# Dell Precision 5680

## Owner's Manual

Regulatory Model: P123F
Regulatory Type: P123F001
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## Notes, cautions, and warnings

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

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

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

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# 1

# Views of Dell Precision 5680

## Right



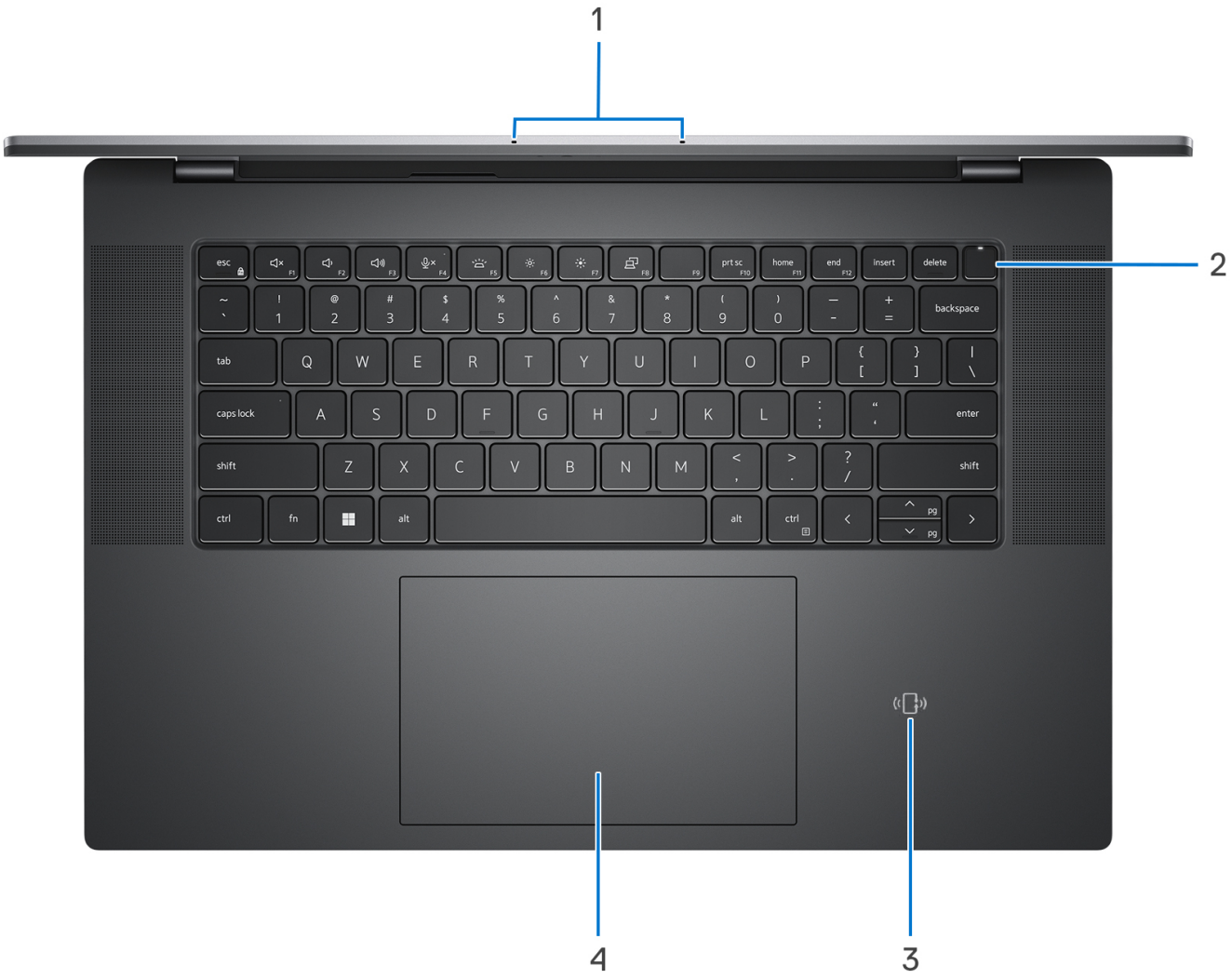

1. SD-card slot
2. USB 3.2 Gen 2 Type-C port with DisplayPort 1.4 Alt Mode
3. Wedge-shaped lock slot

## Left



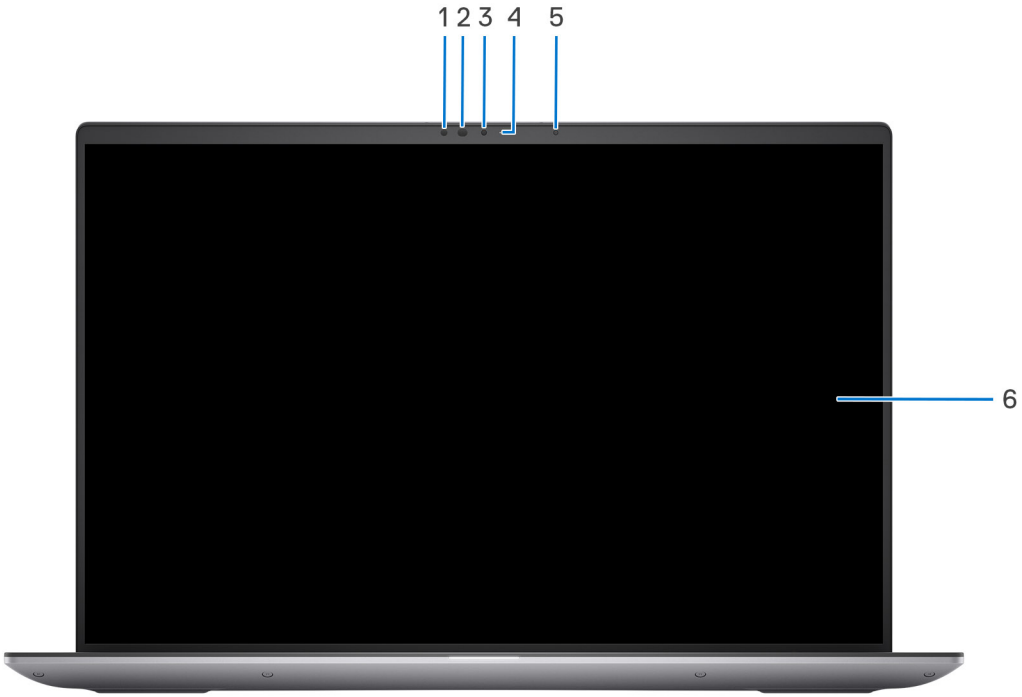

1. HDMI 2.0b port
2. 3.5 mm audio jack
3. Two Thunderbolt 4 (USB Type-C) ports
4. Smartcard reader (optional)

# Top



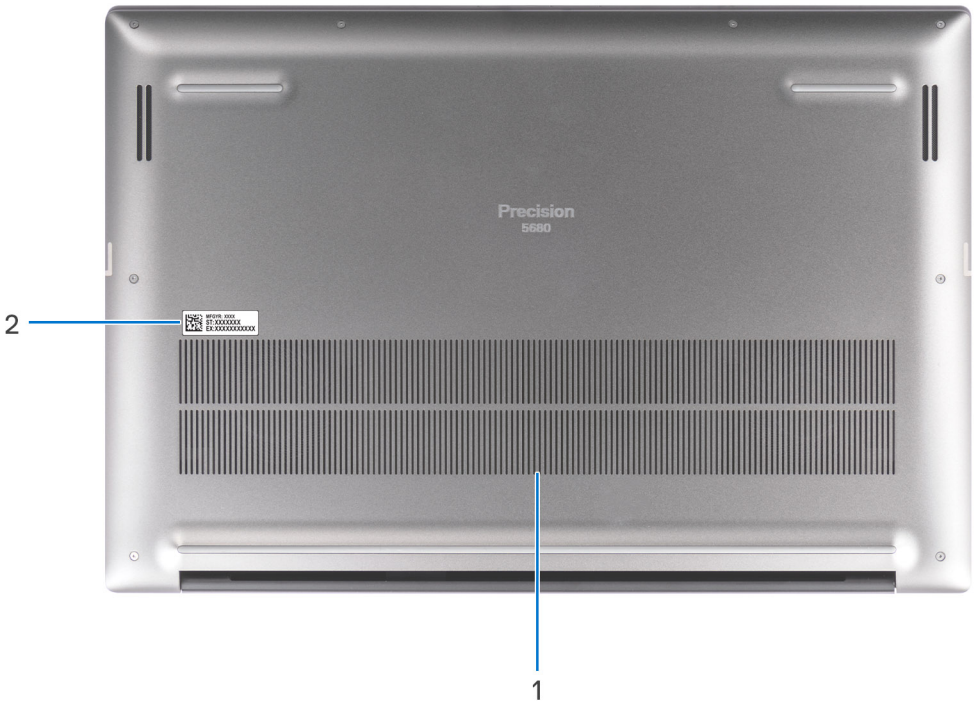

1. Left and right microphones
2. Power button with fingerprint reader
3. NFC/Contactless smart card reader (optional)
4. Haptics Trackpad

# Front




1. IR sensor
2. IR LED
3. Camera
4. Camera-status light
5. Ambient Light Sensor
6. LCD panel

# Bottom




1. Air vents
2. Service Tag location

# 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.




# Battery charge and status light

The following table lists the battery charge and status light behavior of your Dell Precision 5680.

### Table 1. Battery charge and status light behavior

| Power Source | LED Behavior | System Power State | Battery Charge Level |
|---|---|---|---|
| AC Adapter | Off | S0 - S5 | Fully Charged |
| AC Adapter | Solid White | S0 - S5 | < Fully Charged |
| Battery | Off | S0 - S5 | 11-100% |
| Battery | Solid Amber (590+/-3 nm) | S0 - S5 | < 10% |

- S0 (ON) - System is turned on.
- S4 (Hibernate) - The system consumes the least power compared to all other sleep states. The system is almost at an OFF state, expect for a trickle power. The context data is written to hard drive.
- S5 (OFF) - The system is in a shutdown state.

# 2

# Set up your Dell Precision 5680

### 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:** To conserve battery power, the battery might enter power saving mode. Connect the power adapter and press the power button to turn on the computer.

2. Finish 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 www.dell.com/support.

   **For Windows:**

   Follow the on-screen instructions to complete the setup. When setting up, Dell recommends 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 or create a Microsoft account. If not connected to the internet, create an offline account.
   - On the **Support and Protection** screen, enter your contact details.

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

### Table 2. Locate Dell apps

| Resources | Description |
|---|---|
|  | **Dell Product Registration**<br>Register your computer with Dell. |
|  | **Dell Help & Support**<br>Access help and support for your computer. |
|  | **SupportAssist**<br>SupportAssist is the smart technology that keeps your computer running at its best by optimizing settings, detecting issues, removing viruses and notifies when you need to make system updates. SupportAssist proactively checks the health of your system's hardware and software. When an issue is detected, the necessary system state information is sent to Dell to begin troubleshooting. SupportAssist is preinstalled on most of the Dell devices running Windows operating system. For more information, see SupportAssist for Home PCs User's Guide on www.dell.com/serviceabilitytools.<br>**NOTE:** In SupportAssist, click the warranty expiry date to renew or upgrade your warranty. |
|  | **Dell Update**<br>Updates your computer with critical fixes and latest device drivers as they become available. For more information on using Dell Update, search in the Knowledge Base Resource at www.dell.com/support. |
|  | **Dell Digital Delivery**<br>Download software applications, which are purchased but not preinstalled on your computer. For more information on using Dell Digital Delivery, search in the Knowledge Base Resource at www.dell.com/support. |

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# Specifications of Dell Precision 5680

## Dimensions and weight

The following table lists the height, width, depth, and weight of your Dell Precision 5680.

**Table 3. Dimensions and weight**

| Description | Values |
|---|---|
| Height: | |
| Front height | 26.17 mm (1.03 in.) |
| Rear height | 26.17 mm (1.03 in.) |
| Width | 353.68 mm (13.92 in.) |
| Depth | 240.27 mm (9.45 in.) |
| Weight<br>**NOTE:** The weight of your computer depends on the configuration ordered and manufacturing variability. | 1.905 kg (4.20 lb) |

## Processor

The following table lists the details of the processors supported by your Dell Precision 5680.

**Table 4. Processor**

| Description | Option one | Option two | Option three | Option four |
|---|---|---|---|---|
| Processor type | 13th Generation Intel Core i5-13600H vPro Enterprise | 13th Generation Intel Core i7-13700H vPro Essential | 13th Generation Intel Core i7-13800H vPro Enterprise | 13th Generation Intel Core i9-13900H vPro Enterprise |
| Processor wattage | 45 W | 45 W | 45 W | 45 W |
| Processor core count | 12 | 14 | 14 | 14 |
| Processor thread count | 16 | 20 | 20 | 20 |
| Processor speed | Up to 4.80 GHz | Up to 5.0 GHz | Up to 5.2 GHz | Up to 5.4 GHz |
| Processor cache | 18 MB | 24 MB | 24 MB | 24 MB |
| Integrated graphics | Intel Iris Xe Graphics | Intel Iris Xe Graphics | Intel Iris Xe Graphics | Intel Iris Xe Graphics |

# Chipset

The following table lists the details of the chipset supported by your Dell Precision 5680.

### Table 5. Chipset

| Description | Values |
|---|---|
| Chipset | Intel PCH |
| Processor | 13th Generation Intel Core i5/i7/i9 |
| DRAM bus width | 128-bit |
| Flash EPROM | 64 MB |
| PCIe bus | Up to Gen 4.0 |

# Operating system

Your Dell Precision 5680 supports the following operating systems:

- Windows 11 Home, 64-bit
- Windows 11 Pro, 64-bit
- Windows 11 Pro for Workstation, 64-bit
- Windows 11 Pro for Education, 64-bit
- Windows 11 Enterprise, 64-bit
- Ubuntu 22.04 LTS, 64-bit

# Memory

The following table lists the memory specifications of your Dell Precision 5680.

### Table 6. Memory specifications

| Description | Values |
|---|---|
| Memory slots | Integrated on system board<br>**NOTE:** The memory is not replaceable or upgradeable. If memory has error, the system board must be replaced. |
| Memory type | Dual-channel LPDDR5 |
| Memory speed | 6400 MT/s or 6000 MT/s |
| Maximum memory configuration | 64 GB |
| Minimum memory configuration | 16 GB |
| Memory size per slot | 16 GB, 32 GB, 64 GB |
| Memory configurations supported | • 16 GB LPDDR5 at 6400 MT/s, integrated, dual channel<br>• 32 GB LPDDR5 at 6000 MT/s, integrated, dual channel<br>• 64 GB LPDDR5 at 6000 MT/s, integrated, dual channel |

# External ports

The following table lists the external ports on your Dell Precision 5680.

### Table 7. External ports

| Description | Values |
|---|---|
| USB ports | • One USB 3.2 Gen 2 Type-C port with DisplayPort 1.4 Alt Mode<br>• Two Thunderbolt 4 ports (USB Type-C) |
| Audio port | One 3.5 mm audio jack |
| Video port/ports | One HDMI 2.0b port |
| Media-card reader | One SD-card slot |
| Power-adapter port | Two Thunderbolt 4 ports (USB Type-C) |
| Security-cable slot | One wedge-shaped lock slot |

# Internal slots

The following table lists the internal slots of your Dell Precision 5680.

### Table 8. Internal slots

| Description | Values |
|---|---|
| M.2 | • Two M.2 2230/2280 slot for solid-state drive/Intel Optane<br>**NOTE:** To learn more about the features of different types of M.2 cards, search in the Knowledge Base Resource at www.dell.com/support. |

# Wireless module

The following table lists the Wireless Local Area Network (WLAN) module that is supported on your Dell Precision 5680.

### Table 9. Wireless module specifications

| Description | Values |
|---|---|
| Model number | Intel AX211 |
| Transfer rate | Up to 2400 Mbps |
| Frequency bands supported | 2.4 GHz/5 GHz/6 GHz |
| Wireless standards | • Wi-Fi 802.11a/b/g<br>• Wi-Fi 4 (WiFi 802.11n)<br>• Wi-Fi 5 (WiFi 802.11ac)<br>• Wi-Fi 6E (WiFi 802.11ax) |
| Encryption | • 64-bit/128-bit WEP<br>• AES-CCMP<br>• TKIP |

### Table 9. Wireless module specifications (continued)

| Description | Values |
|---|---|
| Bluetooth wireless card | Bluetooth 5.3 |
| | **NOTE:** The version of the Bluetooth wireless card may vary depending on the operating system that is installed on your computer. |

# Audio

The following table lists the audio specifications of your Dell Precision 5680.

### Table 10. Audio specifications

| Description | | Values |
|---|---|---|
| Audio controller | | Realtek ALC711-VD |
| Stereo conversion | | Supported |
| Internal audio interface | | High definition audio interface |
| External audio interface | | One 3.5 mm audio jack |
| Number of speakers | | • 2 x Woofers<br>• 2 x Tweeters |
| Internal-speaker amplifier | | Supported |
| External volume controls | | Keyboard shortcut controls |
| Speaker output: | | |
| | Average speaker output | • Woofer: 2 x 2 W<br>• Tweeters: 2 x 2 W |
| | Peak speaker output | • Woofer: 2 x 2.5 W<br>• Tweeters: 2 x 2.5 W |
| Subwoofer output | | Supported |
| Microphone | | Dual-array microphones in camera assembly |

# Storage

This section lists the storage options on your Dell Precision 5680.

Your Precision 5680 supports one of the following storage configurations:

- 2 x M.2 2230/M.2 2280, solid-state drive
- 2 x M.2 2280, Opal Self-Encrypting solid-state drive

The primary drive of your computer varies with the storage configuration.

### Table 11. Storage specifications

| Storage type | Interface type | Capacity |
|---|---|---|
| M.2 2230, Class 35 solid-state drive | PCIe NVMe Gen 4 | 256 GB |

### Table 11. Storage specifications (continued)

| Storage type | Interface type | Capacity |
|---|---|---|
| M.2 2280, Class 40 solid-state drive | PCIe NVMe Gen 4 | Up to 4 TB |
| M.2 2280, Class 40 solid-state drive, Opal Self-Encrypting solid-state drive | PCIe NVMe Gen 4 | Up to 1 TB |

# Media-card reader

The following table lists the media cards supported by your Dell Precision 5680.

### Table 12. Media-card reader specifications

| Description | Values |
|---|---|
| Media-card type | One SD card slot |
| Media-cards supported | • Secure Digital (SD)<br>• Secure Digital High Capacity (SDHC)<br>• Secure Digital Extended Capacity (SDXC) |
| **NOTE:** The maximum capacity supported by the media-card reader varies depending on the standard of the media card installed in your computer. | |

# Keyboard

The following table lists the keyboard specifications of your Dell Precision 5680.

### Table 13. Keyboard specifications

| Description | Values |
|---|---|
| Keyboard type | Backlit keyboard |
| Keyboard layout | QWERTY |
| Number of keys | • United States and Canada: 79 keys<br>• United Kingdom: 80 keys<br>• Japan: 83 keys |
| Keyboard size | X=19.05 mm key pitch<br>Y=18.05 mm key pitch |
| Keyboard shortcuts | Some keys on your keyboard have two symbols on them. These keys can be used to type alternate characters or to perform secondary functions. To type the alternate character, press Shift and the desired key. To perform secondary functions, press Fn and the desired key.<br>**NOTE:** You can define the primary behavior of the function keys (F1–F12) changing **Function Key Behavior** in BIOS setup program. |

# Camera

The following table lists the camera specifications of your Dell Precision 5680.

### Table 14. Camera specifications

| Description | | Values |
|---|---|---|
| Number of cameras | | One |
| Camera type | | FHD IR camera with narrow FHD+IR w/ XYZ ALS (MIPI), Dual-array microphones |
| Camera location | | Front camera |
| Camera sensor type | | Intel Camera Sensing Technology (ExpressSign-in 2.0) |
| Camera resolution: | | |
| | Still image | 0.90 megapixel |
| | Video | 1920 x 1080 FHD at 30 fps |
| Infrared camera resolution: | | |
| | Still image | 0.23 megapixel |
| | Video | 640 x 360 at 15 fps |
| Diagonal viewing angle: | | |
| | Camera | 78 degrees |
| | Infrared camera | 78 degrees |

# Haptics trackpad

The following table lists the touchpad specifications of your Dell Precision 5680.

### Table 15. Touchpad specifications

| Description | | Values |
|---|---|---|
| Touchpad resolution: | | 300 dpi |
| Touchpad dimensions: | | |
| | Horizontal | 136 mm (5.35 in.) |
| | Vertical | 85 mm (3.34 in.) |
| Touchpad gestures | | For more information about touchpad gestures available on Windows, see the Microsoft knowledge base article at support.microsoft.com. |

# Power adapter

The following table lists the power adapter specifications of your Dell Precision 5680.

### Table 16. Power adapter specifications

| Description | | Option one | Option two |
|---|---|---|---|
| Type | | 100 W Pecos AC adapter, USB-C | 165 W ERP AC adapter, USB-C |
| Input voltage | | 100 VAC—240 VAC | 100 VAC—240 VAC |
| Input frequency | | 50 Hz-60 Hz | 50 Hz–60 Hz |
| Input current (maximum) | | 1.7 A | 2.2 A |
| Output current (continuous) | | • 20 V/5 A<br>• 15 V/3 A<br>• 9 V/3 A<br>• 5 V/3 A | • 28 V/5.893 A<br>• 20 V/6.5 A<br>• 15 V/3 A<br>• 9 V/3 A<br>• 5 V/3 A |
| Rated output voltage | | 20 VDC/15 VDC/9 VDC/5 VDC | 5 VDC/9 VDC/15 VDC/20 VDC/28 VDC |
| Temperature range: | | | |
| | Operating | 0 °C to 40 °C (32 °F to 104 °F) | 0 °C to 40 °C (32 °F to 104 °F) |
| | Storage | -40 °C to 70 °C (-40 °F 158 °F) | -40 °C to 70 °C (-40 °F 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.**

# Battery

The following table lists the battery specifications of your Dell Precision 5680.

### Table 17. Battery specifications

| Description | | Option one | Option two | Option three | Option four |
|---|---|---|---|---|---|
| Battery type | | 4-cell, 66 Whr lithium-ion battery | 6-cell, 99.5 Whr lithium-ion battery | 4-cell 66 Whr lithium-ion LcL battery | 6-cell 99.5 Whr lithium-ion LcL battery |
| Battery voltage | | 15.4 VDC (Nominal) | 11.55 VDC (Nominal) | 15.4 VDC (Nominal) | 11.55 VDC (Nominal) |
| Battery weight (maximum) | | 0.264 kg (0.58 lb) | 0.363 kg (0.8 lb) | 0.264 kg (0.58 lb) | 0.363 kg (0.8 lb) |
| Battery dimensions: | | | | | |
| | Height | 7.66 mm (0.30 in.) | 7.66 mm (0.30 in.) | 7.66 mm (0.30 in.) | 7.66 mm (0.30 in.) |
| | Width | 302 mm (11.89 in.) | 302 mm (11.89 in.) | 302 mm (11.89 in.) | 302 mm (11.89 in.) |
| | Depth | 85.4 mm (3.36 in.) | 85.4 mm (3.36 in.) | 85.4 mm (3.36 in.) | 85.4 mm (3.36 in.) |
| Temperature range: | | | | | |

### Table 17. Battery specifications (continued)

| Description | | Option one | Option two | Option three | Option four |
|---|---|---|---|---|---|
| | Operating | • Charge: 0°C to 50°C (32°F to 122°F)<br>• Discharge: 0°C to 60°C (32°F to 140°F) | • Charge: 0°C to 50°C (32°F to 122°F)<br>• Discharge: 0°C to 60°C (32°F to 140°F) | • Charge: 0°C to 50°C (32°F to 122°F)<br>• Discharge: 0°C to 60°C (32°F to 140°F) | • Charge: 0°C to 50°C (32°F to 122°F)<br>• Discharge: 0°C to 60°C (32°F to 140°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 65°C (-4°F to 149°F) | -20°C to 65°C (-4°F to 149°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)<br>**NOTE:** Control the charging time, duration, start and end time, and so on using the Dell Power Manager application. For more information on the Dell Power Manager see, *Me and My Dell* on www.dell.com. | | • From 0% up to 35% in as little as 20 minutes (ExpressCharge Boost)<br>• 2 hours (Express charge)<br>• 3 hours (Standard charge) | • From 0% up to 35% in as little as 20 minutes (ExpressCharge Boost)<br>• 2 hours (Express charge)<br>• 3 hours (Standard charge) | • 2 hours (Express charge)<br>• 3 hours (Standard charge) | • 2 hours (Express charge)<br>• 3 hours (Standard charge) |
| Coin-cell battery | | No | No | No | No |

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

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

# Display

The following table lists the display specifications of your Dell Precision 5680.

### Table 18. Display specifications

| Description | Option one | Option two |
|---|---|---|
| Display type | 16-inch, FHD+, non-touch, 60Hz, anti-glare, 500 nits WLED, Low Blue Light | 16-inch OLED, touch, 60Hz, anti-smudge, 400 nits WLED |
| Touch options | No | Yes |
| Display-panel technology | WLED with Low Blue Light | OLED with Low Blue Light |
| Display-panel dimensions (active area): | | |

### Table 18. Display specifications (continued)

| Description | | Option one | Option two |
|---|---|---|---|
| | Height | 22.17 mm (0.87 in.) | 22.17 mm (0.87 in.) |
| | Width | 344.68 mm (13.57 in.) | 344.45 mm (13.56 in.) |
| | Diagonal | 406.4 mm (16 in.) | 406.4 mm (16 in.) |
| Display-panel native resolution | | 1920 x 1200 | 3840 x 2400 |
| Luminance (typical) | | 500 nits | 400 nits |
| Megapixels | | 2.3 | 9.2 |
| Color gamut | | DCI-P3 100% | DCI-P3 100% |
| Pixels Per Inch (PPI) | | 142 | 283 |
| Contrast ratio (min.) | | 1300:1 | 100000:1 |
| Response time (max.) | | 30 ms | 1 ms typ. |
| Refresh rate | | 60 Hz | 60 Hz |
| Horizontal view angle | | +/- 85 degrees | +/- 85 degrees typical |
| Vertical view angle | | +/- 85 degrees | +/- 85 degrees typical |
| Pixel pitch | | 0.18 mm | 0.09 mm |
| Power consumption (maximum) | | 6.32 W | 11.14 W |
| Anti-glare vs glossy finish | | Anti-glare | Anti-smudge |

# Fingerprint reader

The following table lists the fingerprint-reader specifications of your Dell Precision 5680.

**NOTE:** The fingerprint reader is located on the power button.

### Table 19. Fingerprint reader specifications

| Description | Values |
|---|---|
| Fingerprint-reader sensor technology | Capacitive |
| Fingerprint-reader sensor resolution | 500 dpi |
| Fingerprint-reader sensor pixel size | 108 x 88 |

# Sensor

The following table lists the sensor of your Dell Precision 5680.

### Table 20. Sensor

| Sensor support |
|---|
| Accelerometer for adaptive thermal |

# GPU—Integrated

The following table lists the specifications of the integrated Graphics Processing Unit (GPU) supported by your Dell Precision 5680.

### Table 21. GPU—Integrated

| Controller | Memory size | Processor |
|---|---|---|
| Intel Iris $X^e$ Graphics | Shared system memory | $13^{th}$ Generation Intel Core i5/i7/i9 processors |

# GPU—Discrete

The following table lists the specifications of the discrete Graphics Processing Unit (GPU) supported by your Dell Precision 5680.

### Table 22. GPU—Discrete

| Controller | Memory size |
|---|---|
| NVIDIA RTX A1000 6GB Laptop GPU | 6 GB |
| NVIDIA RTX 2000 Ada Generation Laptop GPU | 8 GB |
| NVIDIA RTX 3500 Ada Generation Laptop GPU | 12 GB |
| NVIDIA RTX 4000 Ada Generation Laptop GPU | 12 GB |
| NVIDIA RTX 5000 Ada Generation Laptop GPU | 16 GB |
| NVIDIA GeForce RTX 4090 Laptop GPU | 16 GB |

# Multiple display support matrix

The following table lists the multiple display support matrix for your Dell Precision 5680.

### Table 23. Multiple display support matrix

| Graphics Card | Supported external displays |
|---|---|
| Intel Iris $X^e$ Graphics | Yes, supported on USB-C, TBT and HDMI port. |
| NVIDIA RTX A1000 6GB Laptop GPU | Yes, supported on the right side USB-C port only. |
| NVIDIA RTX 2000 Ada Generation Laptop GPU | Yes, supported on the right side USB-C port only. |
| NVIDIA RTX 3500 Ada Generation Laptop GPU | Yes, supported on the right side USB-C port only. |
| NVIDIA RTX 4000 Ada Generation Laptop GPU | Yes, supported on the right side USB-C port only. |
| NVIDIA RTX 5000 Ada Generation Laptop GPU | Yes, supported on the right side USB-C port only. |

### Table 23. Multiple display support matrix (continued)

| Graphics Card | Supported external displays |
|---|---|
| NVIDIA GeForce RTX 4090 Laptop GPU | Yes, supported on the right side USB-C port only. |

# Hardware security

The following table lists the hardware security of your Dell Precision 5680.

### Table 24. Hardware security

| Hardware security |
|---|
| Hardware TPM 2.0 discrete |
| Wedge-shaped lock slot |
| FIPS 140-2 certification for TPM |
| TCG Certificatication for TPM (Trusted Computing Group) |
| ControlVault 3 Advanced Authentication with FIPS 140-2 Level 3 Certification |
| Contacted Smart Card and Control Vault 3 |
| Contactless Smart Card, NFC, and Control Vault 3 |
| Statement of Non-Volatility |

# Smart-card reader

## Contactless smart-card reader

This section lists the contactless smart-card reader specifications of your Dell Precision 5680.

### Table 25. Contactless smart-card reader specifications

| Title | Description | Dell ControlVault 3 contactless smart-card reader with NFC |
|---|---|---|
| Felica Card Support | Reader and software capable of supporting Felica contactless cards | Yes |
| 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 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 |

### Table 25. Contactless smart-card reader specifications (continued)

| Title | Description | Dell ControlVault 3 contactless smart-card reader with NFC |
|---|---|---|
| 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 |
| EMVCo Compliant | Compliant with EMVCO smart card standards as posted to www.emvco.com | Yes |
| EMVCo Certified | Formally certified based on EMVCO smart card standards | Yes |
| NFC Proximity OS Interface | Enumerates NFP (Near Field Proximity) device for OS to utilize | Yes |
| PC/SC OS 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 OS level drivers | Yes |
| Windows Certified | Device certified by Microsoft WHCK | Yes |
| Dell ControlVault support | Device connects to Dell ControlVault for usage and processing | Yes |
| FIDO2 compliance | Dell ControlVault 3 Smart-card reader is compliant with the FIDO SPEC | Yes |

**NOTE:** 125 Khz proximity cards are not supported.

### Table 26. Supported cards

| Manufacturer | Card |
|---|---|
| HID | jCOP readertest3 A card (14443a) |
| | 1430 1L |
| | DESFire D8H |
| | iClass (Legacy) |
| | iClass SEOS |
| NXP/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 |
| | SCE6.0 FIPS 144K Dual + 1K Mifare |
| | SCE6.0 nonFIPS 144K Dual + 1 K Mifare |
| | SCE7.0 FIPS 144K |

### Table 26. Supported cards (continued)

| Manufacturer | Card |
|---|---|
| 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 Precision 5680.

### Table 27. Contacted smart-card reader specifications

| Title | Description | Dell ControlVault 3 smart-card reader |
|---|---|---|
| ISO 7816 -3 Class A Card Support | Reader capable of reading 5V powered smart mcard | Yes |
| ISO 7816 -3 Class B Card Support | Reader capable of reading 3V powered smart card | Yes |
| ISO 7816 -3 Class C Card support | Reader capable of reading 1.8V powered smart card | Yes |
| ISO 7816-1 Compliant | Specification for the reader | Yes |
| ISO 7816 -2 Compliant | Specification for smart card device physical characteristics (size, location of connection points, etc.) | Yes |
| T=0 support | Cards support character level transmission | Yes |
| T=1 support | Cards support block level transmission | Yes |
| EMVCo Compliant | Compliant with EMVCo (for electronic payment standards) smart card standards as posted to www.emvco.com | Yes |
| EMVCo Certified | Formally certified based on EMVCO smart card standards | Yes |
| PC/SC OS 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 OS level drivers. | Yes |
| Windows Certified | Device certified by WHCK | Yes |
| FIPS 201 (PIV/HSPD-12) Compliant via GSA | Device compliant with FIPS 201/PIV/ HSPD-12 requirements | Yes |
| FIDO2 compliance | Dell ControlVault 3 Smart-card reader is compliant with the FIDO SPEC | Yes |

# Operating and storage environment

This table lists the operating and storage specifications of your Dell Precision 5680.

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

### Table 28. 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 | -15.2 m to 3048 m (-49.87 ft to 10000 ft) | -15.2 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 user environment.

† Measured using a 2 ms half-sine pulse.

# Dell Optimizer

This section details the Dell Optimizer specifications of your Dell Precision 5680.

Dell Optimizer is a software application that intelligently optimizes the performance of your system by using artificial intelligence and machine learning. Dell Optimizer dynamically configures your system settings to optimize the performance of your applications. It improves the productivity, performance, and user experience through system usage analysis and learning.

On Dell Precision 5680 with Dell Optimizer, the following features are supported:

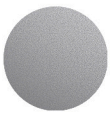
- Improves user experience through computer usage analysis and learning
- Faster application launch and seamless application transition
- Intelligent battery run-time extension
- Optimized Audio for best meeting experience
- Locks computer when walks away for enhanced security
- Faster computer wake-on-user approach
- Intelligently shows alerts
- Updates automatically to minimize disruption

For more information about configuring and using these features, refer Dell Optimizer documentation.

# Color, material, and finish

This section details the color, material, and finish (CMF) specifications of your Dell Precision 5680.





Titan Gray

### Table 29. CMF specifications

| | |
|---|---|
| A Cover (Top) | • Aluminum/Extrusion + CNC + Insert Molded + Beadblast<br>• Anodized Titan Gray<br>• PMS Cool Gray 9C |
| B Cover (Hinge up) | • PC<br>• UV Molding +CNC + Back Printing<br>• Match to Apollo |
| C Cover (Palmrest) | • Plastic PC 50%GFC Bonded MgAl Frame + CNC Drilled speaker Holes<br>• Dell Standard Black, Resin<br>• PMS 19-4205 TPG<br>• Apollo, Velvet |
| D Cover (Bottom) | • Aluminum/Extrusion + CNC + Insert Molded + Beadblast<br>• Anodized Titan Gray<br>• PMS Cool Gray 9C |

**NOTE:** Titan Gray, Dull – Cool Gray 9C = RGB 117 120 123 HEX/HTML 75787B CMYK 30 22 17 57

**NOTE:** Apollo –19-4205 TPG RGB 64 65 69 HEX/HTML 404145 CMYK NA

4

# Working inside your computer

## Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included 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 the Regulatory Compliance home page at www.dell.com/regulatory_compliance.**

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

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

**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: 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 ports and the connectors are correctly oriented and aligned.**

**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.**

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

## 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 shut-down instructions.
3. Disconnect your computer and all attached devices from their electrical outlets.
4. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.

5. Remove any media card and optical disk from your computer, if applicable.
6. Enter the service mode, if you are able to power on your computer.

**Service Mode**

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

**CAUTION: If you are unable to turn on the computer to put it into Service Mode or the computer does not support Service Mode then 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 AC adapter is disconnected.

a. Hold **<B>** key on the keyboard and press the power button for 3 seconds or until the Dell logo appears on the screen.
b. Press any key to continue.
c. If the AC adapter is not disconnected, a message prompting you to remove the AC adapter appears on the screen. Remove the AC adapter and then press any key to continue the **Service Mode** procedure. The **Service Mode** procedure 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.
e. Once the computer shuts down, it has successfully entered Service Mode.

**NOTE:** If you are unable to power on your computer or unable to enter service mode skip this process.

# Safety precautions

The safety precautions chapter details the primary steps to be taken before performing any disassembly instructions.

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

- Turn off the system and all attached peripherals.
- Disconnect the system and all attached peripherals from AC power.
- Disconnect all network cables, telephone, and telecommunications lines from the system.
- Use an ESD field service kit when working inside any notebook to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to reduce the chance of getting electrocuted.

## Standby power

Dell products with standby power must be unplugged before you open the case. Systems that incorporate standby power are essentially powered while turned off. The internal power enables the system to be remotely turned on (wake on LAN) and suspended into a sleep mode and has other advanced power management features.

Unplugging, pressing, and holding the power button for 15 seconds should discharge residual power in the system board.

## Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done through the use of 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 non-metal surface. The wrist strap should be secure and in full contact with your skin, and ensure that you remove all jewelry such as watches, bracelets, or rings prior to bonding 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 DIMMs, and system boards. Very slight charges can damage circuits in ways that may not be obvious, such as intermittent problems or a shortened product life span. As the industry pushes for lower power requirements and increased density, ESD protection is an increasing concern.

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

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

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

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

Perform the following steps to prevent ESD damage:

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

# ESD field service kit

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

## Components of an ESD field service kit

The components of an ESD field service kit are:

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

- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

### ESD protection summary

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

## Transporting sensitive components

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

## After working inside your computer

**About this task**

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

**Steps**

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

   **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. Your computer will automatically return to normal functioning mode.

## BitLocker

**CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress, and the system 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, see Knowledge Article: updating the BIOS on Dell systems 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
- Torx #5 (T5) screwdriver

- Plastic scribe

# Screw list

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

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

**NOTE:** Screw color may vary with the configuration ordered.

### Table 30. Screw list

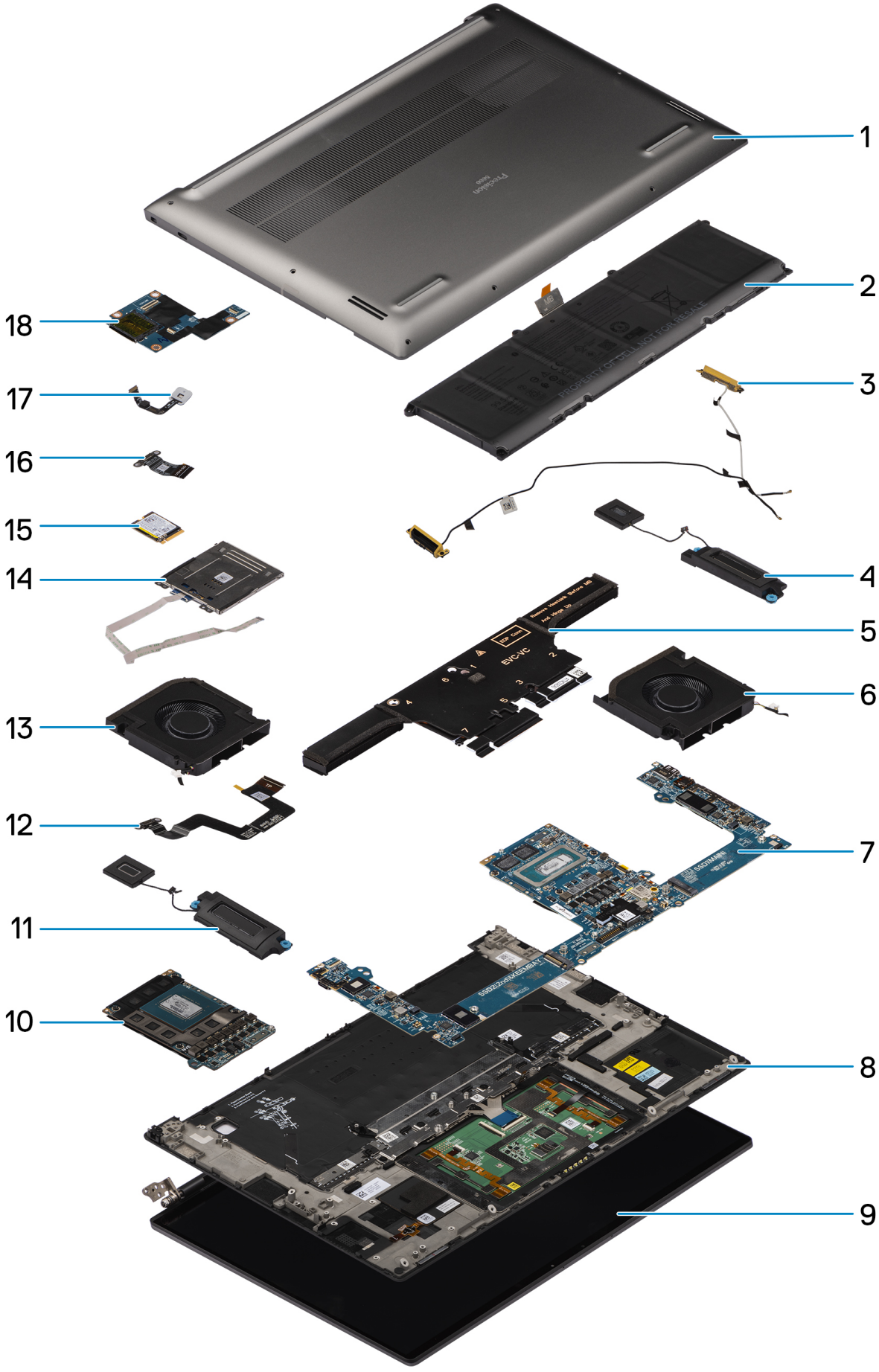
| Component | Screw type | Quantity | Screw image |
|---|---|---|---|
| Base cover | M2x3<br>(T5 Torx screw) | 8 |  |
| M.2 2230 Solid-state drive | M2x2 | 2 |  |
| M.2 2280 Solid-state drive | M2x2 | 1 |  |
| VPU card | M2x2 | 2 |  |
| Battery | M2x4 | 6 |  |
| Left fan | M2x4 | 2 |  |
| Right fan | M2x4 | 2 |  |
| Heatsink | Captive screws | 7 |  |
| Display hinges | M2.5x5 | 8 |  |
| Display FPC cable | M1.4x4 (T5 Torx screw) | 2 |  |
| Display FPC cover | M1.4x4 (T5 Torx screw) | 2 |  |
| SD card reader daughterboard | M2x1.5 | 3 |  |
| USH and SD card reader daughterboard | M2x1.5 | 4 |  |
| Smart-card reader | M1.6x1.7 | 2 |  |

### Table 30. Screw list (continued)

| Component | Screw type | Quantity | Screw image |
|---|---|---|---|
| GPU card FPC | M1.4x4 (T5 Torx screw) | 4 |  |
| GPU card bridge | M1.6x4.5 | 4 |  |
| PC bridge bracket | M2x4 | 2 |  |
| GPU card | M2x4 | 2 |  |
| Dummy GPU card | M2x4 | 2 |  |
| System board | M2x4 | 9 |  |
| Speakers | M1.6x1.8 | 4 |  |
| Touchpad FPC | M1.4x1.2 | 2 |  |
| SD card reader daughterboard FPC/USH and SD card reader daughterboard FPC | M1.4x1.2 | 2 |  |
| WLAN antennas | Captive screws | 4 |  |
| Power button with fingerprint reader | M1.6x2 | 3 |  |

# Major components of Dell Precision 5680

The following image shows the major components of Dell Precision 5680.


1
2
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1. Base cover
2. Battery
3. WLAN antennas
4. Left speaker
5. Heatsink
6. Left fan
7. System board
8. Palm-rest and keyboard assembly
9. Display assembly
10. GPU card
11. Right speaker
12. Touchpad FPC cable
13. Right fan
14. Smart-card reader
15. Solid-state drive
16. USH and SD card reader daughterboard FPC/SD card reader daughterboard FPC
17. Power button with fingerprint reader
18. USH and SD card reader daughterboard

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

5

# Removing and installing Customer Replaceable Units (CRUs)

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

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

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

# Secure Digital (SD) Card

## Removing the SD card

### Prerequisites

Follow the procedure in Before working inside your computer.

**NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.

.

### About this task

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





**Steps**

1. Push the SD card to eject it from the slot.
2. Remove the SD card from the computer.

# Installing the SD card

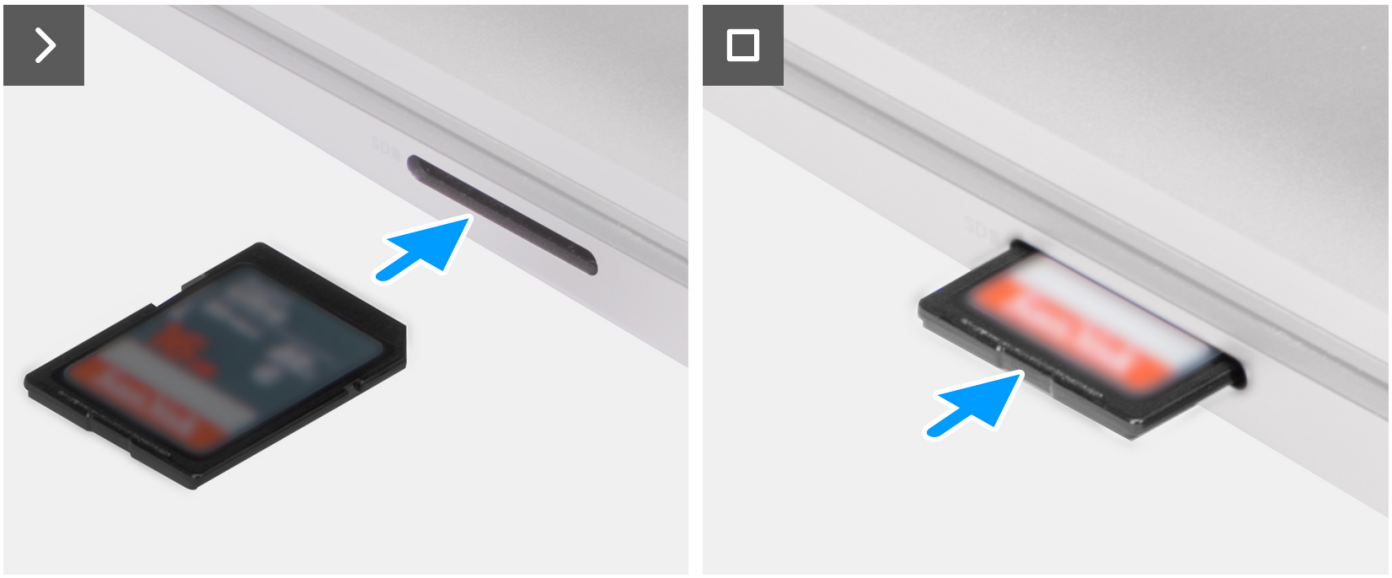
**Prerequisites**

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

**About this task**

The following image provides a visual representation of the SD card installation procedure.





### Steps

Insert the SD card into its slot until it click into place.

### Next steps

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

# 6

# Removing and installing Field Replaceable Units (FRUs)

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

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

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

**CAUTION: Dell Technologies recommends that this set of repairs, if needed, to be conducted by trained technical repair specialists.**

**CAUTION: As a reminder, your warranty does not cover damages that may occur during the courses of 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.

# Base cover

## Removing the base cover

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.

### About this task

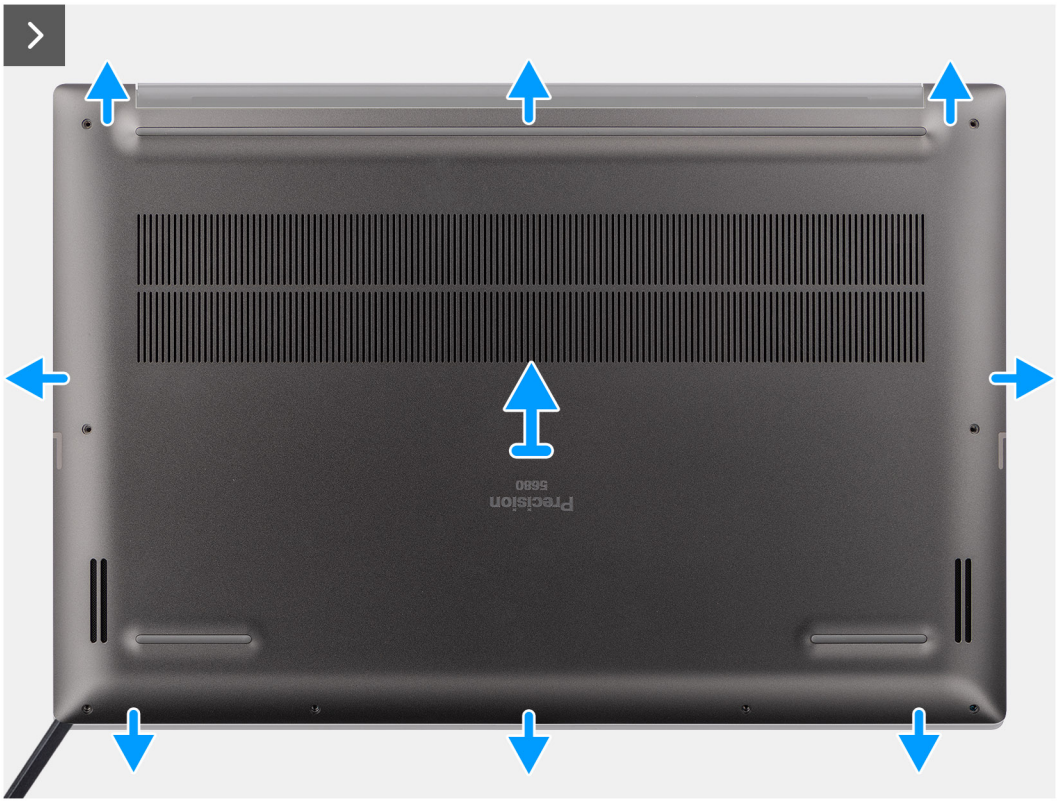
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

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

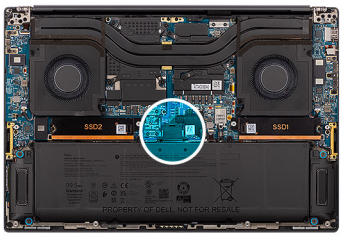


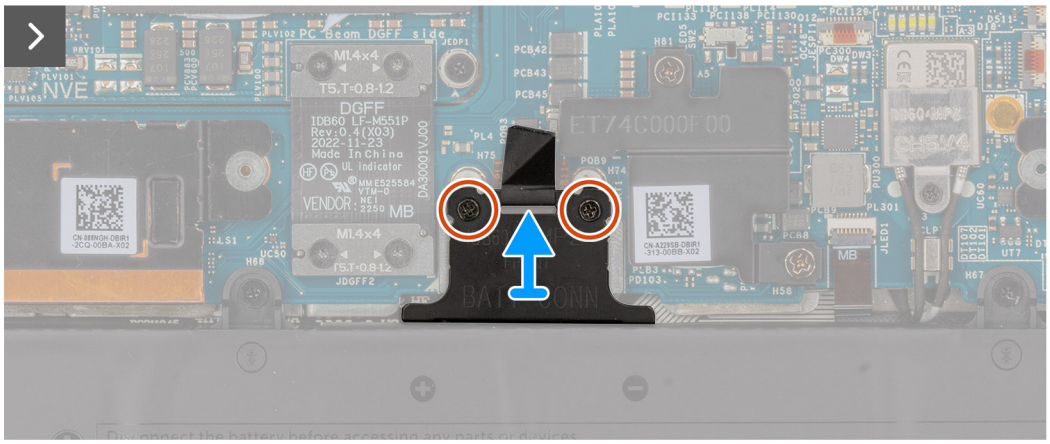
**8x**
M2x3

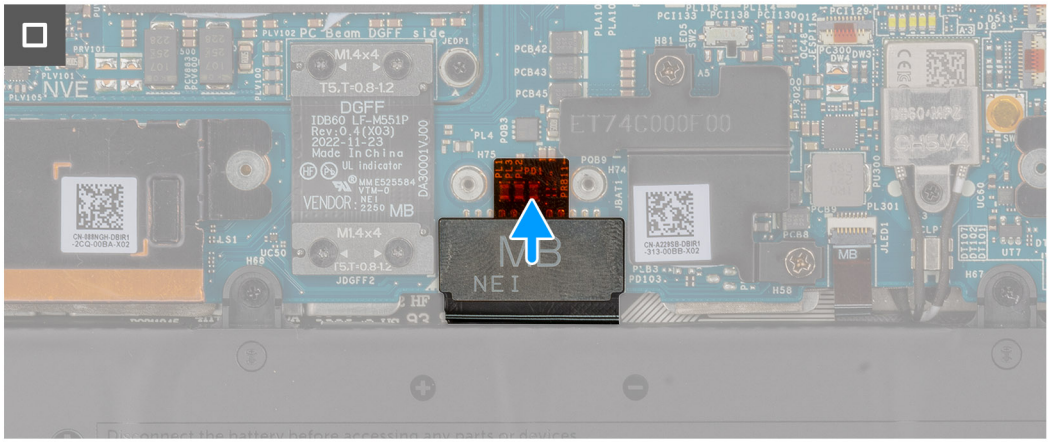










### Steps

1. Remove the eight (M2x3) T5 Torx screws that secure the base cover to the computer.
2. Using a plastic scribe, pry open the base cover starting from the SD-card slot on the base cover.

   **CAUTION: Do not fully insert the plastic scribe into the SD-card slot before prying. Only pry the edge of base cover nearest to the SD-card slot opening.**

   **CAUTION: Do not pry up from the top side (near the vents) of the base cover as this may cause damage to the rear side of the cover.**

3. Work your way around the bottom, left and right sides of the base cover.
4. Lift the bottom of the base cover and push it towards the rear of the system to remove it from the computer.

   **CAUTION: Do not grasp from the rear vents and lift the base cover directly upwards to remove it, as this may cause damage to the rear side of the cover.**

5. Loosen the two captive screws that secure the battery connector bracket in place.
6. Disconnect the battery FPC cable from the connector on the system board.

   **NOTE:** Pull the pull tab vertically to disconnect the battery FPC cable.

# Installing the base cover

### Prerequisites

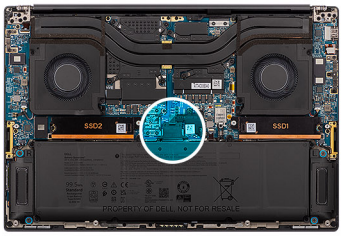
If you are replacing a component, remove the necessary component before the installation procedure.

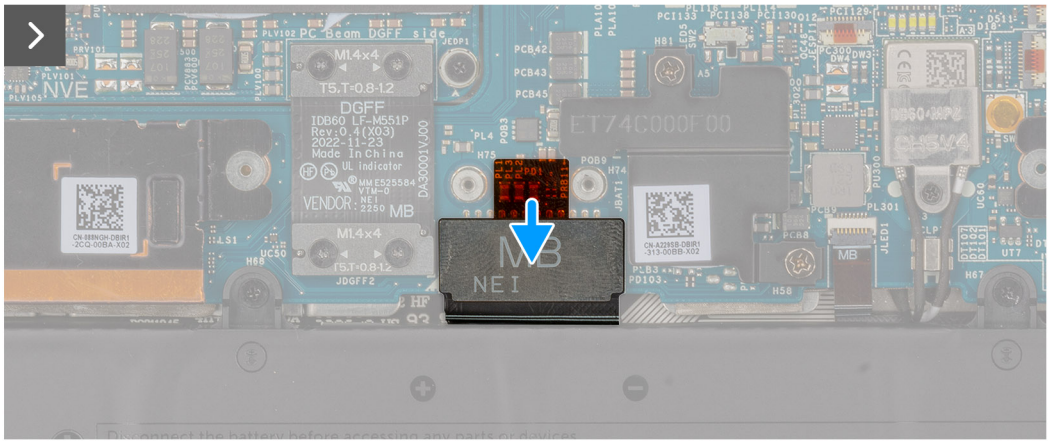
### About this task

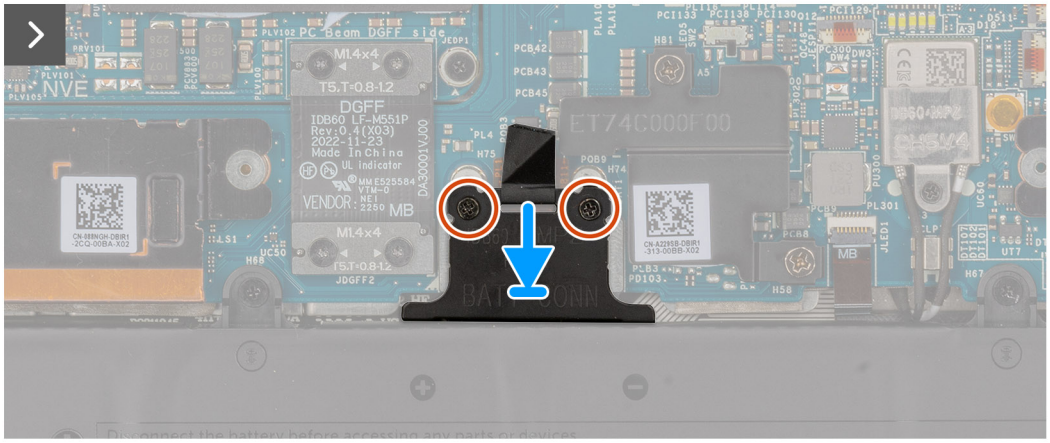
**CAUTION: The information in this installation section is intended for authorized service technicians only.**

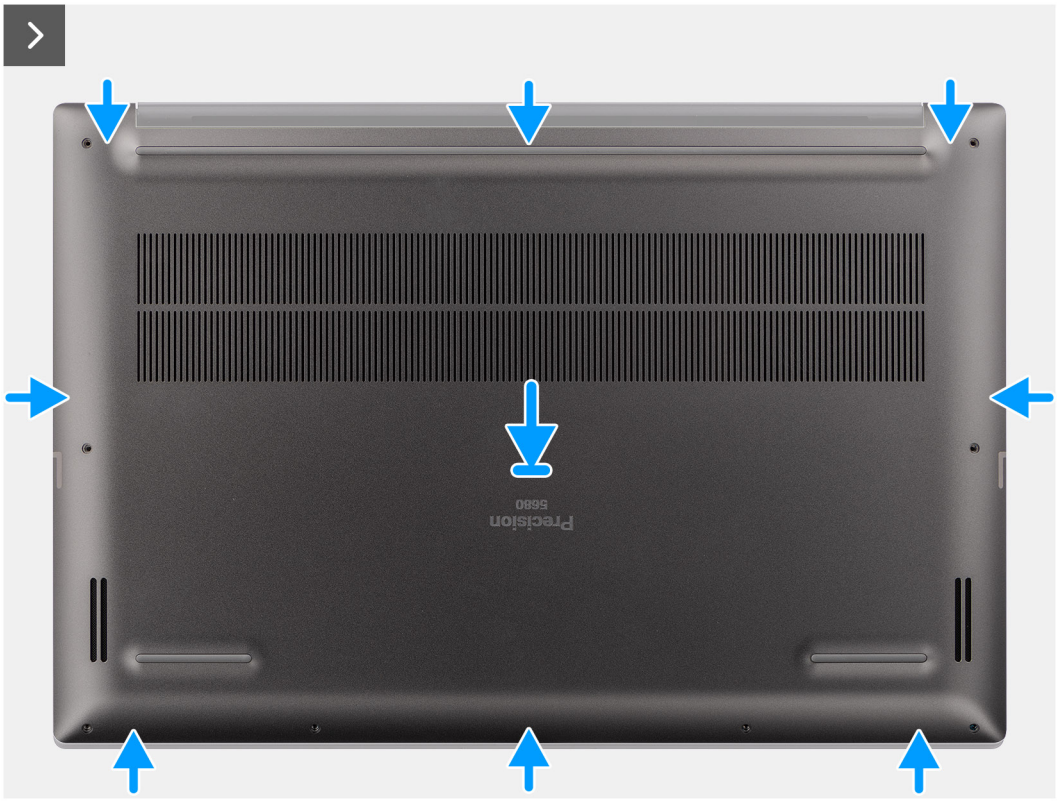
The following images indicate the location and provide a visual representation of the base cover installation procedure.












**8x**
M2x3



### Steps

1. Connect the battery FPC cable to the connector on the system board.
2. Tighten the two captive screws to secure the battery connector bracket in place.
3. Align and place the base cover on the palm-rest assembly, and snap the base cover into place.
4. Replace the eight (M2x3) T5 Torx screws to secure the base cover to the computer.

### Next steps

1. Install the SD card.
2. Follow the procedure in After working inside your computer.

# Solid-state drive

## Removing the M.2 2230 solid-state drive

### Prerequisites

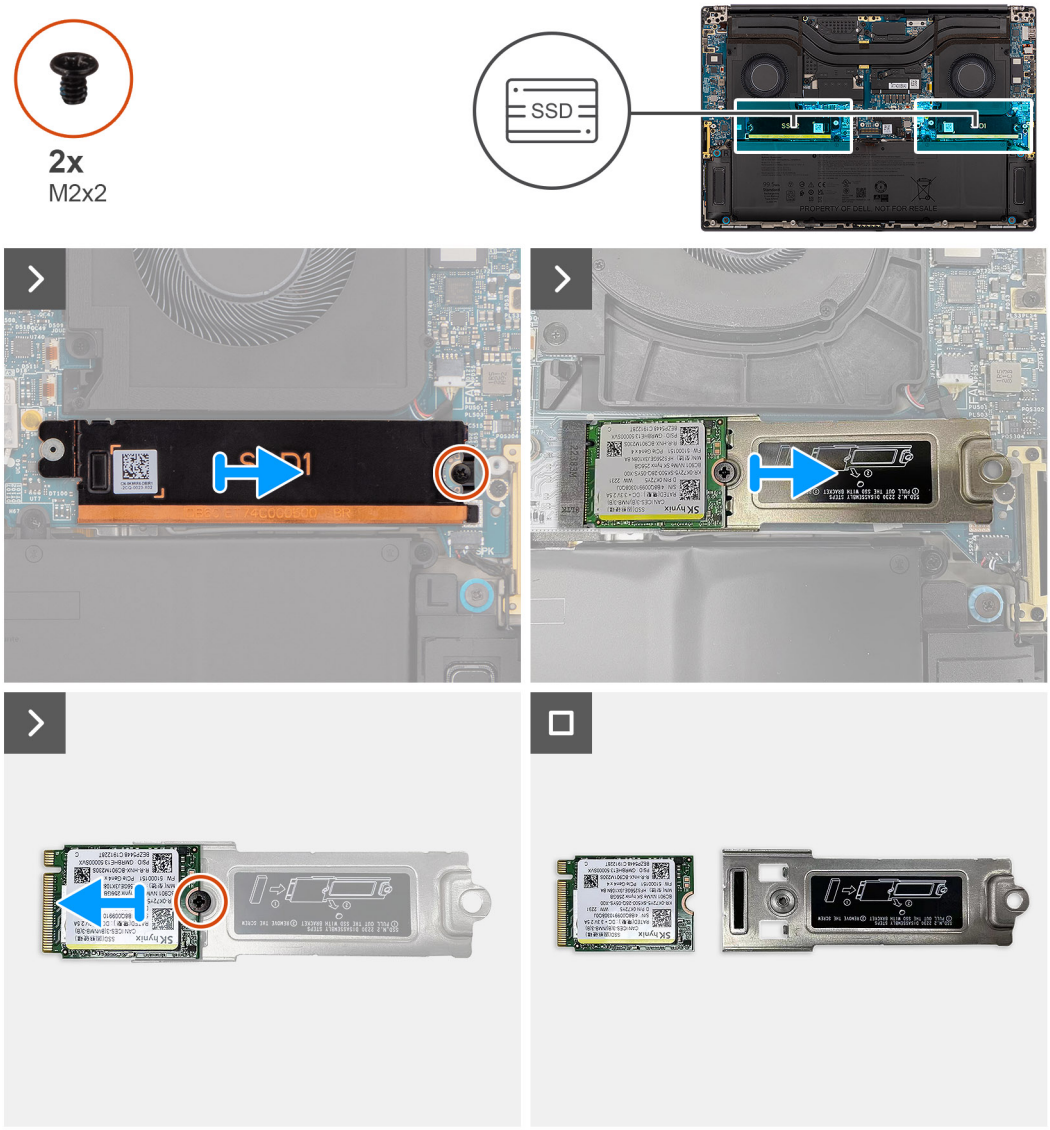
1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.

### About this task

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

The following images indicate the location of the solid-state drive and provide a visual representation of the removal procedure.

**NOTE:** The following procedure is applicable for models shipped with an M.2 2230 solid-state drive in the SSD1 and/or SSD2 slot.




### Steps

1. Remove the single (M2x2) screw that secures the solid-state drive thermal plate in place.
2. Remove the solid-state drive thermal plate from the system board.
3. Remove the M.2 2230 solid-state drive with the solid-state drive bracket from the system board.
4. Remove the single (M2x2) screw that secures the M.2 2230 solid-state drive to the solid-state drive bracket.
5. Remove the M.2 2230 solid-state drive from the solid-state drive bracket.

## Installing the M.2 2230 solid-state drive

### Prerequisites

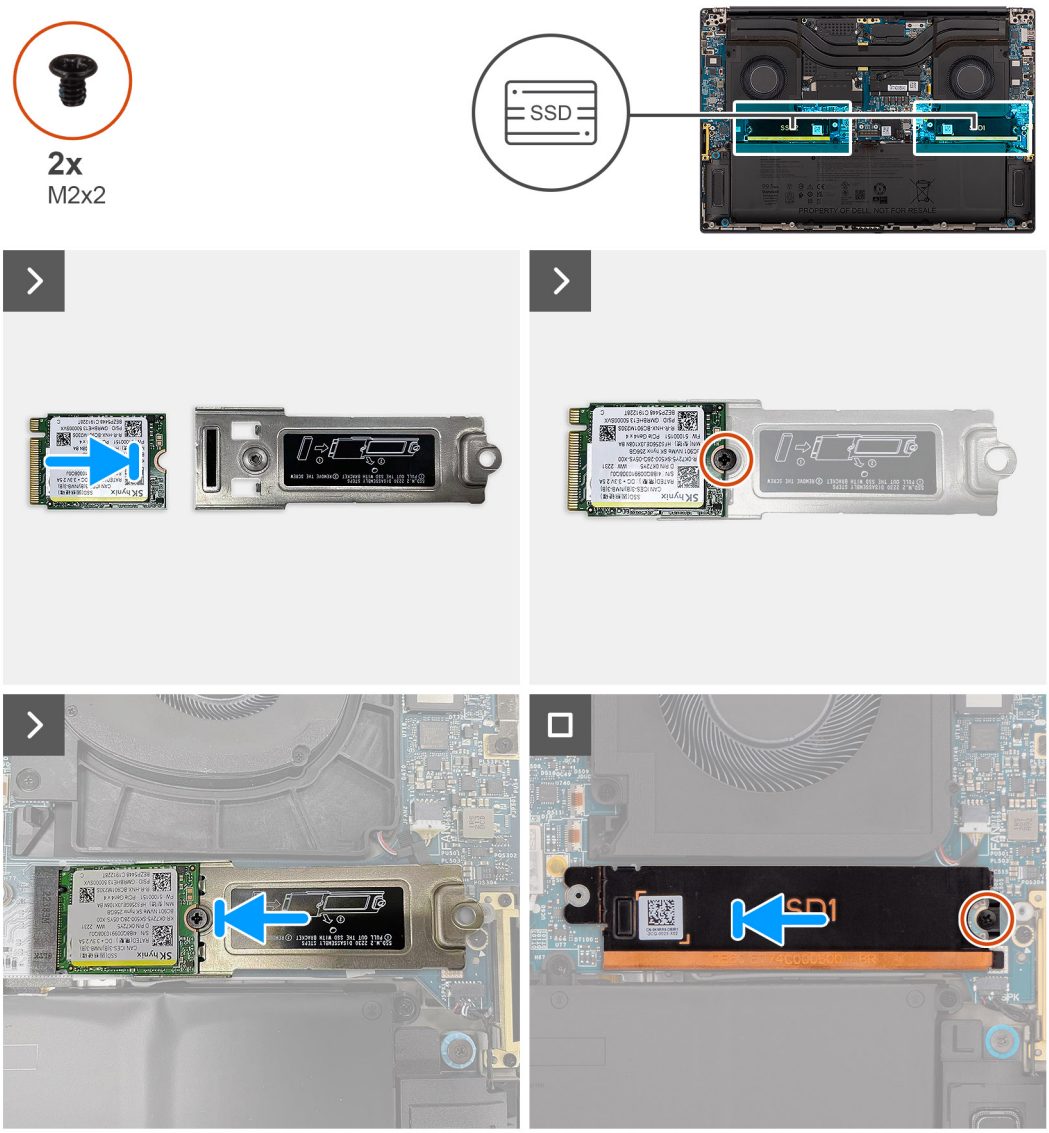
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

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

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

**NOTE:** The following procedure is applicable for models shipped with an M.2 2230 solid-state drive in the SSD1 and/or SSD2 slot.




### Steps

1. Align the screw hole on the M.2 2230 solid-state drive with the screw hole on the solid-state drive bracket.
2. Replace the single (M2x2) screw to secure the M.2 2230 solid-state drive to the solid-state drive bracket.
3. Align the notch on the solid-state drive with the tab on the M.2 card connector.
4. Slide the M.2 2230 solid-state drive with the solid-state drive bracket into the M.2 card connector on the system board.
5. Align and place the solid-state drive thermal plate in place.
6. Replace the single (M2x2) screw to secure the solid-state drive thermal plate to the system board.

### Next steps

1. Install the base cover.
2. Install the SD card.
3. Follow the procedure in After working inside your computer.

# Removing the M.2 2280 solid-state drive

### Prerequisites

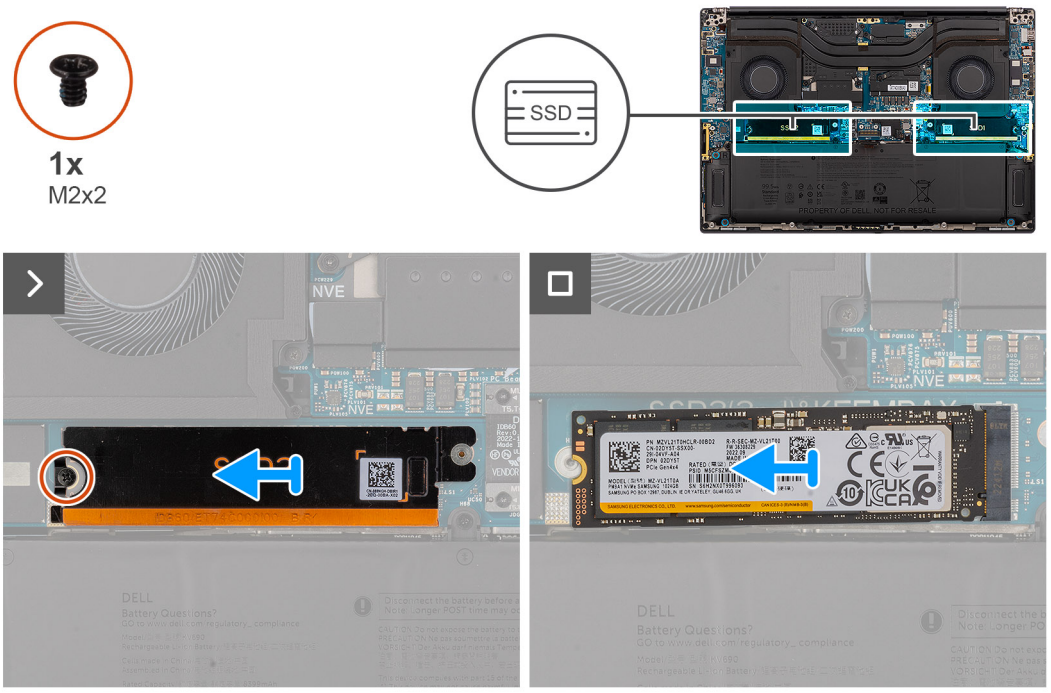
1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.

### About this task

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

The following images indicate the location of the solid-state drive and provide a visual representation of the removal procedure.

**NOTE:** The following procedure is applicable for models shipped with an M.2 2280 solid-state drive in the SSD1 and/or SSD2 slot.




### Steps

1. Remove the single (M2x2) screw that secures the solid-state drive thermal plate in place.
2. Remove the solid-state drive thermal plate from the system board.
3. Remove the M.2 2230 solid-state drive from the system board.

# Installing the M.2 2280 solid-state drive

### Prerequisites

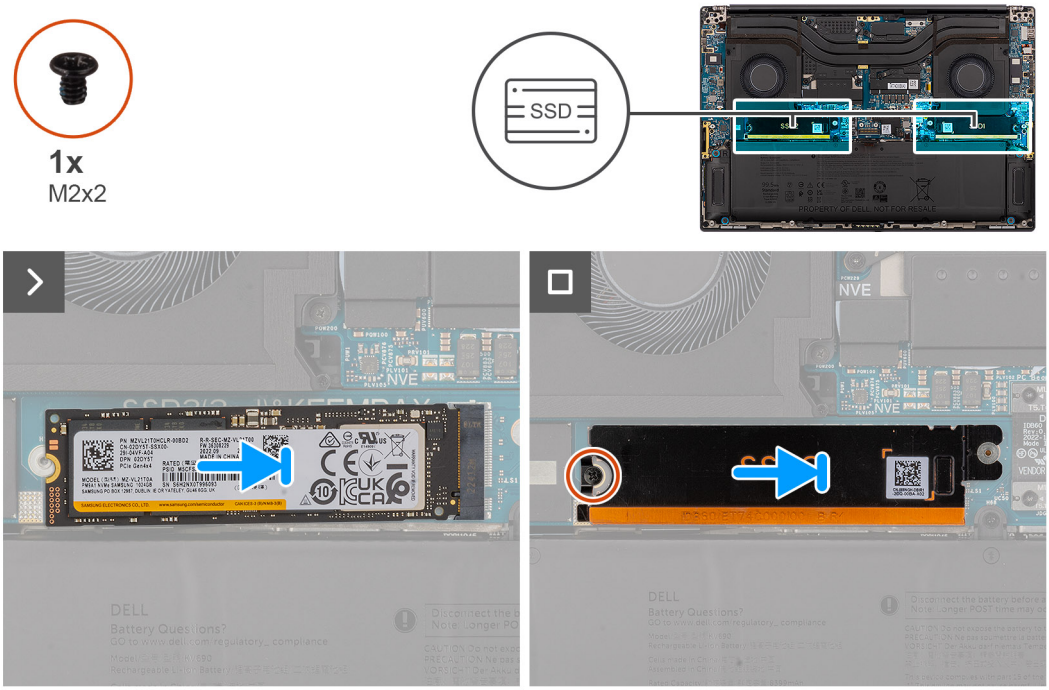
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

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

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

**NOTE:** The following procedure is applicable for models shipped with an M.2 2280 solid-state drive in the SSD1 and/or SSD2 slot.




### Steps

1. Align the notch on the solid-state drive with the tab on the M.2 card connector.
2. Slide the M.2 2280 solid-state drive into the M.2 card connector on the system board.
3. Align and place the solid-state drive thermal plate in place.
4. Replace the single (M2x2) screw to secure the solid-state drive thermal plate to the system board.

### Next steps

1. Install the base cover.
2. Install the SD card.
3. Follow the procedure in After working inside your computer.

# VPU card

## Removing the VPU card

### Prerequisites

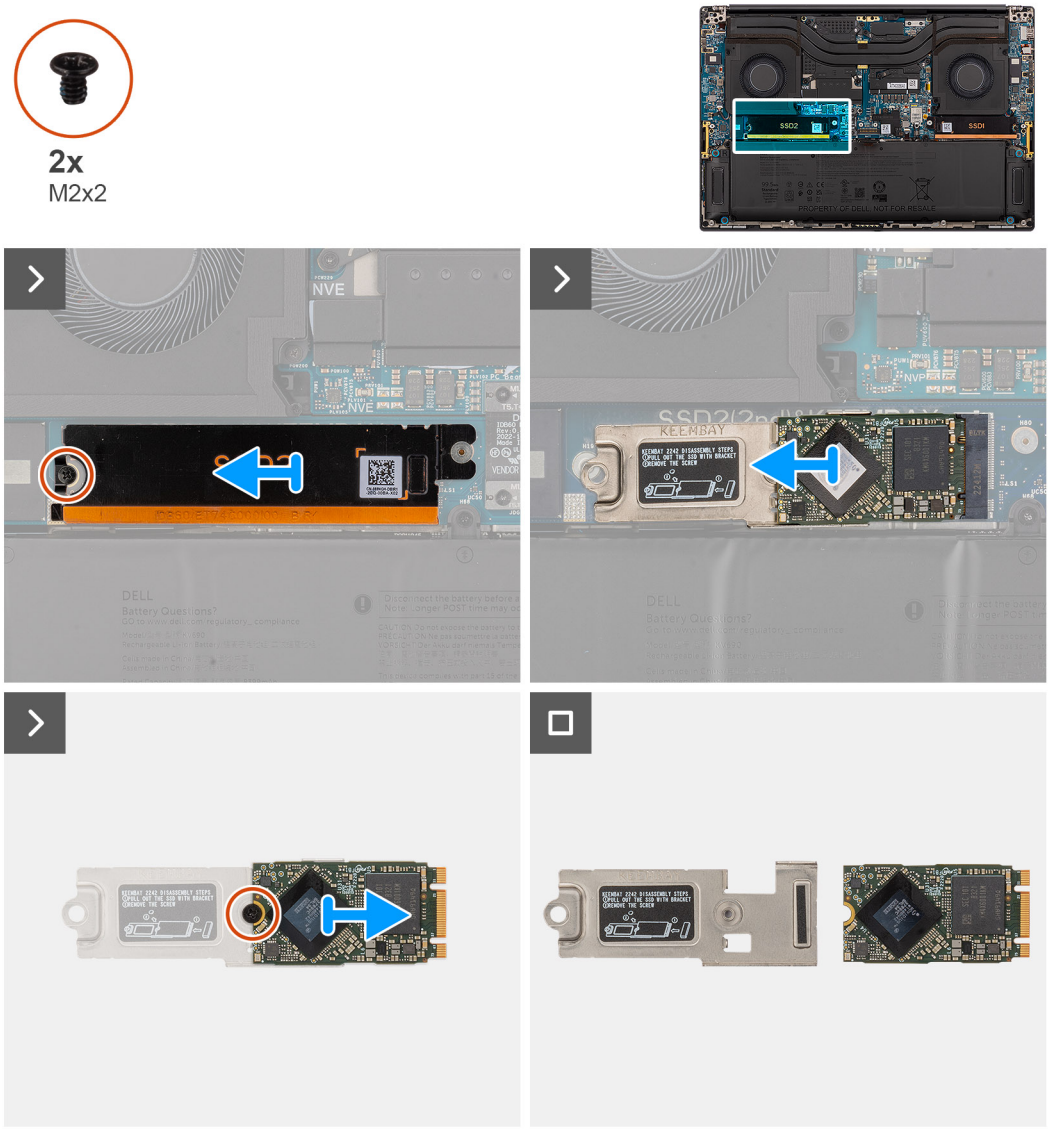
1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.

**NOTE:** The following procedure is applicable for models shipped with a VPU card in the SSD2 slot only.

### About this task

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

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




### Steps

1. Remove the single (M2x2) screw that secures the VPU card thermal plate in place.
2. Remove the VPU card thermal plate from the system board.
3. Remove the VPU card with VPU card bracket from the system board.
4. Remove the single (M2x2) screw that secures the VPU card to the VPU card bracket.
5. Remove the VPU card from the VPU card bracket.

## Installing the VPU card

### Prerequisites

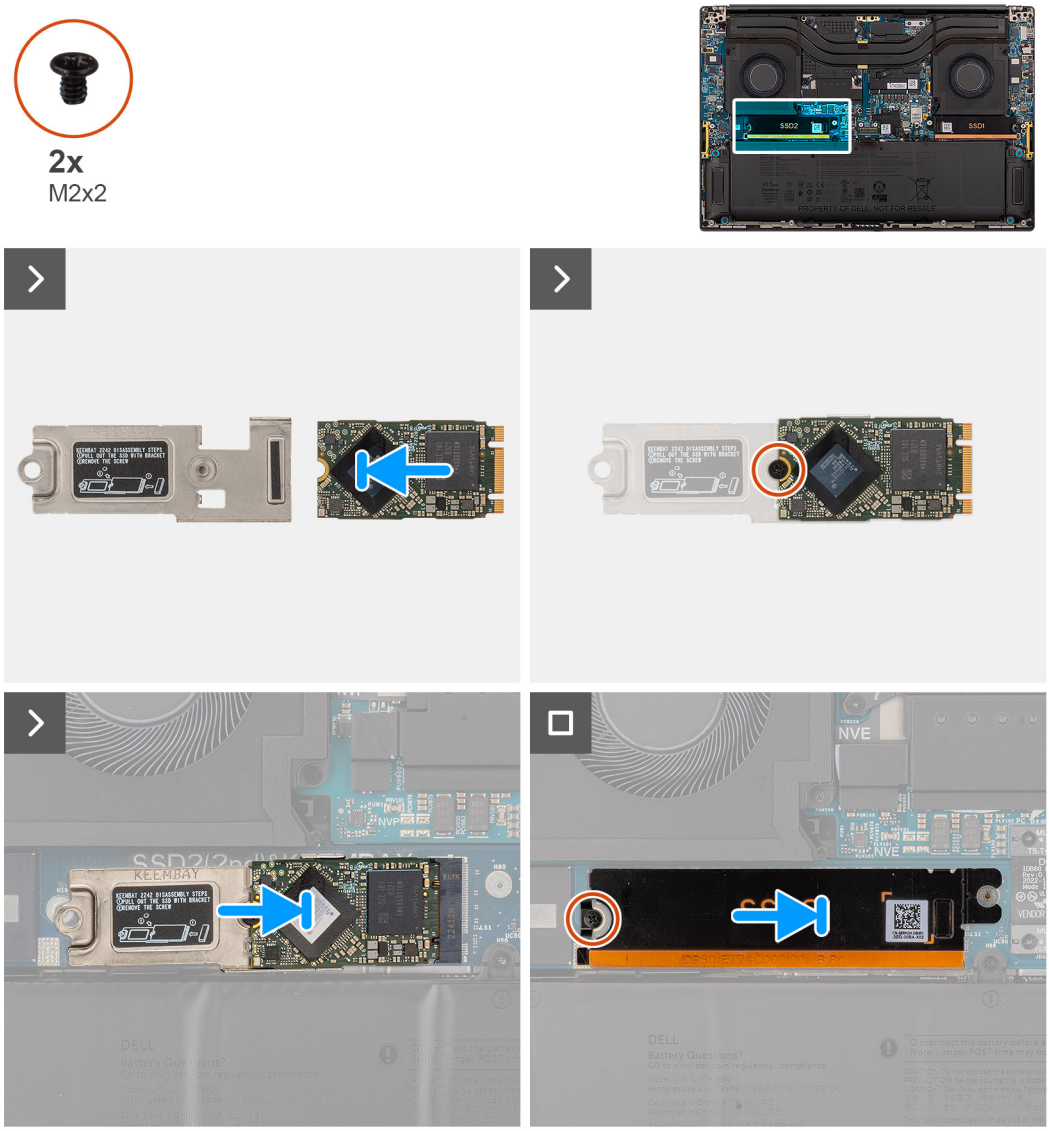
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

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

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

**NOTE:** The following procedure is applicable for models shipped with a VPU card in the SSD2 slot only.




### Steps

1. Align the screw hole on the VPU card with the screw hole on the VPU card bracket.
2. Replace the single (M2x2) screw to secure the VPU card to the VPU card bracket.
3. Align and place the VPU card with the VPU card bracket on the system board.
4. Align and place the VPU card thermal plate in place.
5. Replace the single (M2x2) screw to secure the VPU card thermal plate on the system board.

### Next steps

1. Install the base cover.
2. Install the SD card.
3. Follow the procedure in After 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 system 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.**
- **Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.**
- **If the battery gets stuck inside your computer as a result of 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 www.dell.com/contactdell.**
- **Always purchase genuine batteries from www.dell.com 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

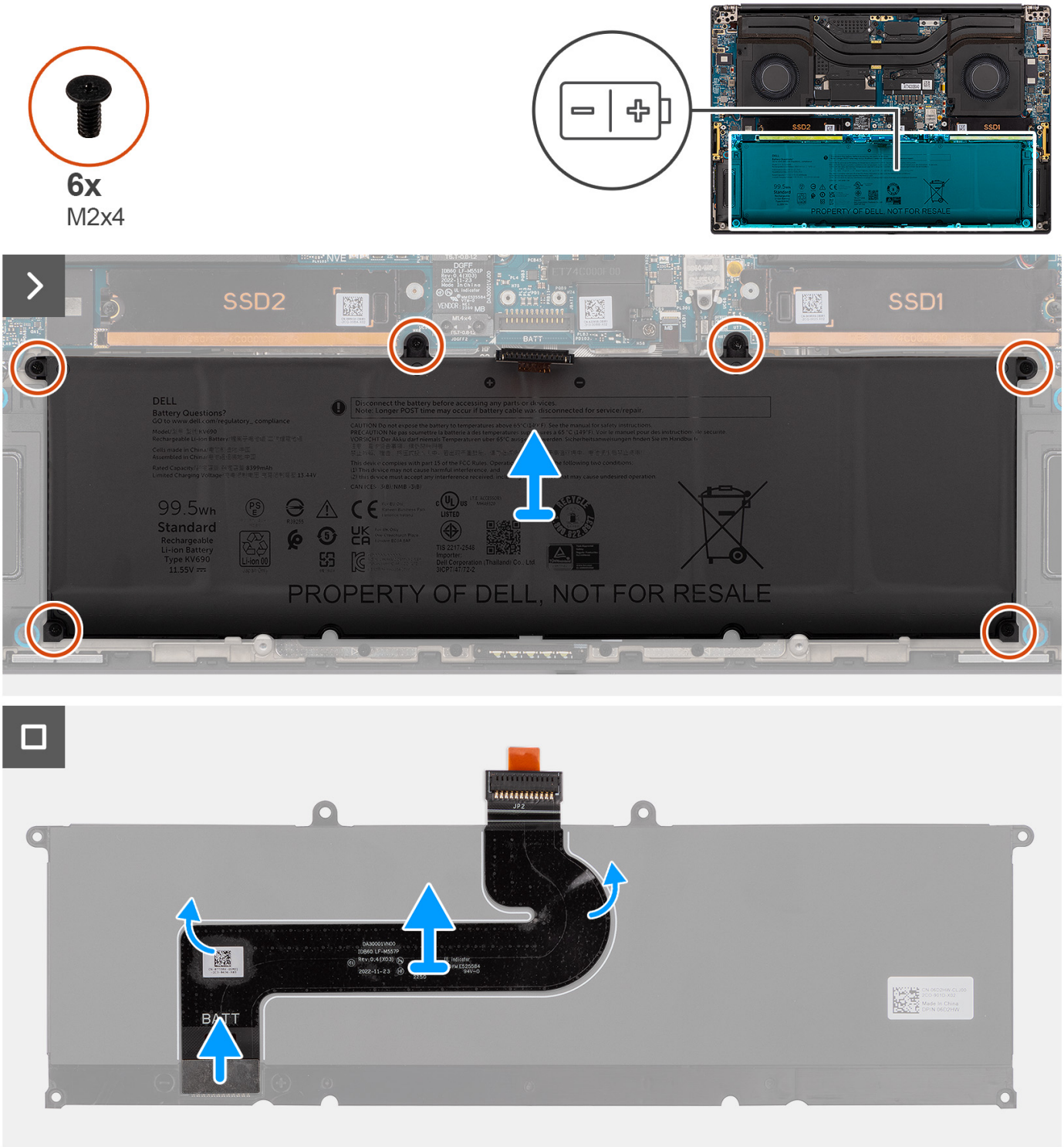
1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.

**NOTE:** If battery was disconnected from system board for service, there will be a delay during system boot-up as the system will undergo RTC battery reset.

### About this task

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

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




### Steps

1. Remove the six (M2x4) screws that secure the battery to the plam-rest assembly.
2. Lift the battery away from the computer.
3. Peel off the battery FPC cable from the battery.
4. Disconnect and remove the battery FPC cable from the connector on the battery.

**NOTE:** Pull the pull tab vertically to disconnect the battery FPC cable.

**NOTE:** When system battery is disconnected or completely discharged, the system date and time will be reset. When the system is power on under this condition, it will take slightly more time before the Dell logo is displayed, followed by the Time-of-day not set message. Select BIOS-Setup in the caution screen to configure the date and time.

# Installing the battery

### Prerequisites

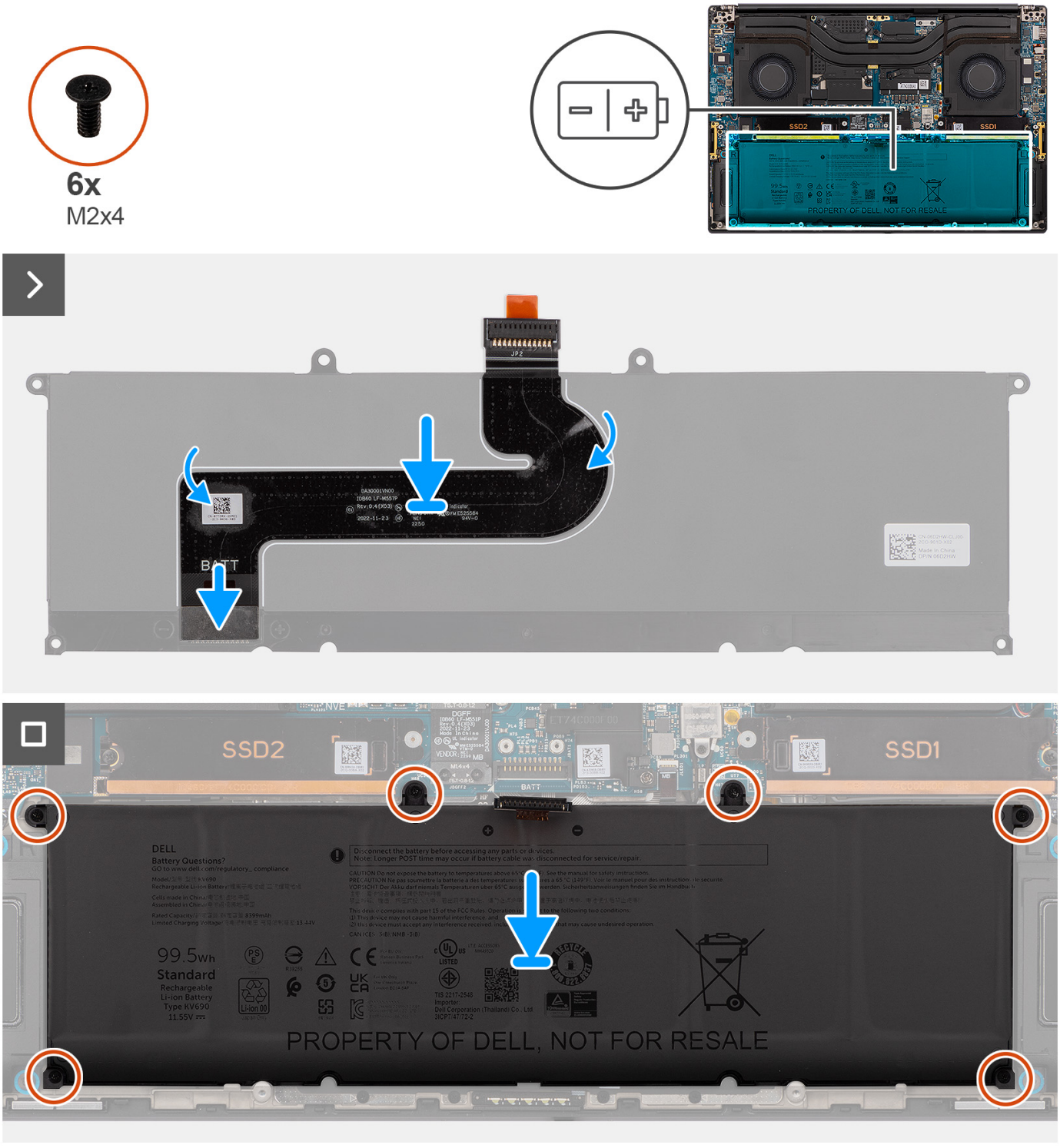
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

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

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

**NOTE:** If battery was disconnected from system board for service, there will be a delay during system boot-up as the system will undergo RTC battery reset.




### Steps

1. Connect the battery FPC cable to the connector on the battery.
2. Adhere the battery FPC cable on the battery.
3. Align and place the battery into the slot on the chassis.
4. Replace the six (M2x4) screws to secure the battery to the plam-rest assembly.

### Next steps

1. Install the base cover.

2. Install the SD card.
3. Follow the procedure in After working inside your computer.

# System fan

## Removing the left fan

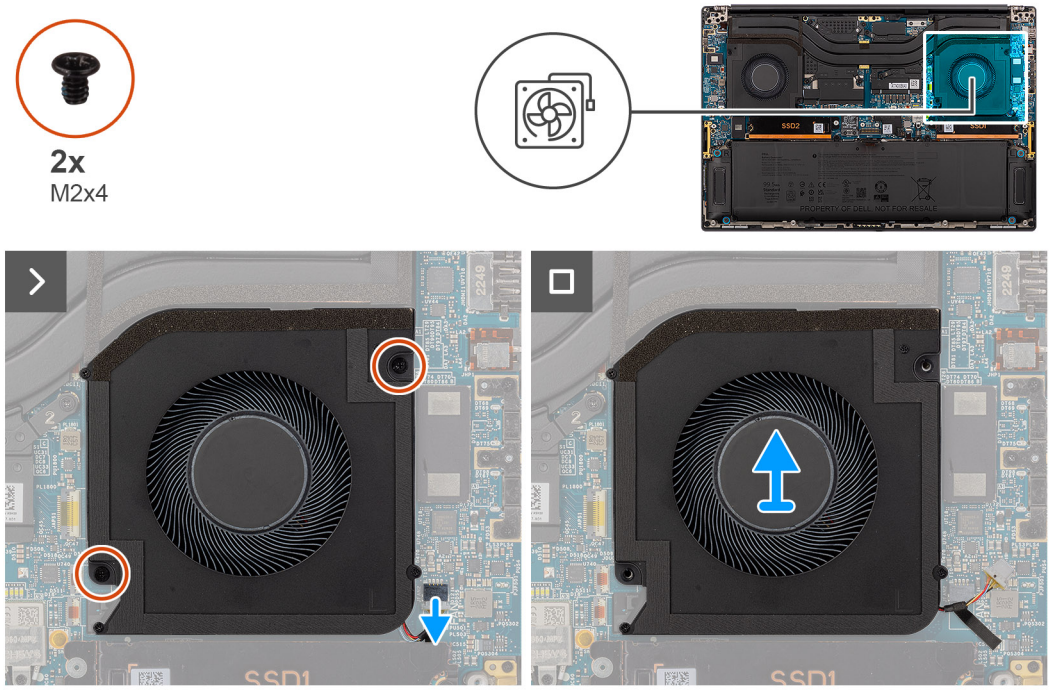
### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.

### About this task

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

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




### Steps

1. Disconnect the left-fan cable from the connector on the system board.
2. Remove the two (M2x4) screws that secure the left fan to the palm-rest assembly.
3. Lift the left fan from the outside and remove it from the palm-rest assembly.

## Installing the left fan

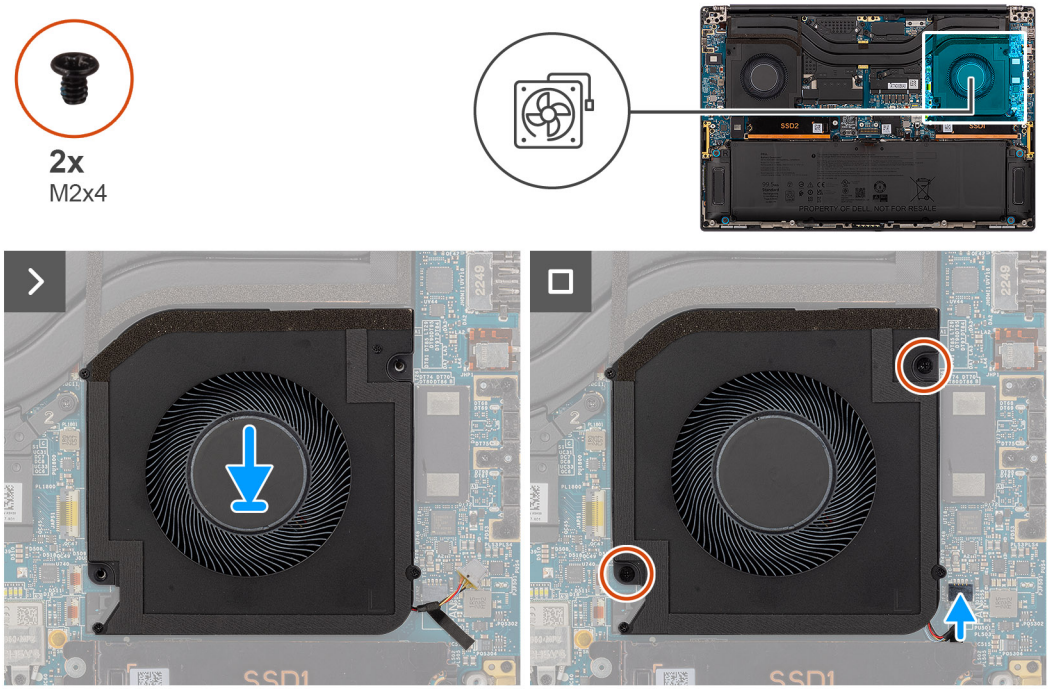
### Prerequisites

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

### About this task

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

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




### Steps

1. Align and place the left-fan onto the palm-rest assembly.
2. Replace the two (M2x4) screws to secure the left fan to the palm-rest assembly.
3. Connect the left fan cable to the connector on the system board.

### Next steps

1. Install the base cover.
2. Install the SD card.
3. Follow the procedure in After working inside your computer.

## Removing the right fan

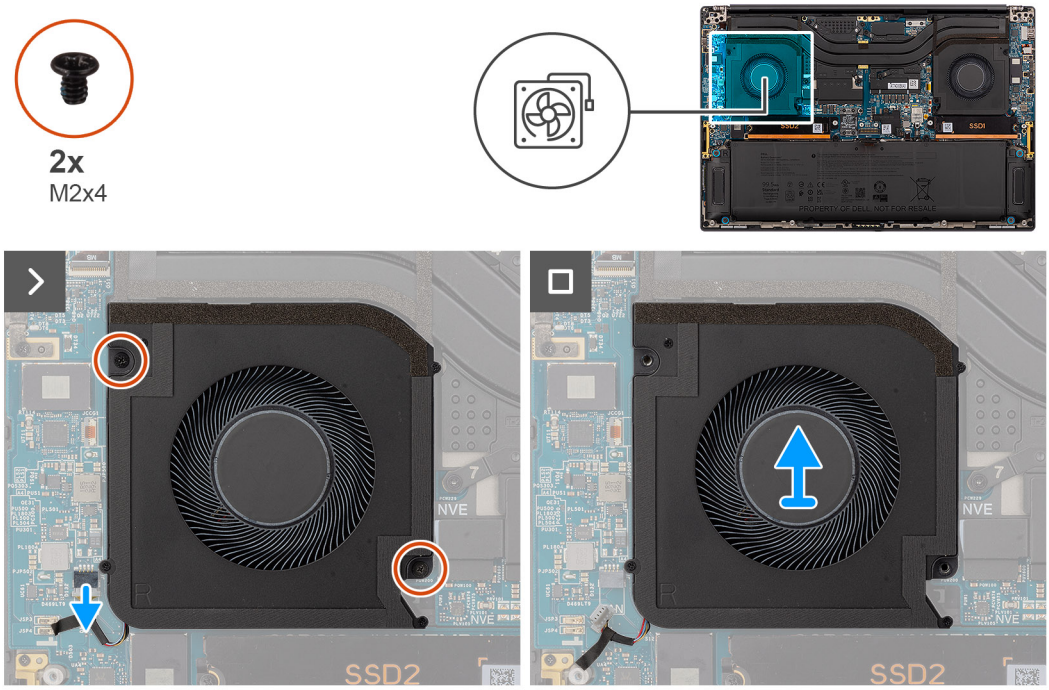
### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.

### About this task

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

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




### Steps

1. Disconnect the right-fan cable from the connector on the system board.
2. Remove the two (M2x4) screws that secure the right fan to the palm-rest assembly.
3. Lift the right fan from the outside and remove it from the palm-rest assembly.

## Installing the right fan

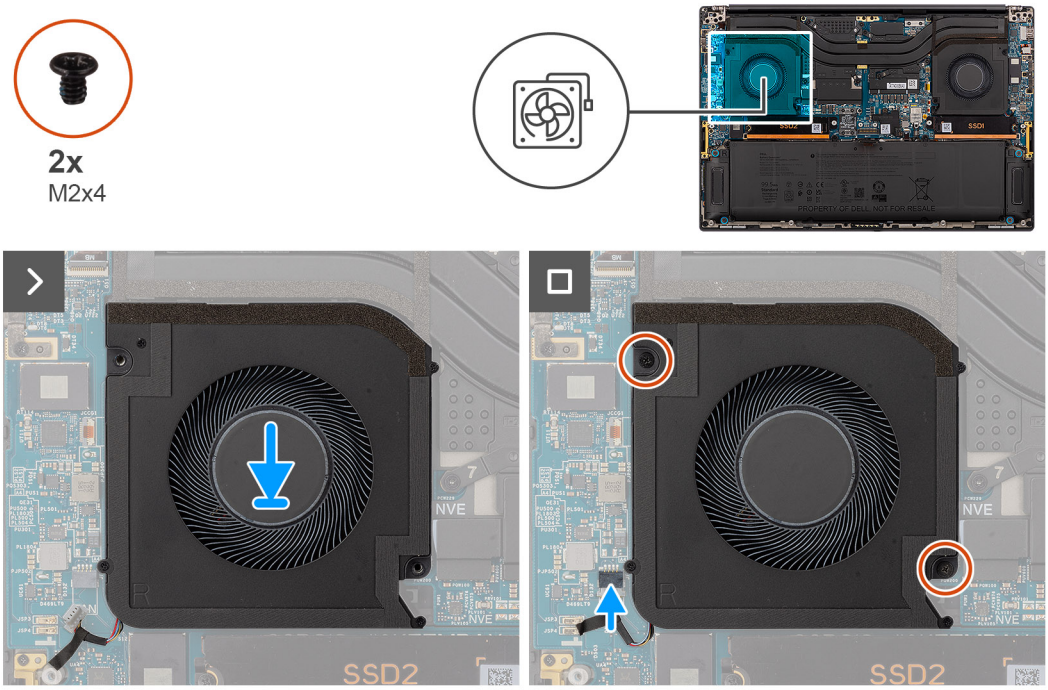
### Prerequisites

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

### About this task

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

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




### Steps

1. Align and place the right-fan onto the palm-rest assembly.
2. Replace the two (M2x4) screws to secure the right fan to the palm-rest assembly.
3. Connect the right fan cable to the connector on the system board.

### Next steps

1. Install the base cover.
2. Install the SD card.
3. Follow the procedure in After working inside your computer.

# Heat sink

## Removing the heat sink

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.

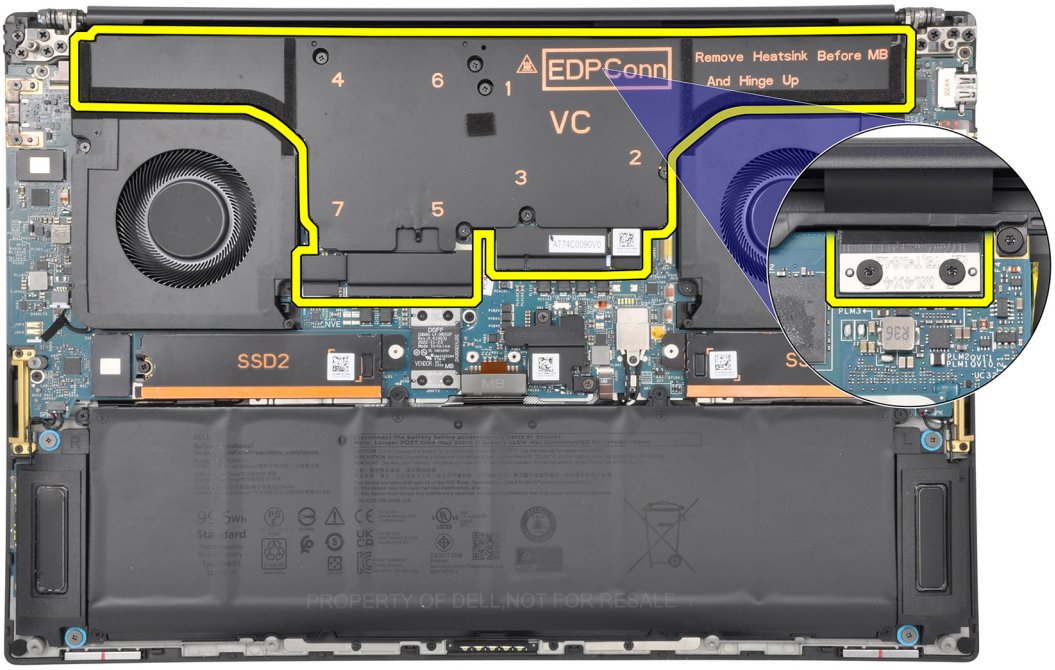
### About this task

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

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

**NOTE:** For models shipped with a heatsink labeled “VC” (Vapor Chamber), the heatsink must be removed prior to removal of the display assembly or system board.

**NOTE:** For models shipped with a heatsink labeled “VC” (Vapor Chamber), the heatsink covers the display cable:

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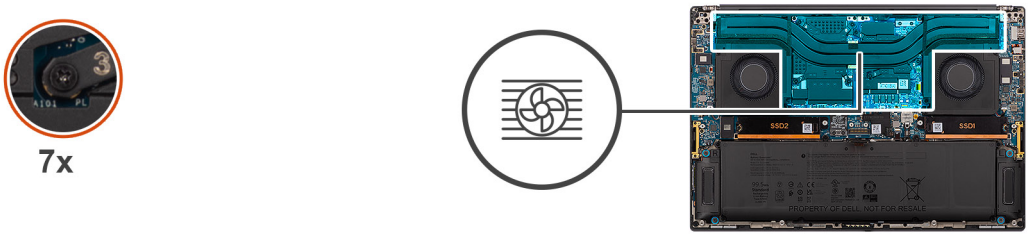
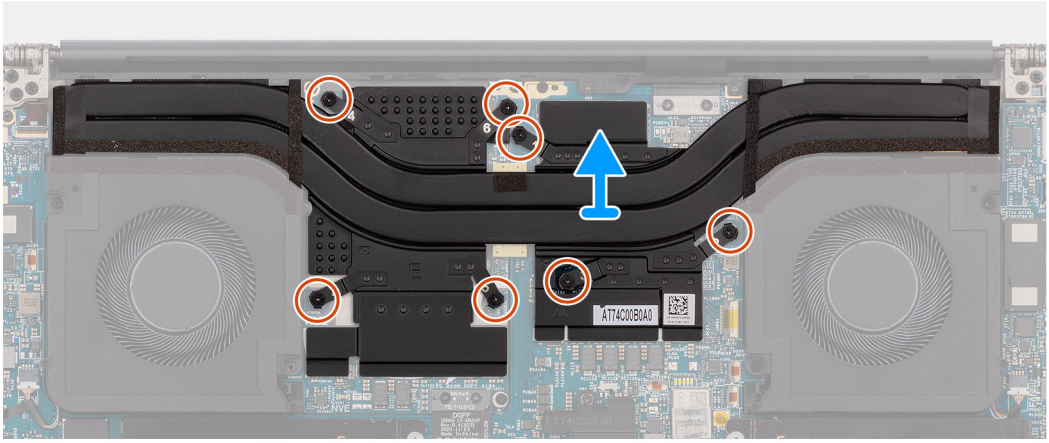


### Steps

1. For systems shipped with an integrated GPU card, loosen the three captive screws in descending order (3>2>1) that secure the heat sink to the system board.
2. For systems shipped with a discrete GPU card, loosen the seven captive screws in descending order (7>6>5>4>3>2>1) that secure the heat sink to the system board.
3. Lift the heat sink off the system board.

**NOTE:** Themal pads (thermal conductors) are on the heatsink. If the heatsink is replaced, the new heatsink is shipped with thermal pads. Ensure all thermal pads are in place between the heatsink and the system board.

# Installing the heat sink

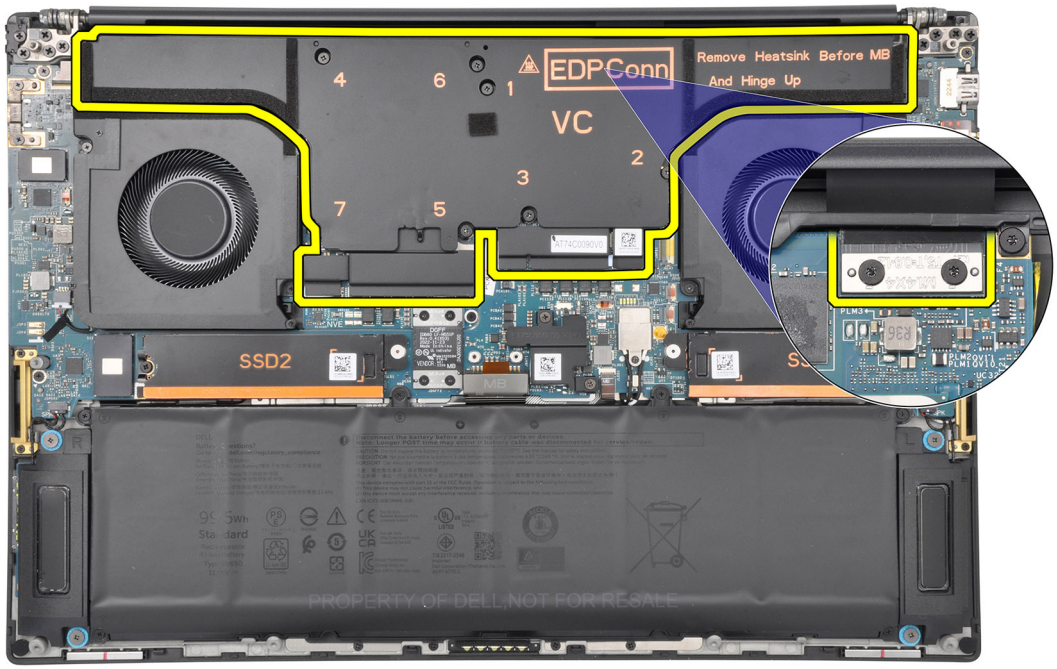
### Prerequisites

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

### About this task

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

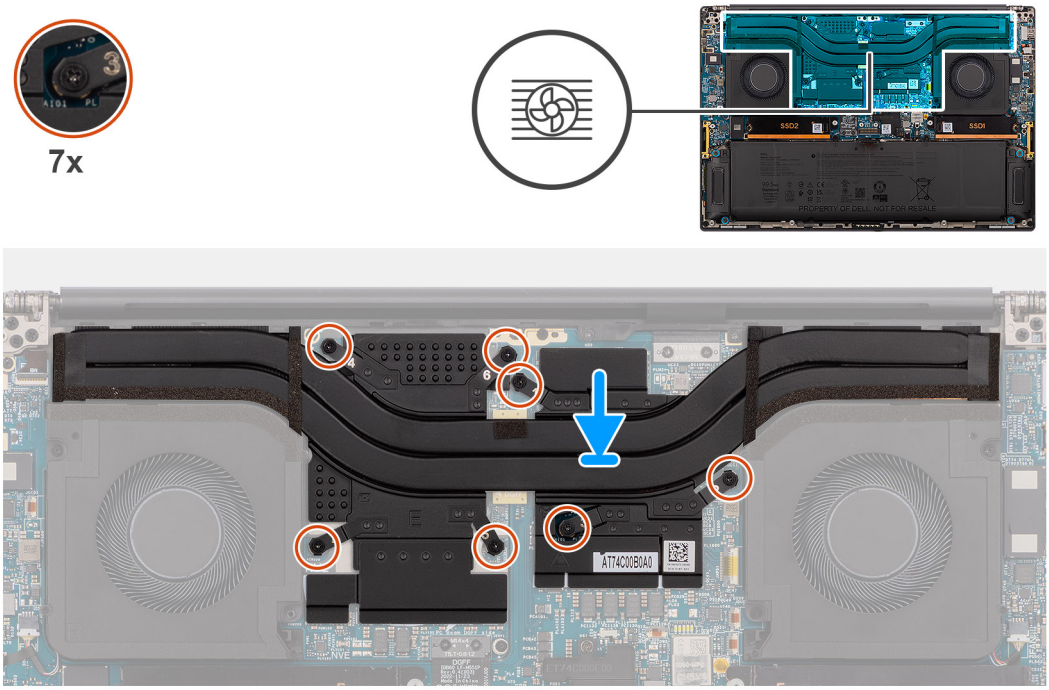
**NOTE:** For models shipped with a heatsink labeled “VC” (Vapor Chamber), the heatsink covers the display cable:




.

**NOTE:** Themal pads (thermal conductors) are on the heatsink. If the heatsink is replaced, the new heatsink is shipped with thermal pads. Ensure all thermal pads are in place between the heatsink and the system board.

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




### Steps

1. Align the screw holes on the heat sink with the screw holes on the system board.
2. For systems shipped with an integrated GPU card, tighten the three captive screws in ascending order (1>2>3) to secure the heat sink to the system board.
3. For systems shipped with a discrete GPU card, tighten the seven captive screws in ascending order (1>2>3>4>5>6>7) to secure the heat sink to the system board.

### Next steps

1. Install the base cover.
2. Install the SD card.
3. Follow the procedure in After working inside your computer.

# Display assembly

## Removing the display assembly

### Prerequisites

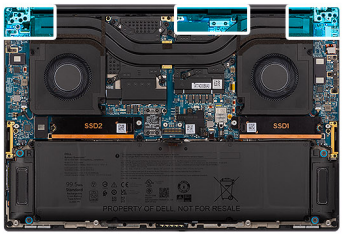
1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the heatsink for systems shipped with vapor chamber VC heatsink.

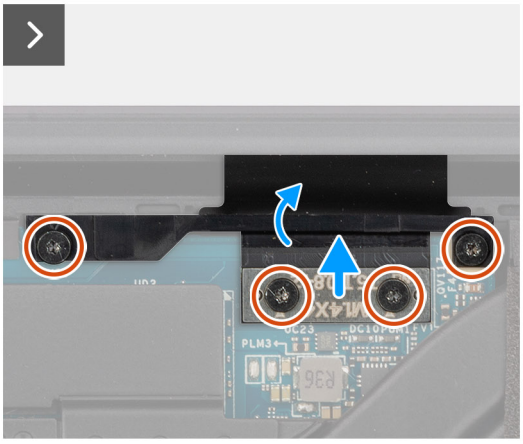
### About this task

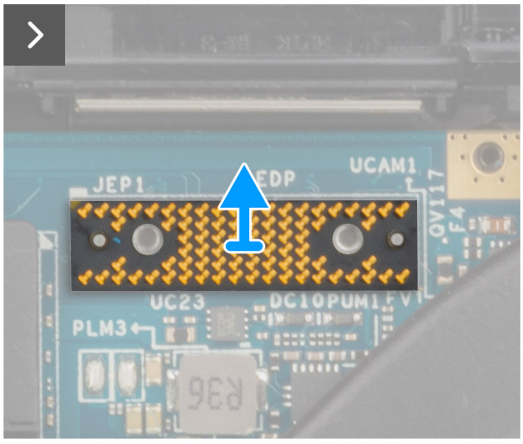
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

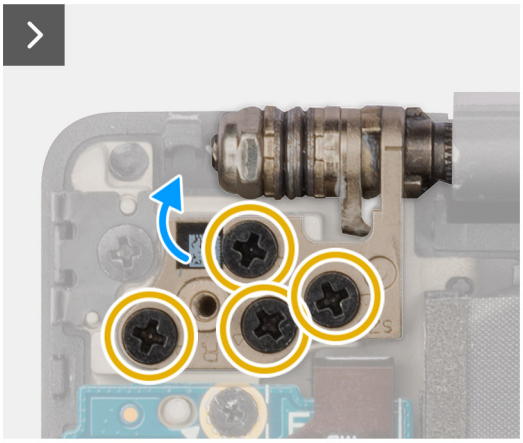
The following images indicate the location of the display assembly and provide a visual representation of the removal procedure.

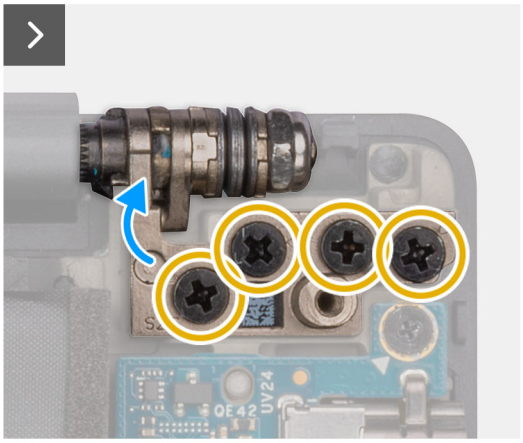

4x
M1.4x4
8x
M2.5x5

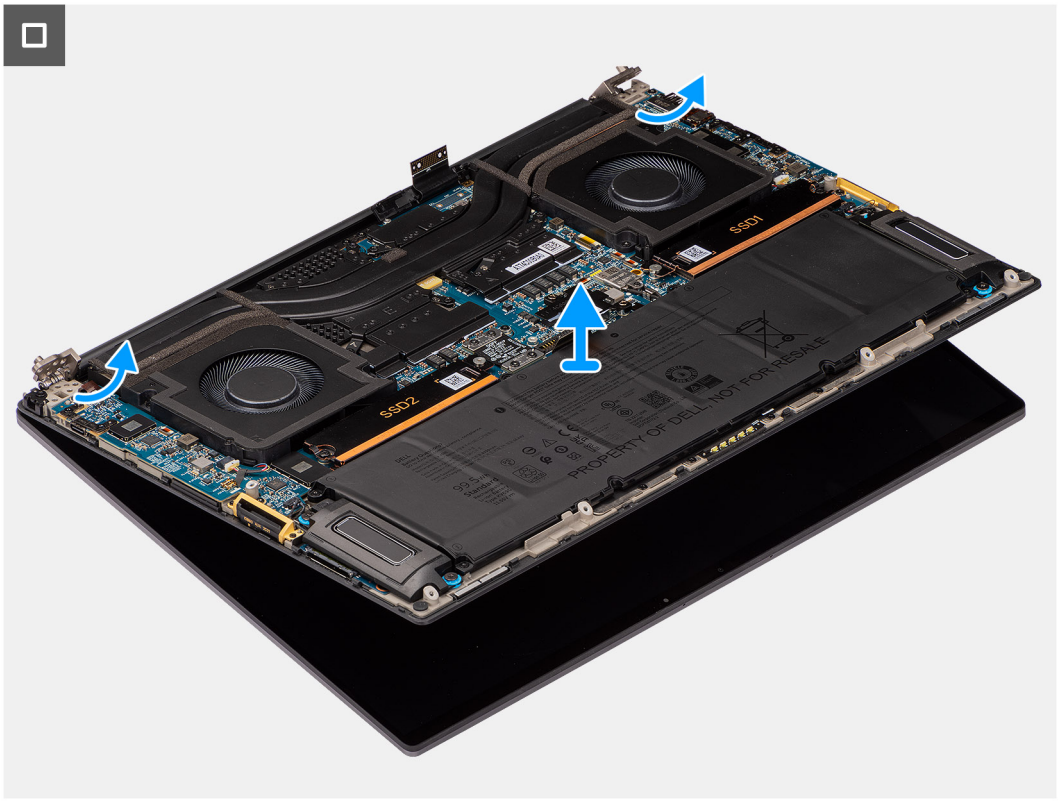





JEP1
EDP
UCAM1
UC23
PLM3



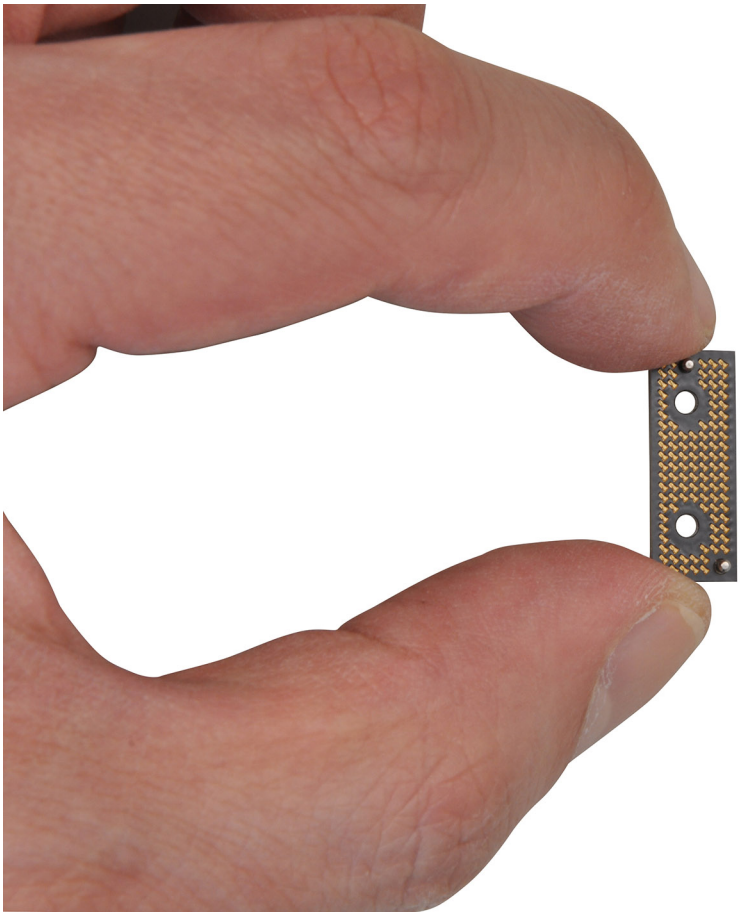





### Steps

1. Remove the two (M1.4x4) T5 Torx screws that secure the display FPC cover in place.
2. Flip open the display FPC cover.
3. Remove the two (M1.4x4) T5 Torx screws that secure the display FPC cable in place.
4. Disconnect the display FPC cable from the connector on the system board.
5. Remove the interposer board from the computer.

**CAUTION: Technicians must remove the interposer board immediately after disconnecting the display FPC to prevent the board from falling out of the computer during subsequent removal procedures. The pins on the interposer board are very fragile. Avoid contact with the pins on the board, instead handle the board by lifting and holding from the edges or the sides.**



6. Remove the eight (M2.5x5) screws that secure the display assembly to the computer.
7. Slightly lift the bottom assembly and slide it to the left and away from the display assembly. Remove the display assembly from the computer.

   **NOTE:** The display assembly is a Hinge-Up Design (HUD) assembly and cannot be further disassembled once it is removed from the bottom chassis. If any components in the display assembly are malfunctioning and need to be replaced, replace the entire display assembly.

## Installing the display assembly

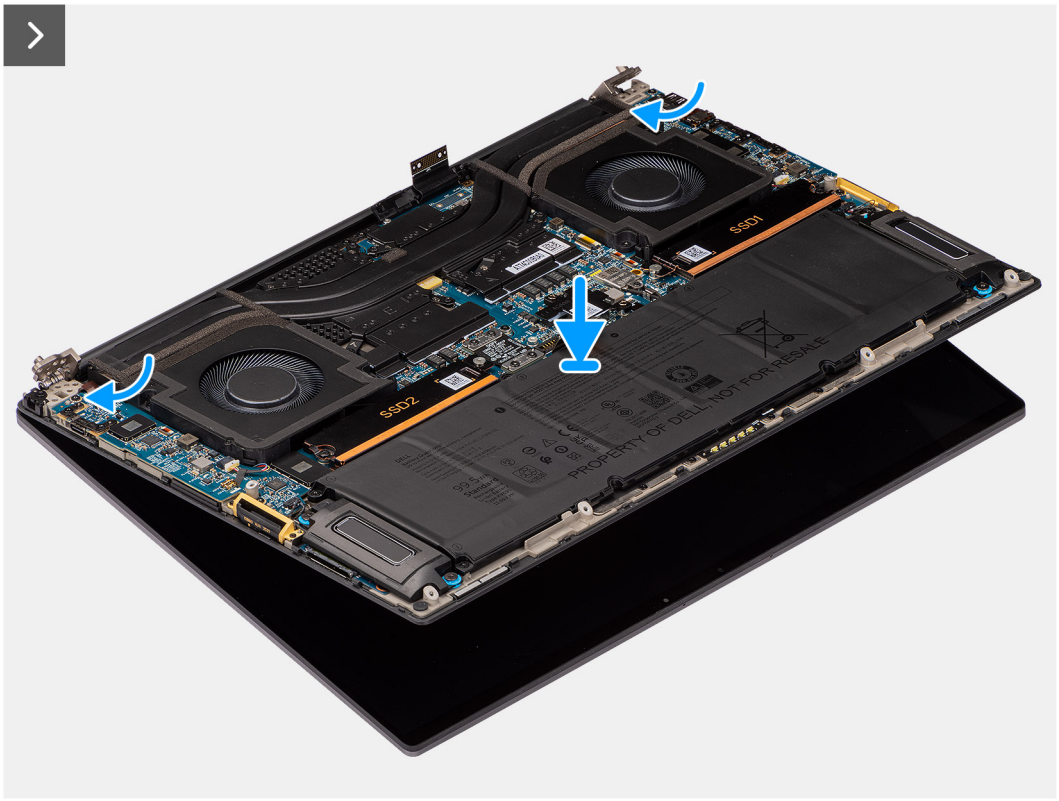
### Prerequisites

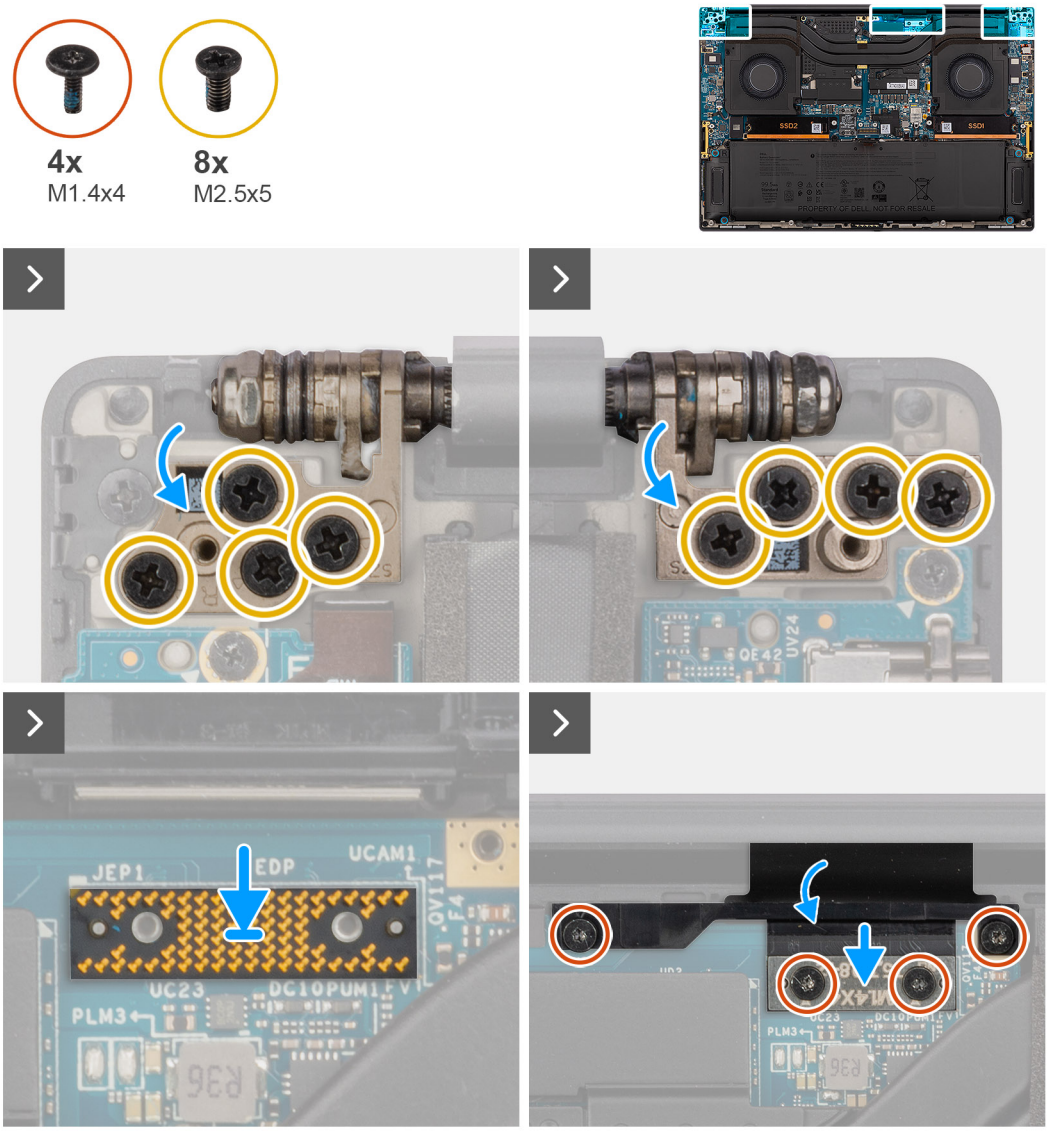
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

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

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


SSD1
SSD2
PROPERTY OF DELL. NOT FOR RESALE



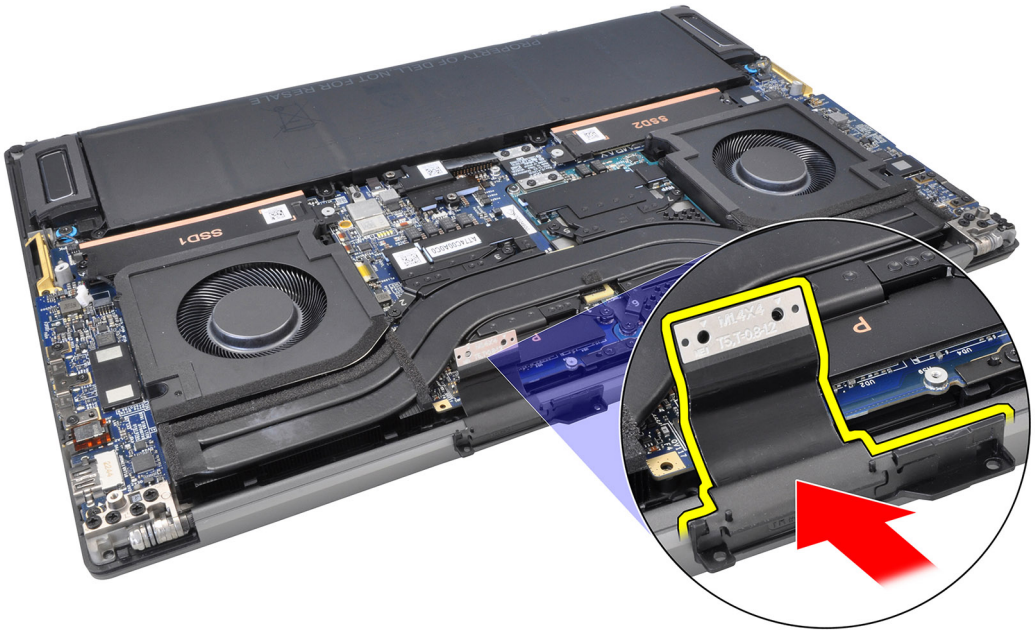

### Steps

1. Align and place the bottom assembly under the hinges of the display assembly.
2. Replace the eight (M2.5x5) screws to secure the display assembly to the computer.
3. Align and place the interposer board on the computer.

   **CAUTION: The pins on the interposer board are very fragile. Avoid contact with the pins on the board, instead handle the board by lifting and holding from the edges or the sides.**

4. Connect the display FPC cable to the connector on the system board.

**NOTE:** Tuck the display FPC into the gap between the system board and the palm-rest before connecting the display FPC to the system board.



5. Replace the two (M1.4x4) T5 Torx screws to secure the display FPC cable in place.
6. Flip close the display FPC cover.
7. Replace the two (M1.4x4) T5 Torx screws to secure the display FPC cover in place.

### Next steps

1. Install the heatsink for systems shipped with vapor chamber VC heatsink.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in After working inside your computer.

# SD-card reader daughterboard

## Removing the SD-card reader daughterboard

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.

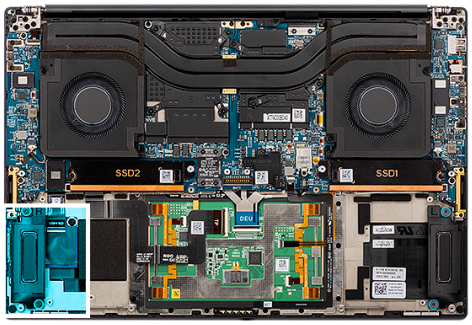
### About this task

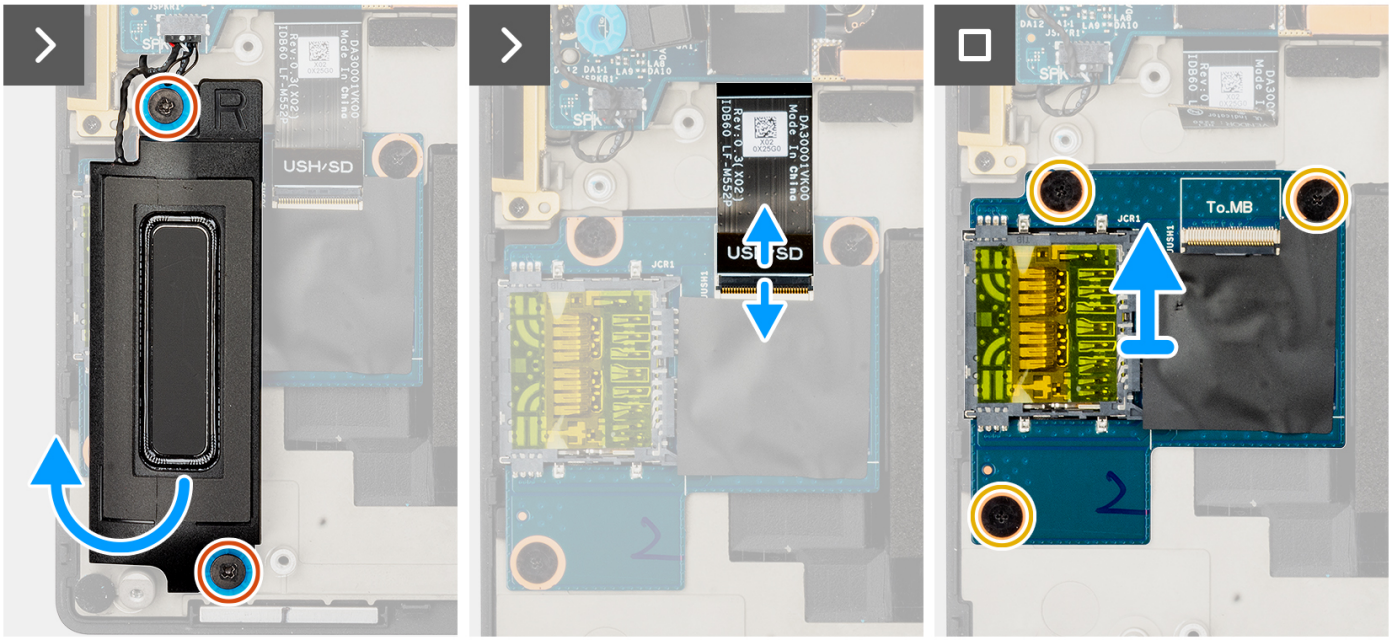
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

**NOTE:** The following procedure is applicable for computers shipped without a USH module only.

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




### Steps

1. Remove the two (M1.6x1.8) screws that secure the right speaker in place.
2. Slightly lift the right speaker from the palm-rest assembly.

   **CAUTION: Do not completely remove the right speaker, as it is still attached to the tweeter underneath the system board.**

3. Disconnect the SD-card reader daughterboard FFC from the connector on the SD-card reader daughterboard.
4. Remove the three (M2x1.5) screws that secure the SD-card reader daugherboard to the palm-rest assembly.
5. Lift and remove the SD-card reader daugherboard from the palm-rest assembly.

## Installing the SD-card reader daughterboard

### Prerequisites

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

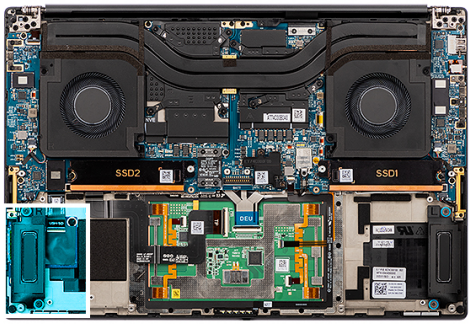
### About this task

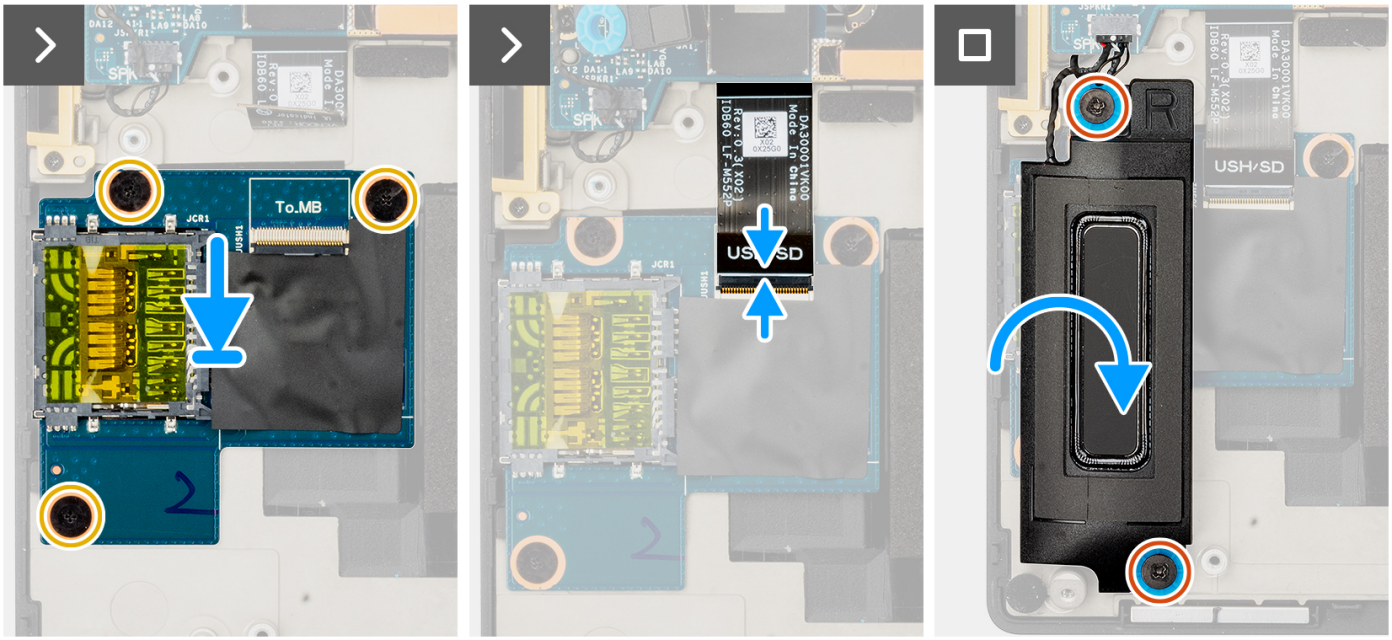
**CAUTION: The information in this installation section is intended for authorized service technicians only.**

**NOTE:** The following procedure is applicable for systems shipped without a USH module only.

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




### Steps

1. Align and place the SD-card reader daugherboard into the slot on the palm-rest assembly.
2. Replace the three (M2x1.5) screws to secure the SD-card reader daugherboard to the palm-rest assembly.
3. Connect the SD-card reader daugherboard FFC cable to the connector on the SD card reader daugherboard.
4. Align and place the right speaker into the slot on the palm-rest assembly.
5. Replace the two (M1.6x1.8) screws to secure the right speaker in place.

### Next steps

1. Install the battery.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in After working inside your computer.

# USH and SD-card reader daughterboard

## Removing the USH and SD-card reader daughterboard

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.

2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.

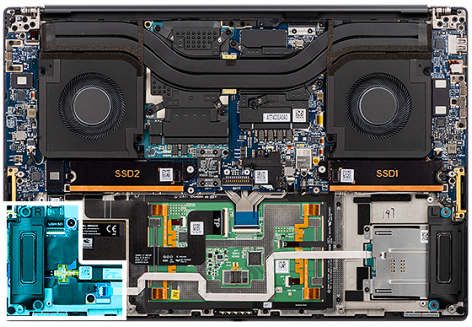
### About this task

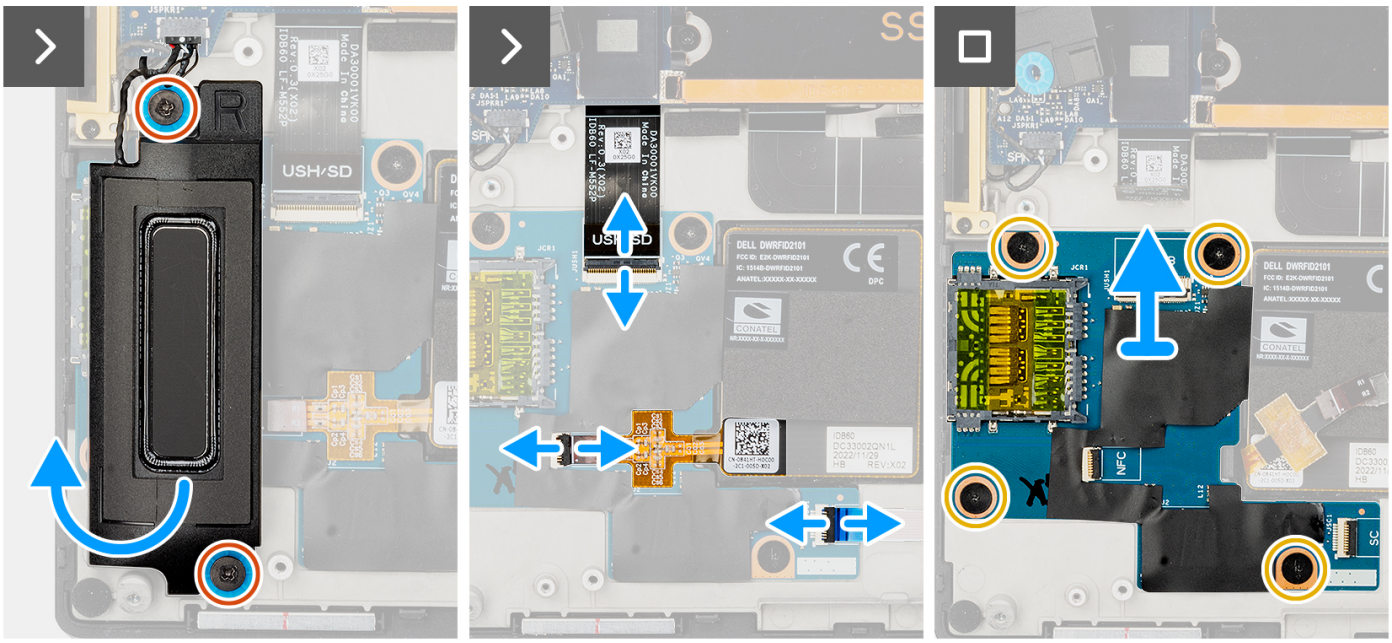
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

**NOTE:** The following procedure is applicable for computers shipped with a USH module only.

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




### Steps

1. Remove the two (M1.6x1.8) screws that secure the right speaker in place.
2. Slightly lift the right speaker from the palm-rest assembly.

   **CAUTION: Do not completely remove the right speaker, as it is still attached to the tweeter underneath the system board.**

3. Disconnect the USH and SD-card reader daughterboard FFC cable, smart-card reader FFC cable (for systems shipped with a SmartCard) and NFC module FFC cable from the connectors on the USH and SD-card reader daughterboard.
4. Peel back the NFC module FFC from the USH and SD-card reader daughterboard.
5. Remove the four (M2x1.5) screws that secure the USH and SD-card reader daugherboard to the palm-rest assembly.
6. Lift and remove the USH and SD-card reader daugherboard from the palm-rest assembly.

# Installing the USH and SD-card reader daughterboard

### Prerequisites

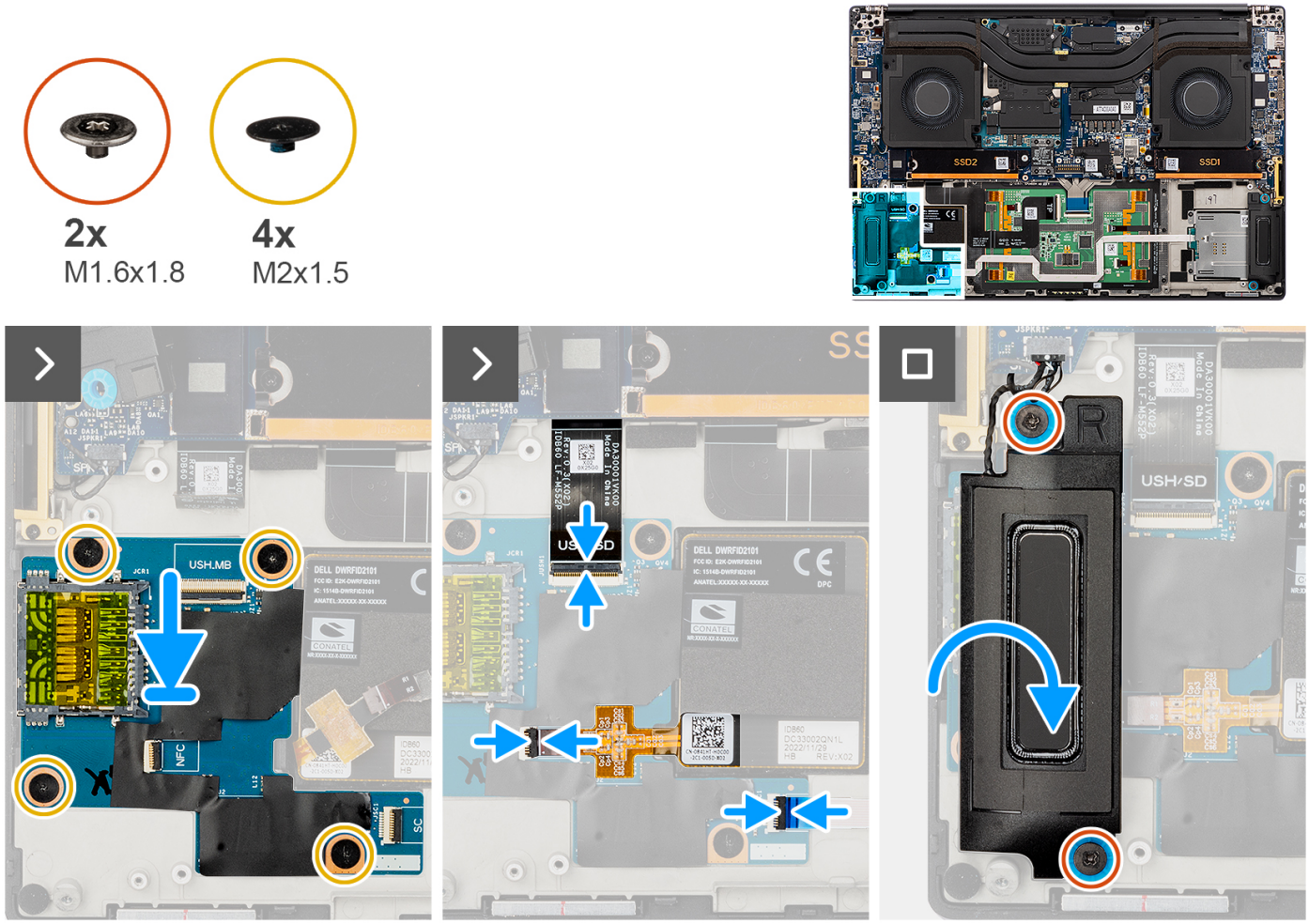
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

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

**NOTE:** The following procedure is applicable for computer shipped with a USH module only.

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




### Steps

1. Align and place the USH and SD-card reader daugherboard into the slot on the palm-rest assembly.
2. Replace the four (M2x1.5) screws to secure the USH and SD-card reader daugherboard to the palm-rest assembly.
3. Adhere the NFC module FFC on the USH and SD-card reader daughterboard.
4. Connect the USH and SD-card reader daughterboard FFC cable, smart-card reader FFC cable (for systems shipped with a SmartCard) and NFC module FFC cable to the connector on the SD-card reader daugherboard.
5. Align and place the right speaker into the slot on the palm-rest assembly.
6. Replace the two (M1.6x1.8) screws to secure the right speaker in place.

### Next steps

1. Install the battery.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in After working inside your computer.

# Smart-card reader

## Removing the smart-card reader

### Prerequisites

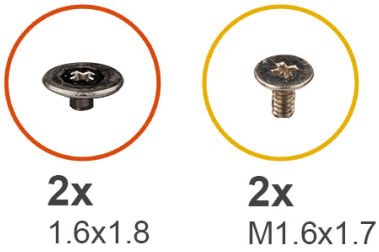
1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the Battery.

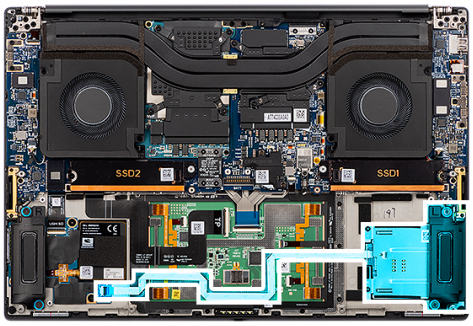
### About this task

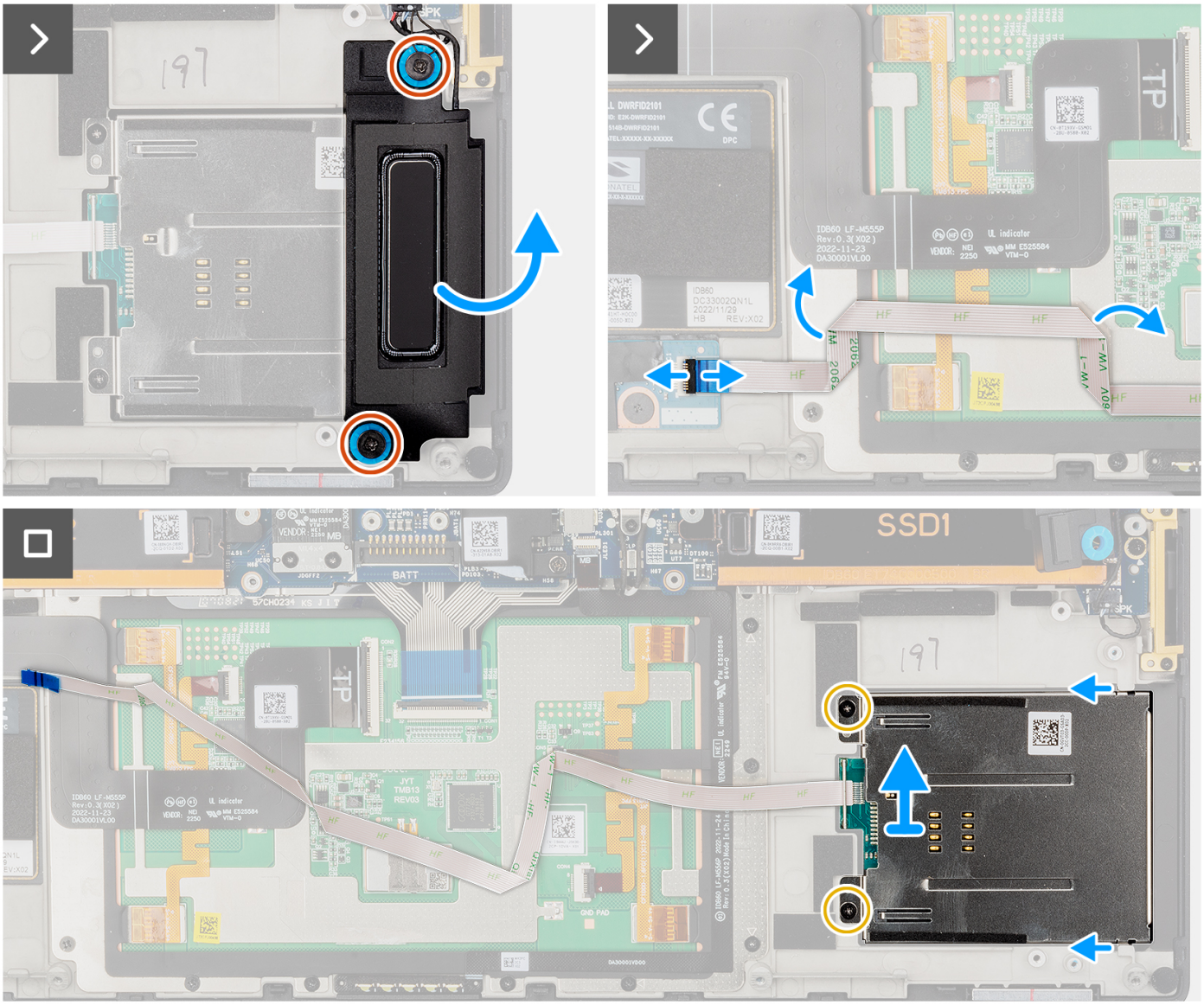
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

**NOTE:** The following procedure is applicable for systems shipped with a smart-card reader only.

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




### Steps

1. Remove the two (M1.6x1.8) screws that secure the left speaker in place.
2. Slightly lift the left speaker from the chassis.

   **CAUTION: Do not completely remove the left speaker, as it is still attached to the tweeter underneath the system board.**

3. Disconnect the smart-card reader FFC cable from the connectors on the USH and SD card reader daughterboard.
4. Peel back the smart-card reader FFC from the palm-rest assembly.

5. Remove the two (M1.6x1.7) screws that secure the smart-card reader in place.
6. Lift and remove the smart-card reader with the smart-card reader FFC from the chassis.

# Installing the smart-card reader

### Prerequisites

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

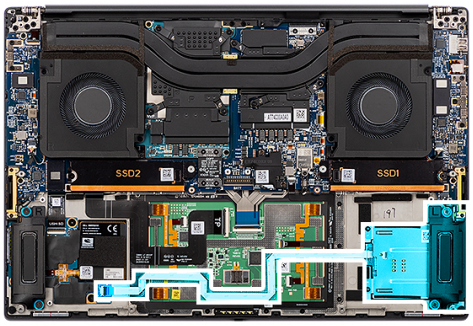
### About this task

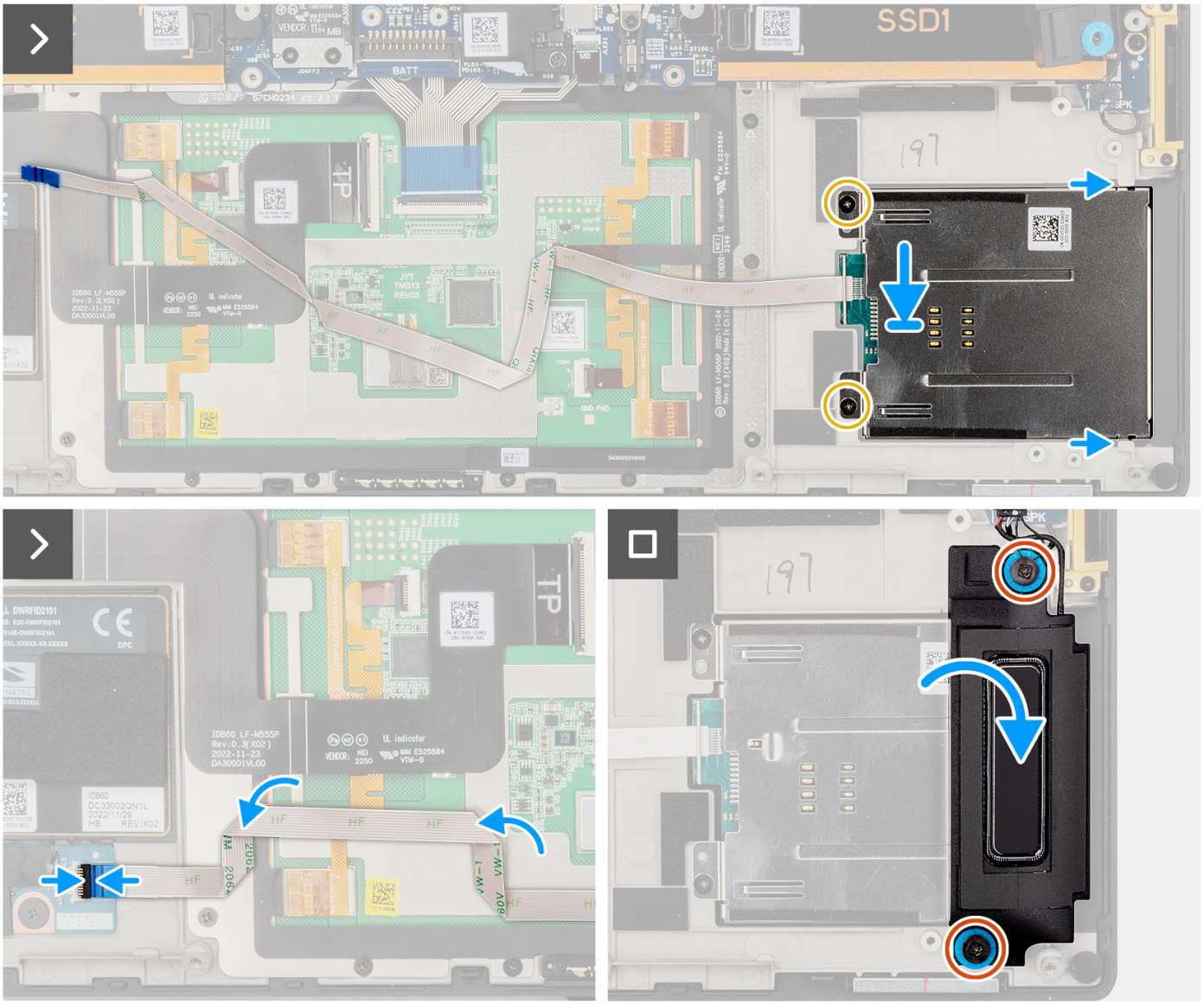
**CAUTION: The information in this installation section is intended for authorized service technicians only.**

**NOTE:** The following procedure is applicable for systems shipped with a smart-card reader only.

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




### Steps

1. Align and place the smart-card reader with the smart-card reader FFC into the slot on the chassis.
2. Replace the two (M1.6x1.7) screws to secure the smart-card reader to the chassis.
3. Adhere the smart-card reader FFC on the palm-rest assembly.
4. Connect the smart-card reader FFC cable to the connector on the USH and SD card reader daugherboard.
5. Align and place the left speaker into the slot on the chassis.
6. Replace the two (M1.6x1.8) screws to secure the left speaker in place.

### Next steps

1. Install the Battery.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in After working inside your computer.

# GPU card

## Removing the GPU card

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the Battery.
5. Remove the heatsink.

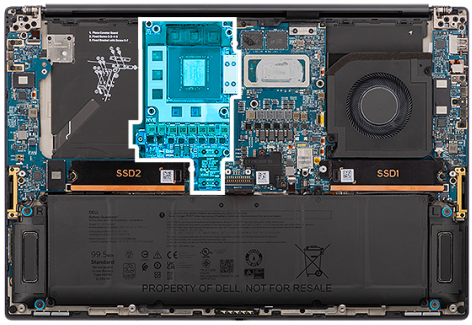
### About this task

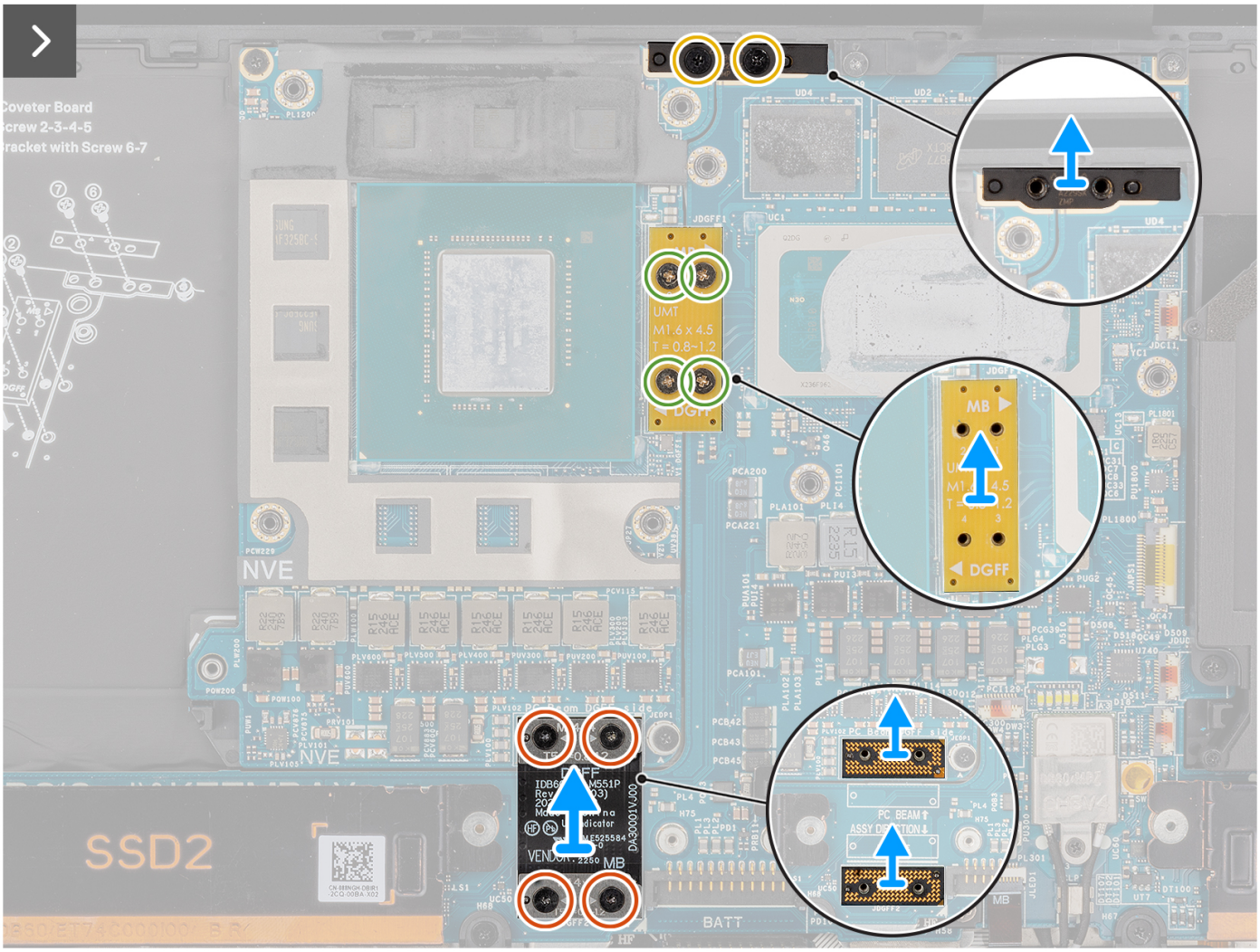
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

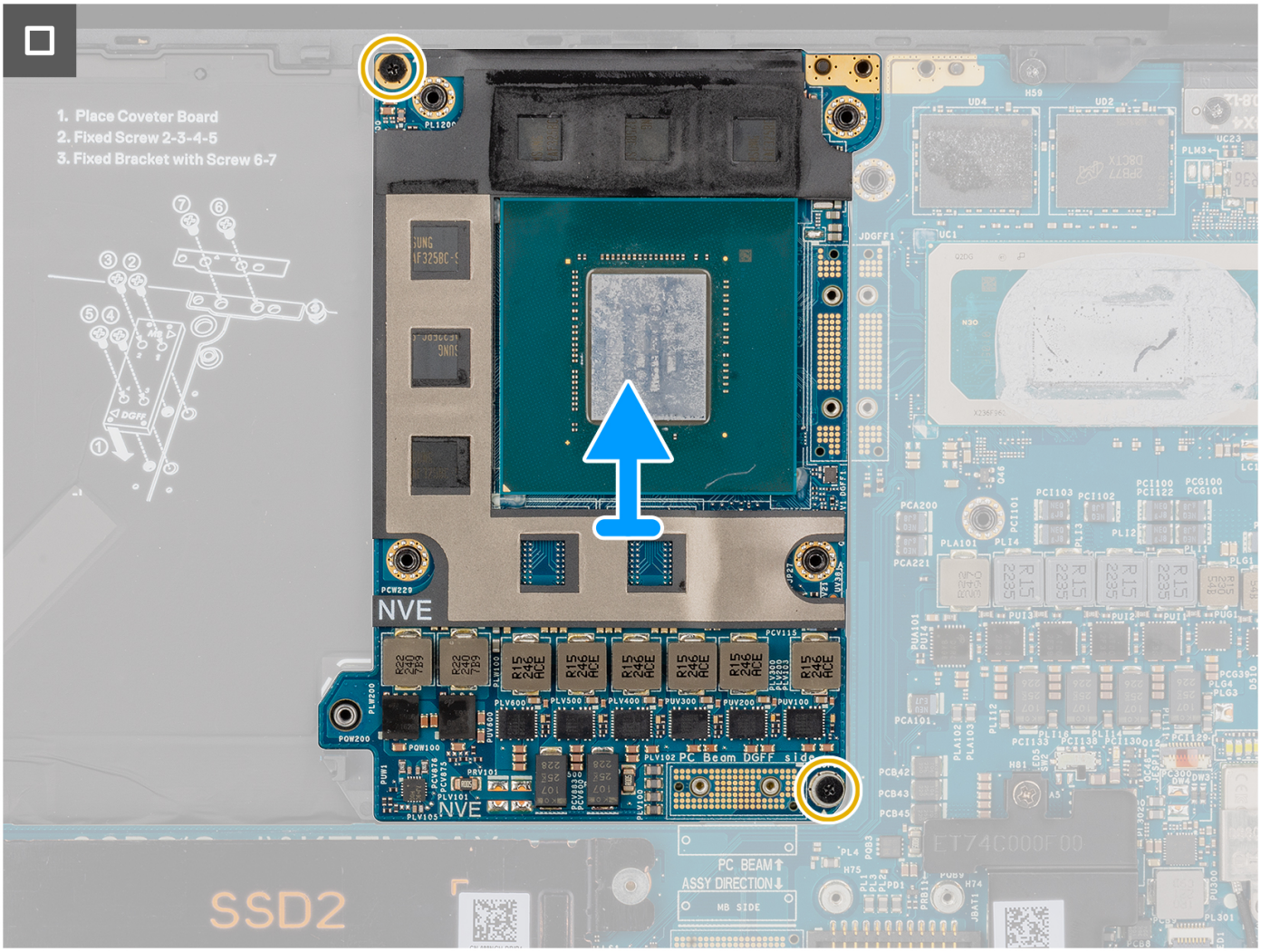
**NOTE:** The following procedure is applicable for systems shipped with a GPU card only.

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


4x
M1.4x4
4x
M2x4
4x
M1.6x4.5


SSD2
SSD1
PROPERTY OF DELL. NOT FOR RESALE


UMT
M1.6 x 4.5
T = 0.8~1.2
DGFF
MB
NVE
SSD2
BATT
PC BEAM

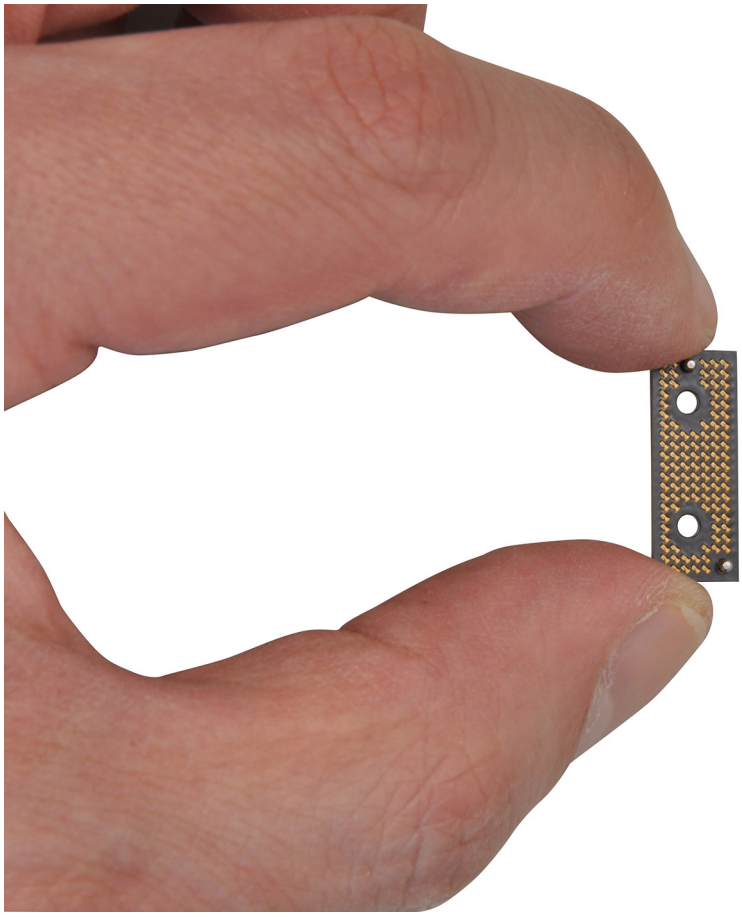



**Steps**

1. Remove the four (M1.4x4) T5 Torx screws sequentially as mentioned on the GPU card FPC that secure the GPU card FPC in place.
2. Remove the GPU card FPC from the system board.
3. Remove the two GPU card FPC interposer boards from the system board.

**NOTE:** The pins on the interposer board are very fragile. Avoid contact with the pins on the board, instead handle the board by lifting and holding from the edges or the sides.

NOTE:



4. Remove the four (M1.6x4.5) screws that secure the GPU card bridge in place.
5. Remove the GPU card bridge from the system board.
6. Remove the two (M2x4) screws that secure the PC bridge bracket in place.
7. Remove the PC bridge bracket from the system board.
8. Remove the two (M2x4) screws that secure the GPU card in place.
9. Remove the GPU card from the system board.

# Installing the GPU card

### Prerequisites

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

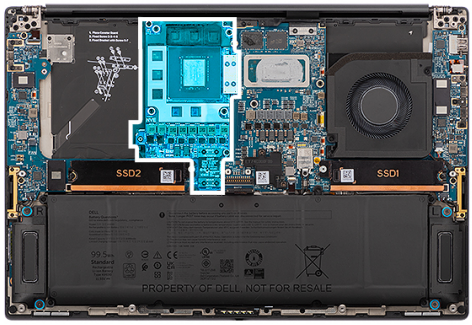
### About this task

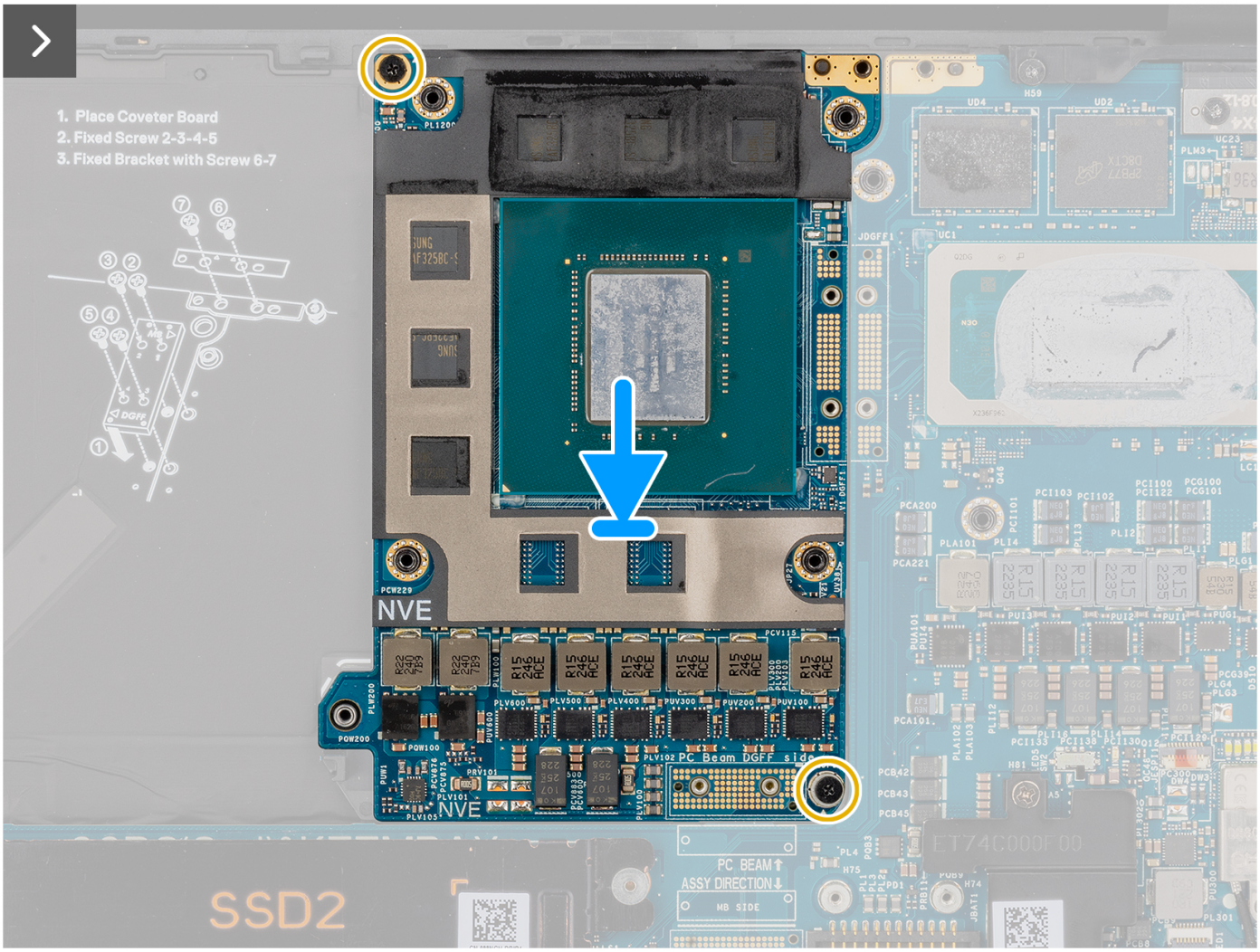
**CAUTION: The information in this installation section is intended for authorized service technicians only.**

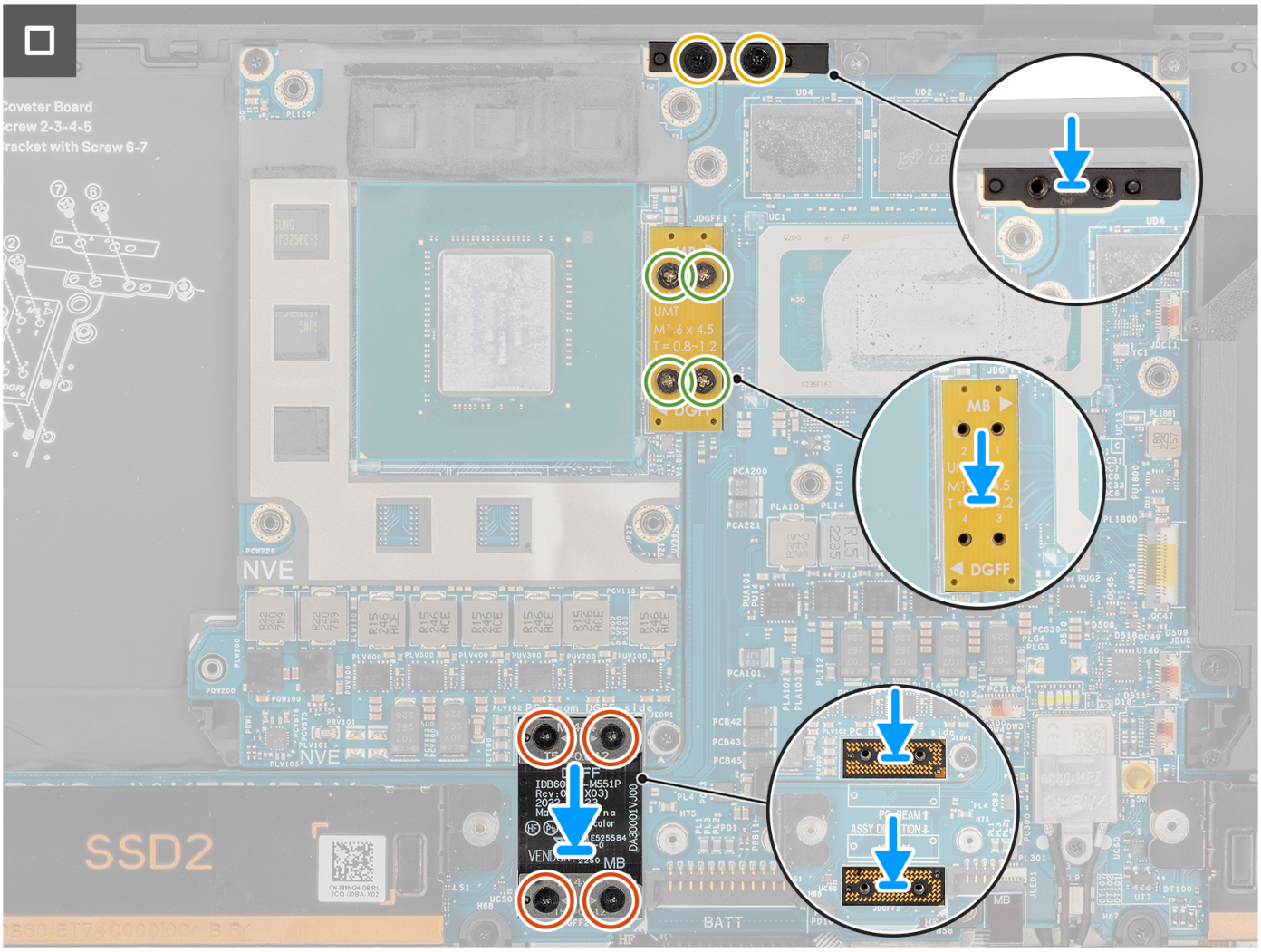
**NOTE:** The following procedure is applicable for systems shipped with a GPU card only.

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


4x
M1.4x4
4x
M2x4
4x
M1.6x4.5


SSD2
SSD1
PROPERTY OF DELL. NOT FOR RESALE


1. Place Coveter Board
2. Fixed Screw 2-3-4-5
3. Fixed Bracket with Screw 6-7
NVE
NVE
PC_Beam_DGFF_side
PC BEAM
ASSY DIRECTION
MB SIDE
SSD2




### Steps

1. Align and place the GPU card into the slot on the system board.
2. Replace the two (M2x4) screws to secure the GPU card in place.
3. Align and place the PC bridge bracket into the slot on the system board.
4. Replace the two (M2x4) screws to secure the PC bridge bracket in place.
5. Align and place the GPU card bridge into the slot on the system board.
6. Replace the four (M1.6x4.5) screws to secure the GPU card bridge in place.
7. Align and place the two GPU card FPC interposer boards into the slot on the system board.
8. Align and place the GPU card FPC into the slot on the system board.
9. Replace the four (M1.4x4) T5 Torx screws sequentially as mentioned on the GPU card FPC to secure the GPU card FPC in place.

### Next steps

1. Install the heatsink.
2. Install the Battery.
3. Install the base cover.
4. Install the SD card.
5. Follow the procedure in After working inside your computer.

# Dummy GPU card

## Removing the dummy GPU card

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the Battery.
5. Remove the heatsink.

### About this task

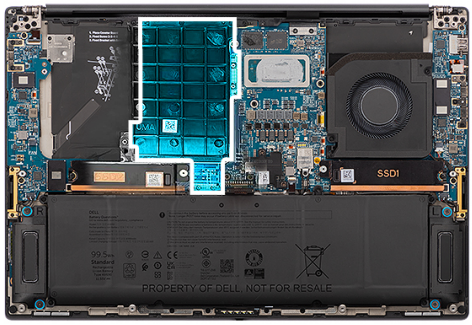
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

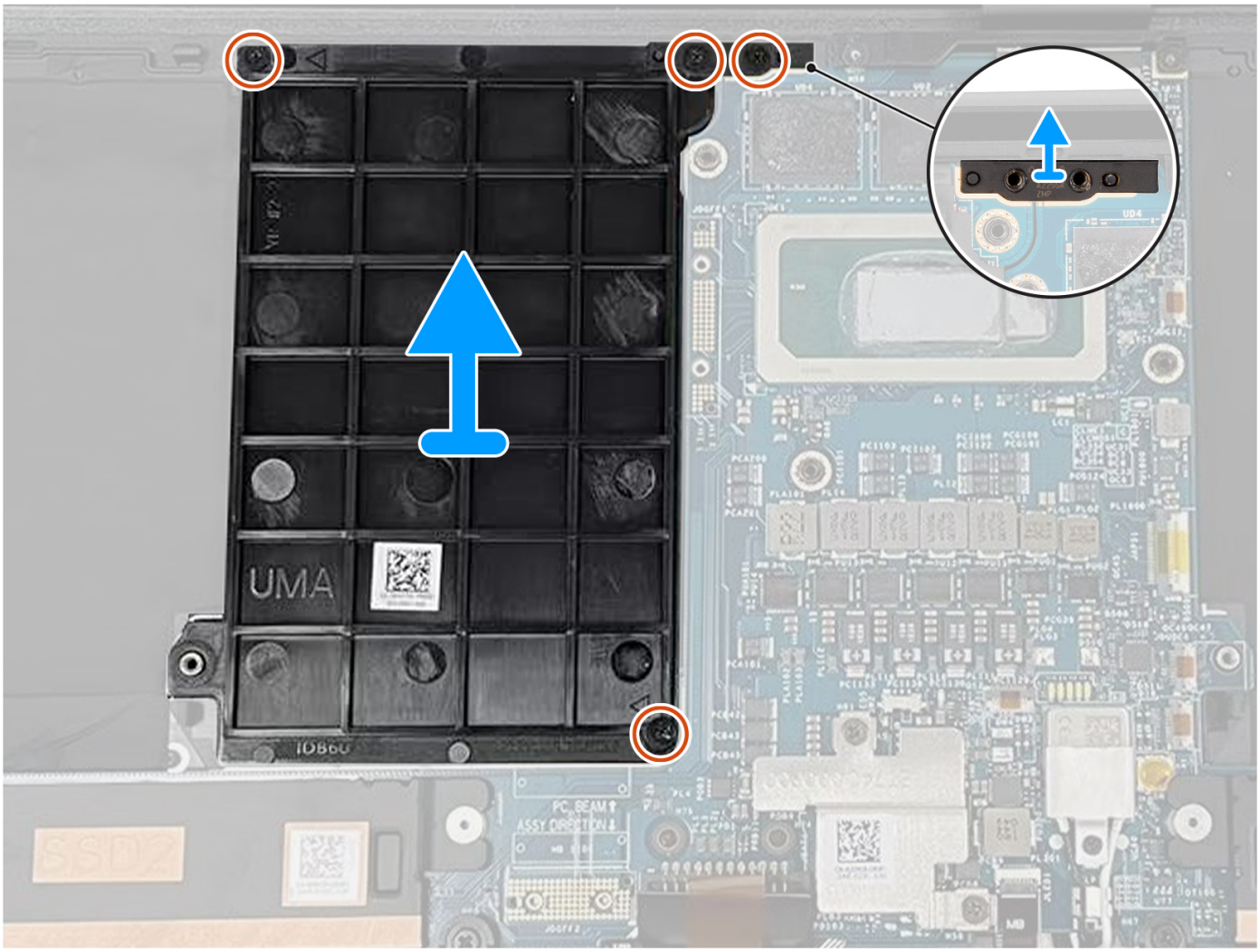
**NOTE:** The following procedure is applicable for systems shipped with an integrated system board only.

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



4x
M2x4




### Steps

1. Remove the two (M2x4) screws that secure the PC bridge bracket in place.
2. Remove the PC bridge bracket from the system board.
3. Remove the two (M2x4) screws that secure the dummy GPU card in place.
4. Remove the dummy GPU card from the system board.

## Installing the dummy GPU card

### Prerequisites

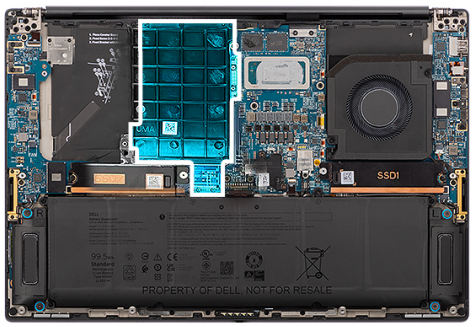
If you are replacing a component, remove the existing component before performing the installation procedure.

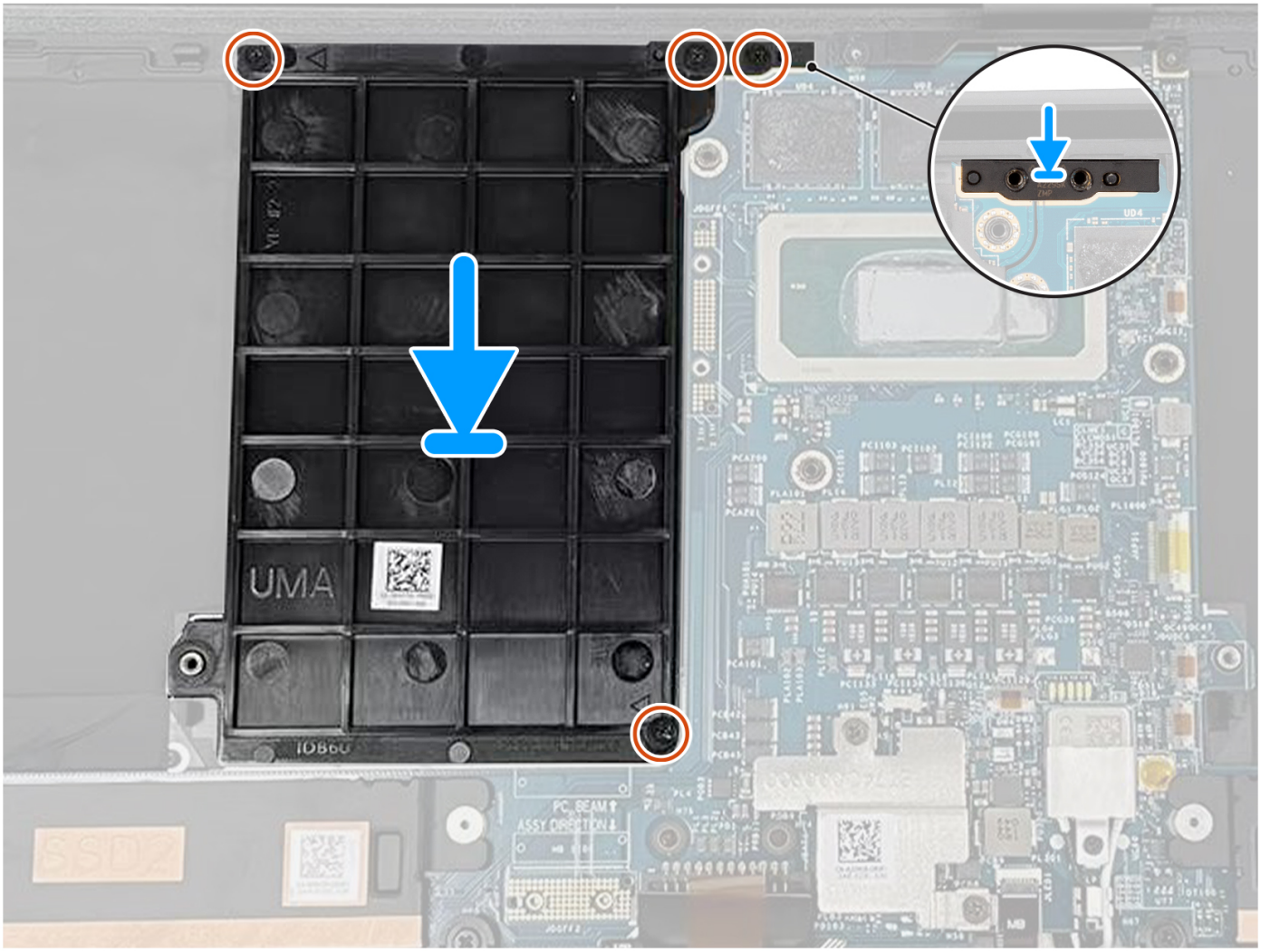
### About this task

**NOTE:** The following procedure is applicable for systems shipped with an integrated system board only.

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




### Steps

1. Align and place the dummy GPU card into the slot on the system board.
2. Replace the two (M2x4) screws to secure the dummy GPU card in place.
3. Align and place the PC bridge bracket into the slot on the system board.
4. Replace the two (M2x4) screws to secure the PC bridge bracket in place.

### Next steps

1. Install the heatsink.
2. Install the Battery.
3. Install the base cover.
4. Install the SD card.
5. Follow the procedure in After working inside your computer.

# System board

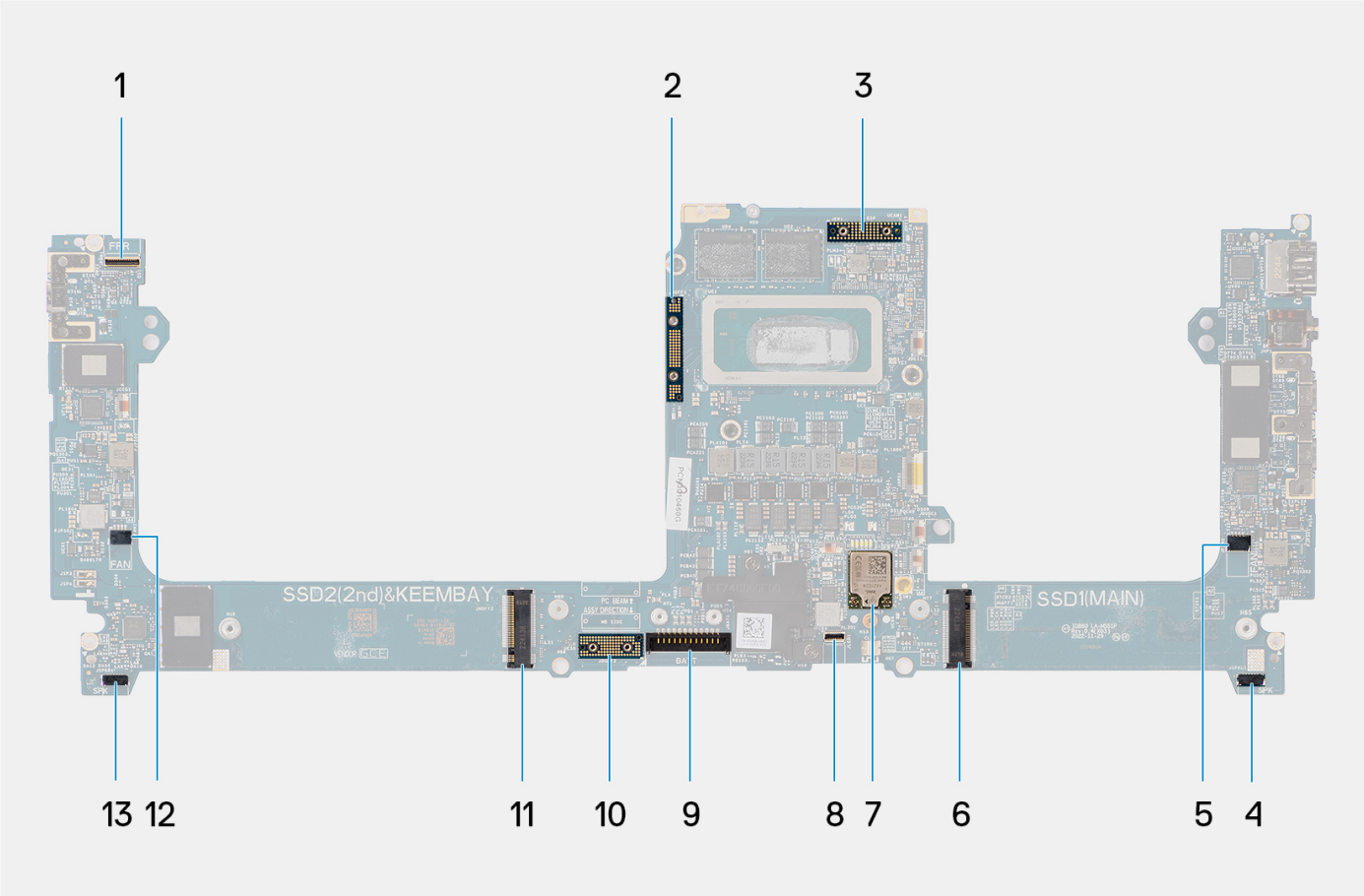
## Removing the system board

### Prerequisites

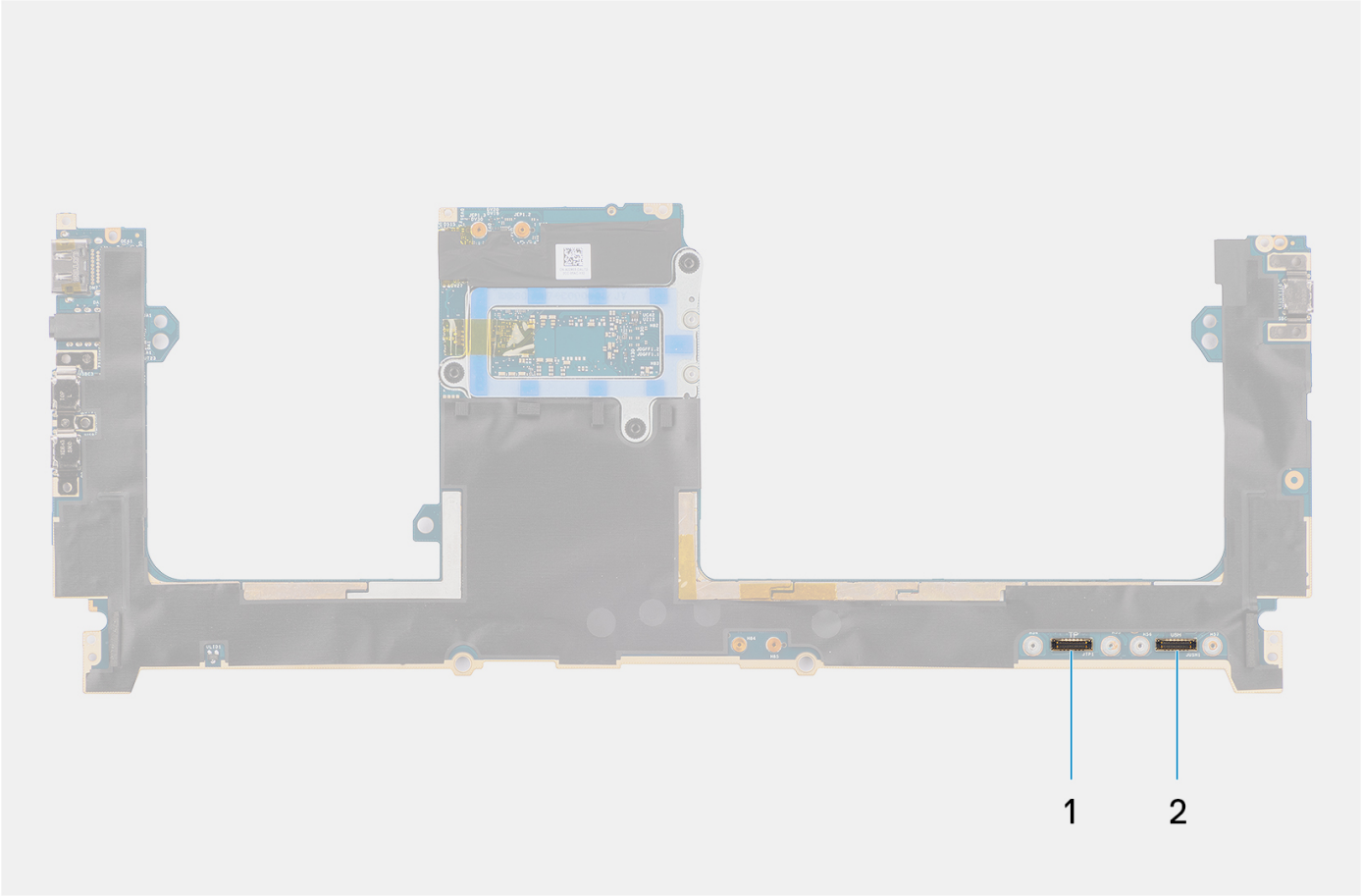
1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the M.2 solid-state drive, for systems shipped with a solid-state drive.
5. Remove the VPU card, for systems shipped with a VPU card.
6. Remove the Battery.
7. Remove the left fan.
8. Remove the right fan.
9. Remove the heatsink.

### About this task

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



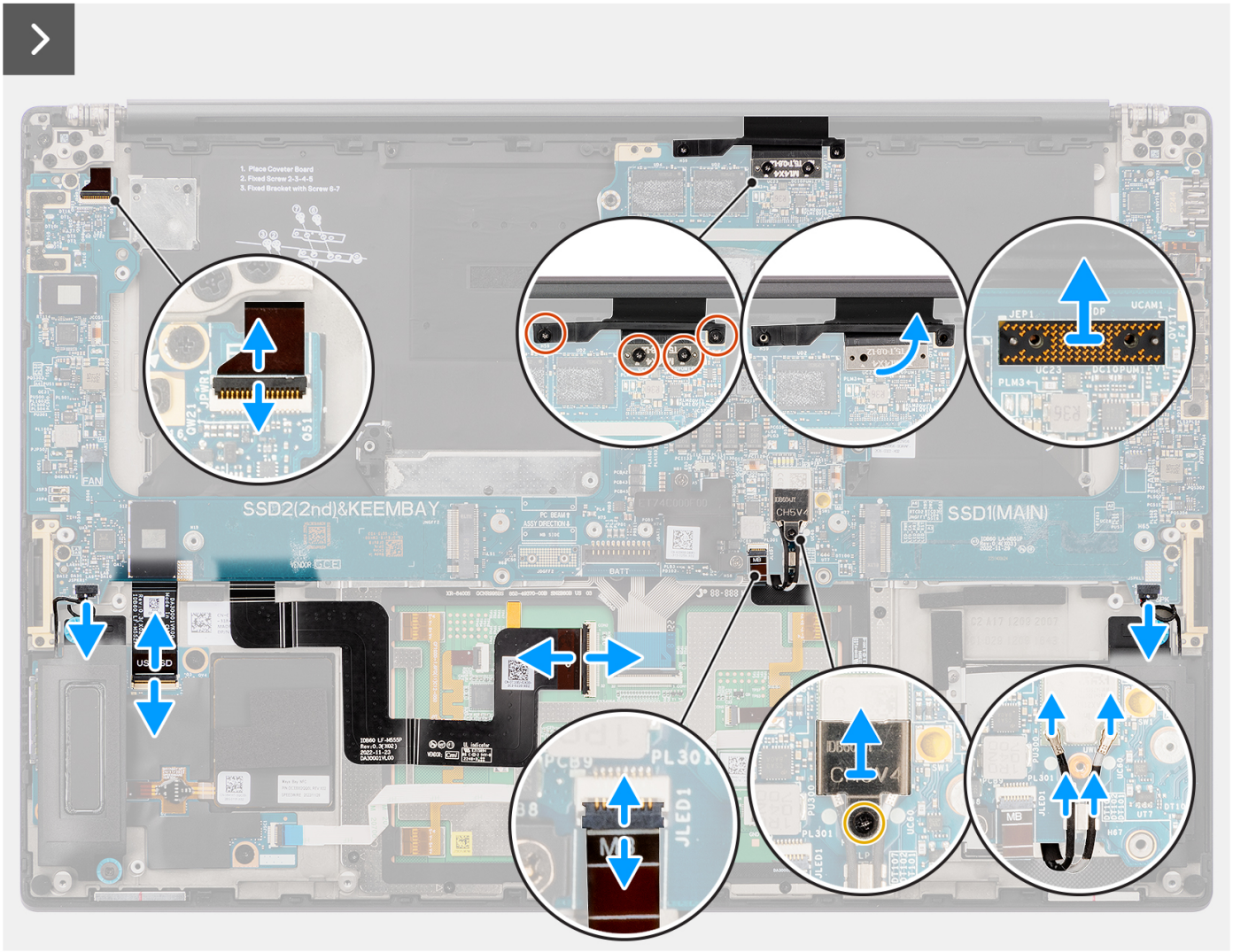

1. Power button with fingerprint reader cable connector
2. GPU card bridge
3. Display FPC cable
4. Left-speaker cable connector
5. Left-fan cable connector
6. Solid-state drive connector
7. WLAN antennas connector
8. Keyboard backlit cable connector
9. Battery cable connector
10. GPU card FPC interposer board
11. Solid-state drive/VPU card connector
12. Right-fan cable connector
13. Right-speaker cable connector

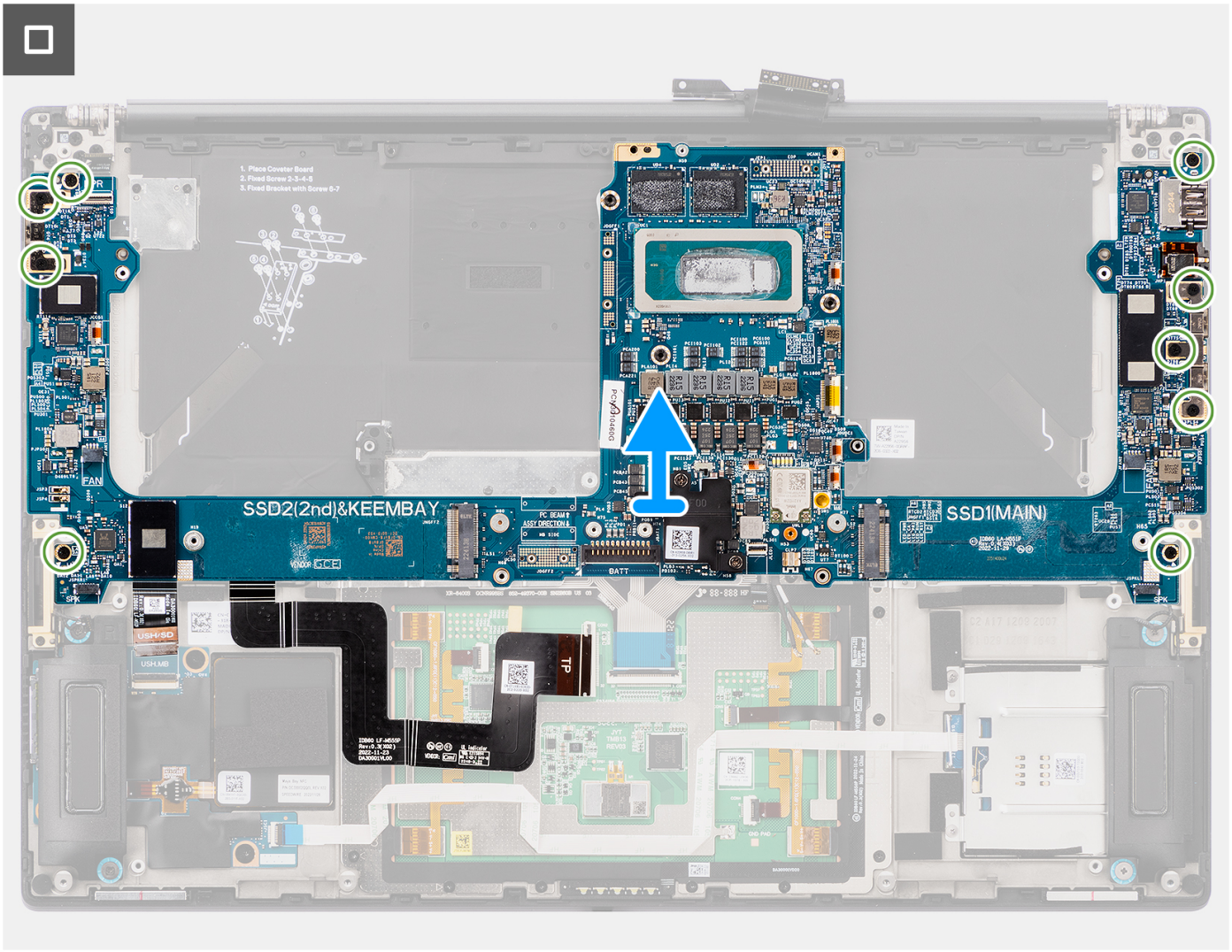



1. Touchpad cable connector
2. USH I/O board cable connector

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


4x
M1.4x4
1x
9x
M2x4

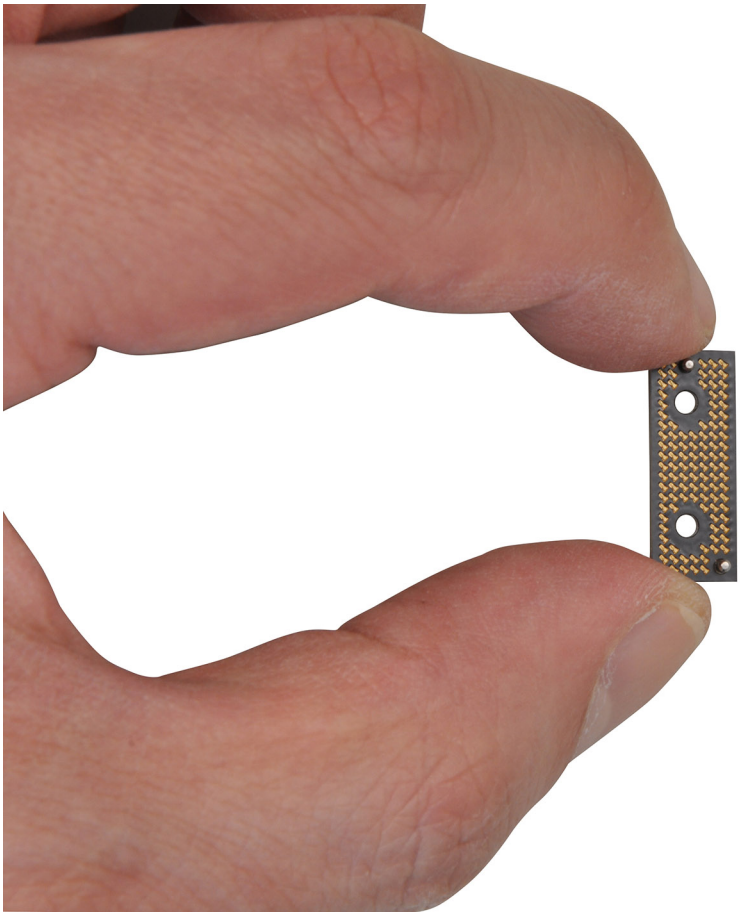

1. Place Coverter Board
2. Fixed Screw 2-3-4-5
3. Fixed Bracket with Screw 6-7
SSD2(2nd)&KEEMBAY
SSD1(MAIN)




### Steps

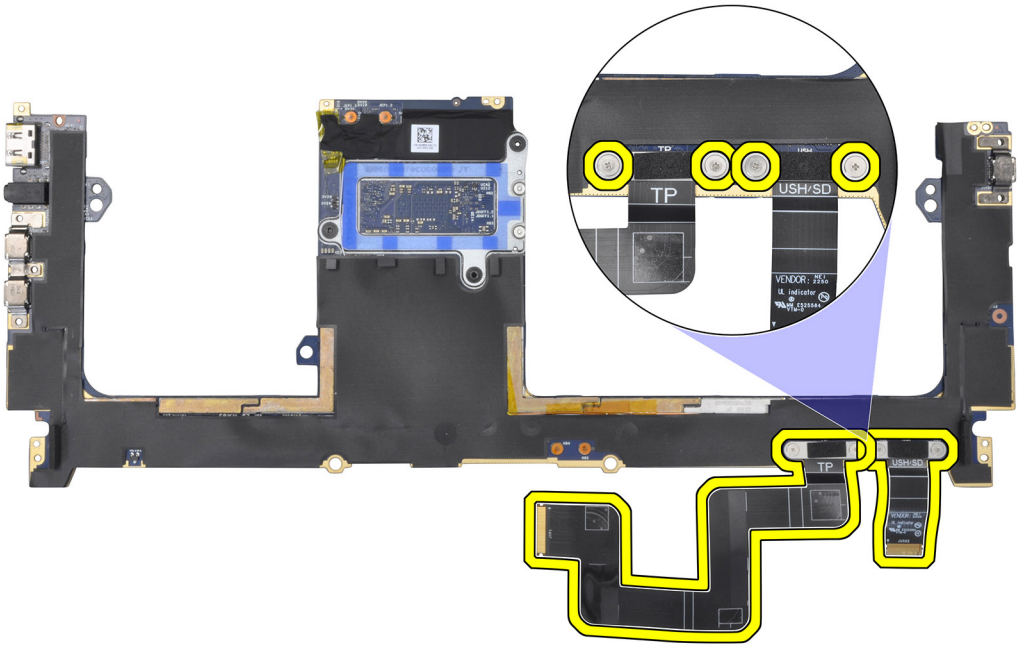
1. For systems shipped with a GPU card, remove the four (M1.4x4) T5 Torx screws that secure the GPU card FPC in place.
2. For systems shipped with a GPU card, remove the GPU card FPC from the system board.
3. For systems shipped with a GPU card, remove the two GPU card FPC interposer boards from the system board.
4. For systems shipped with a GPU card, remove the four (M1.6x4.5) screws that secure the GPU card bridge in place.
5. For systems shipped with a GPU card, remove the GPU card bridge from the system board.
6. For systems shipped with a WLAN card, loosen the captive screw that secures the WLAN bracket in place.
7. For systems shipped with a WLAN card, remove the WLAN bracket from the system board.
8. For systems shipped with a WLAN card, disconnect the antenna cables from the connectors on the WLAN module.
9. For systems shipped with a WLAN card, unroute the antenna cables from the metal clips on the system board.
10. Remove the two (M1.4x4) screws that secure the display FPC cover in place.
11. Flip open the display FPC cover.
12. Remove the two (M1.4x4) T5 Torx screws that secure the display FPC in place.
13. Disconnect the display FPC cable from the connector on the system board.
14. Remove the display FPC interposer board from the system board.

**NOTE:** Technicians must remove the interposer board immediately after disconnecting the display FPC to prevent the board from falling out of the system during subsequent removal procedures. The pins on the interposer board are very fragile. Avoid contact with the pins on the board, instead handle the board by lifting and holding from the edges or the sides.



15. For systems shipped without a USH module, disconnect the SD-card reader daughterboard FPC cable from the connector on the SD-card reader daughterboard.
16. For systems shipped with a USH module, disconnect the USH and SD-card reader daughterboard FPC cable from the connector on the USH and SD-card reader daughterboard.
17. Disconnect the touchpad FPC cable from the connector on the touchpad module.
18. Peel the SD-card reader daughterboard FPC/USH and SD-card reader daughterboard FPC cable and touchpad FPC cable from the palm-rest assembly.
19. Disconnect the power button with fingerprint reader FPC cable, right speaker cable, front LED FPC cable, and left speaker cable from the connectors on the system board.
20. Remove the two (M2x4) screws that secure the PC bridge support bracket in place.
21. Remove the PC bridge support bracket from the system board.
22. Remove the nine (M2x4) screws that secure the system board to the palm-rest assembly.
23. Remove the system board off the chassis.

**NOTE:** Replacement of the system board requires further removal of the touchpad FPC and SD-Card reader daughter board FPC/USH and SD-Card reader daughterboard FPC. Refer disassembly procedures of touchpad and SD card reader daughterboard FPC/USH and SD-card reader daughterboard FPC for more information.




# Installing the system board

### Prerequisites

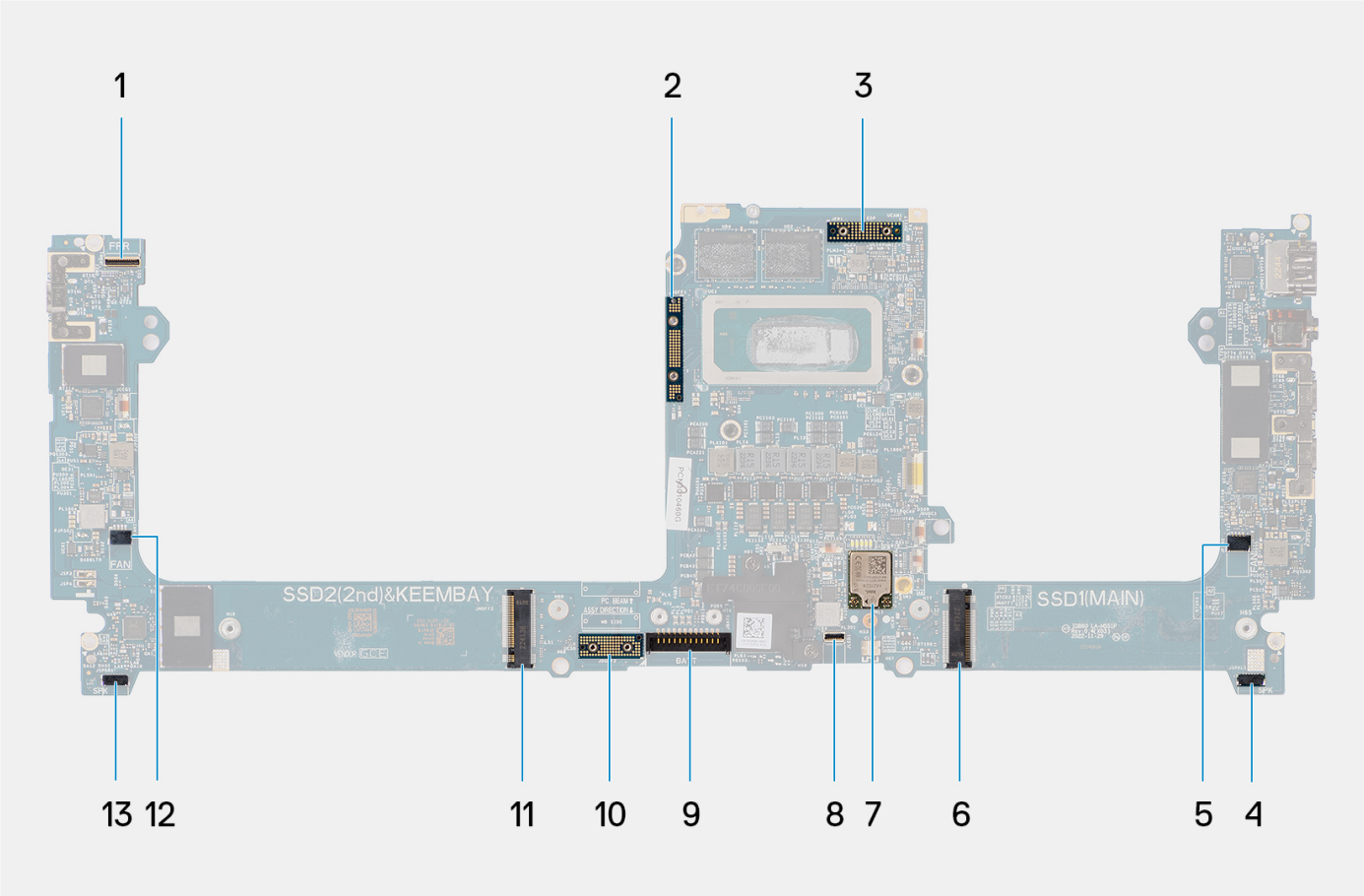
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

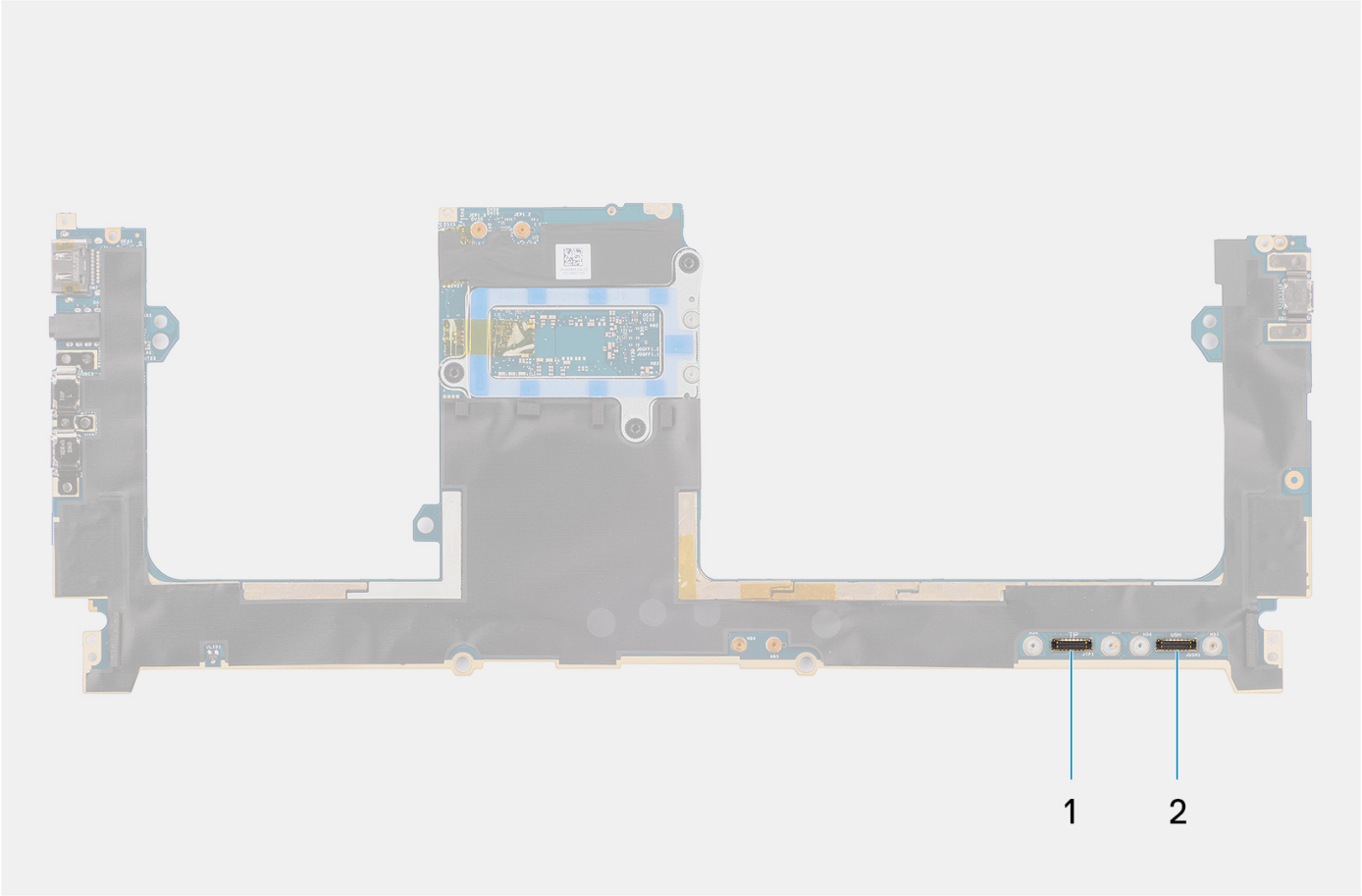
**CAUTION: The information in this installation section is intended for authorized service technicians only.**

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

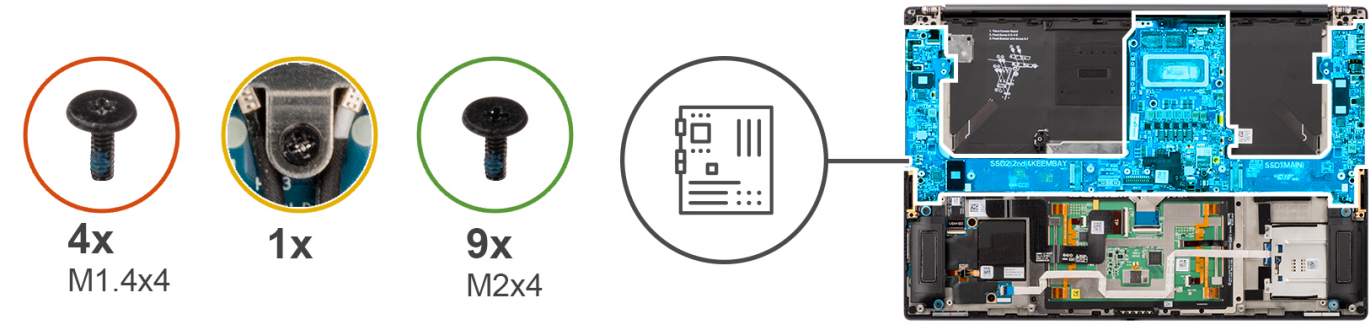
**NOTE:** Replacement of the system board requires further removal of the touchpad FPC and SD Card reader daughter board FPC/USH and SD Card reader daughter board FPC. Refer disassembly procedures of touchpad and SD card reader daughterboard FPC/USH and SD card reader daughterboard FPC for more information.

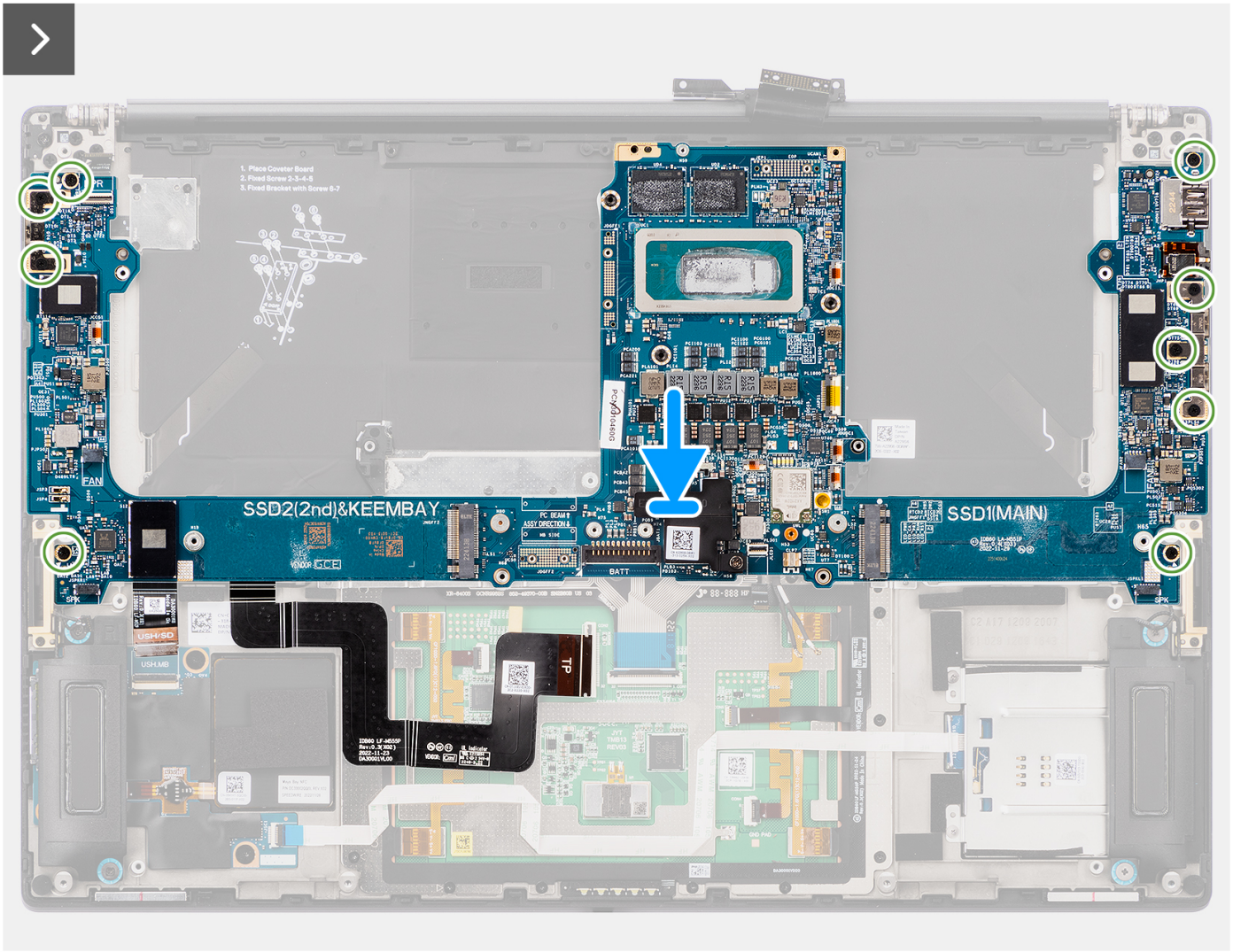


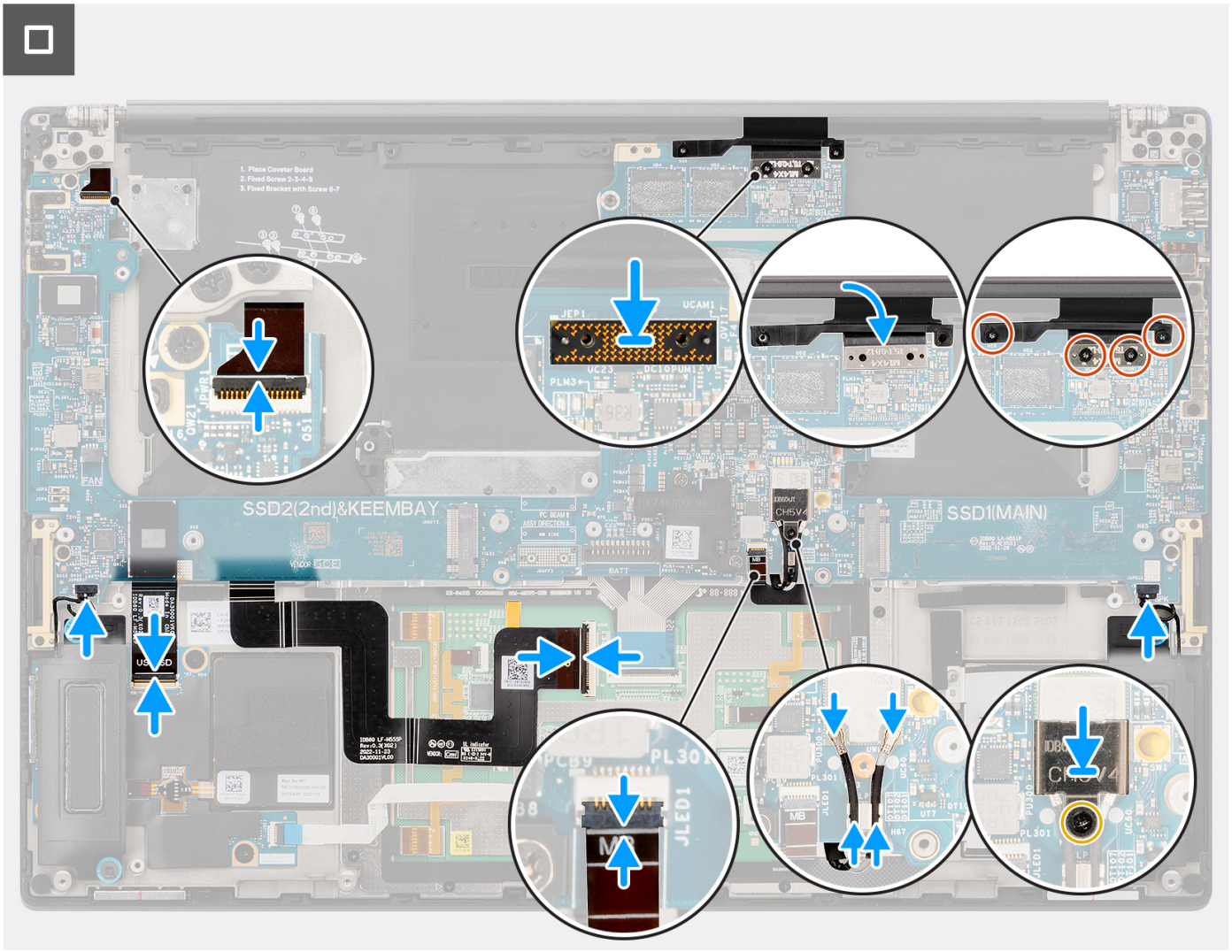

1. Power button with fingerprint reader cable connector
2. GPU card bridge
3. Display FPC cable
4. Left-speaker cable connector
5. Left-fan cable connector
6. Solid-state drive connector
7. WLAN antennas connector
8. Keyboard backlit cable connector
9. Battery cable connector
10. GPU card FPC interposer board
11. Solid-state drive/VPU card connector
12. Right-fan cable connector
13. Right-speaker cable connector




1. Touchpad cable connector
2. USH I/O board cable connector


4x
M1.4x4
1x
9x
M2x4


SSD2(2nd)&KEEMBAY
SSD1(MAIN)
FAN
SPK
BATT
TP




### Steps

1. Align and place the system board on the palm-rest assembly.
2. Replace the nine (M2x4) screws to secure the system board to the palm-rest assembly.
3. Align and place the PC bridge support bracket on the system board.
4. Replace the two (M2x4) screws to secure the PC bridge support bracket in place.
5. Connect the power button with fingerprint reader FPC cable, right speaker cable, front LED FPC cable, and left speaker cable to the connectors on the system board.
6. Adhere the SD-card reader daughterboard FPC/USH and SD-card reader daughterboard FPC cable and touchpad FPC cable on the palm-rest assembly.
7. Connect the touchpad FPC cable to the connector on the touchpad module.
8. For systems shipped with a USH module, connect the USH and SD-card reader daughterboard FPC cable to the connector on the USH and SD-card reader daughterboard.
9. For systems shipped without a USH module, connect the SD-card reader daughterboard FPC cable to the connector on the SD-card reader daughterboard.
10. Align and place the display FPC interposer board on the system board.

    **NOTE:** The pins on the interposer board are very fragile. Avoid contact with the pins on the board, instead handle the board by lifting and holding from the edges or the sides.

11. Connect the display FPC cable to the connector on the system board.
12. Replace the two (M1.4x4) T5 Torx screws to secure the display FPC in place.
13. Flip close the display FPC cover.

14. Replace the two (M1.4x4) screws to secure the display FPC cover in place.
15. For systems shipped with a WLAN card, route the antenna cables through the metal clips on the system board.
16. For systems shipped with a WLAN card, connect the antenna cables to the connectors on the WLAN module.
17. For systems shipped with a WLAN card, align and place the WLAN bracket on the system board.
18. For systems shipped with a WLAN card, tighten the captive screw to secures the WLAN bracket in place.
19. For systems shipped with a GPU card, align and place the GPU card bridge on the system board.
20. For systems shipped with a GPU card, replace the four (M1.6x4.5) screws to secure the GPU card bridge in place.
21. For systems shipped with a GPU card, align and place the two GPU card FPC interposer boards on the system board.
22. For systems shipped with a GPU card, align and place the GPU card FPC from the system board.
23. For systems shipped with a GPU card, replace the four (M1.4x4) T5 Torx screws to secure the GPU card FPC in place.

### Next steps

1. Install the heatsink.
2. Install the right fan.
3. Install the left fan.
4. Install the Battery.
5. Install the VPU card, for systems shipped with a VPU card.
6. Install the M.2 solid-state drive, for systems shipped with a solid-state drive.
7. Install the base cover.
8. Install the SD card.
9. Follow the procedure in After working inside your computer.

# Speakers

## Removing the speakers

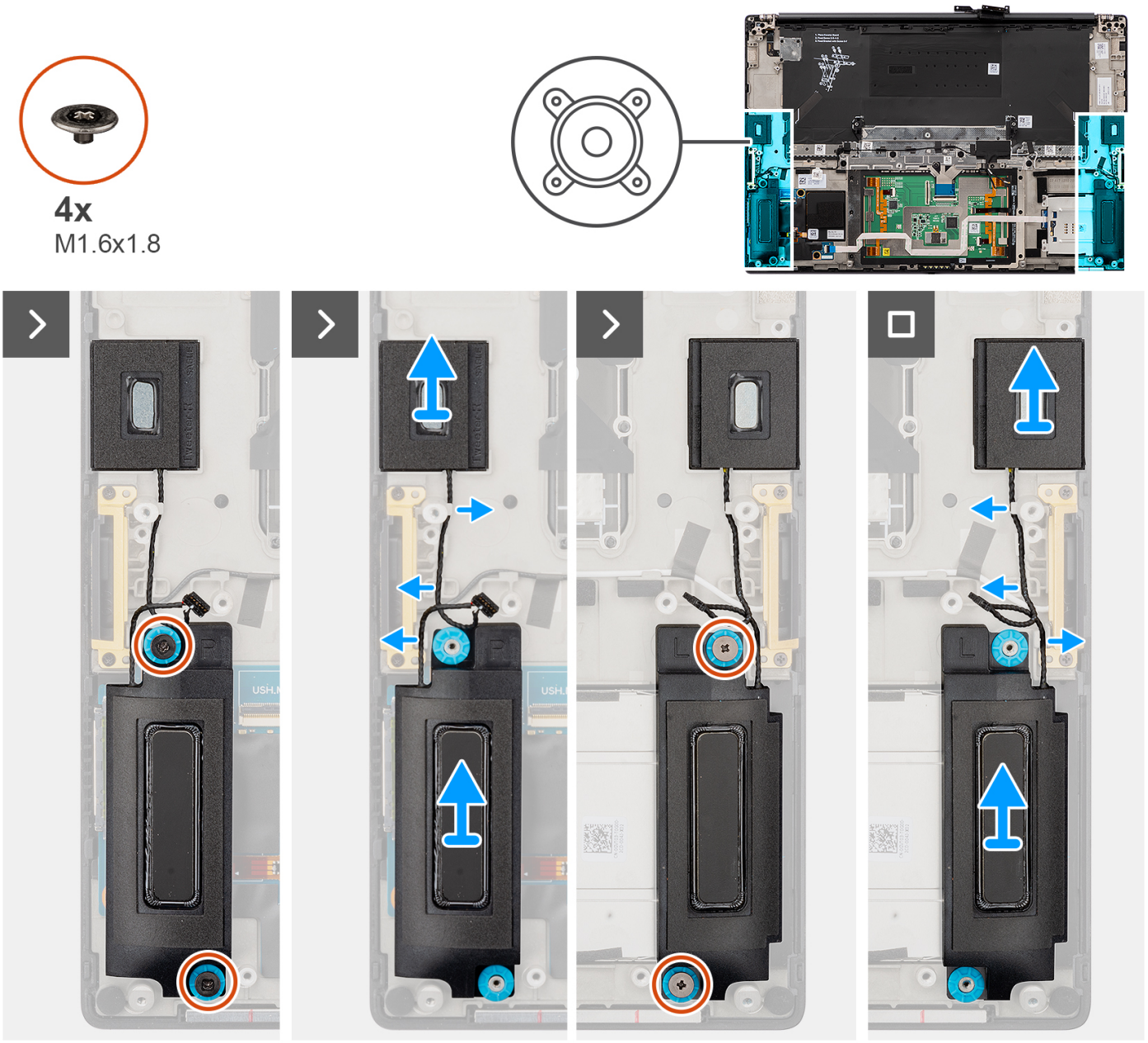
### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the M.2 solid-state drive, for systems shipped with a solid-state drive.
5. Remove the VPU card, for systems shipped with a VPU card.
6. Remove the Battery.
7. Remove the left fan.
8. Remove the right fan.
9. Remove the heatsink.
10. Remove the system board.

### About this task

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

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




### Steps

1. Remove the left and right tweeter speakers from their slots on the computer.
2. Unroute the left and right tweeter speaker cables from the routing guides on the system board.
3. Remove the four (M1.6x1.8) screws that secure the left and right speakers in place.
4. Lift the left and right speakers off the computer.

## Installing the speakers

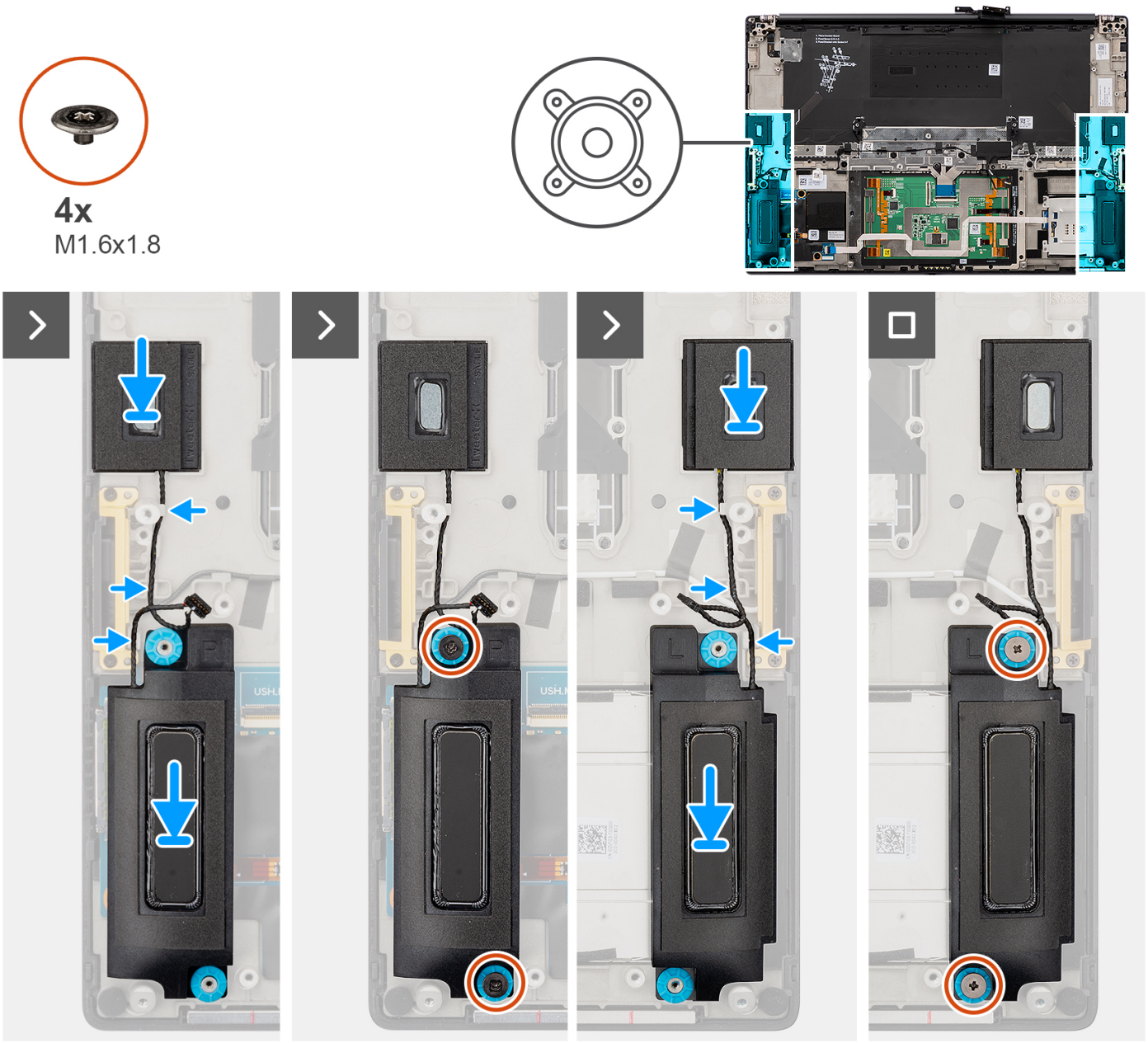
### Prerequisites

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

### About this task

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

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




### Steps

1. Align and place the left and right speakers into the slot on the computer.
2. Route the left and right tweeter speaker cables through the routing guides on the system board.
3. Replace the four (M1.6x1.8) screws to secure the left and right speakers in place.

### Next steps

1. Install the system board.
2. Install the heatsink.
3. Install the right fan.
4. Install the left fan.
5. Install the Battery.
6. Install the VPU card, for systems shipped with a VPU card.
7. Install the M.2 solid-state drive, for systems shipped with a solid-state drive.
8. Install the base cover.

9. Install the SD card.
10. Follow the procedure in After working inside your computer.

# Haptics trackpad FPC

## Removing the touchpad FPC

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

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the M.2 solid-state drive, for systems shipped with a solid-state drive.
5. Remove the VPU card, for systems shipped with a VPU card.
6. Remove the Battery.
7. Remove the left fan.
8. Remove the right fan.
9. Remove the heatsink.
10. Remove the system board.

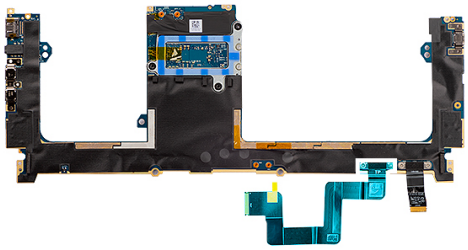
### About this task

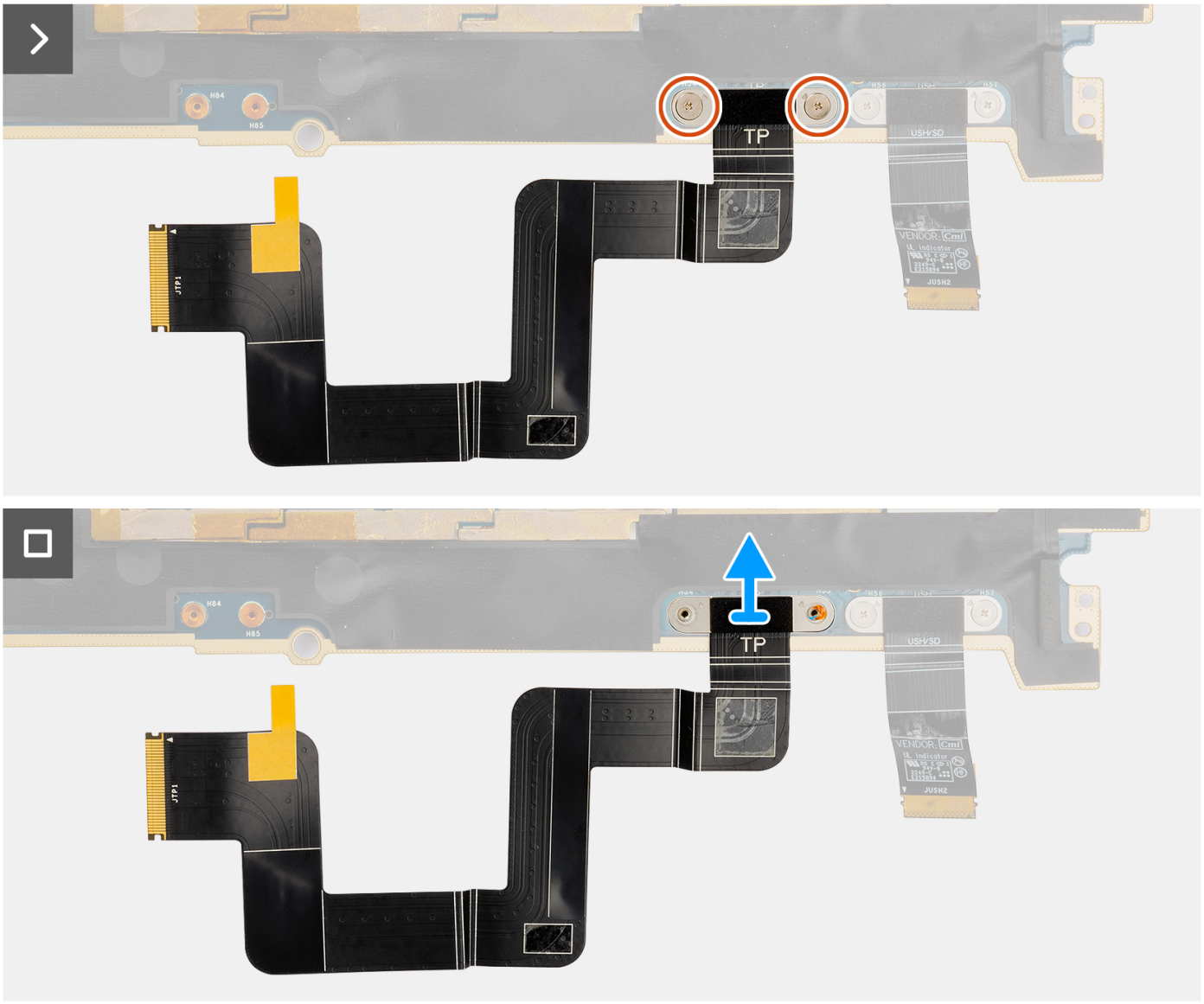
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

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



**2x**
M1.4x1.2






### Steps

1. Remove the two screws (M1.4x1.2) that secure the touchpad FPC to the system board.
2. Disconnect and remove the touchpad FPC from the system board.

# Installing the touchpad FPC

### Prerequisites

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

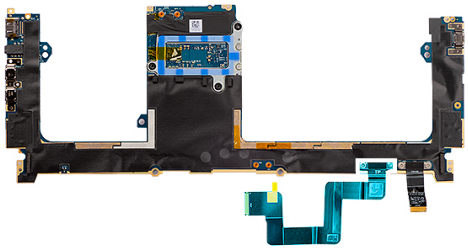
### About this task

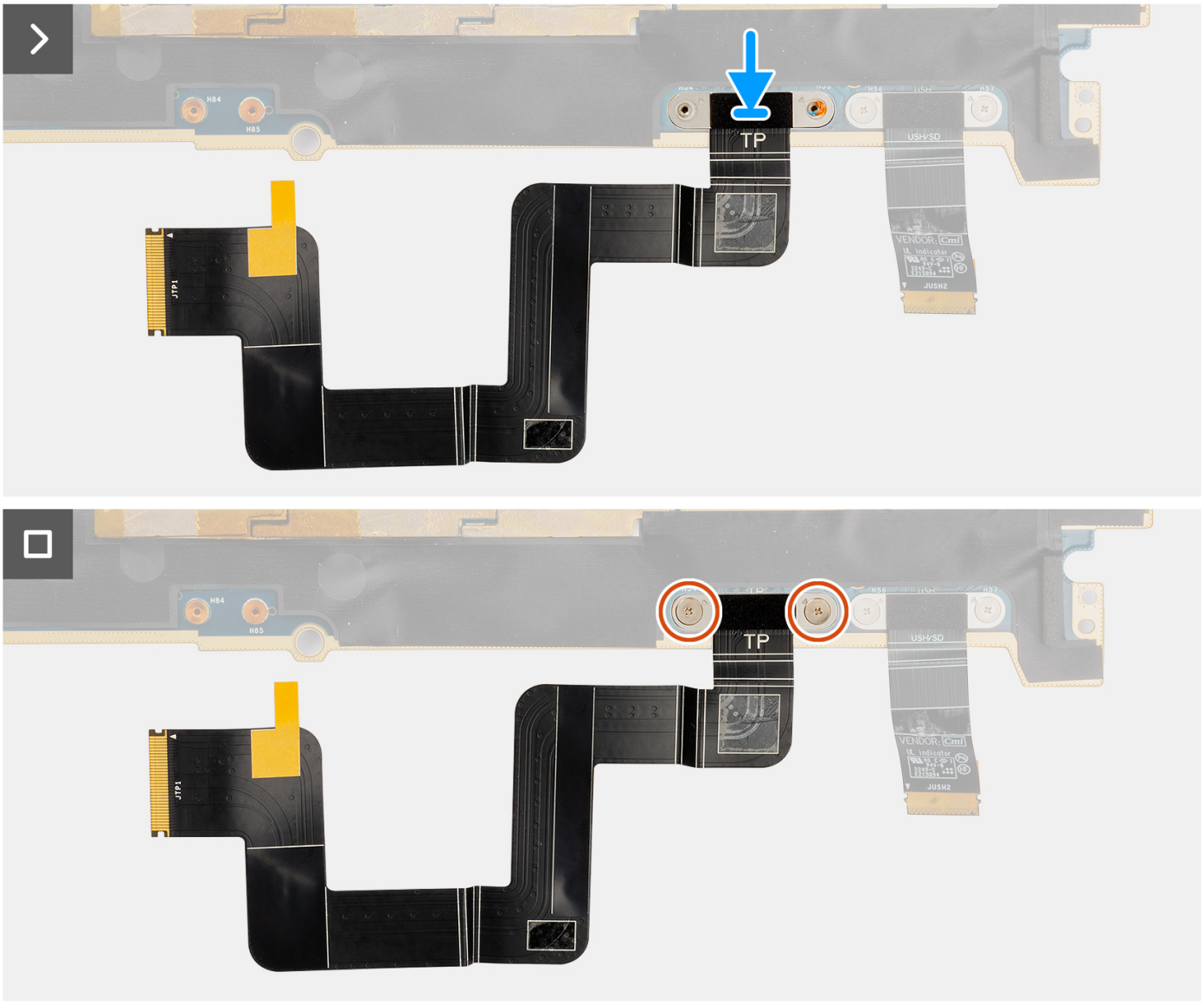
**CAUTION: The information in this installation section is intended for authorized service technicians only.**

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



**2x**
M1.4x1.2






### Steps

1. Align and place the touchpad FPC into its slot on the system board.
2. Replace the two (M1.4x1.2) screws that secure the touchpad FPC to the system board.
3. Connect the touchpad FPC to the connector on the system board.

### Next steps

1. Install the system board.
2. Install the heatsink.

3. Install the right fan.
4. Install the left fan.
5. Install the Battery.
6. Install the VPU card, for systems shipped with a VPU card.
7. Install the M.2 solid-state drive, for systems shipped with a solid-state drive.
8. Install the base cover.
9. Install the SD card.
10. Follow the procedure in After working inside your computer.

# SD card reader daughterboard FPC

## Removing the SD card reader daughterboard FPC

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the M.2 solid-state drive, for systems shipped with a solid-state drive.
5. Remove the VPU card, for systems shipped with a VPU card.
6. Remove the Battery.
7. Remove the left fan.
8. Remove the right fan.
9. Remove the heatsink.
10. Remove the system board.

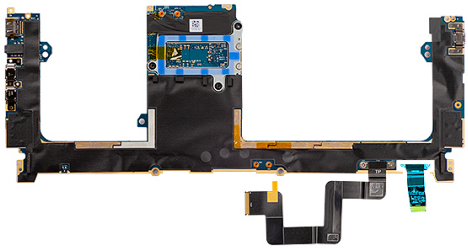
### About this task

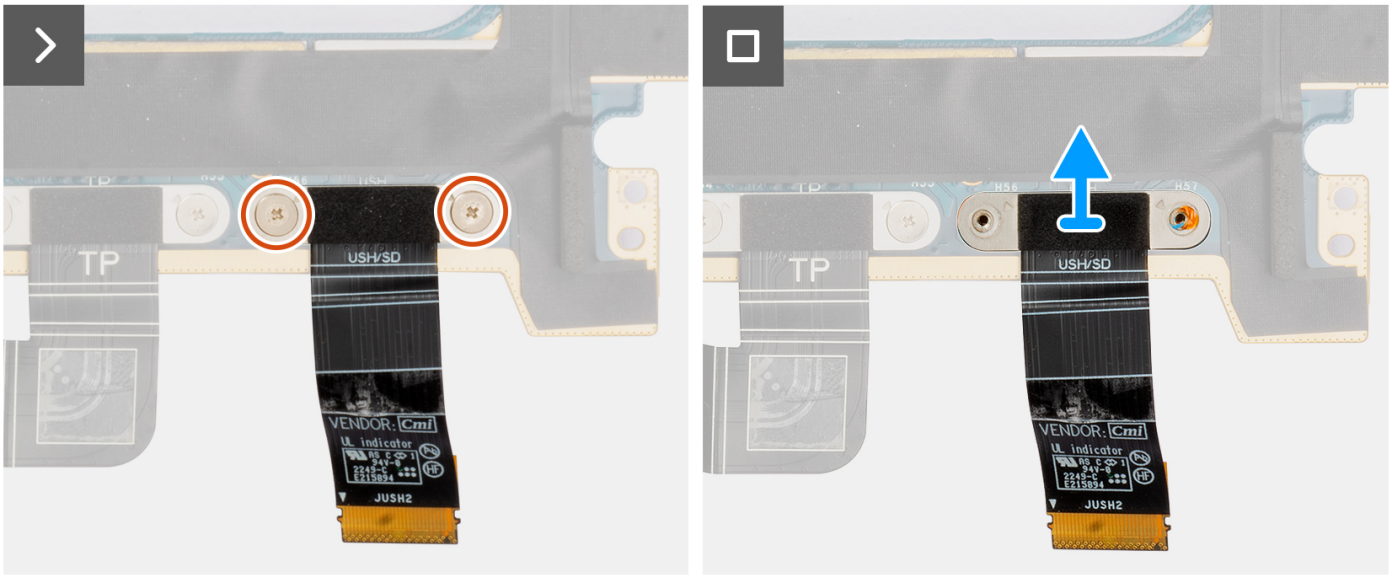
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

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



2x
M1.4x1.2






### Steps

1. Remove the two (M1.4X1.2) screws that secure the SD card reader daughterboard FPC in place.
2. Disconnect and remove the SD card reader daughterboard FFC cable from the connector on the system board.

## Installing the SD card reader daughterboard FPC

### Prerequisites

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

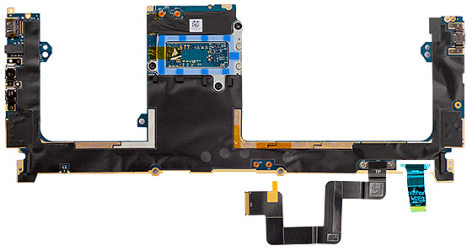
### About this task

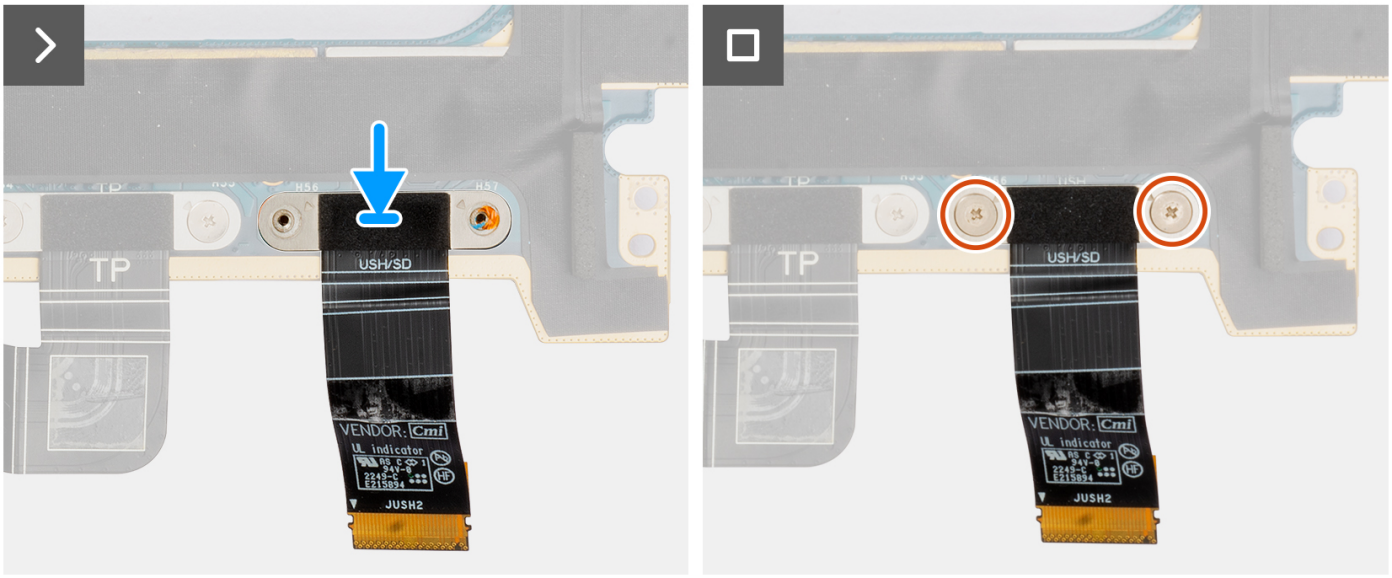
**CAUTION: The information in this installation section is intended for authorized service technicians only.**

The following image indicates the location of the SD card reader daughterboard FPC and provides a visual representation of the installation procedure.



2x
M1.4x1.2






### Steps

1. Align and place the SD card reader daugherboard FPC in place.
2. Replace the two (M1.4x1.2) screws to secure the SD card reader daugherboard FPC in place.
3. Connect the SD card reader daugherboard FFC cable to the connector on the system board.

### Next steps

1. Install the system board.
2. Install the heatsink.
3. Install the right fan.
4. Install the left fan.
5. Install the Battery.
6. Install the VPU card, for systems shipped with a VPU card.
7. Install the M.2 solid-state drive, for systems shipped with a solid-state drive.
8. Install the base cover.
9. Install the SD card.
10. Follow the procedure in After working inside your computer.

# USH and SD card reader daughterboard FPC

## Removing the USH and SD card reader daughterboard FPC

### Prerequisites

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

**NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.

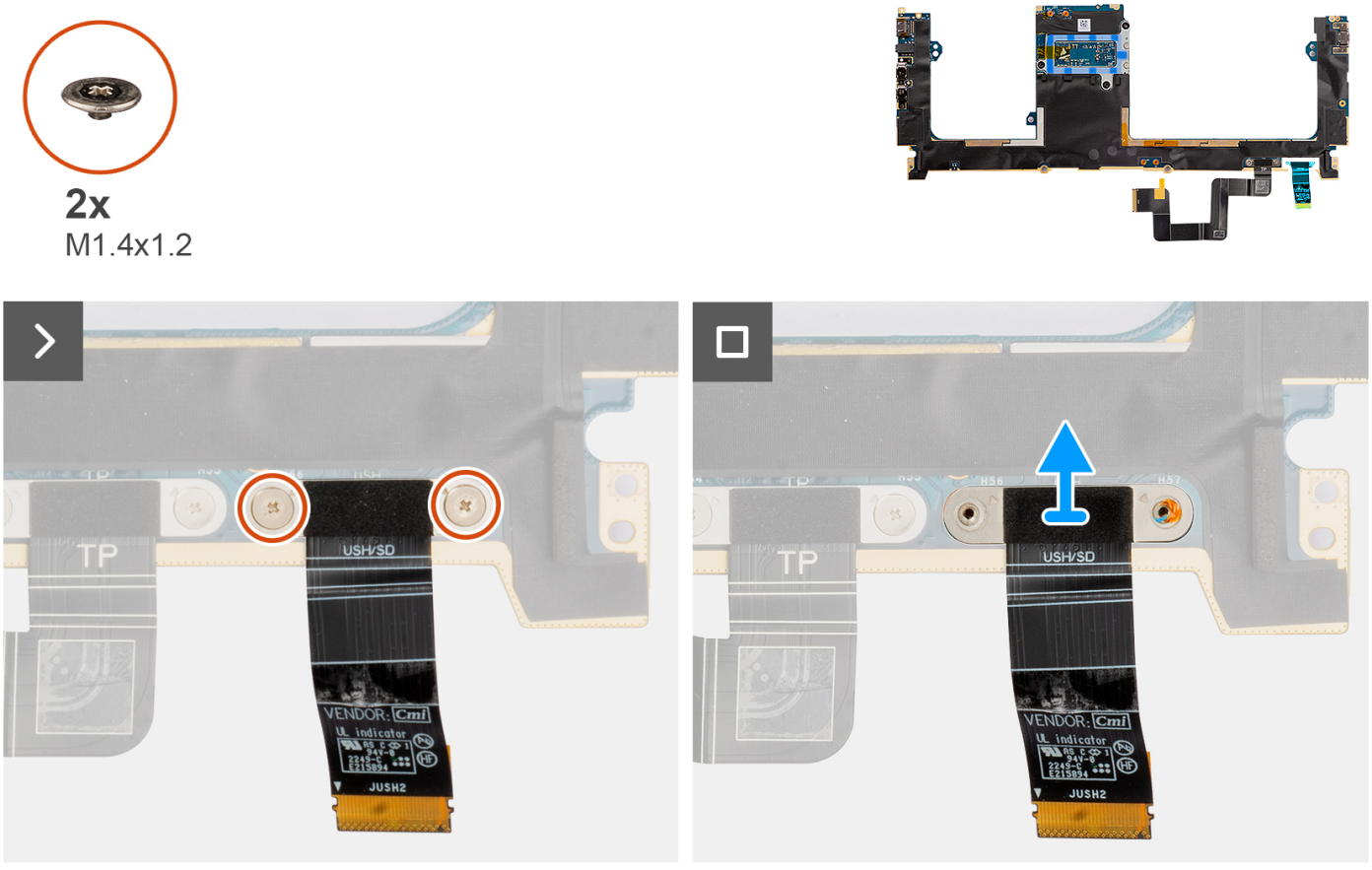
2. Remove the SD card.
3. Remove the base cover.
4. Remove the M.2 solid-state drive, for systems shipped with a solid-state drive.
5. Remove the VPU card, for systems shipped with a VPU card.
6. Remove the Battery.
7. Remove the left fan.
8. Remove the right fan.
9. Remove the heatsink.
10. Remove the system board.

### About this task

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

**NOTE:** The following procedure is applicable for systems shipped with a USH and SD card reader daughterboard FPC only.

The following images indicate the location of the USH and SD card reader daughterboard FPC and provide a visual representation of the removal procedure.




### Steps

1. Remove the two (M1.4X1.2) screws that secure the USH and SD card reader daughterboard FPC in place.
2. Disconnect and remove the USH and SD card reader daughterboard FFC cable from the connector on the system board.

# Installing the USH and SD card reader daughterboard FPC

### Prerequisites

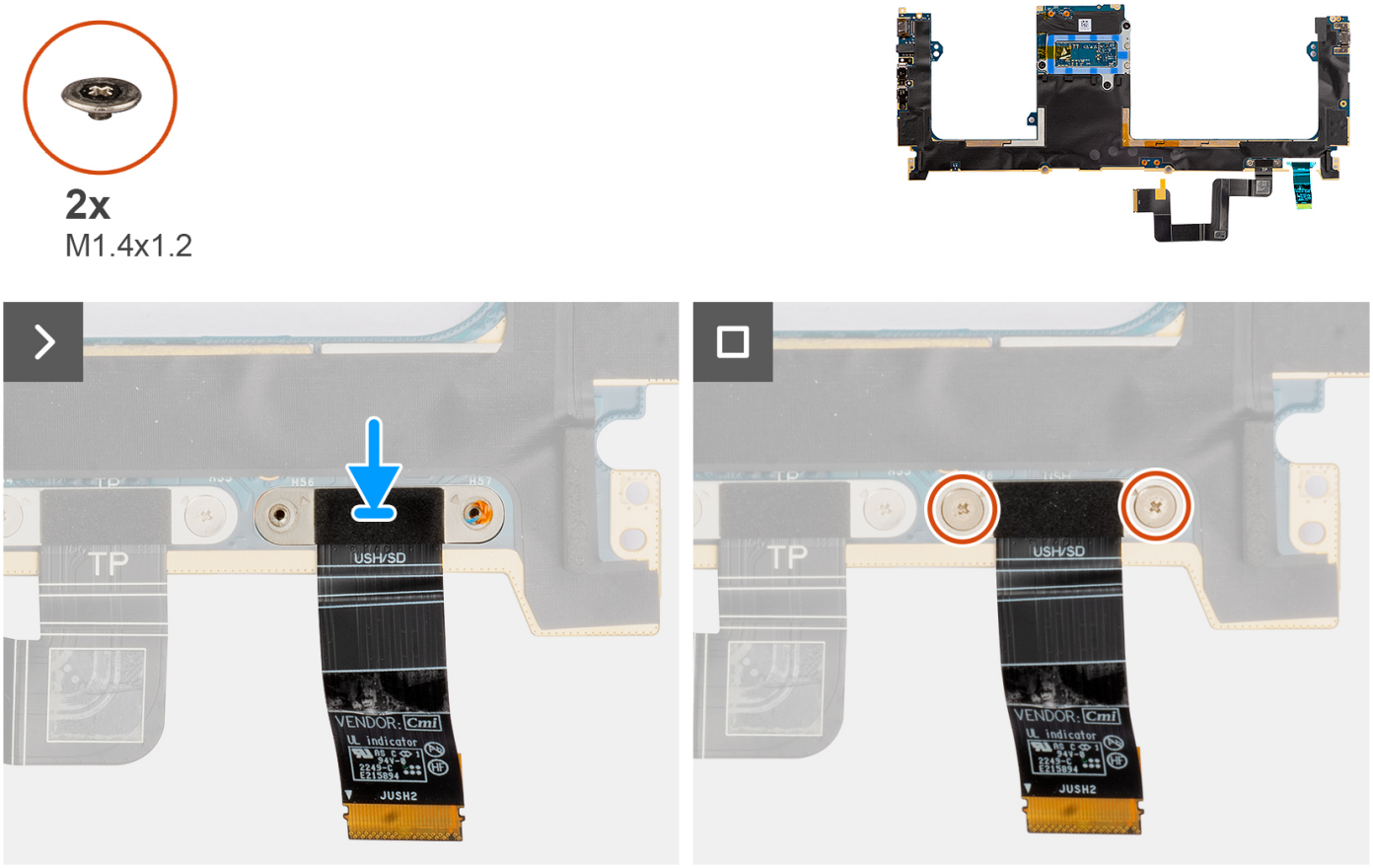
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

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

The following image indicates the location of the USH and SD card reader daughterboard FPC and provides a visual representation of the installation procedure.

**NOTE:** The following procedure is applicable for systems shipped with a USH and SD card reader daughterboard FPC only.




### Steps

1. Align and place the USH and SD card reader daugherboard FPC in place.
2. Replace the two (M1.4x1.2) screws to secure the USH and SD card reader daugherboard FPC in place.
3. Connect the USH and SD card reader daugherboard FFC cable to the connector on the system board.

### Next steps

1. Install the system board.
2. Install the heatsink.
3. Install the right fan.
4. Install the left fan.
5. Install the Battery.
6. Install the VPU card, for systems shipped with a VPU card.

7. Install the M.2 solid-state drive, for systems shipped with a solid-state drive.
8. Install the base cover.
9. Install the SD card.
10. Follow the procedure in After working inside your computer.

# Wireless Local Area Network (WLAN) Antennas

## Removing the WLAN antenna module

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the M.2 solid-state drive, for systems shipped with a solid-state drive.
5. Remove the VPU card, for systems shipped with a VPU card.
6. Remove the Battery.
7. Remove the left fan.
8. Remove the right fan.
9. Remove the heatsink.
10. Remove the system board.

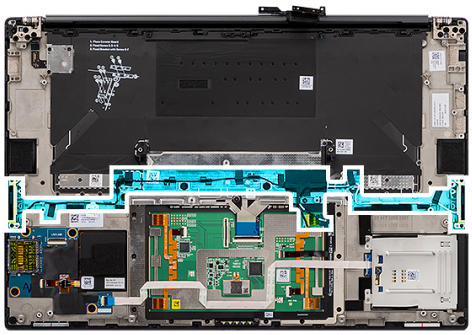
### About this task

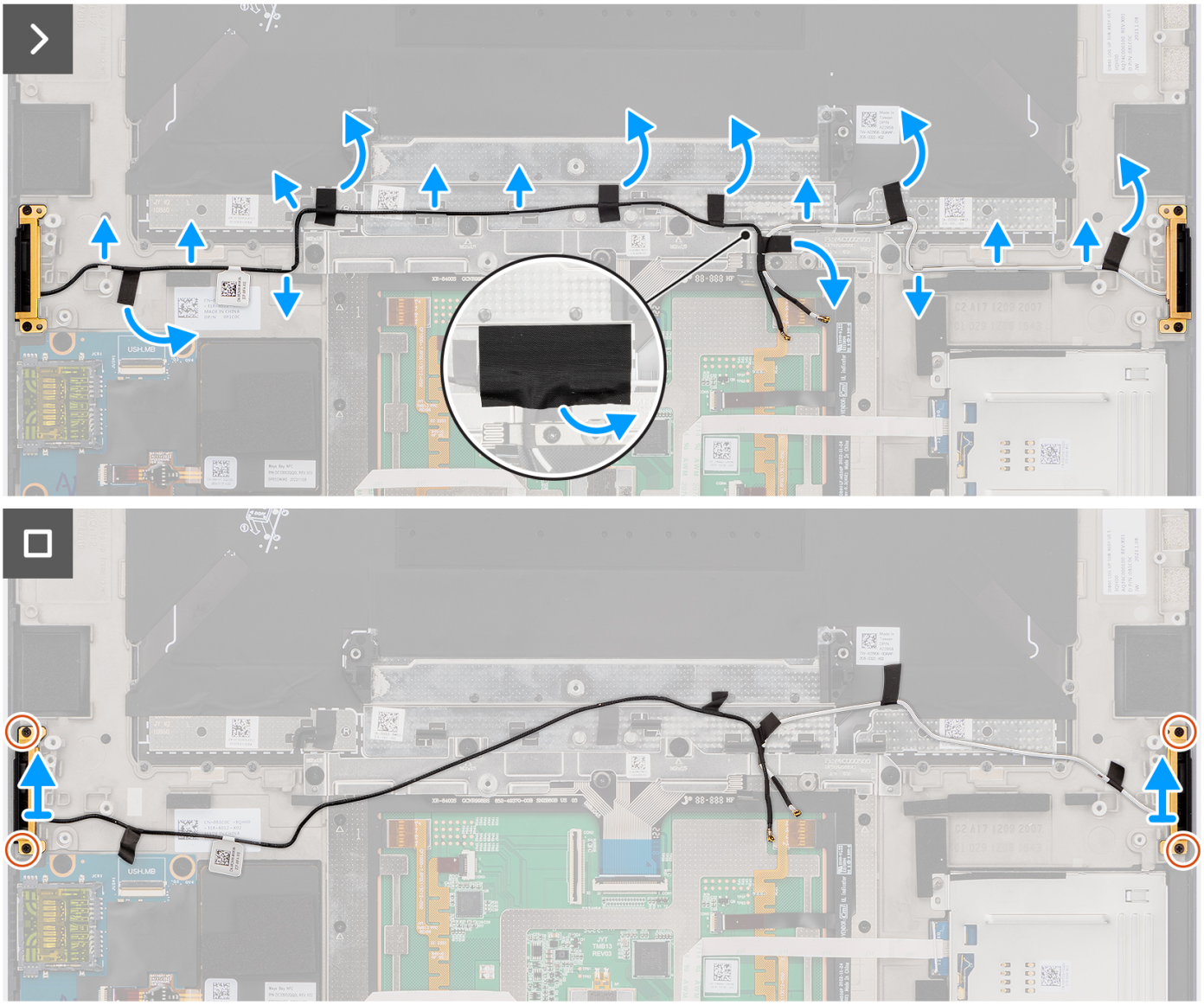
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

**NOTE:** The following procedure is applicable for systems shipped with WLAN antennas only.

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





### Steps

1. Remove the left and right tweeter speakers from their slots on the chassis.
2. Peel off the tape that secures the WLAN antenna cables to the palm-rest assembly.
3. Unroute the WLAN antenna cables from the routing guides on the palm-rest assembly.
4. Loosen the four captive screws that secure the WLAN antennas in place.
5. Remove the WLAN antennas off the system.

# Installing the WLAN antenna module

### Prerequisites

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

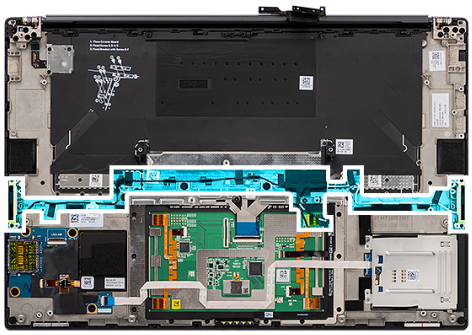
### About this task

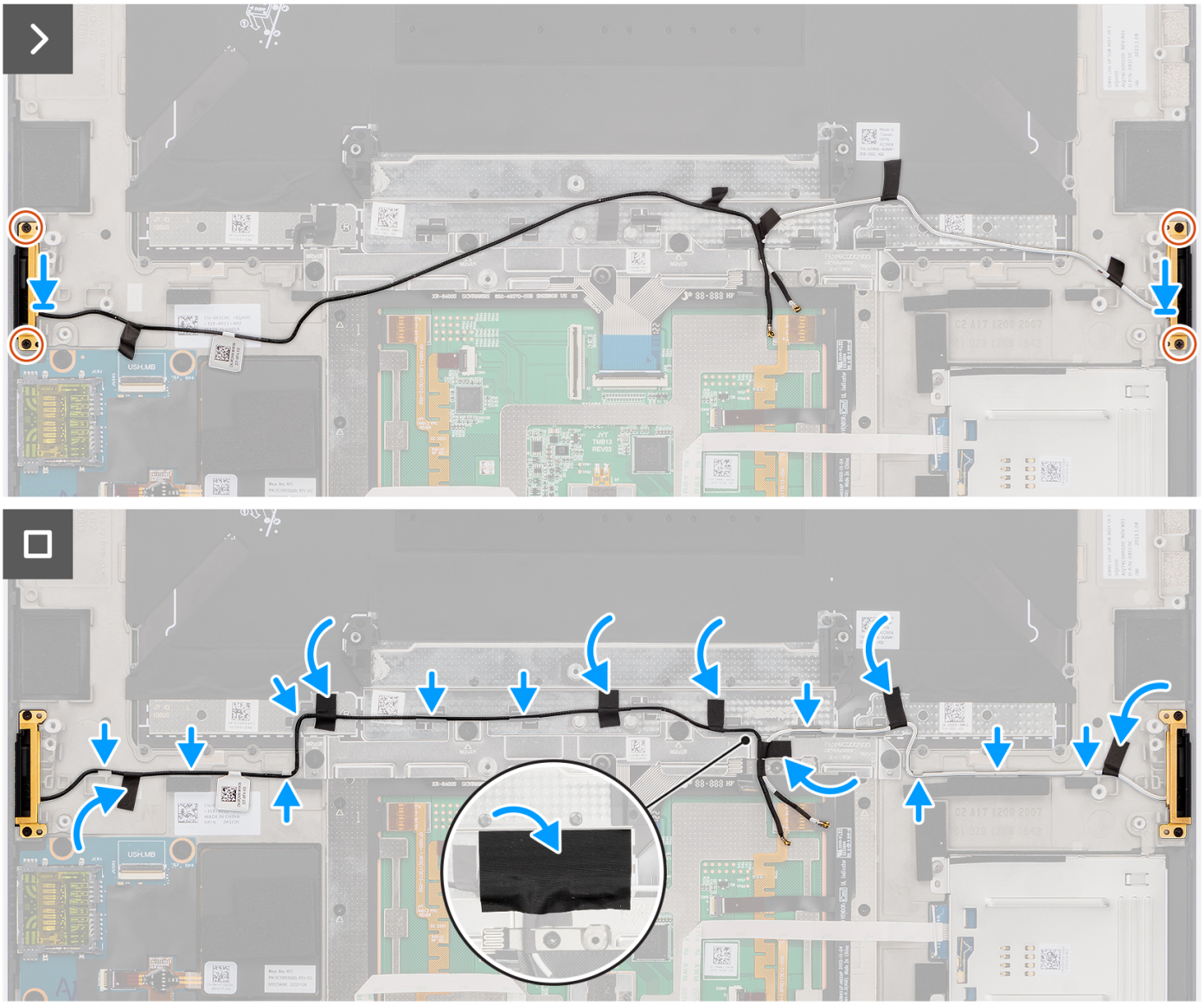
**CAUTION: The information in this installation section is intended for authorized service technicians only.**

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

**NOTE:** The following procedure is applicable for systems shipped with WLAN antennas only.





### Steps

1. Align and place the WLAN antennas in the slot on the system.
2. Route the WLAN antenna cables through the routing guides on the palm-rest assembly.
3. Replace the four captive screws to secure the WLAN antenna cables to the palm-rest assembly.
4. Adhere the tape to secure the WLAN antenna cables to the palm-rest assembly.
5. Align and place the left and right speakers into the slot on the chassis.

### Next steps

1. Install the system board.
2. Install the heatsink.
3. Install the right fan.
4. Install the left fan.
5. Install the Battery.
6. Install the VPU card, for systems shipped with a VPU card.
7. Install the M.2 solid-state drive, for systems shipped with a solid-state drive.
8. Install the base cover.
9. Install the SD card.
10. Follow the procedure in After working inside your computer.

# Power button with fingerprint reader assembly

## Removing the power button with fingerprint reader assembly

### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the M.2 solid-state drive, for systems shipped with a solid-state drive.
5. Remove the VPU card, for systems shipped with a VPU card.
6. Remove the Battery.
7. Remove the left fan.
8. Remove the right fan.
9. Remove the heatsink.
10. Remove the system board.

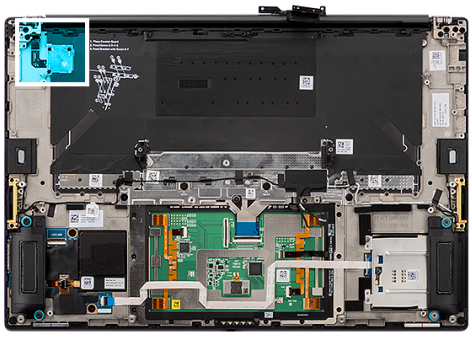
### About this task

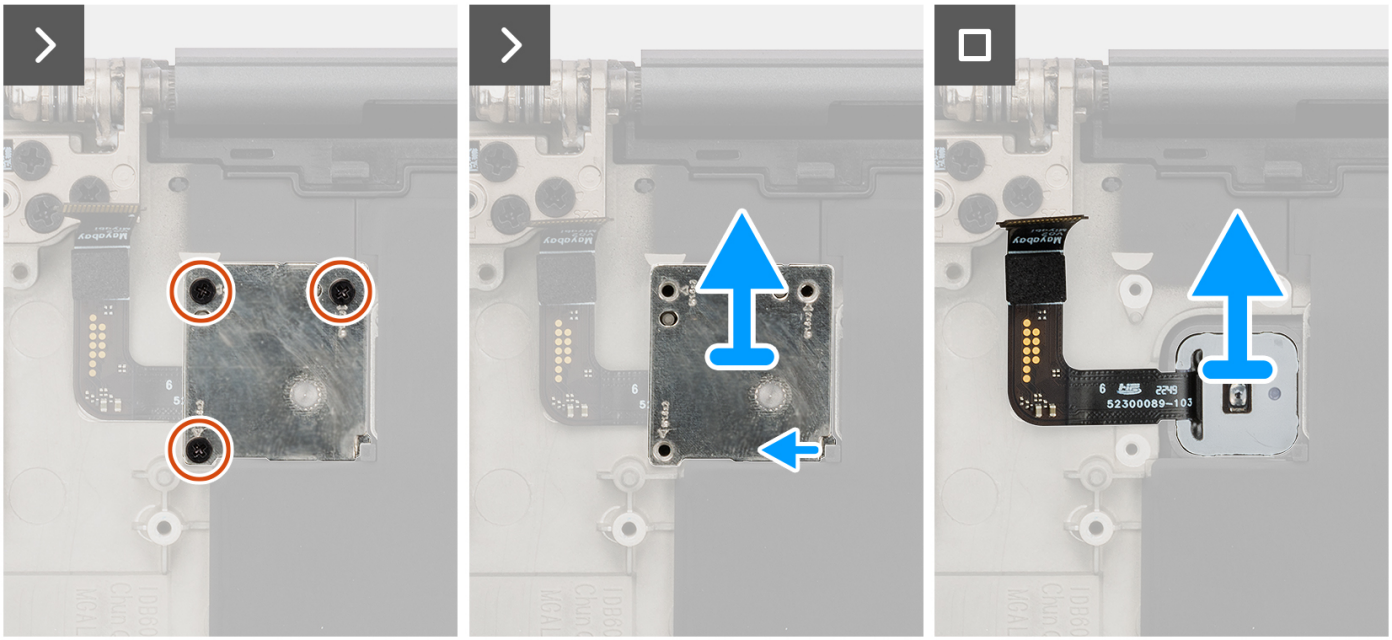
**CAUTION: The information in this removal section is intended for authorized service technicians only.**

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



3x
M1.6x2





### Steps

1. Remove the three (M1.6x2) screws that secure the power button with fingerprint reader bracket in place.
2. Lift the power button with fingerprint reader bracket off the system.
3. Peel off and remove the power button with fingerprint reader assembly from the palm-rest assembly.

## Installing the power button with fingerprint reader assembly

### Prerequisites

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

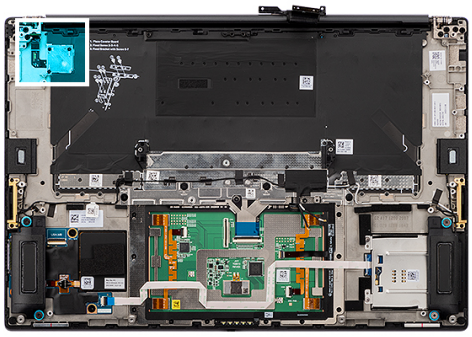
### About this task

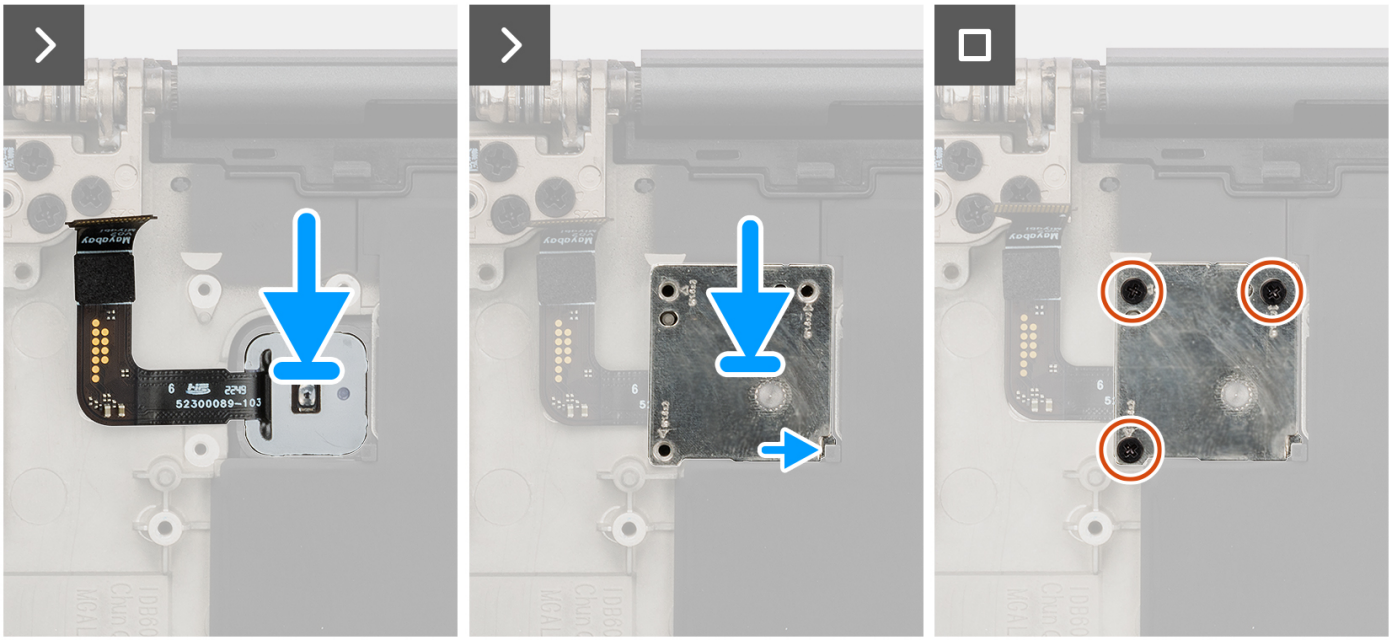
**CAUTION: The information in this installation section is intended for authorized service technicians only.**

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



**3x**
M1.6x2





### Steps

1. Align, place, and adhere the power button with fingerprint reader assembly on the palm-rest assembly.
2. Place the power button with fingerprint reader bracket on the power button assembly.
3. Replace the three (M1.6x2) screws to secure the power button bracket in place.

### Next steps

1. Install the system board.
2. Install the heatsink.
3. Install the right fan.
4. Install the left fan.
5. Install the Battery.
6. Install the VPU card, for systems shipped with a VPU card.
7. Install the M.2 solid-state drive, for systems shipped with a solid-state drive.
8. Install the base cover.
9. Install the SD card.
10. Follow the procedure in After working inside your computer.

# Palm-rest assembly

## Removing the palm-rest assembly

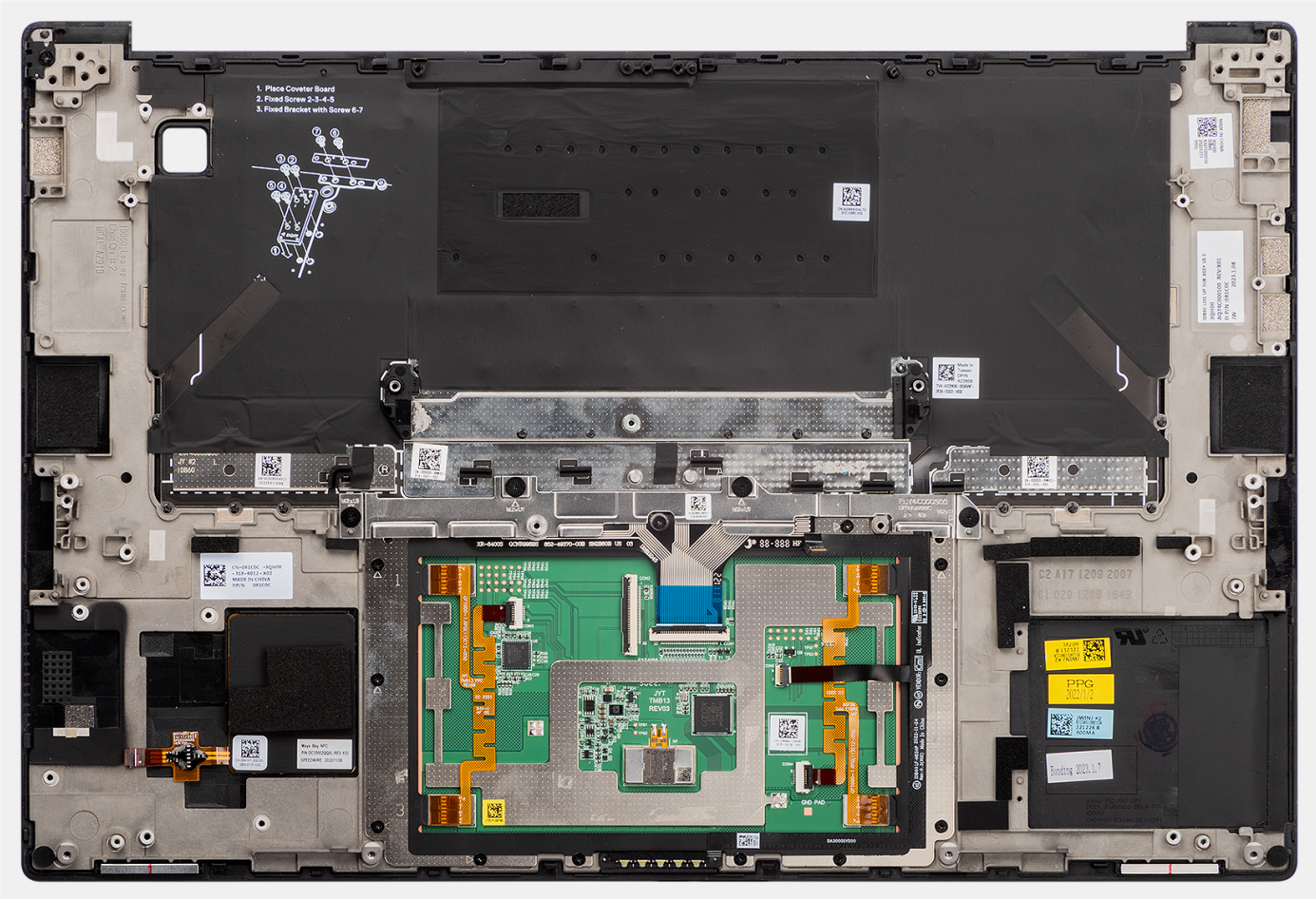
### Prerequisites

1. Follow the procedure in Before working inside your computer.
   **NOTE:** Ensure that your computer is in Service Mode. For more information see, step 6 in Before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the M.2 solid-state drive, for systems shipped with a solid-state drive.
5. Remove the VPU card, for systems shipped with a VPU card.
6. Remove the Battery.
7. Remove the display assembly.
8. Remove the left fan.
9. Remove the right fan.
10. Remove the heatsink.
11. Remove the smart-card reader for systems shipped with a smart-card reader.
12. Remove the GPU card or dummy GPU card.
13. Remove the system board.
14. Remove the speakers.
15. Remove the WLAN antennas.
16. Remove the power button with fingerprint reader assembly.

### About this task

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

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




# Installing the palm-rest assembly

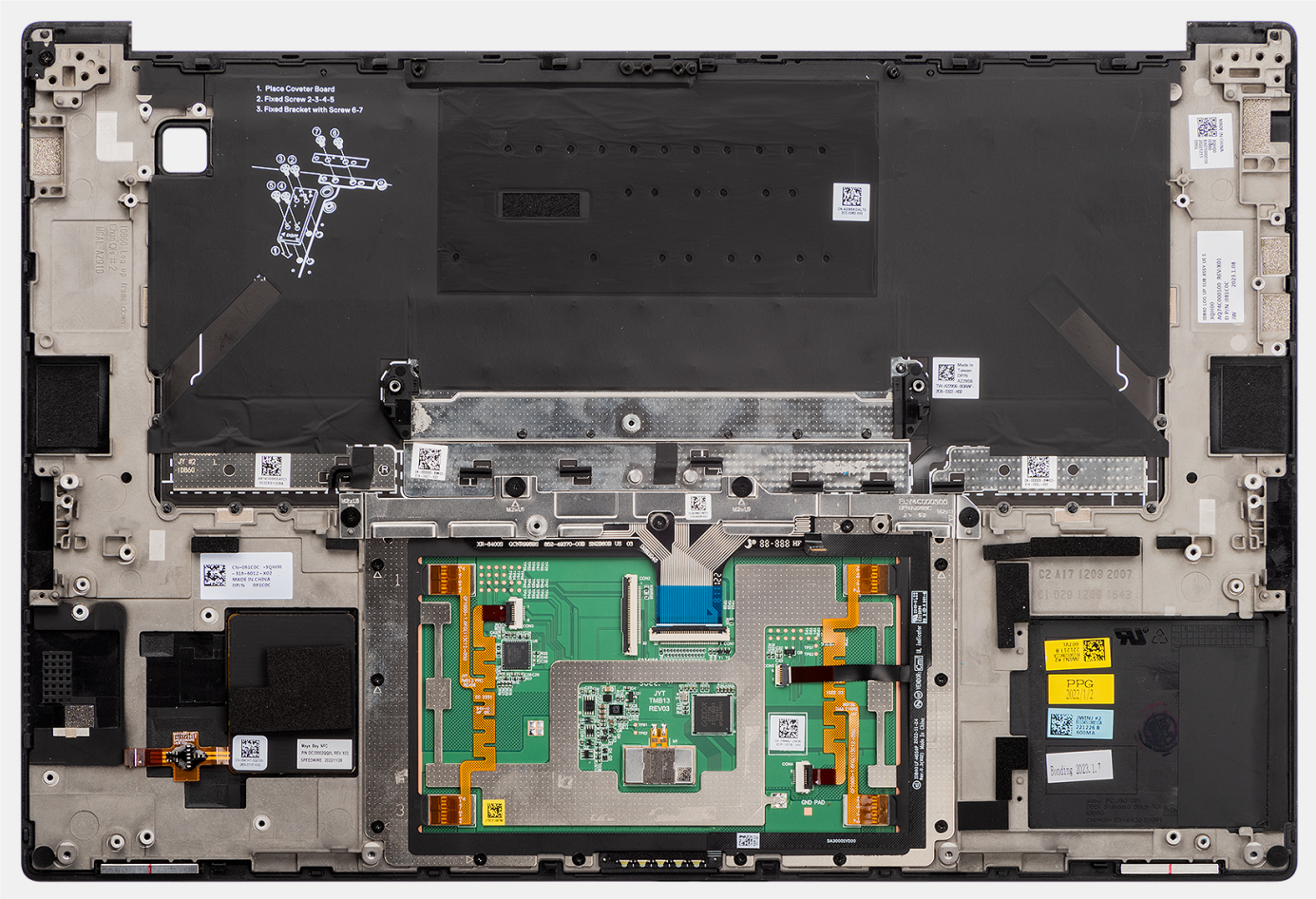
### Prerequisites

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

### About this task

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

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




### Steps

Place the palm-rest assembly on a flat surface.

### Next steps

1. Install the power button with fingerprint reader.
2. Install the WLAN antennas.
3. Install the speakers.
4. Install the system board.
5. Install the GPU card or dummy GPU card.
6. Install the smart-card reader for systems shipped with a smart-card reader.
7. Install the heatsink.
8. Install the right fan.
9. Install the left fan.
10. Install the display assembly.
11. Install the Battery.
12. Install the VPU card, for systems shipped with a VPU card.
13. Install the M.2 solid-state drive, for systems shipped with a solid-state drive.
14. Install the base cover.
15. Install the SD card.
16. Follow the procedure in After working inside your computer.

# 7

# Software

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

## Operating system

Your Dell Precision 5680 supports the following operating systems:

- Windows 11 Home, 64-bit
- Windows 11 Pro, 64-bit
- Windows 11 Pro for Workstation, 64-bit
- Windows 11 Pro for Education, 64-bit
- Windows 11 Enterprise, 64-bit
- Ubuntu 22.04 LTS, 64-bit

## Drivers and downloads

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

# 8

# BIOS Setup

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

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

**NOTE:** Before you change the settings in BIOS Setup, it is recommended that you note down the original settings for future reference.

Use BIOS Setup for the following purposes:

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

## Entering BIOS setup program

**About this task**

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

## Navigation keys

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

**Table 31. 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 follow the link in the field. |
| Spacebar | Expands or collapses a drop-down list, if applicable. |
| Tab | Moves to the next focus area.<br>**NOTE:** For the standard graphics browser only. |
| Esc | Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system. |

## One time boot menu

To enter **one time boot menu**, turn on your computer, and then press F12 immediately.

**NOTE:** It is recommended to shutdown the computer if it is on.

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

- Removable Drive (if available)
- STXXXX Drive (if available)

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

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

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

# System setup options

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

### Table 32. System setup options—System information menu

| **Overview for Dell Precision 5680** | |
|---|---|
| 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. |
| 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.<br>Default: Enabled |
| **Battery** | Displays the battery health information. |
| Primary | Displays the primary battery. |
| Battery Level | Displays the battery level. |
| Battery State | Displays the battery state. |
| Health | Displays the battery health. |
| AC Adapter | Displays whether an AC adapter is connected. If connected, the AC adapter type. |
| Battery Life Type | Displays the battery life type. |
| **PROCESSOR** | |
| 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. |

### Table 32. System setup options—System information menu (continued)

| Overview for Dell Precision 5680 | |
|---|---|
| Microcode Version | Displays the microcode version. |
| Intel Hyper-Threading Capable | Displays whether the processor is Hyper-Threading (HT) capable. |
| 64-Bit Technology | Displays whether 64-bit technology is used. |
| **MEMORY** | |
| Memory Installed | Displays the total computer memory installed. |
| Memory Available | Displays the total computer memory available. |
| Memory Speed | Displays the memory speed. |
| Memory Channel Mode | Displays single or dual channel mode. |
| Memory Technology | Displays the technology that is used for the memory. |
| **DEVICES** | |
| Panel Type | Displays the Panel Type of the computer. |
| Video Controller | Displays the integrate graphics information of the computer. |
| Video Memory | Displays the video memory information of the computer. |
| Wi-Fi Device | Displays the Wi-Fi device installed in 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 whether a Bluetooth device is installed in the computer. |
| Pass Through MAC Address | Displays the MAC address of the video pass-through. |
| dGPU Video Controller | Displays the dGPU video controller. |

### Table 33. System setup options—Boot Configuration menu

| Boot Configuration | |
|---|---|
| **Boot Sequence** | |
| Boot Mode: UEFI only | Displays the boot mode of this computer. |
| Boot Sequence | Displays the boot sequence. |
| **Secure Digital (SD) Card Boot** | Enables or disables Secure Digital (SD) Card boot. |
| **Secure Boot** | |
| Enable Secure Boot | Enables or disables checking of boot software (including firmware drivers and the operating system). |
| Enable Microsoft UEFI CA | By default, the is enabled. |
| Secure Boot Mode | Modifies the behavior of Secure Boot to allow evaluation or enforcement of UEFI driver signatures.<br>By default, Deployed Mode is selected. |
| **Expert Key Management** | |
| Enable Custom Mode | Enables or disables custom mode to allow keys in the PK, KEK, db, and dbx security key databases to be modified.<br>Default: OFF |

### Table 34. System setup options—Integrated Devices menu

| Integrated Devices | |
|---|---|
| **Date/Time** | |
| Date | Sets the computer date in MM/DD/YYYY format. Changes to the date take effect immediately. |
| Time | Sets the computer time in HH/MM/SS 24-hour format. You can switch between 12-hour and 24-hour clock. Changes to the time take effect immediately. |
| **Thunderbolt Adapter Configuration** | |
| Enable Thunderbolt Technology Support | Enables or disables the Thunderbolt Technology feature and associated ports and adapters.<br>Default: ON |
| Enable Thunderbolt Boot Support | Enables or disables Thunderbolt adapter features during pre-boot.<br>Default: OFF |
| Enable Thunderbolt (and PCIe behind TBT) pre-boot modules | Enables or disables the setting that allows PCIe devices that are connected via a Thunderbolt adapter.<br>Default: OFF |
| Disable USB4 PCIE Tunneling | Disable the USB4 PCIE Tunneling option.<br>By default, the option is disabled. |
| Video/Power only on Type-C Ports | Enable or disable the Type-C port functionality to video or only power.<br>By default, the Video/Power only on Type-C Ports option is disabled. |
| **Camera** | |
| Enable Camera | Enables or disables the camera.<br>By default, Enable Camera is selected. |
| **Audio** | |
| Enable Audio | Enables or disables all integrated audio controller.<br>Default: ON |
| Enable Microphone | Enables or disables microphone.<br>By default, Enable Microphone is selected. |
| Enable Internal Speaker | Enables or disables internal speaker.<br>By default, Enable Internal Speaker is selected. |
| **USB Configuration** | Enables or disables booting from USB mass storage devices such as external hard drive, optical drive, and USB drive.<br>By default, Enable USB Boot Support is selected.<br>By default, Enable External USB Ports is selected. |
| **Type-C Dock Override** | Enables to use connected Type-C Dell Dock to provide data stream with external USB ports disabled. When Type-C Dock override is enabled, the Video/Audio/Lan submenu is activated.<br>By default, the Type-C Dock Override option is enabled. |
| **Miscellaneous Devices** | |
| Enable Fingerprint Reader Device | Enables or disables the Fingerprint Reader Device.<br>By default, Enable Fingerprint Reader Device is selected. |

### Table 35. System setup options—Storage menu

| Storage | |
|---|---|
| **SATA Operation** | Configures operating mode of the integrated SATA hard drive controller.<br>Default: RAID On. SATA is configured to support RAID (Intel Rapid Restore Technology). |
| **Storage Interface** | Displays the storage interface. |
| **Drive Information** | Displays the information of various onboard drives. |
| **Enable SMART Reporting** | Enables or disables Self-Monitoring, Analysis, and Reporting Technology (SMART).<br>Default: OFF |
| **Enable MediaCard** | Enables to switch all media cards On/Off or set the media card to read-only state.<br>By default, Enable Secure Digital (SD) Card is selected. |
| Secure Digital (SD) Card Read-Only Mode | Enable or disable the SD card read-only mode.<br>By default, the Secure Digital (SD) Card Read-Only Mode option is not enabled. |

### Table 36. System setup options—Display menu

| Display | |
|---|---|
| **Display Brightness** | |
| Brightness on battery power | Sets the screen brightness when the computer is running on battery power.<br>Default: 50 |
| Brightness on AC power | Sets the screen brightness when the computer is running on AC power.<br>Default: 100 |
| **Touch Screen** | Enables or disables the touch screen for the OS.<br>**NOTE:** The touch screen will always work in the BIOS setup irrespective of this setting. |
| **Full Screen Logo** | Enabled or disabled the computer to display full screen logo if the image match screen resolution.<br>Default: OFF |

### Table 37. System setup options—Connection menu

| Connection | |
|---|---|
| **Wireless Device Enable** | Enable or disable internal WLAN/Bluetooth devices.<br>By default, WLAN is selected.<br>By default, Bluetooth is selected. |
| **Enable UEFI Network Stack** | |
| Enable UEFI Network Stack | When enabled, UEFI networking protocols are installed and available, allowing pre-OS and early OS networking features to use any enabled NICs. This may be used without PXE turned on.<br>Default: ON |
| **Wireless Radio Control** | |
| Control WLAN radio | Enables to sense the connection of the computer to a wired network and subsequently disable the selected wireless radios (WLAN and/or WWAN). |

### Table 37. System setup options—Connection menu (continued)

| Connection | |
|---|---|
| | Upon disconnection from the wired network, the selected wireless radios are re-enabled.<br>Default: OFF |
| Dynamic Wireless Transmit Power | By default, the option is enabled. |
| **HTTPs Boot Feature** | |
| HTTPs Boot | Enable or disable the HTTPs Boot feature.<br>By default, the HTTPs Boot option is enabled. |
| HTTPs Boot Mode | With Auto Mode, the HTTPs Boot extracts Boot URL from the DHCP. With Manual Mode, the HTTPs Boot reads Boot URL from the user-provided data.<br>By default, the Auto Mode option is enabled. |

### Table 38. System setup options—Power menu

| Power | |
|---|---|
| **Battery Configuration** | Enables the computer to run on battery during power usage hours. Use the below options to prevent AC power usage between certain times of each day.<br>By default Adaptive is selected. |
| **Advanced Configuration** | |
| Enable Advanced Battery Charge Configuration | Enables Advanced Battery Charge Configuration from the beginning of the day to a specified work period. Advanced Battery Charged maximizes battery health while still supporting heavy use during the work day.<br>Default: OFF |
| **Peak Shift** | Enables the computer to run on battery during peak power usage hours.<br>Default: OFF |
| **Thermal Management** | Sets cooling fan and processor heat management to adjust system performance, noise, and temperature.<br>By default, Optimized is selected. |
| **USB Wake Support** | |
| Wake on Dell USB-C Dock | Enables connecting a Dell USB-C Dock to wake the computer from Standby, Hibernate, or Power off.<br>Default: ON |
| **Block Sleep** | Blocks the computer from entering Sleep (S3) mode in the operating system.<br>Default: OFF<br>**NOTE:** If enabled, the computer will not go to sleep, Intel Rapid Start will be disabled automatically, and the operating system power option will be blank if it was set to Sleep. |
| **Lid Switch** | |
| Enable Lid Switch | Enables or disables the lid switch.<br>Default: ON |
| Power On Lid Open | Enables the computer to power up from the off state whenever the lid is opened.<br>Default: ON |

### Table 38. System setup options—Power menu (continued)

| Power | |
|---|---|
| **Intel Speed Shift Technology** | Enables or disables the Intel Speed Shift Technology support. Setting this option to enable allows the operating system to select the appropriate processor performance automatically.<br>Default: ON |

### Table 39. System setup options—Security menu

| Security | |
|---|---|
| **TPM 2.0 Security On** | Select whether or not the Trusted Platform Model (TPM) is visible to the OS.<br>Default: ON |
| PPI Bypass for Clear Commands | Enables or disables the operating system to skip BIOS Physical Presence Interface (PPI) user prompts when issuing the Clear command.<br>Default: OFF |
| Attestation Enable | Enables to control whether the TPM Endorsement Hierarchy is available to the OS. Disabling this setting restricts the ability to use the TPM for signature operations.<br>Default: ON |
| Key Storage Enable | Enables to control whether the TPM Endorsement Hierarchy is available to the OS. Disabling this setting restricts the ability to use the TPM for storing owner data.<br>Default: ON |
| SHA-256 | Enables or disables the BIOS and the TPM to use the SHA-256 hash algorithm to extend measurements into the TPM PCRs during BIOS boot.<br>Default: ON |
| Clear | Enables or disables the computer to clear the TPM owner information, and returns the TPM to the default state.<br>Default: OFF |
| Chassis Intrusion | Controls the chassis intrusion feature.<br>By default, the option is disabled. |
| **SMM Security Mitigation** | |
| SMM Security Mitigation | Enables or disables additional UEFI SMM Security Mitigation protections.<br>Default: ON<br>**NOTE:** This feature may cause compatibility issues or loss of functionality with some legacy tools and applications. |
| **Data Wipe on Next Boot** | |
| Start Data Wipe | When enabled, the BIOS will queue up a data wipe cycle for storage device(s) connected to the motherboard on the next reboot.<br>Default: OFF |
| **Absolute** | |
| Absolute | Enables, disables or permanently disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute Software.<br>By default, Enable Absolute is selected. |
| **UEFI Boot Path Security** | |

### Table 39. System setup options—Security menu (continued)

| Security | |
|---|---|
| UEFI Boot Path Security | Controls whether the system will prompt the user to enter the admin password (if set) when booting to a UEFI boot path device from the F12 boot menu.<br>By default, Always Except Internal HDD is selected. |
| **Firmware Device Tamper Detection** | By default, the Silent option is enabled. |
| Clear Firmware Tamper Detection | By default, the option is disabled. |

### Table 40. System setup options—Passwords menu

| Passwords | |
|---|---|
| **Admin Password** | Sets, changes, or deletes the administrator password (sometimes called the "setup password"). The administrator password enables several security features. |
| **System Password** | Set, change, or delete the computer password. |
| **M.2 PCIe SSD1** | |
| **Password Configuration** | |
| Upper Case Letter | When enabled, password must contain at least one upper case letter.<br>Default: OFF |
| Upper Case Letter | When enabled, password must contain at least one lower case letter.<br>Default: OFF |
| Digit | When enabled, password must contain at least one digit number.<br>Default: OFF |
| Special Character | When enabled, password must contain at least one special character.<br>Default: OFF |
| Minimum Characters | Sets the minimum number of characters allowed for passwords.<br>Default: 04 |
| **Password Bypass** | |
| Password Bypass | When enabled, the system and the hard drive passwords are prompted when the computer is powered on from the Off state.<br>By default, Disabled is selected. |
| **Password Changes** | |
| Enable Non-Admin Password Changes | When On, users can change the system and the hard drive password without the need for administrator password.<br>Default: ON |
| **Admin Setup Lockout** | |
| Enable Admin Setup Lockout | Enables or disables the user from entering BIOS Setup when an administrator password is set.<br>Default: OFF |
| **Master Password Lockout** | |
| Enable Master Password Lockout | Enables or disables the master password support.<br>Default: OFF |
| **Allow Non-Admin PSID Revert** | |

### Table 40. System setup options—Passwords menu (continued)

| Passwords | |
|---|---|
| Enable Allow Non-Admin PSID Revert | Controls access to the Physical Security ID (PSID) revert of NVMe hard-drives from the Dell Security Manager prompt.<br>By default, the option is disabled. |

### Table 41. System setup options—Update Recovery menu

| Update Recovery | |
|---|---|
| **UEFI Capsule Firmware Updates** | |
| Enable UEFI Capsule Firmware Updates | Controls whether this computer allows BIOS updates via EUFI capsule update packages.<br>Default: ON |
| **BIOS Recovery from Hard Drive** | |
| BIOS Recovery from Hard Drive | Enables the computer to recover from a bad BIOS image, as long as the Boot Block portion is intact and functioning.<br>Default: ON<br>**NOTE:** BIOS recovery is designed to fix the main BIOS block and cannot work if the Boot Block is damaged. In addition, this feature cannot work in the event of EC corruption, ME corruption, or a hardware issue. The recovery image must exist on an unencrypted partition on the drive. |
| **BIOS Downgrade** | |
| Allow BIOS Downgrade | Controls flashing of the system firmware to previous revisions.<br>Default: ON |
| **SupportAssist OS Recovery** | |
| SupportAssist OS Recovery | Enables or disables the boot flow for SupportAssist OS Recovery tool in the event of certain system errors.<br>Default: ON |
| **BIOSConnect** | |
| BIOSConnect | Enables or disables cloud Service OS recover 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.<br>Default: ON |
| **Dell Auto OS Recovery Threshold** | Controls the automatic boot flow for SupportAssist System Resolution Console and for Dell operating system Recovery tool.<br>By default, 2 is selected. |

### Table 42. System setup options—System Management menu

| System Management | |
|---|---|
| Service Tag | Displays the Service Tag of the computer. |
| Asset Tag | Creates a system Asset Tag that can be used by an IT administrator to uniquely identify a particular system. Once set in BIOS, the Asset Tag cannot be changed. |
| **AC Behavior** | |
| Wake on AC | Enables the computer to turn on and go to boot when AC power is supplied to the computer.<br>Default: OFF |

### Table 42. System setup options—System Management menu (continued)

| System Management | |
|---|---|
| **Wake on LAN/WLAN** | |
| Wake on LAN/WLAN | Enables or disables the computer to turn on by a special LAN/WLAN signal.<br>By default, Disabled is selected. |
| 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.<br>By default, the option is disabled. |
| Intel AMT Capability | By default, the Restrict Preboot Access option is selected. |
| **Diagnostics** | |
| OS Agent Requests | By default, the option is enabled. |
| **Power-on-Self-Test Automatic Recovery** | By default, the option is enabled. |

### Table 43. System setup options—Keyboard menu

| Keyboard | |
|---|---|
| **Fn Lock Options** | |
| Fn Lock Options | Enables or disables the Fn lock option.<br>Default: ON |
| Lock Mode | Default: Lock Mode Secondary. Lock Mode Secondary = If this option is selected, the F1-F12 keys scan the code for their secondary functions. |
| **Keyboard Illumination** | |
| Keyboard Illumination | Configures the operating mode of the keyboard illumination feature.<br>Default: Dim |
| **Keyboard Backlight Timeout on AC** | |
| Keyboard Backlight Timeout on AC | Configures the timeout value for the keyboard when an AC adapter is connected to the computer. The keyboard backlight timeout value is only effect when the backlight is enabled.<br>Default, 10 seconds |
| **Keyboard Backlight Timeout on Battery** | |
| Keyboard Backlight Timeout on Battery | Configures the timeout value for the keyboard when the computer is running on battery. The keyboard backlight timeout value is only effect when the backlight is enabled.<br>Default, 10 seconds |
| **Device Configuration Hotkey Access** | Manages whether you can access device configuration screens through hotkeys during computer startup.<br>By default, the option is enabled. |

### Table 44. System setup options—Pre-Boot Behavior menu

| Pre-Boot Behavior | |
|---|---|
| **Adapter Warnings** | |
| Enable Adapter Warnings | Enables or disables the computer to display adapter warning messages when adapters with too little power capacity are detected. |

### Table 44. System setup options—Pre-Boot Behavior menu (continued)

| Pre-Boot Behavior | |
|---|---|
| | Default: ON |
| **Warnings and Errors** | |
| Warnings and Errors | Selects an action on encountering a warning or error during boot.<br>By default, Prompt on Warnings and Errors is selected.<br>**NOTE:** Errors deemed critical to the operation of the computer hardware will always halt the computer. |
| **USB-C Warnings** | |
| Enable Dock Warning Messages | Enables or disables dock warning messages.<br>Default: ON |
| **Fastboot** | |
| Fastboot | Configures the speed of the UEFI boot process.<br>By default, Thorough is selected. |
| **Extend BIOS POST Time** | |
| Extend BIOS POST Time | Configures the BIOS POST (Power-On Self-Test) load time.<br>By default, 0 seconds is selected. |
| **MAC Address Pass-Through** | |
| MAC Address Pass-Through | Replaces the external NIC MAC address (in a supported dock or dongle) with the selected MAC address from the computer.<br>By default, System Unique MAC Address is selected.<br>By default, the Passthrough MAC Address option is enabled. |
| **Sign of Life** | |
| Early Logo Display | Displays Logo Sign of Life.<br>Default: ON |
| Keyboard Backlight Sign of Life | By default, the option is enabled. |

### Table 45. System setup options—Virtualization menu

| Virtualization | |
|---|---|
| **Intel Virtualization Technology** | |
| Intel Virtualization Technology | Enables or disables the computer to run a virtual machine monitor (VMM).<br>Default: ON |
| **VT for Direct I/O** | |
| Enable Intel VT for Direct I/O | Enables or disables the computer to perform Virtualization Technology for Direct I/O (VT-d). VT-d is an Intel method that provides virtualization for memory map I/O.<br>Default: ON |
| **Intel Trusted Execution Technology(TXT)** | |
| Enable Intel Trusted Execution Technology (TXT) | Specifies whether a measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Technology.<br>By default, the option is disabled. |

### Table 45. System setup options—Virtualization menu (continued)

| Virtualization | |
|---|---|
| **DMA Protection** | |
| Enable Pre-Boot DMA Support | By default, the option is enabled. |
| Enable OS Kernel DMA Support | By default, the option is enabled. |

### Table 46. System setup options—Performance menu

| Performance | |
|---|---|
| **Multi-Core Support** | |
| Active Cores | Changes the number of CPU cores available to the operating system. The default value is set to the maximum number of cores.<br>By default, All Cores is selected. |
| **Intel SpeedStep** | |
| Enable Intel SpeedStep Technology | Enables or disables the Intel SpeedStep Technology to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production.<br>Default: ON |
| **C-States Control** | |
| Enable C-State Control | Enables or disables the CPU's ability to enter and exit low-power states.<br>Default: ON |
| **Intel Turbo Boost Technology** | |
| Enable Intel Turbo Boost Technology | Enabled or disabled the Intel TurboBoost mode of the processor. If enabled, the Intel TurboBoost driver increases the performance of the CPU or graphics processor.<br>Default: ON |
| Intel Turbo Boost Maximum Technology 3.0 | |
| **Intel Hyper-Threading Technology** | |
| Enable Intel Hyper-Threading Technology | Enabled or disabled the Intel Hyper-Threading mode of the processor. If enabled, the Intel Hyper-Threading increases the efficiency of the processor resources when multiple threads run on each core.<br>Default: ON |
| Prestos 3 | |

### Table 47. System setup options—System Logs menu

| System Logs | |
|---|---|
| **BIOS Event Log** | |
| Clear Bios Event Log | Select keep or clear BIOS events.<br>By default, Keep is selected. |
| **Thermal Event Log** | |
| Clear Thermal Event Log | Select keep or clear Thermal events.<br>By default, Keep is selected. |
| **Power Event Log** | |
| Clear POWER Event Log | Select keep or clear Power events. |

**Table 47. System setup options—System Logs menu (continued)**

| System Logs |
| --- |
| By default, Keep is selected. |

# Updating the BIOS

## Updating the BIOS in Windows

### 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 system 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 re-install. For more information on this subject, search in the Knowledge Base Resource at www.dell.com/support.**

### Steps

1. Go to www.dell.com/support.
2. Click **Product support**. In the **Search support** box, enter the Service Tag of your computer, and then click **Search**.

   **NOTE:** If you do not have the Service Tag, use the SupportAssist feature 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 www.dell.com/support.

## 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 www.dell.com/support.

## Updating the BIOS using the USB drive in Windows

### About this task

**CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system 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 re-install. For more information on this subject, search in the Knowledge Base Resource at www.dell.com/support.**

### Steps

1. Follow the procedure from step 1 to step 6 in Updating the BIOS in Windows to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, search in the Knowledge Base Resource at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.

5. Restart the computer and press **F12** .
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
   The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

# Updating the BIOS from the F12 One-Time boot menu

Update your computer BIOS using the BIOS update.exe file that is copied to a FAT32 USB drive and booting from the F12 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 re-install. For more information on this subject, search in the Knowledge Base Resource at www.dell.com/support.**

### BIOS Update

You can run the BIOS update file from Windows using a bootable USB drive or you can also update the BIOS from the F12 One-Time boot menu on the computer.

Most of the Dell computers built after 2012 have this capability, and you can confirm by booting your computer to the F12 One-Time Boot Menu to see if BIOS FLASH UPDATE is listed as a boot option for your computer. If the option is listed, then the BIOS supports this BIOS update option.

**NOTE:** Only computers with BIOS Flash Update option in the F12 One-Time boot menu can use this function.

### Updating from the One-Time boot menu

To update your BIOS from the F12 One-Time boot menu, you need the following:

- USB drive formatted to the FAT32 file system (key 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 that is connected to the computer
- Functional computer battery to flash the BIOS

Perform the following steps to perform the BIOS update flash process from the F12 menu:

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

### Steps

1. From a turn off state, insert the USB drive where you copied the flash into a USB port of the computer.
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 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 update is completed.

# System and setup password

**Table 48. System and setup password**

| Password type | Description |
|---|---|
| System password | Password that you must enter to log in to your system. |
| Setup password | Password that you must enter to access and make changes to the BIOS settings of your computer. |

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

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

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

**NOTE:** System and setup password feature is disabled.

## Assigning a System Setup password

### Prerequisites

You can assign a new **System or Admin Password** only when the status is in **Not Set**.

### About this task

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 visible.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.
   - At least one special character: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [ \ ] ^ _ ` { | }
   - Numbers 0 through 9.
   - Upper case letters from A to Z.
   - Lower case letters from a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and save the changes as prompted by the pop-up message.
5. Press Y to save the changes.
   The computer restarts.

## Deleting or changing an existing system setup password

### Prerequisites

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.

### About this task

To enter the System Setup, press F12 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 **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 and/or Setup password, reenter the new password when prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.

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

# Clearing BIOS (System Setup) and System passwords

### About this task

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

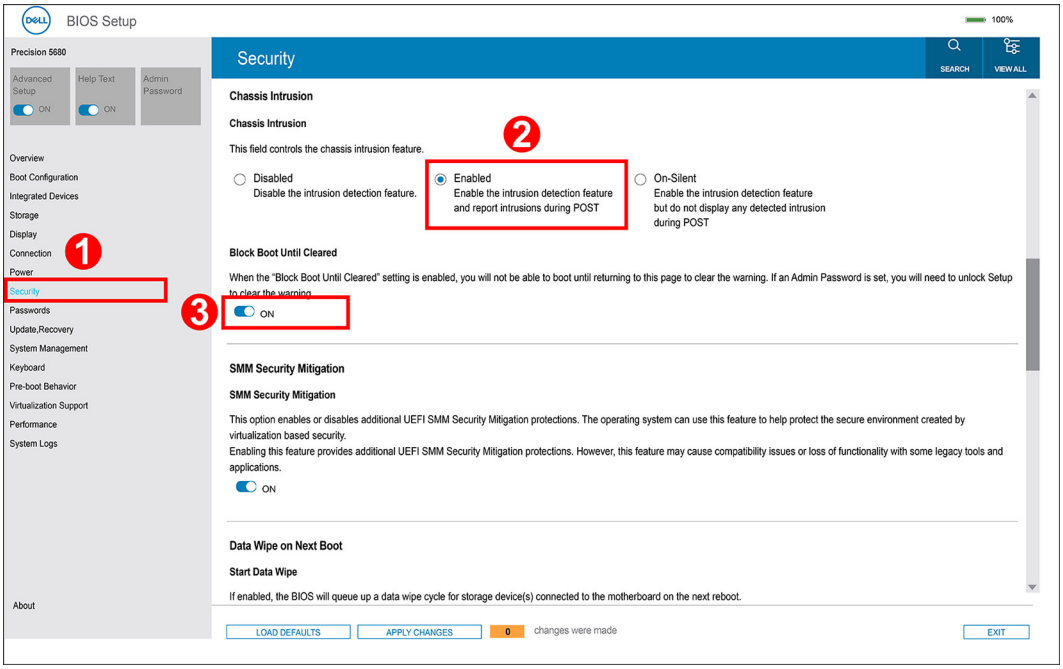
**NOTE:** For information on how to reset Windows or application passwords, refer to the documentation accompanying Windows or your application.

# Clearing Chassis Intrusion Alerts

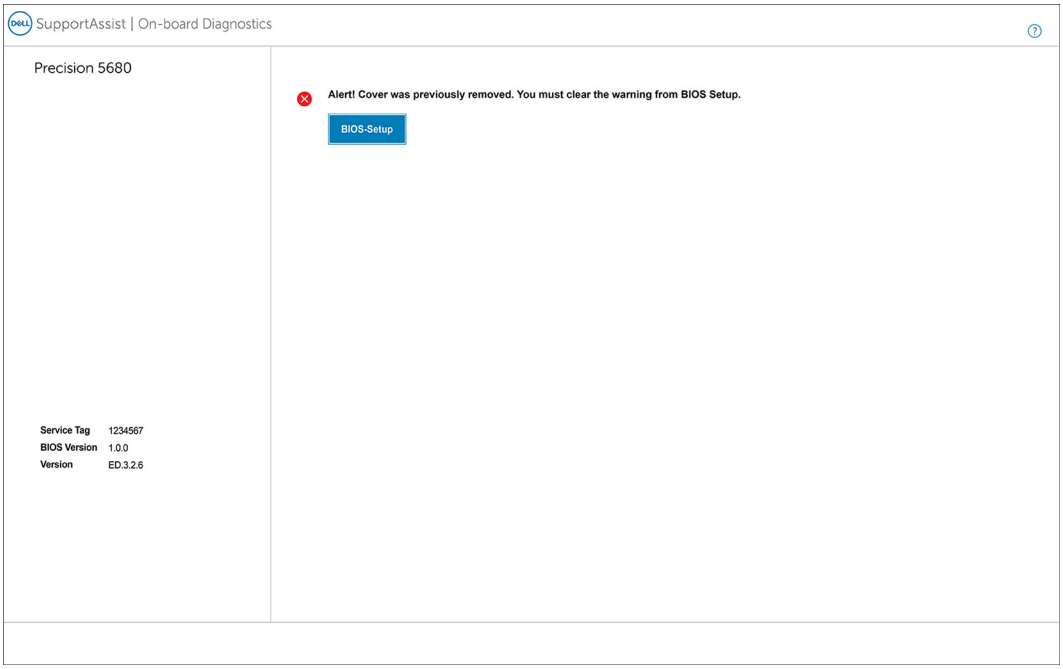
The system features a chassis intrusion switch which is able to detect any time the base cover has been removed from the system.

Alerts to notify you of any intrusions can be enabled via the **Chassis Intrusion** field in the **Security** sub-menu of the BIOS setup menu.

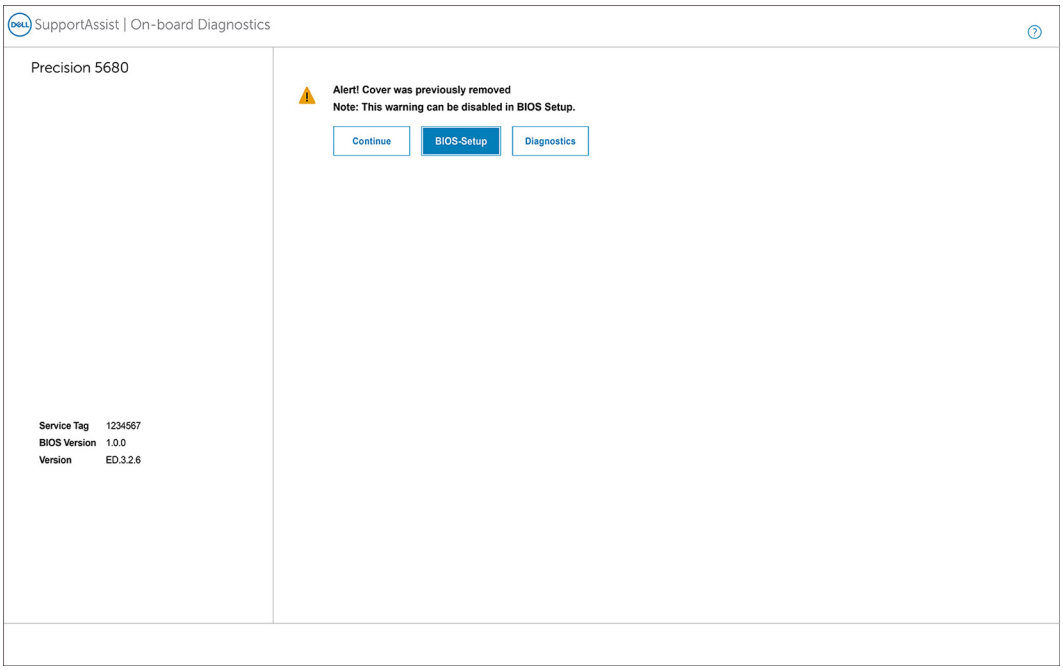
When enabled, the **Block Boot Until Cleared** field allows you to choose whether to prevent normal boot up of the system until the intrusion alert is cleared.




- If **Block Boot Until Cleared** is set to **ON**, the user must select **BIOS-Setup** and clear the intrusion alert in order to boot up normally.

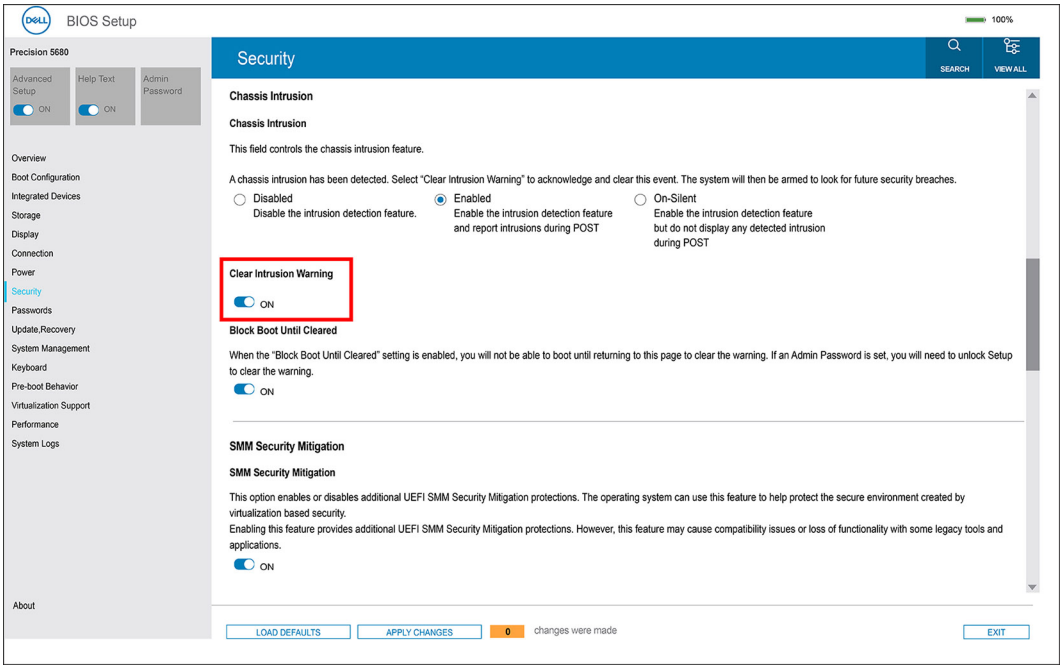



- If **Block Boot Until Cleared** is set to **OFF**, select **Continue** to boot up normally or **BIOS-Setup** to clear the alert.




**NOTE:** If **Continue** is selected, the user will continue to see the alert each time the system is powered on until the alert is cleared.

To clear the alert, select **ON** in the **Clear Intrusion Warning** field in the **Security** sub-menu of the BIOS setup menu.


BIOS Setup
100%
Precision 5680
Advanced Setup
ON
Help Text
ON
Admin Password
Overview
Boot Configuration
Integrated Devices
Storage
Display
Connection
Power
Security
Passwords
Update,Recovery
System Management
Keyboard
Pre-boot Behavior
Virtualization Support
Performance
System Logs
About
Security
SEARCH
VIEW ALL
Chassis Intrusion
Chassis Intrusion
This field controls the chassis intrusion feature.
A chassis intrusion has been detected. Select "Clear Intrusion Warning" to acknowledge and clear this event. The system will then be armed to look for future security breaches.
Disabled
Disable the intrusion detection feature.
Enabled
Enable the intrusion detection feature and report intrusions during POST
On-Silent
Enable the intrusion detection feature but do not display any detected intrusion during POST
Clear Intrusion Warning
ON
Block Boot Until Cleared
When the "Block Boot Until Cleared" setting is enabled, you will not be able to boot until returning to this page to clear the warning. If an Admin Password is set, you will need to unlock Setup to clear the warning.
ON
SMM Security Mitigation
SMM Security Mitigation
This option enables or disables additional UEFI SMM Security Mitigation protections. The operating system can use this feature to help protect the secure environment created by virtualization based security.
Enabling this feature provides additional UEFI SMM Security Mitigation protections. However, this feature may cause compatibility issues or loss of functionality with some legacy tools and applications.
ON
LOAD DEFAULTS
APPLY CHANGES
0
changes were made
EXIT

# 9

# Troubleshooting

## Handling swollen rechargeable Li-ion batteries

Like most laptops, Dell laptops use Lithium-ion batteries. One type of Lithium-ion battery is the rechargeable Li-ion battery. Rechargeable Li-ion batteries have increased in popularity in recent years and have become 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.

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 should be replaced and disposed of properly. We recommend contacting Dell product 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 system. To discharge the battery, unplug the AC adapter from the system and operate the system only on battery power. When the system will no longer power on when the power button is pressed, the battery is fully discharged.
- 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 product support at https://www.dell.com/support 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 https://www.dell.com 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 on 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 www.dell.com/support.

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

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

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

# 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 with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing you to:

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

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

For more information, see the knowledge base article 000180971.

## Running the SupportAssist Pre-Boot System Performance Check

**Steps**

1. Turn on your computer.
2. As the computer boots, press the F12 key as the Dell logo appears.
3. On the boot menu screen, select the **Diagnostics** option.
4. Click the arrow at the bottom left corner.
   Diagnostics front page is displayed.
5. Click the arrow in the lower-right corner to go to the page listing.
   The items detected are listed.
6. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
7. Select the device from the left pane and click **Run Tests**.
8. If there are any issues, error codes are displayed.
   Note the error code and validation number and contact Dell.

# Built-in self-test (BIST)

## M-BIST

M-BIST (Built In Self-Test) is the system board's 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 POST (Power On Self Test).

### How to run M-BIST

**NOTE:** M-BIST must be initiated on the system from a power-off state either connected to AC power or with battery only.

1. Press and hold both the **M** key on the keyboard and the **power button** to initiate M-BIST.
2. With both the **M** key and the **power button** held down, the battery indicator LED may exhibit two states:
   a. OFF: No fault detected with the system board
   b. AMBER: Indicates a problem with the system board
3. If there is a failure with the system board, the battery status LED will flash one of the following error codes for 30 seconds:

**Table 49. LED error codes**

| Blinking Pattern | | Possible Problem |
|---|---|---|
| **Amber** | **White** | |
| 2 | 1 | CPU Failure |
| 2 | 8 | LCD Power Rail Failure |
| 1 | 1 | TPM Detection Failure |
| 2 | 4 | Memory/RAM failure |

4. If there is no failure with the system board, the LCD will cycle through the solid color screens described in the LCD-BIST section for 30 seconds and then power off.

# LCD Power rail 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 will flash 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 L-BIST Test:

1. Press the power button to start the system.
2. If the system 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 supplied to the LCD.
3. For cases, when a [2,7] error code is shown, check to see if the display cable is properly connected.
4. For cases when a [2,8] error code is shown, replace the system board.

# LCD Built-in Self Test (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 PC settings.

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

## How to invoke LCD BIST Test

1. Power off the Dell laptop.
2. Disconnect any peripherals that are connected to the laptop. Connect only the AC adapter (charger) to the laptop.
3. Ensure that the LCD (screen) is clean (no dust particles on the surface of the screen).
4. Press and hold **D** key and **Power on** the laptop to enter LCD built-in self test (BIST) mode. Continue to hold the D key, until the system boots up.
5. The screen will display solid colors and change colors on the entire screen to white, black, red, green, and blue twice.
6. Then it will display the colors white, black and red.
7. Carefully inspect the screen for abnormalities (any lines, fuzzy color or distortion on the screen).
8. At the end of the last solid color (red), the system will shut down.

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

# System diagnostic lights

**Battery-status light**

Indicates the power and battery-charge status.

**Solid white**—Power adapter is connected and the battery has more than 5 percent charge.

**Amber**—Computer is running on battery and the battery has less than 5 percent charge.

**Off**

- Power adapter is connected, and the battery is fully charged.
- Computer is running on battery, and the battery has more than 5 percent charge.
- Computer is in sleep state, hibernation, or turned off.

The power and battery-status light blinks amber along with beep codes indicating failures.

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

The following table shows different power and battery-status light patterns and associated problems.

### Table 50. LED codes

| Diagnostic light codes | Problem description | Recommended Solution |
|---|---|---|
| **1,1** | TPM detection failure | Replace the system board. |
| **1,2** | Unrecoverable SPI flash failure | Replace the system board. |
| **1,5** | i-Fuse failure | Replace the system board. |
| **1,6** | EC internal failure | Disconnect all power source (AC, battery, coin cell) and drain flea power by pressing and holding down the power button. |
| **2,1** | Processor failure | Replace the CPU. If CPU is on-board, replace the system board. |
| **2,2** | System board: BIOS or ROM (Read-Only Memory) failure | Replace the system board. |
| **2,3** | No memory or RAM (Random-Access Memory) detected | Reseat and swap memory modules between the slots. If the problem persists, replace the memory module |
| **2,4** | Memory or RAM (Random-Access Memory) failure | Reseat and swap memory modules between the slots. If the problem persists, replace the memory module. |
| **2,5** | Invalid memory installed | Reseat and swap memory modules between the slots. If the problem persists, replace the memory module. |
| **2,6** | System board or chipset error | Replace the system board. |
| **2,7** | Display failure - SBIOS message | Replace the LCD module. |
| **2,8** | Display failure - EC detection of power rail failure | Replace the system board. |
| **3,1** | Coin-cell battery failure | Reset the CMOS battery connection. If the problem persists, replace the RTC battery. |
| **3,2** | PCI, video card/chip failure | Replace the system board. |
| **3,3** | BIOS Recovery Image not found | Flash latest BIOS version. If the problem persists, replace the system board. |
| **3,4** | Recovery image found but invalid | Flash latest BIOS version. If the problem persists, replace the system board. |
| **3,5** | Power-rail failure | Replace the system board. |
| **3,6** | System BIOS Flash incomplete | Replace the system board. |

**Table 50. LED codes (continued)**

| Diagnostic light codes | Problem description | Recommended Solution |
|---|---|---|
| **3,7** | Management Engine (ME) error | Replace the system board. |

# Recovering the operating system

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

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

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

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at www.dell.com/serviceabilitytools. Click **SupportAssist** and then, click **SupportAssist OS Recovery**.

# Backup media and recovery options

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

# Wi-Fi power cycle

### About this task

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

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

### Steps

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

# Drain residual 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 are requested to drain residual flea power before removing or replacing any components in your computer.

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

### To drain residual flea power (perform a hard reset)

#### Steps

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

**NOTE:** For more information about performing a hard reset, search in the Knowledge Base Resource at www.dell.com/support.

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# Getting help and contacting Dell

## Self-help resources

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

**Table 51. Self-help resources**

| Self-help resources | Resource location |
|---|---|
| Information about Dell products and services | www.dell.com |
| My Dell app | |
| Tips | |
| Contact Support | In Windows search, type `Contact Support`, and press Enter. |
| Online help for operating system | www.dell.com/support/windows<br>www.dell.com/support/linux |
| Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals and documents. | Your Dell computer is uniquely identified by 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 www.dell.com/support.<br>For more information on how to find the Service Tag for your computer, see Locate the Service Tag on your computer. |
| Dell knowledge base articles for a variety of computer concerns | 1. Go to www.dell.com/support.<br>2. On the menu bar at the top of the Support page, select **Support** > **Knowledge Base**.<br>3. In the Search field on the Knowledge Base page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles. |

## Contacting Dell

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

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

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