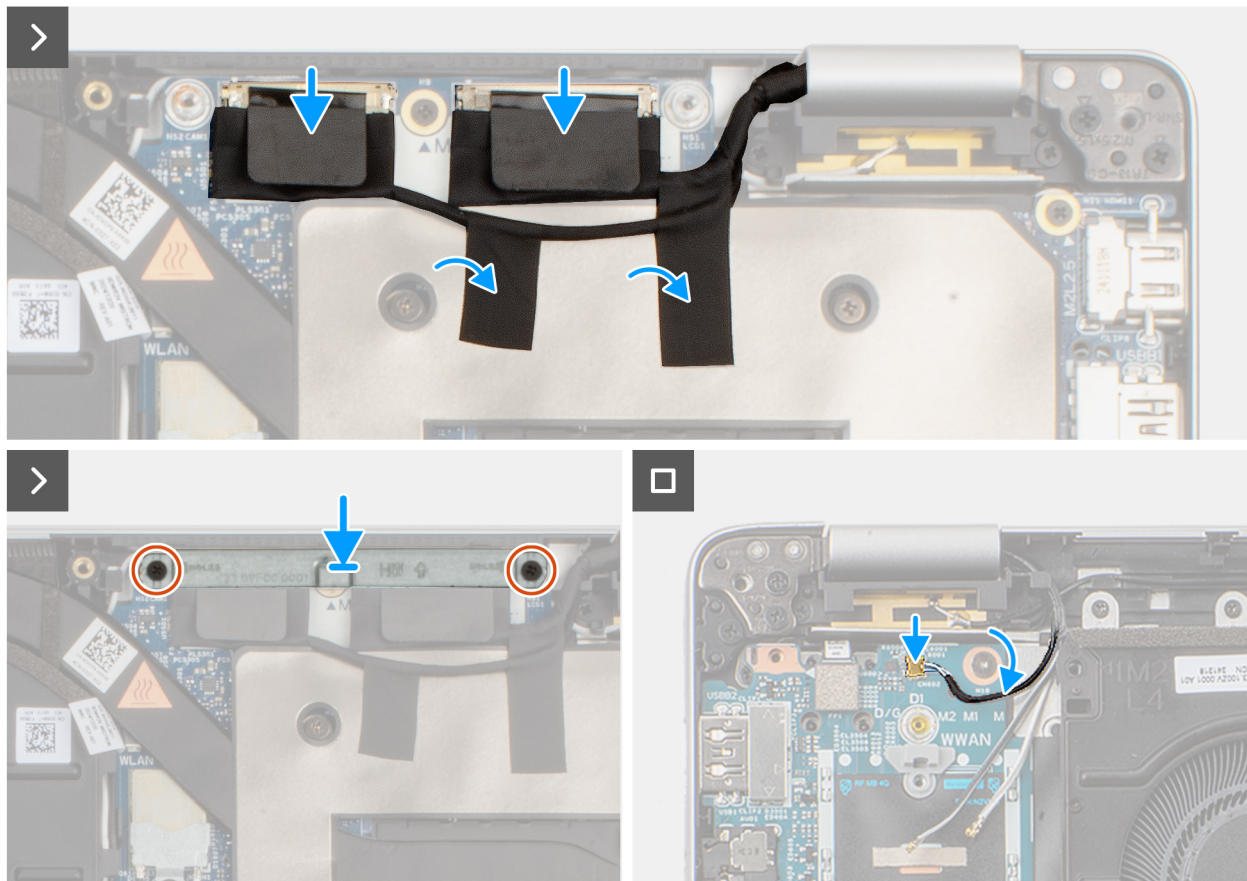


Figure 59. Installing the display assembly

Steps

1. Place the palm-rest assembly facing upwards on a flat table and place the display assembly at a 90-degree angle.
2. Align the screw holes on the palm-rest assembly with the screw holes on the display hinges.
3. Replace the four screws (M2.5x5) that secure the left and right display hinges to the palm-rest assembly.
4. Connect the display cable and camera cable (optional) to the display cable connector (LCD1) and (LCD2) on the system board.
5. Adhere the tape that secures the display cable and camera cable (optional) to the heat-sink thermal shield.
6. Align the screw holes on the display-cable bracket with the screw holes on the system board.
7. Replace the two screws (M2x2.5) that secure the display-cable bracket to the system board.
8. Connect the Darwin cable on the I/O board.

Next steps

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

Display bezel

Removing the display bezel

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

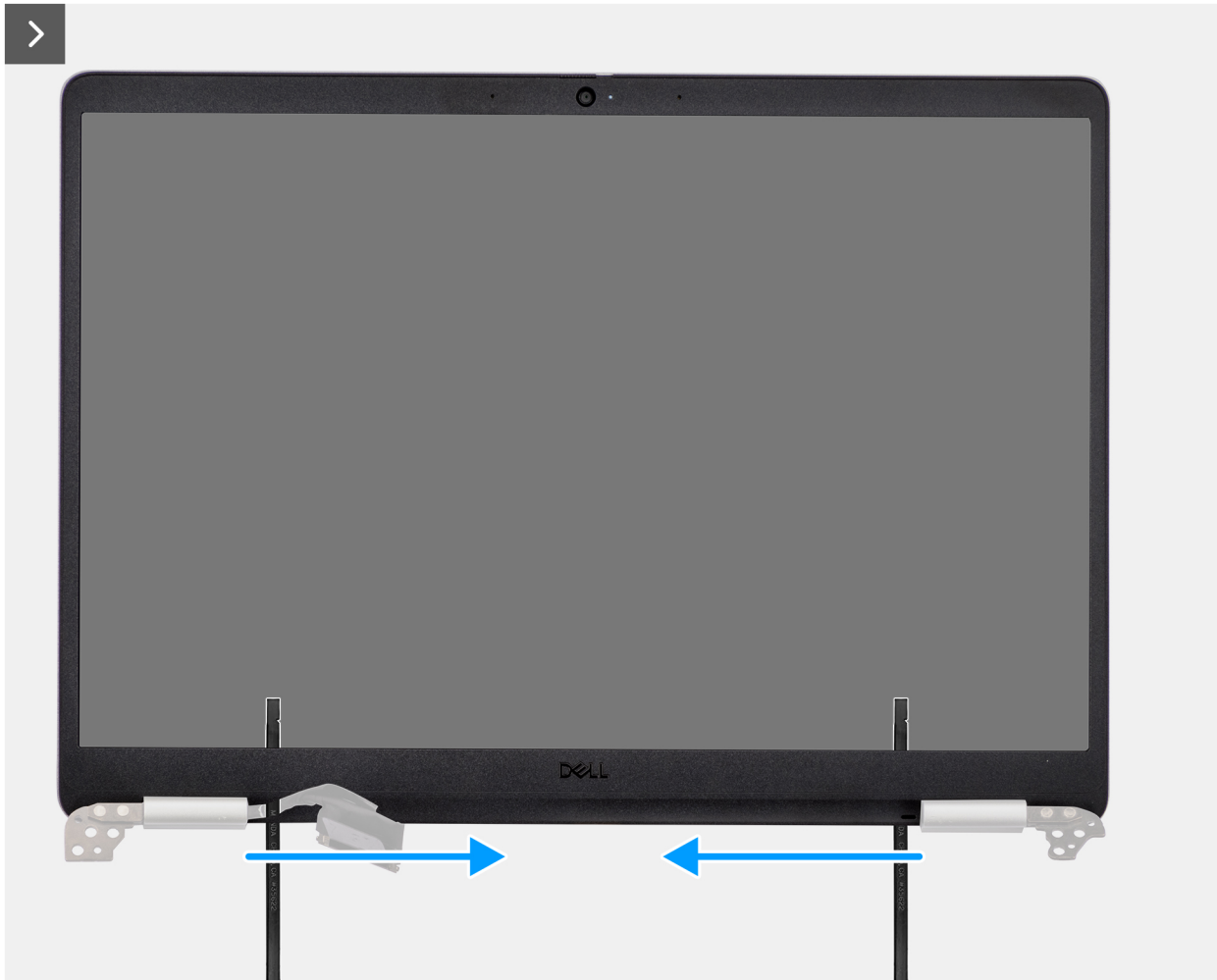
Prerequisites

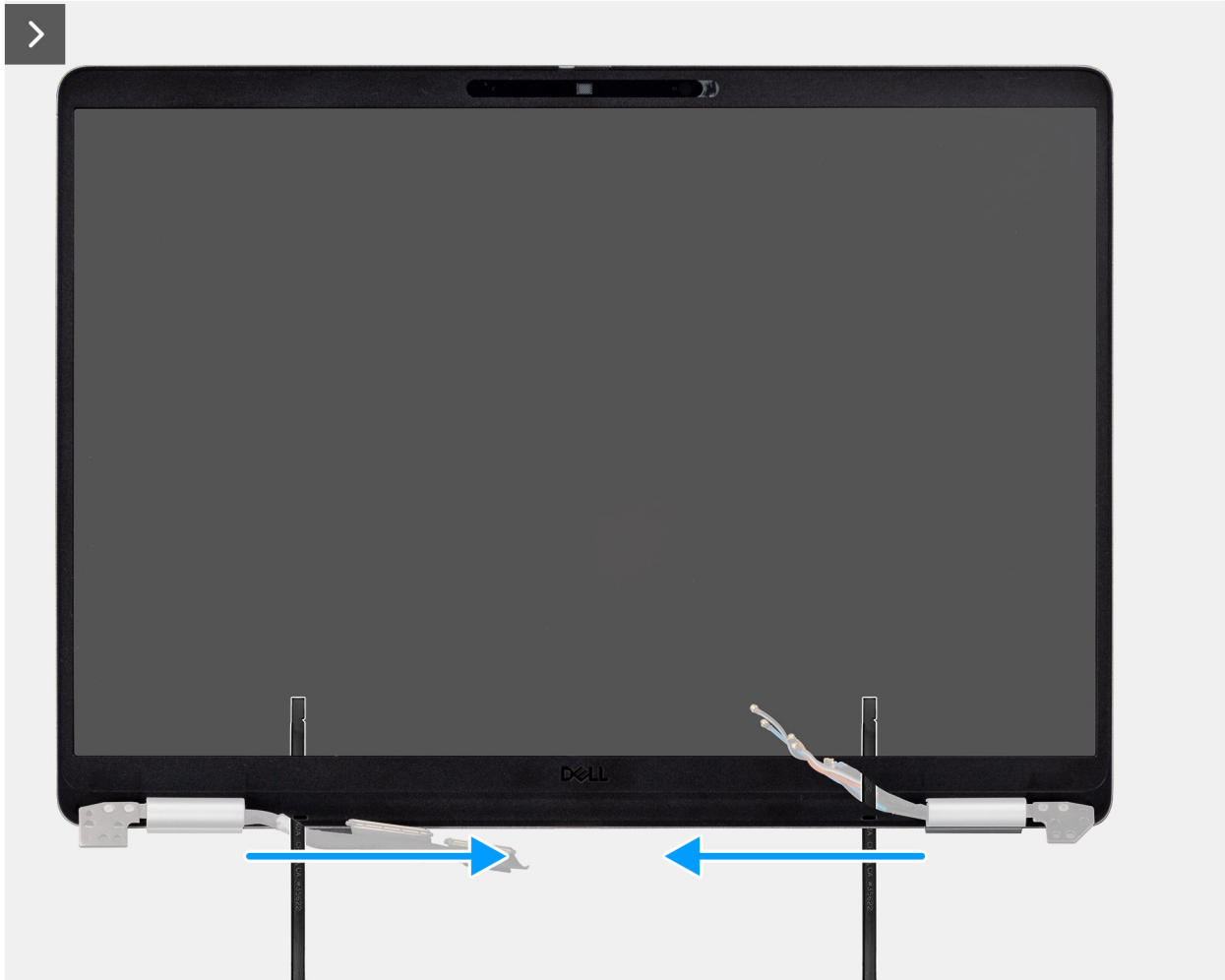
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM-card tray](#) (optional).
3. Remove the [base cover](#).
4. Remove the [battery](#).
5. Remove the [4G WWAN card](#).
6. Remove the [display assembly](#).

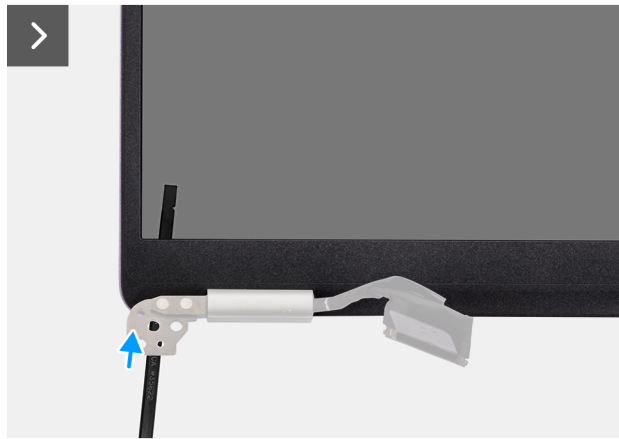
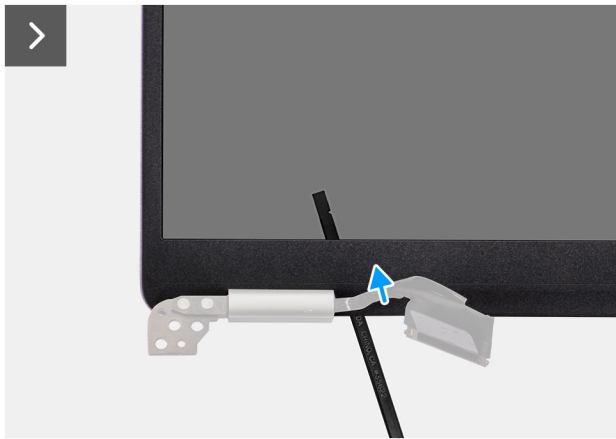
About this task

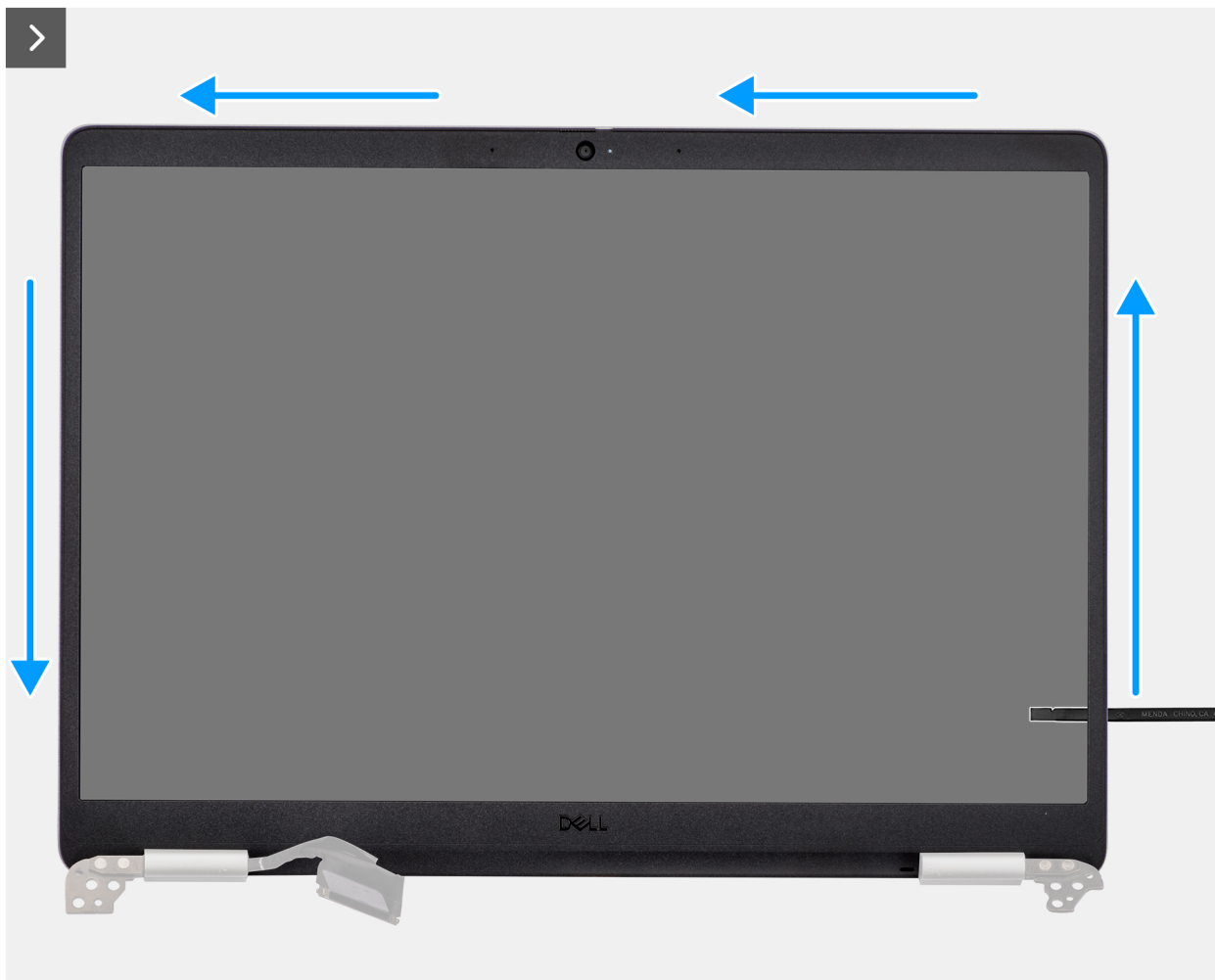
The following images indicate the location of the display bezel and provide a visual representation of the removal procedure.

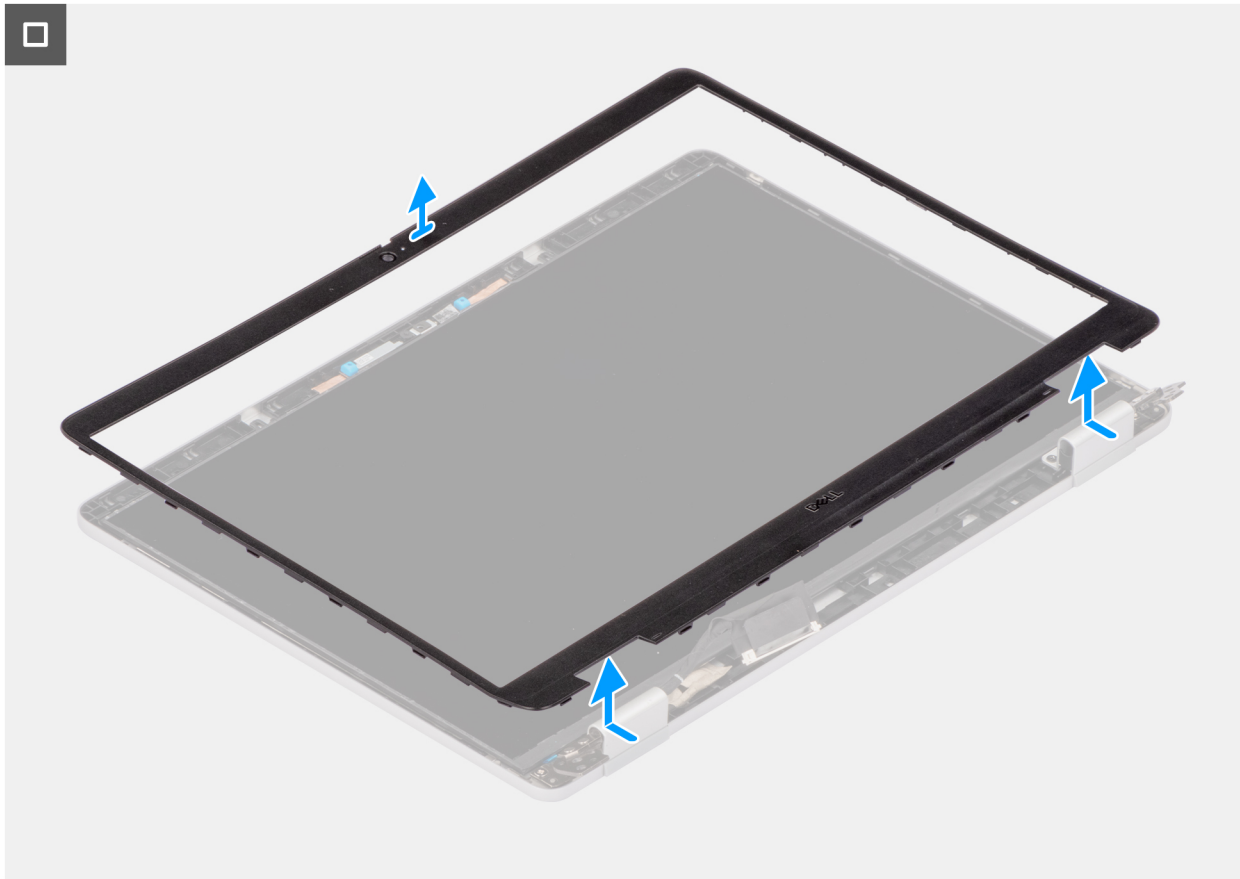













Steps

1. Insert a flat-head slotted screwdriver (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.

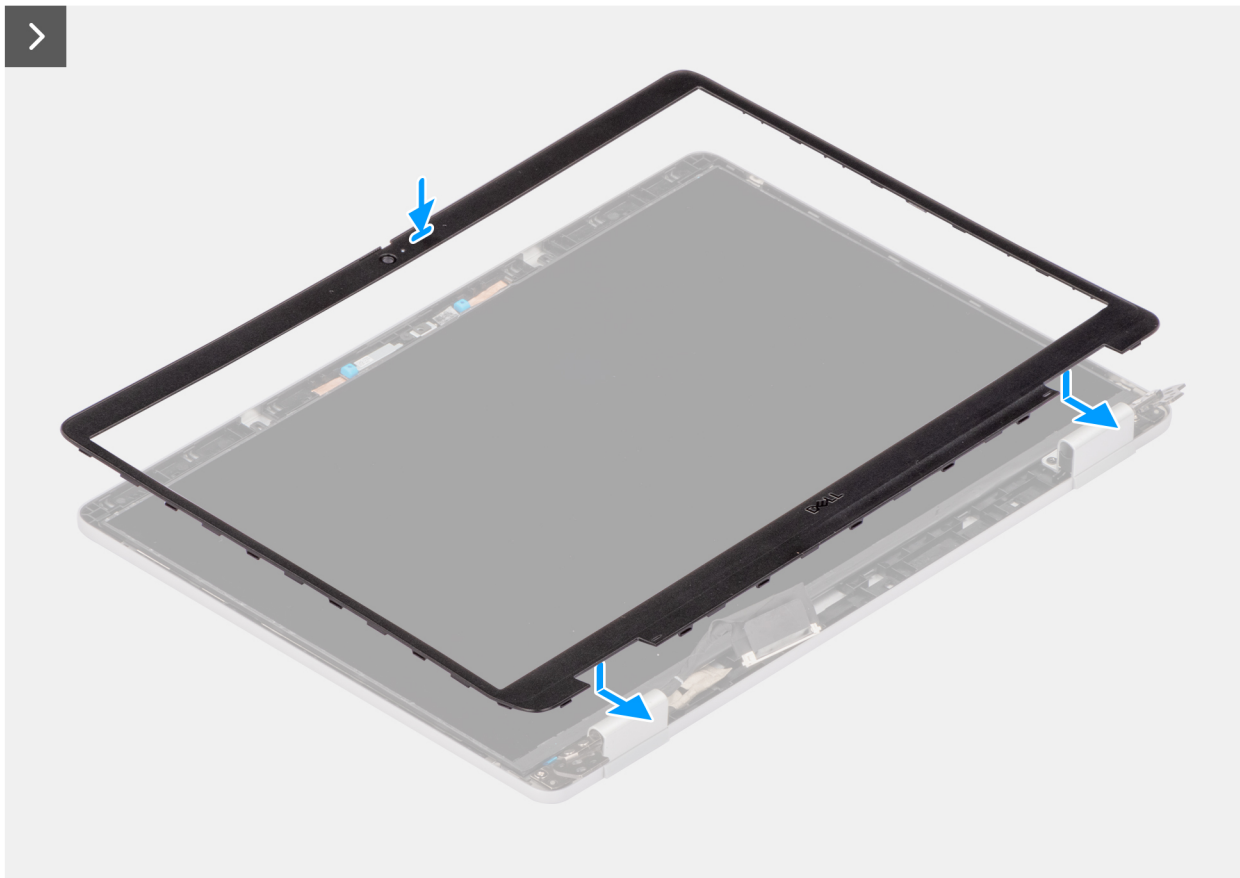
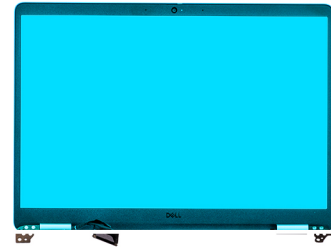
Prerequisites

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 60. Installing the 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. Install the [display assembly](#).
2. Install the [4G WWAN card](#).
3. Install the [battery](#).
4. Install the [base cover](#).
5. Install the [SIM-card tray](#) (optional).
6. 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.

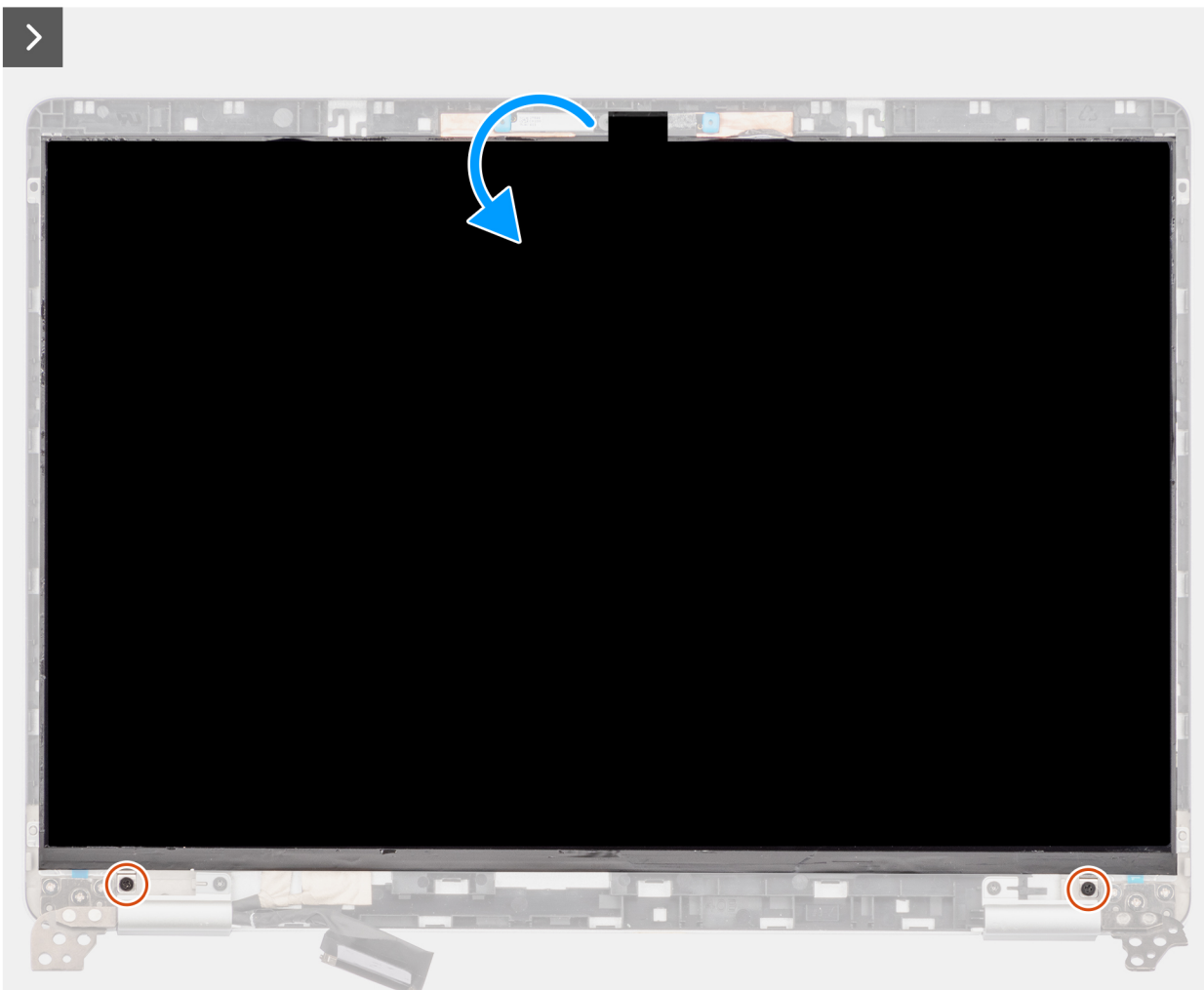


Figure 61. Removing display panel

Figure 62. Removing the Display

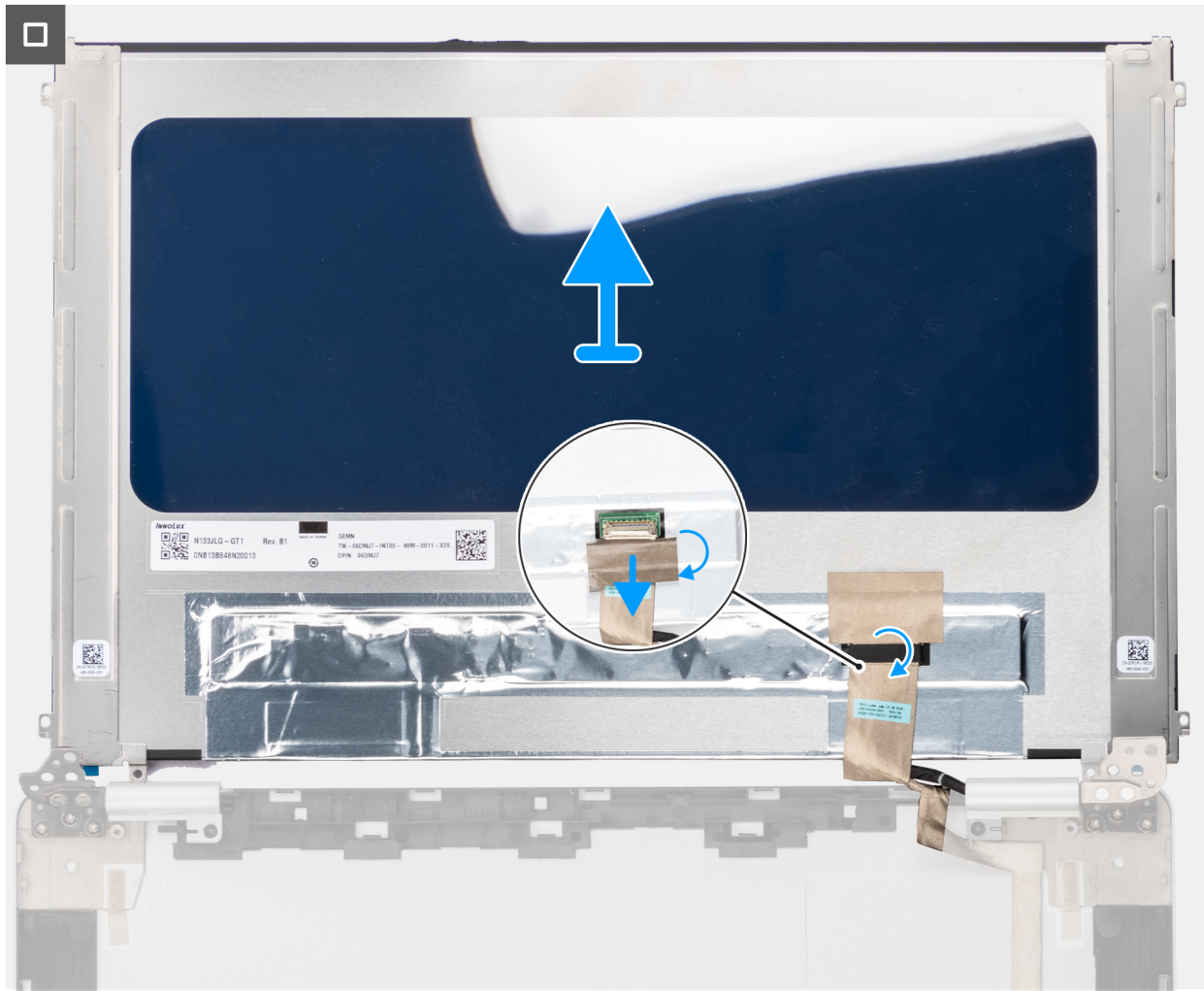


2x
M2x2.5



panel

Figure 63. Removing the Display panel



Steps

1. Remove the two screws (M2x2.5) 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. Open the latch and 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.

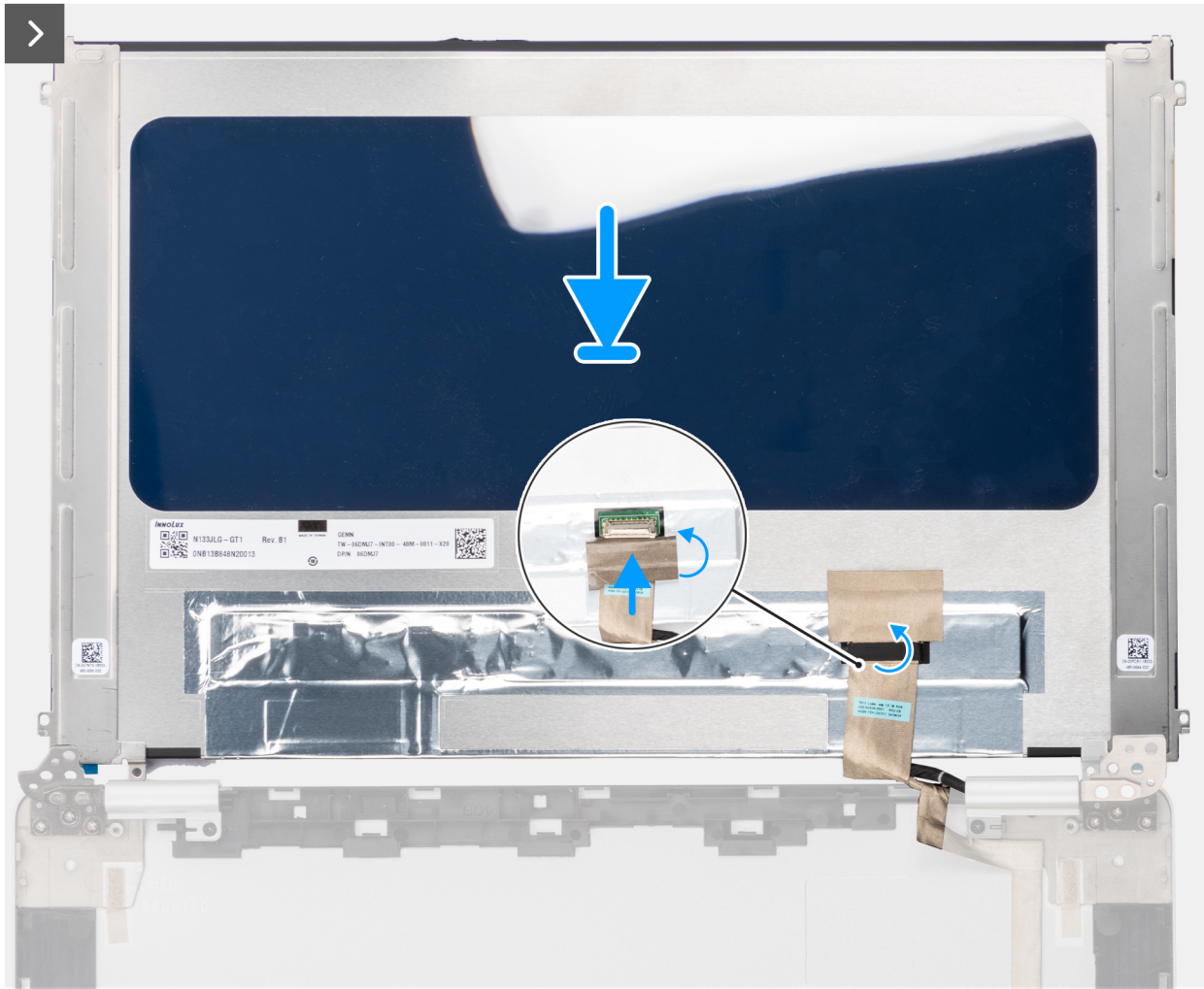
Prerequisites

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 64. Installing the display panel





2x
M2x2.5

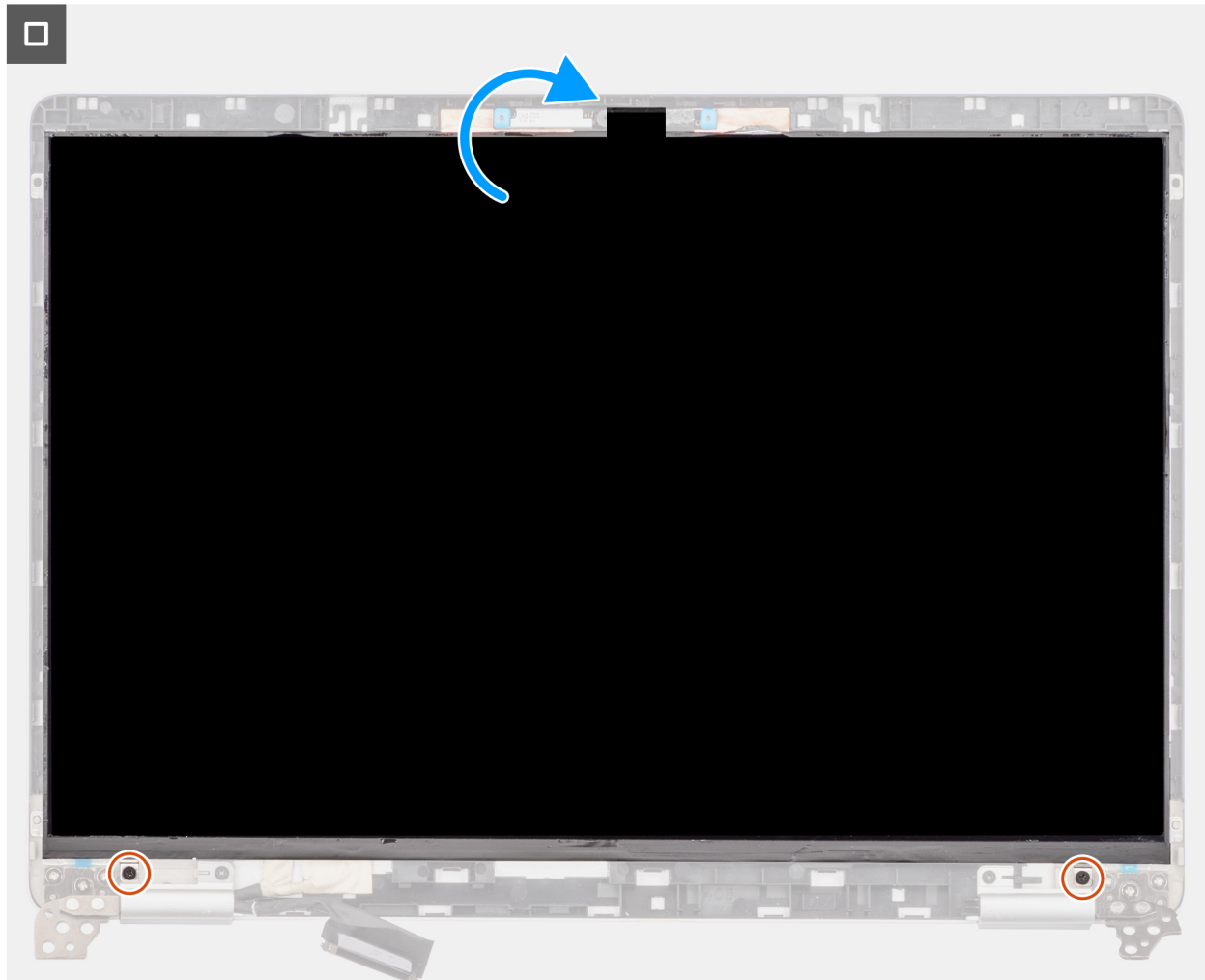


Figure 65. Installing the display panel

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 (M2x2.5) that 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. Install the [display bezel](#).
2. Install the [display assembly](#).
3. Install the [4G WWAN card](#).
4. Install the [base cover](#).

5. Install the [SIM-card tray](#) (optional).
6. Follow the procedure in [After working inside your computer](#).

Display hinges

Removing the display hinges

 **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 hinges and provide a visual representation of the removal procedure.

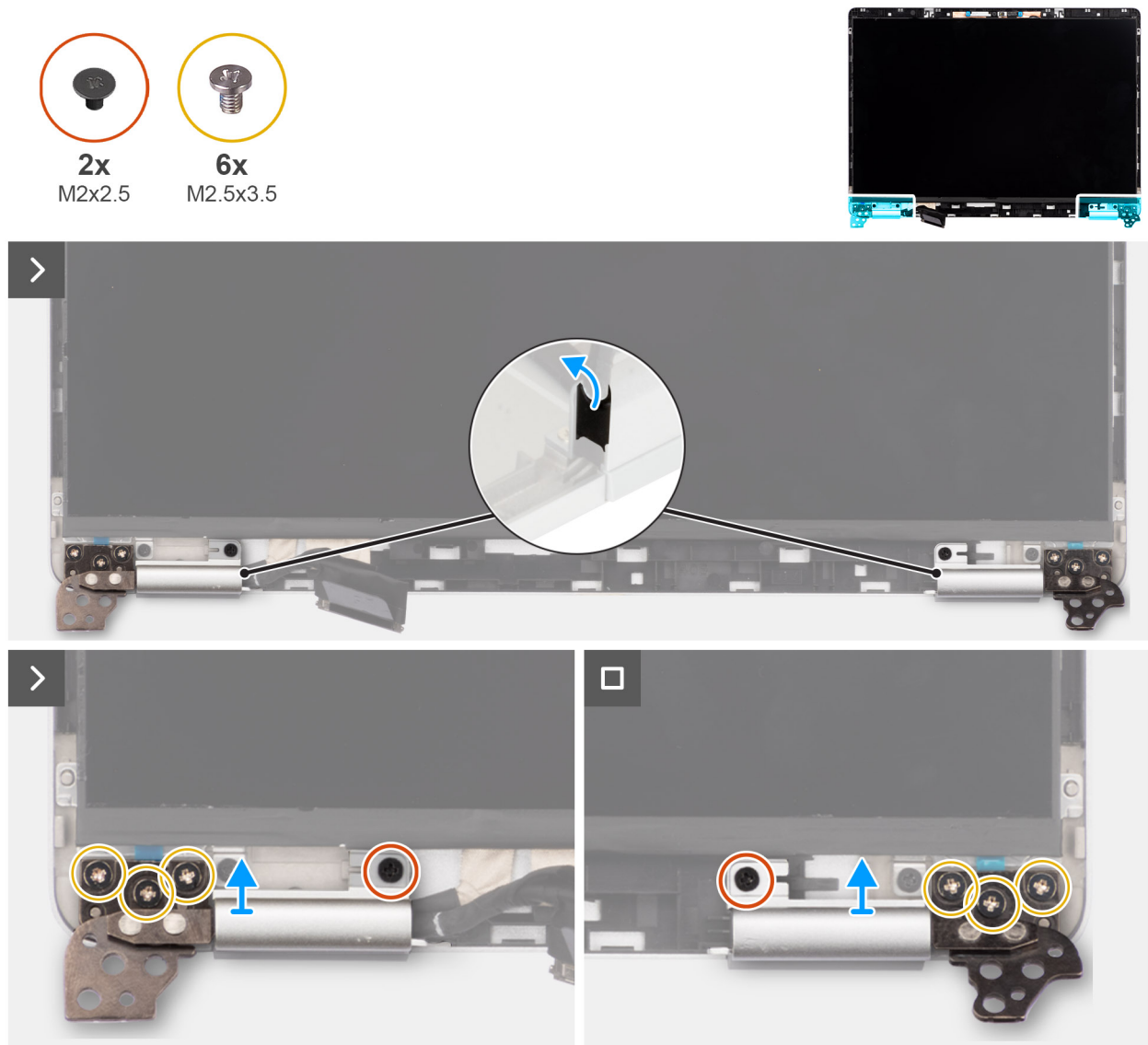


Figure 66. Removing the display hinges

Steps

1. Lift the hinge cap securing the hinges to the display back cover.
2. Remove the two screws (M2x2.5) that secure the left and right display hinges to the display back cover.
3. Remove the six screws (M2.5x3.5) that secure the left and right display hinges to the display back cover.
4. Lift the left and right hinges off the display back cover.

Installing the display hinges

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 hinges and provide a visual representation of the installation procedure.

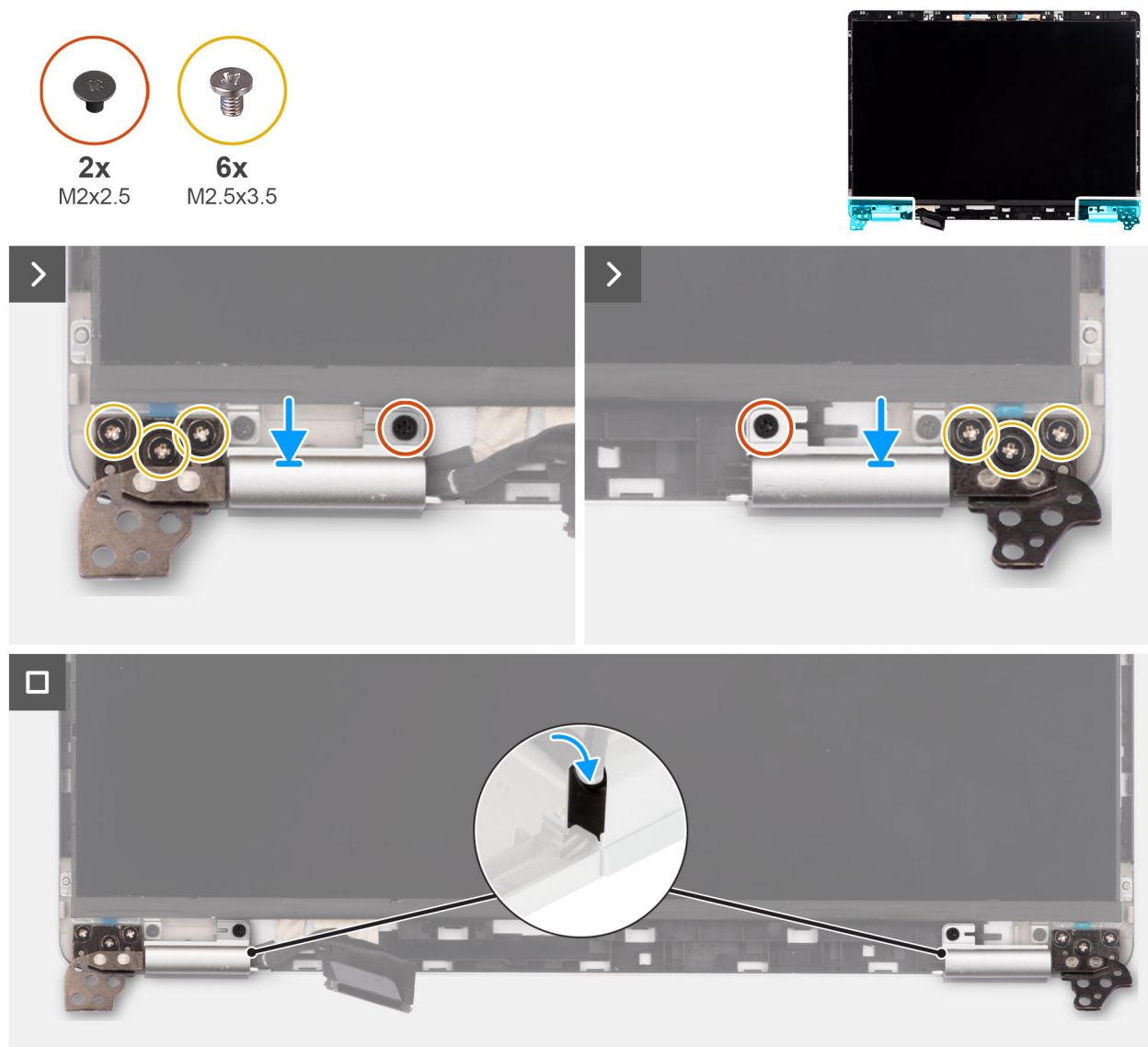


Figure 67. Installing the display hinges

Steps

1. Align the screw hole on the left and right display hinges with the screw hole on the display back cover.
2. Replace the six screws (M2.5x3.5) that secure the left and right display hinges to the display back cover.
3. Replace the two screws (M2x2.5) that secure the right and left display hinges to the display back cover.
4. Align and place the hinge cap securing the display hinges on the display back cover.

Next steps

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

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](#).

About this task

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

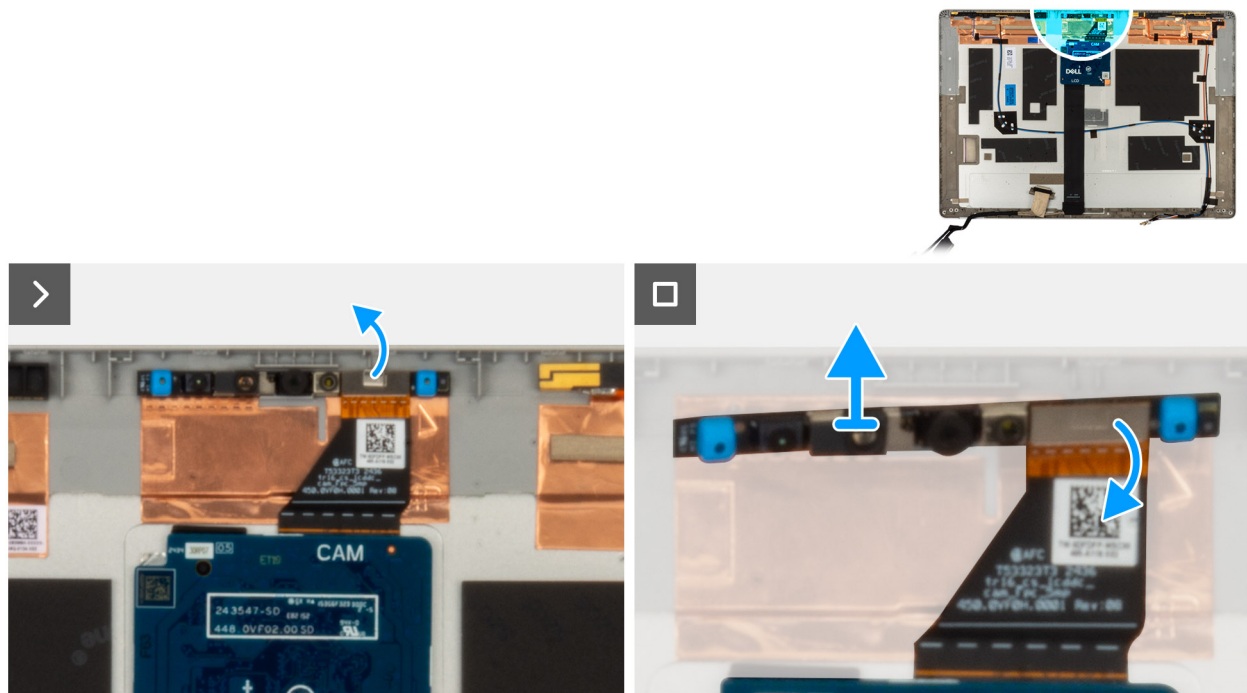


Figure 68. Removing the camera module

Steps

1. Peel the tape that secures the camera cable to the display back cover.
2. Disconnect the camera cable from the camera module.
3. Carefully lift the camera module starting from the prying point at the bottom edge of the camera module.
4. 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 69. 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 to secure the camera cable to the camera.

Next steps

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

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](#).

About this task

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

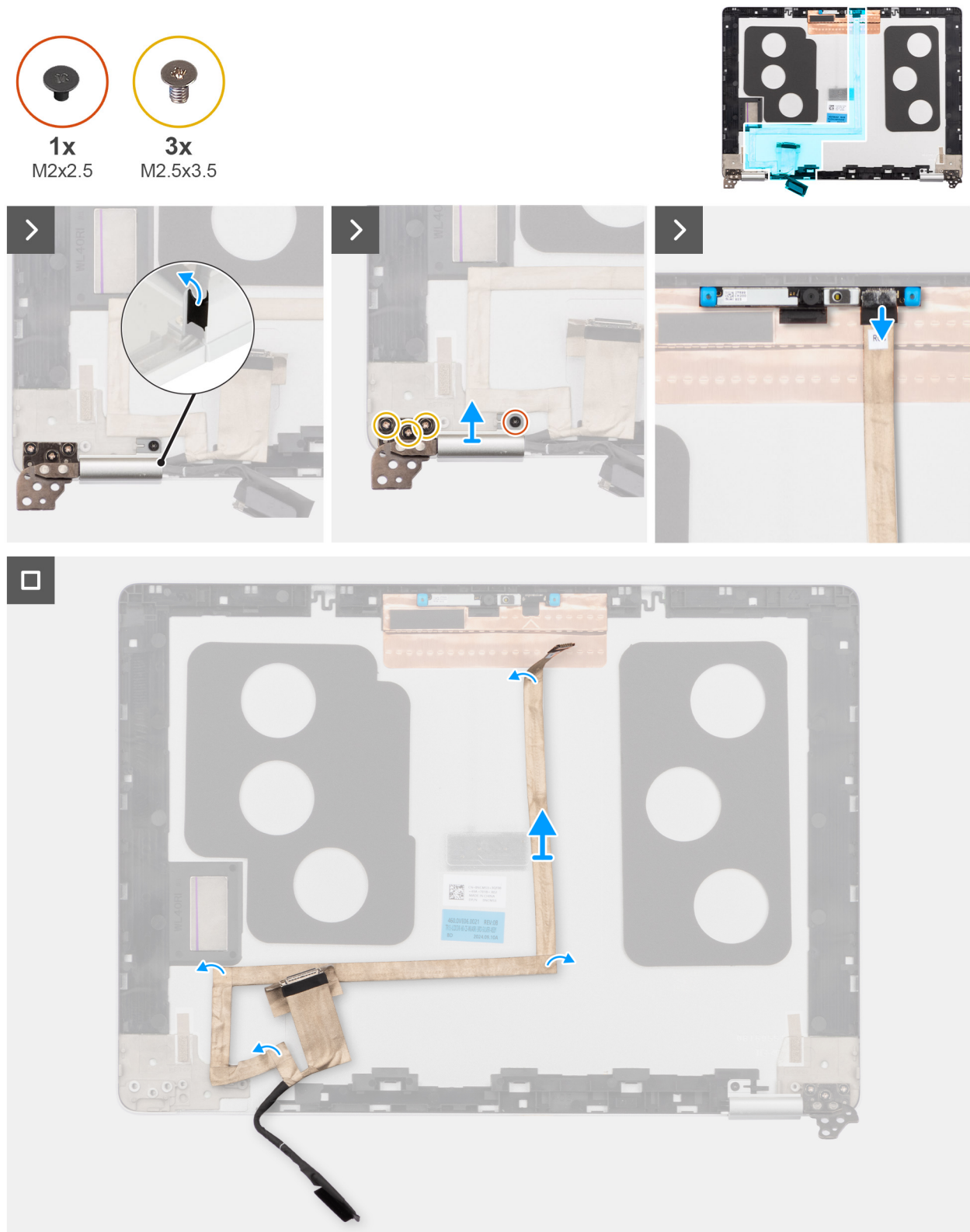


Figure 70. Removing the display cable

Steps

1. Lift the hinge cap securing the left display hinge to the display back cover.
2. Remove the screw (M2x2.5) that screws the hinge cap to the display back cover.
3. Remove the three screws (M2.5x3.5) that secure the left display hinge to the display back cover.

4. Disconnect the display cable from the camera module.
5. Peel the display cable off the display back cover.

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.

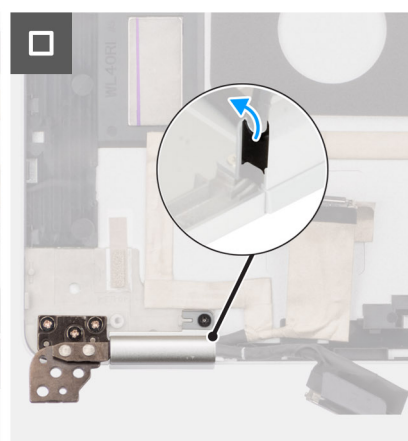
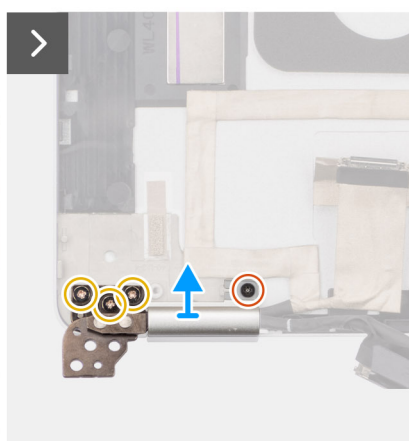
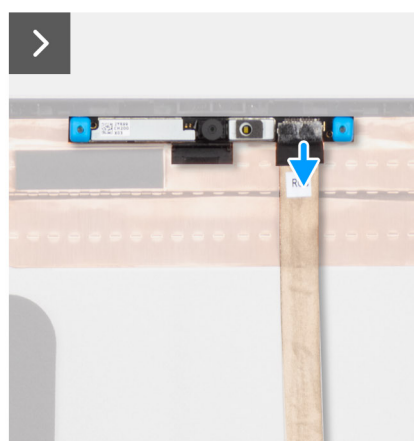
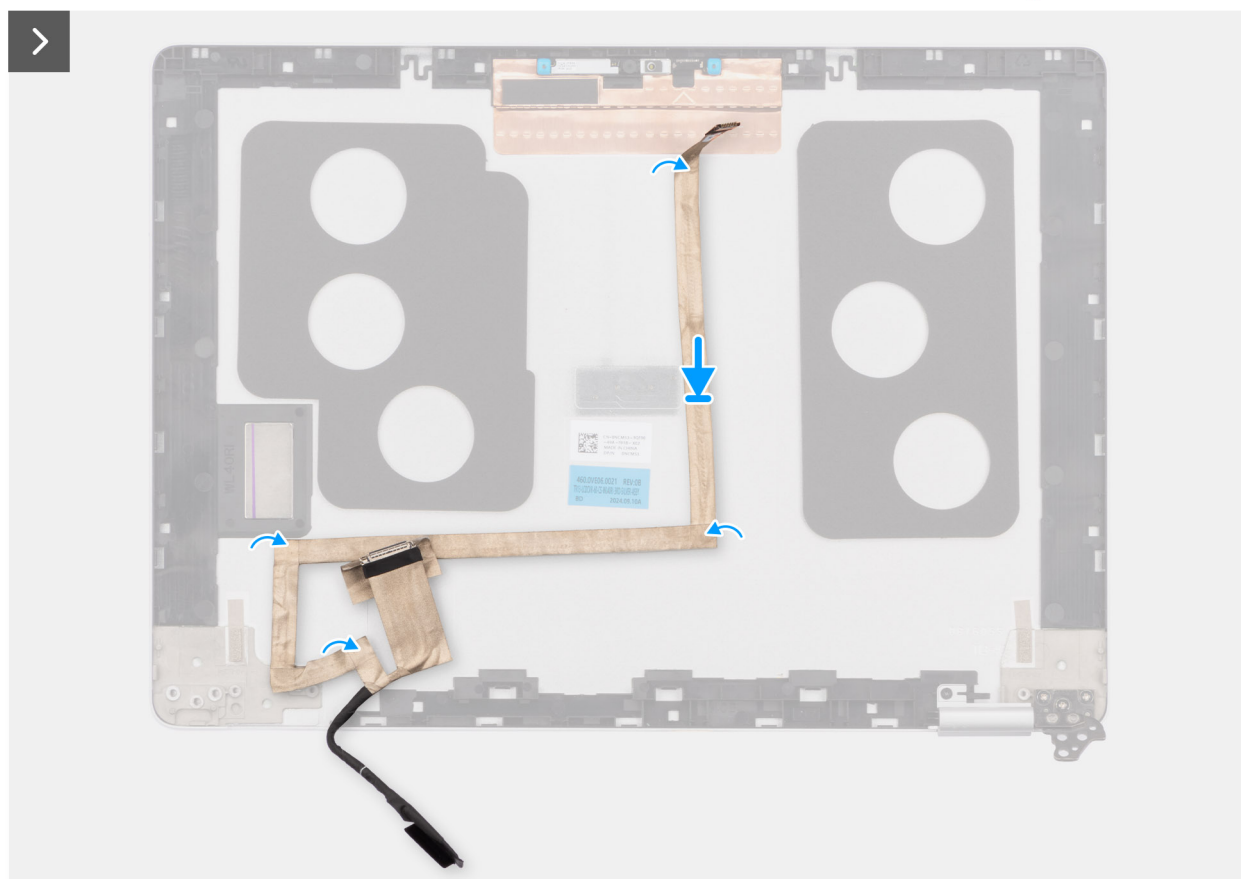
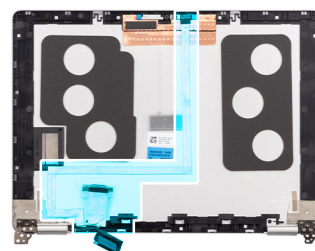


Figure 71. Installing the display cable

Steps

1. Adhere the display cable on to the display back cover.
2. Connect the display cable from the camera module.
3. Replace the three screws (M2.5x3.5) that secure the hinges to the display display back cover.

4. Replace the screw (M2x2.5) that screws the left display hinge cap to the display back cover.
5. Align and place the hinge cap securing the left display hinge on the display back cover.

Next steps

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

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](#).

About this task

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

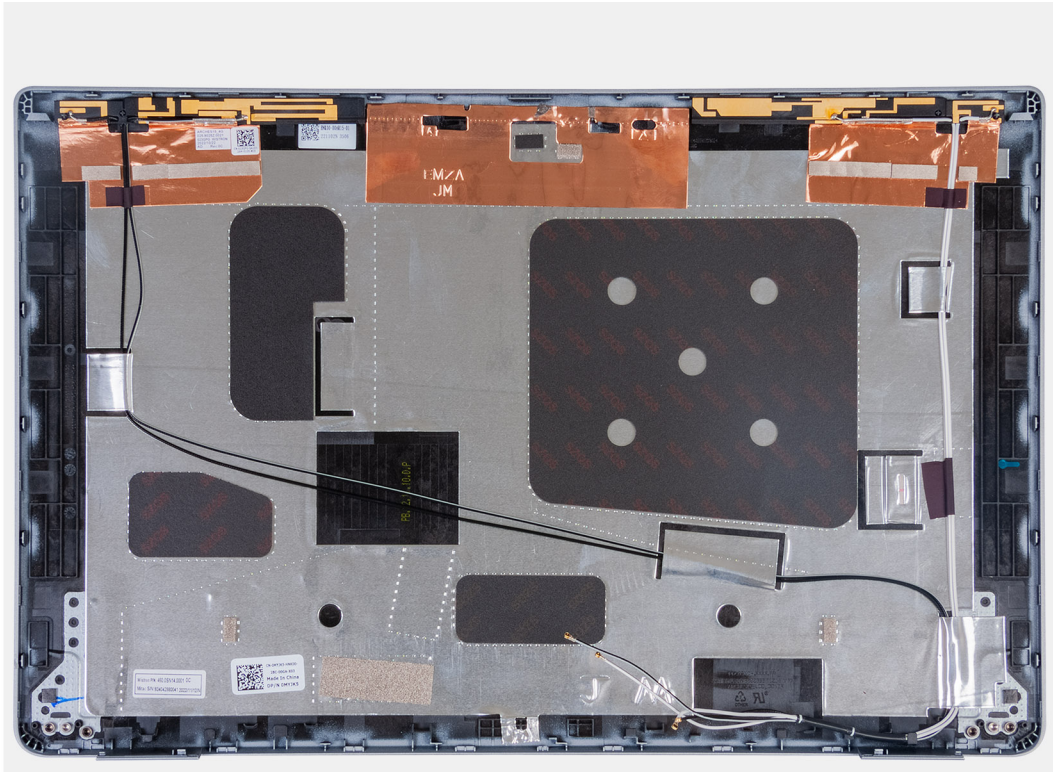


Figure 72. Removing the display back cover

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 73. Installing the display back cover

Steps

Place the display back cover on a flat surface.

Next steps

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

Software


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

Operating system

Your Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1 supports the following operating systems:

- Windows 11 Home
- Windows 11 Pro
- Windows 10 Home
- Windows 10 Pro
- Ubuntu Linux 24.04 LTS

 **NOTE:** Ubuntu is supported only on Dell Pro 13 Plus.


 **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.

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](#).

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 or may not be displayed.

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 a user-selectable option, such as the user password, type of storage device that is installed, and enable or disable base devices.

Entering BIOS Setup program

About this task

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

Navigation keys


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

Table 34. 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 [System setup options](#).

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 visible.

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 35. BIOS Setup options—Overview menu

Overview	
Dell Pro 13 Plus/Dell Pro 13 Plus 2-in-1	
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 35. 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
DIMM 3 Size	Displays the total memory that is installed in DIMM Slot 3
DIMM 4 Size	Displays the total memory that is installed in DIMM Slot 4
Devices Information	
Panel Type	Displays the type of display panel available on the computer.

Table 35. BIOS Setup options—Overview menu (continued)

Overview	
Panel Revision	Displays the panel revision of the computer.
Video Controller	Displays the type of video controller available on the computer.
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.

Table 36. 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	<p>Enables the computer to boot using only validated boot software.</p> <p>By default, the Enable Secure Boot option is disabled.</p> <p>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.</p> <p> 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.</p>
Enable Microsoft UEFI CA	<p>When disabled, the UEFI CA is removed from the BIOS UEFI Secure Boot database.</p> <p> 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.</p> <p>By default, the Enable Microsoft UEFI CA option is disabled.</p> <p>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.</p>
Secure Boot Mode	<p>Enables or disables the Secure Boot operation mode.</p> <p>By default, the Deployed Mode is selected.</p> <p> NOTE: Deployed Mode should be selected for normal operation of Secure Boot.</p>

Table 36. BIOS Setup options—Boot Configuration menu (continued)

Boot Configuration	
Expert Key Management	
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 37. 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. i 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. i 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 Internal 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.

Table 37. BIOS Setup options—Integrated Devices menu (continued)

Integrated Devices	
	By default, the Microphone Mute Led option is disabled.

Table 38. 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 39. 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 40. 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 the Contactless smartcard/NFC. By default, the Contactless smartcard/NFC option is enabled.
Wireless Radio Control	

Table 40. BIOS Setup options—Connection menu (continued)

Connection	
Control WLAN Radio	<p>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.</p> <p>By default, the Control WLAN Radio option is disabled.</p>
Control WWAN Radio	<p>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.</p> <p>By default, the Control WWAN Radio option is disabled.</p>

Table 41. BIOS Setup options—Power menu

Power	
Battery Configuration	
Battery Configuration	<p>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.</p> <p>By default, the Adaptive option is selected. Battery settings are adaptively optimized based on your typical battery usage pattern.</p>
Advanced Configuration	
Enable Advanced Battery Charge Configuration	<p>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.</p> <p>By default, the Enable Advanced Battery Charge Configuration option is disabled.</p>
Peak Shift	
Enable Peak Shift	<p>Enables the computer to run on battery during peak power usage hours.</p> <p>By default, the Enable Peak Shift option is disabled.</p>
USB PowerShare	
Enable USB PowerShare	<p>Enables or disables the USB PowerShare on the computer.</p> <p>By default, the Enable USB Powershare option is disabled.</p>
Thermal Management	
Thermal Management	<p>Enables or disables cooling of fan and manages processor heat to adjust the computer performance, noise, and temperature.</p> <p>By default, the Optimized option is selected. Standard setting for balanced performance, noise, and temperature.</p>
USB Wake Support	
Wake on Dell USB-C Dock	<p>When enabled, connecting a Dell USB-C Dock wakes the computer from Standby, Hibernate, and Power Off.</p> <p>By default, the Wake on Dell USB-C Dock option is enabled.</p>
Block Speed	
Block Speed	<p>This options lets you to block entering sleep mode.</p> <p>By default, the Block Speed option is enabled.</p>
Lid Switch	
Enable Lid Switch	<p>Enables or disables the Lid Switch.</p>

Table 41. BIOS Setup options—Power menu (continued)

Power	
	By default, the Enable Lid Switch option is enabled.

Table 42. BIOS Setup options—Security menu

Security	
TPM 2.0 Security On	<p>Allows you to enable or disable TPM.</p> <p>By default, the TPM 2.0 Security On option is enabled.</p> <p>For additional security, Dell Technologies recommends keeping TPM 2.0 Security On enabled to allow these security technologies to fully function.</p>
Attestation Enable	<p>The Attestation Enable option controls the endorsement hierarchy of TPM. Disabling the Attestation Enable option prevents TPM from being used to digitally sign certificates.</p> <p>By default, the Attestation Enable option is enabled.</p> <p>For additional security, Dell Technologies recommends keeping the Attestation Enable option is enabled.</p> <p>NOTE: When disabled, this feature may cause compatibility issues or loss of functionality in some operating systems.</p>
Key Storage Enable	<p>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.</p> <p>By default, the Key Storage Enable option is enabled.</p> <p>For additional security, Dell Technologies recommends keeping the Key Storage Enable option is enabled.</p> <p>NOTE: When disabled, this feature may cause compatibility issues or loss of functionality in some operating systems.</p>
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	<p>By default, the PPI Bypass for Clear Commands option is disabled.</p> <p>For additional security, Dell Technologies recommends keeping the PPI Bypass for Clear Commands option disabled.</p>
Chassis intrusion	
Chassis Intrusion	<p>The chassis intrusion detection enables a physical switch that triggers an event when the computer cover is opened.</p> <p>When set to Enabled, a notification is displayed on the next boot and the event is logged in the BIOS Events log.</p> <p>When set to On-Silent, the event is logged in the BIOS Events log, but no notification is displayed.</p> <p>When set to Disabled, no notification is displayed and no event is logged in the BIOS Events log.</p> <p>By default, the Chassis Intrusion option is enabled.</p> <p>For additional security, Dell Technologies recommends keeping the Chassis Intrusion Detection option is disabled.</p>
SMM Security Mitigation	When this option enables and disables additional UEFI SMM Security Mitigation Protections.
AMD Memory Guard	

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



Security	
AMD Memory Guard	<p>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.</p> <p>By default, the AMD Memory Guard option is disabled.</p>
Data Wipe on Next Boot	
Start Data Wipe	<p>Data Wipe is a secure wipe operation that deletes information from a storage device.</p> <p> CAUTION: The secure Data Wipe operation deletes information in a way that it cannot be reconstructed.</p> <p>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.</p> <p>When enabled, the data wipe option provides prompts to wipe any storage devices that are connected to the computer on the next boot.</p> <p>By default, the Start Data Wipe option is disabled.</p>
Absolute	
Absolute	<p>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.</p> <p>By default, the Absolute option is enabled.</p> <p>For additional security, Dell Technologies recommends keeping the Absolute option is enabled.</p> <p> NOTE: When the Absolute features are activated, the Absolute integration cannot be disabled from the BIOS setup screen.</p>
UEFI Boot Path Security	
UEFI Boot Path Security	<p>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.</p> <p>By default, the Always Except Internal HDD option is enabled.</p>
Authenticated BIOS Interface	
Enable Authenticated BIOS Interface	<p>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.</p> <p>By default, the Enable Authenticated BIOS Interface option is disabled.</p>
Legacy Manageability Interface Access	<p>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.</p> <p>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.</p>

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



Security	
	<p>When set to Enabled, the Legacy Manageability Interface can be used to read and change BIOS configuration settings.</p> <p>When set to Read-Only, BIOS configuration settings can be read, but cannot be changed through the Legacy Manageability Interface.</p> <p>When set to Disabled, the Legacy Manageability Interface is disabled. BIOS configuration reads and writes are blocked.</p>
Firmware Device Tamper Detection	
Firmware Device Tamper Detection	<p>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.</p> <p>By default, the Silent option is enabled.</p> <p>For additional security, Dell Technologies recommends keeping the Firmware Device Tamper Detection option is enabled.</p>
Clear Firmware Device Tamper Detection	<p>Allows you to clear the events that are logged when tampering of firmware device is detected.</p> <p>By default, the Clear Firmware Device Tamper Detection option is disabled.</p> <p> NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.</p>
Pluton Security Processor	
Pluton Security Processor	<p>Enables or disables the utilization of the Pluton Security Processor by the operating system to provide security services such as Key Storage Provider functionality.</p> <p>By default, the Pluton Security Processor option is enabled.</p> <p> NOTE: For additional security, Dell Technologies recommends keeping the Pluton Security Processor option enabled.</p>

Table 43. BIOS Setup options—Passwords menu

Passwords	
Admin Password	<p>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.</p> <p>The following rules and dependencies apply to the Administrator Password -</p> <ul style="list-style-type: none"> • 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). <p>Dell Technologies recommends using an administrator password to prevent unauthorized changes to BIOS setup options.</p>
System Password	<p>The System Password prevents the computer from booting to an operating system without entering the correct password.</p> <p>The following rules and dependencies apply when the System Password is used -</p>

Table 43. BIOS Setup options—Passwords menu (continued)

Passwords	
	<ul style="list-style-type: none"> • 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. <p>Dell Technologies recommends using the computer password in situations where it is likely that a computer may be lost or stolen.</p>
M.2 PCIe SSD-0	<p>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.</p> <p>The following rules and dependencies apply when the Hard Drive Password or M.2 PCIe SSD-0 Password option is used.</p> <ul style="list-style-type: none"> • 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. <p>Dell Technologies recommends using a hard drive password to protect unauthorized data access.</p>
Password Configuration	<p>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).</p> <p>Dell Technologies recommends setting the minimum password length to at least eight characters.</p>
Password Changes	
Allow Non-Admin Password Changes	<p>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.</p> <p>By default, the Allow Non-Admin Password Changes option is enabled.</p> <p>For additional security, Dell Technologies recommends keeping the Allow Non-Admin Password Changes option disabled.</p>

Table 43. BIOS Setup options—Passwords menu (continued)





Passwords	
	<p> NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.</p>
Admin Setup Lockout	<p>The Admin Setup Lockout option prevents an end user from even viewing the BIOS setup configuration without first entering the administrator password (if set).</p> <p>By default, the Admin Setup Lockout option is disabled.</p> <p>For additional security, Dell Technologies recommends keeping the Admin Setup Lockout option disabled.</p>
Master Password Lockout	
Enable Master Password Lockout	<p>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.</p> <p> NOTE: When the owner password is set, the Master Password Lockout option is not available.</p> <p> NOTE: When an internal hard drive password is set, it must first be cleared before Master Password Lockout can be changed.</p> <p>By default, the Enable Master Password Lockout option is disabled.</p> <p>Dell does not recommend enabling the Master Password Lockout unless you have implemented your own password recovery computer.</p>
Allow Non-Admin PSID Revert	<p>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.</p> <p>By default, the Enable Allow Non-Admin PSID Revert option is disabled.</p> <p> NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.</p>

Table 44. BIOS Setup options—Update, Recovery menu



Update, Recovery	
UEFI Capsule Firmware Updates	
BIOS Recovery from Hard Drive	<p>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.</p> <p>By default, the BIOS Recovery from Hard Drive option is enabled.</p> <p> NOTE: BIOS Recovery from Hard Drive is not available for self-encrypting drives (SED).</p> <p> 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.</p>
BIOS Downgrade	
Allow BIOS Downgrade	<p>Controls flashing of the computer firmware to previous revisions.</p> <p>By default, the Allow BIOS Downgrade option is enabled.</p>
SupportAssist OS Recovery	<p>Enables or disables the boot flow for SupportAssist OS Recovery tool in the event of certain computer errors.</p>

Table 44. BIOS Setup options—Update, Recovery menu (continued)

Update, Recovery	
	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 45. 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 46. 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.

Table 46. BIOS Setup options—Keyboard menu (continued)

Keyboard	
	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 47. BIOS Setup options—Pre-boot Behavior menu

Preboot Behavior	
Adapter Warnings	
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. i 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 48. 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. i 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.

Table 48. BIOS Setup options—Virtualization menu (continued)

Virtualization	
	<p>i NOTE: This option is provided only for compatibility purposes, since some older hardware is not DMA capable.</p>
Enable OS Kernel DMA Support	<p>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.</p> <p>i NOTE: This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi).</p> <p>By default, the Enable OS Kernel DMA Support option is enabled.</p> <p>i NOTE: This option is provided only for compatibility purposes, since some older hardware is not DMA capable.</p>
Internal Port DMA Compatability Mode	<p>Allows you to control the boot compatibility for integrated PCIe peripherals by disabling PCIe DMA protection on internal PCIe ports.</p> <p>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 DMA compatibility issues. This option does not directly enable DMA protection in the operating system.</p> <p>i NOTE: This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi).</p> <p>By default, the Internal Port DMA Compatibility Mode option is enabled.</p> <p>i NOTE: This option is provided only for compatibility purposes, since some older hardware is not DMA capable.</p>

Table 49. BIOS Setup options—Performance menu

Performance	
C-State Control	
Enable C-State Control	<p>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.</p> <p>By default, the Enable C-State Control option is enabled.</p> <p>i NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.</p>
AMD Simultaneous Multithreading	
Enable AMD Simultaneous Multithreading	<p>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.</p> <p>By default, the Enable AMD Simultaneous Multithreading option is enabled.</p> <p>i NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.</p>
AMD Core Performance Boost	
Enable AMD Core Performance Boost	<p>By default, the AMD Core Performance Boost option is enabled.</p> <p>i NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.</p>
NUMA Nodes Per Socket	
NUMA Nodes Per Socket	Controls how system memory is distributed among processor cores.

Table 49. BIOS Setup options—Performance menu (continued)

Performance	
	By default, the Auto option is selected.

Table 50. 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. By default, the Keep Log option is selected.


Table 51. 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 52. 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.

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 53. LED error codes

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

- 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

- Turn on your computer.
- 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.
- For cases, when a [2,7] error code is shown, check to see if the display cable is properly connected.
- 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

- Turn off your computer.
- Disconnect any peripherals that are connected to the computer. Connect only the AC adapter (charger) to the computer.
- Ensure that the LCD (screen) is clean (no dust particles on the surface of the screen).
- 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.
- The screen displays solid colors and changes colors on the entire screen to white, black, red, green, and blue twice.
- Then it displays the colors white, black, and red.
- Carefully inspect the screen for abnormalities (any lines, fuzzy color, or distortion on the screen).
- 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 13 Plus/Dell Pro 13 Plus 2-in-1.

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 54. 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 54. Diagnostic light codes (continued)

Diagnostic light codes (Amber, White)	Problem description	Recommended solutions
4,2	CPU Power cable connection issue	<ul style="list-style-type: none">• Perform the PSU BIST Test, reseal 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.



CAUTION: The battery is a Field Replaceable Unit (FRU) and the removal and installation procedures are intended for authorized service technicians only.

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.

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 55. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	Dell Site
Tips	
Contact Support	In Windows search, type <code>Contact Support</code> , 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	<ol style="list-style-type: none"> 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.