Alienware 16 Area-51

AA16250

Owner's Manual

Regulatory Model: P141F
Regulatory Type: P141F001/P141F002
August 2025
Rev. A06

DELL Technologies

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.

Contents

1

Views of Alienware 16 Area-51 AA16250

Left

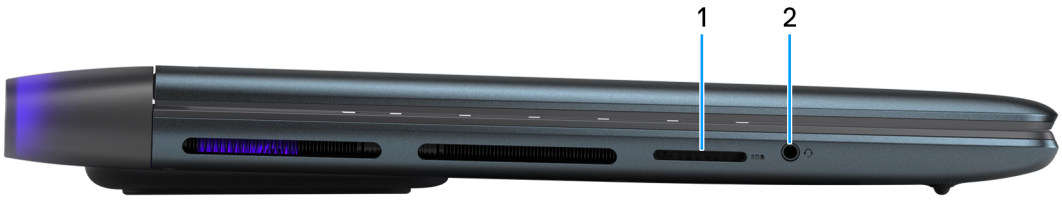


Figure 1. Left view

1. **SD-card slot**

   Insert an SD card to expand your storage and store photos, videos, and data from your computer. The computer supports the following card types:

   - Secure Digital (SD)
   - Secure Digital High Capacity (SDHC)
   - Secure Digital Extended Capacity (SDXC)

2. **Universal audio jack**

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

Top

Figure 2. Top view

1. **Power button**

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

   When the computer is turned on, press the power button to put the computer into sleep state; press and hold the power button for 10 seconds to force shut-down the computer.

   NOTE: The power-button behavior can be customized in the operating system.

2. **Speaker assembly (2)**

   Provides audio output. Thelocation that is called out indicates the tweeter (2) location on the computer.

3. **Touchpad**

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

NOTE: This computer supports AlienFX, allowing you to customize colors and transition effects across multiple zones, including the keyboard and power button. For more information, see Alienware Command Center.

Back

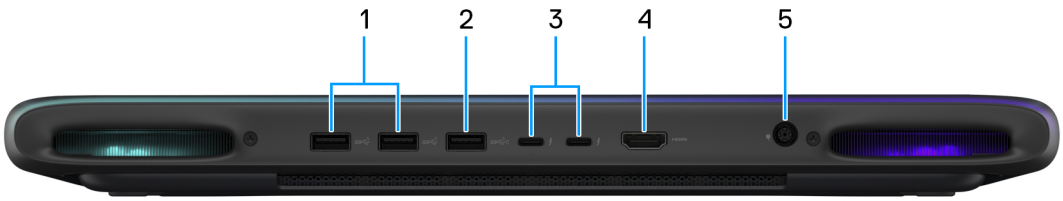


Figure 3. Back view

1. **USB 3.2 Gen 1 (5 Gbps) ports (2)**

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

2. **USB 3.2 Gen 1 (5 Gbps) port with PowerShare**

   Connect devices such as external storage devices and printers.

   Supports data transfer speeds up to 5 Gbps. PowerShare enables you to charge connected USB devices.

   NOTE: Connected USB devices will not charge when the computer is turned off or in sleep state. To start charging connected devices, turn on the computer.

3. **Thunderbolt 4 with DisplayPort Alt Mode/USB Type-C/USB4/Power Delivery (2)**

   Supports USB4, DisplayPort 2.1, Thunderbolt 4 and also enables you to connect to an external display using a display adapter. Supports data transfer rates of up to 40 Gbps (for computers that are shipped with NVIDIA GeForce RTX 5070 and below) for USB4 and Thunderbolt 4.

   NOTE: A USB Type-C to DisplayPort adapter (sold separately) may be required to connect a DisplayPort device based on the display you are connecting to.

   NOTE: USB4 is backward compatible with USB 3.2, USB 2.0, and Thunderbolt 3.

   NOTE: Thunderbolt 4 supports two 4K displays or one 8K display.

   Thunderbolt 5 with DisplayPort Alt Mode/USB Type-C/USB4/Power Delivery (2)

   Supports USB4, DisplayPort 2.1, Thunderbolt 4 and also enables you to connect to an external display using a display adapter. Supports data transfer rates of up to 80 Gbps (for computers that are shipped with NVIDIA GeForce RTX 5070Ti and above) and with Bandwidth Boost up to 120 Gbps.

   NOTE: A USB Type-C to DisplayPort adapter (sold separately) may be required to connect a DisplayPort device based on the display you are connecting to.

   NOTE: USB4 is backward compatible with USB 3.2, USB 2.0, and Thunderbolt 4.

   NOTE: Thunderbolt 5 supports two 4K displays or one 8K display.

4. **HDMI port**

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

5. **Power-adapter port**

   Connect the power adapter to charge your computer battery.

Bottom

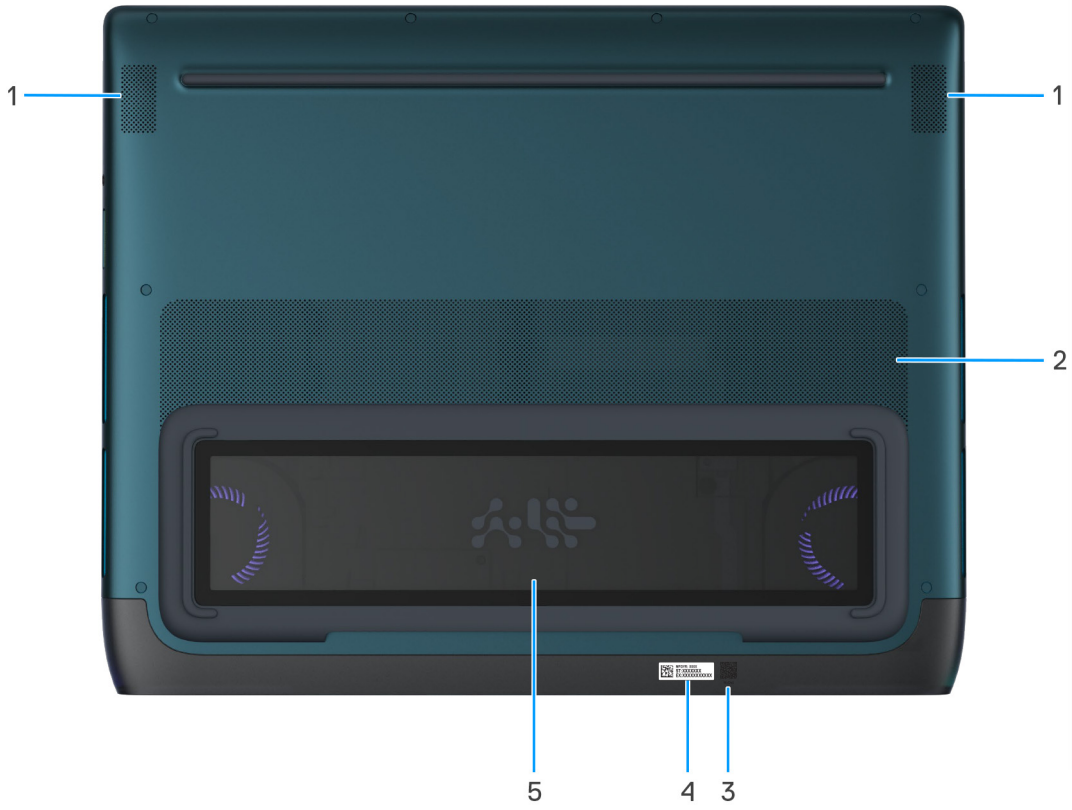


Figure 4. Bottom view

1. **Speaker assembly (2)**

   Provides audio output. The location that is called out indicates the woofer (2) location on the computer.

2. **Air vents**

   Air vents provide ventilation for your computer. Clogged air vents can cause overheating and can affect the performance of your computer and potentially cause hardware issues. Keep the air vents clear of obstructions and clean them regularly to prevent the accumulation of dust and dirt. For more information about cleaning air vents, search for articles in the Knowledge Base Resource at Dell Support Site.

3. **MyAlienware QR code**

   MyAlienware is your hub for content that is personalized to your computer, including videos, articles, manuals, and access to support.

4. **Service Tag label**

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

5. **Gorilla Glass panel (optional)**

   See through scratch-resistant Gorilla Glass panel.

   NOTE: The Gorilla Glass panel is only available on computers shipped with NVIDIA GeForce RTX 5070 Ti, NVIDIA GeForce RTX 5080, or NVIDIA GeForce RTX 5090 graphics cards.

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

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. The Express Service Code is a numeric version of the Service Tag.

For more information about how to find the Service Tag of your computer, search in the Knowledge Base Resource at the Dell Support Site.

Figure 5. Service Tag/Express Service Code location

2

Set up your Alienware 16 Area-51 AA16250

About this task

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

Steps

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

Figure 6. Connect the power adapter and press the power button

2. Connect the USB Type-C Ethernet dongle to the Thunderbolt 4 port of your computer for wired network (optional).

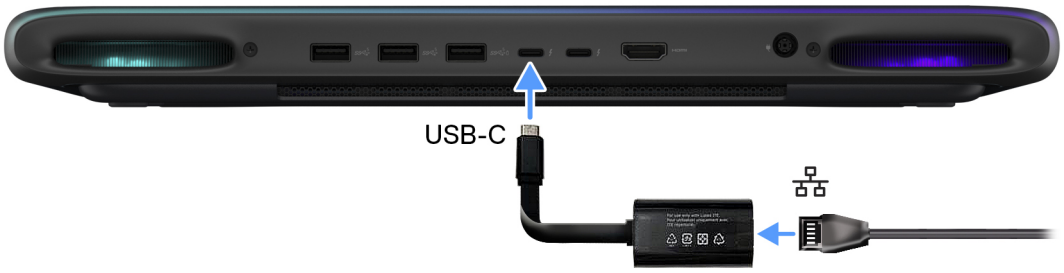


Figure 7. Connect the USB Type-C Ethernet dongle

NOTE: Depending on the configuration ordered, this computer may be shipped with a USB-C Ethernet dongle.

3

Specifications of Alienware 16 Area-51 AA16250

Dimensions and weight

The following table lists the height, width, depth, and weight of your Alienware 16 Area-51 AA16250.

Table 1. Dimensions and weight

Description	Values
Front height	24.22 mm (0.95 in.)
Peak height	28.50 mm (1.12 in.)
Width	365 mm (14.37 in.)
Depth	290 mm (11.41 in.)
Weight **NOTE:** The weight of your computer depends on the configuration that is offered.	• Minimum: 3.15 kg (6.94 lb) • Maximum: 3.40 kg (7.49 lb)

Processor

The following table lists the details of the processors that are supported in your Alienware 16 Area-51 AA16250.

Table 2. Processor

Description		Option one	Option two
Processor type		Intel Core Ultra 7 255HX	Intel Core Ultra 9 275HX
Processor wattage		55 W	55 W
Processor total core count		20	24
Performance-cores		8	8
Efficient-cores		12	16
Processor total thread count **NOTE:** Intel Hyper-Threading Technology is only available on Performance-cores.		20	24
Processor speed		5.2 GHz	5.4 GHz
Frequency—Performance cores			
	Processor base frequency	2.4 GHz	2.7 GHz
	Maximum turbo frequency	5.2 GHz	5.4 GHz
Frequency—Efficient cores			
	Processor base frequency	1.8 GHz	2.1 GHz

Table 2. Processor (continued)

Description		Option one	Option two
	Maximum turbo frequency	4.5 GHz	4.6 GHz
Processor cache		30	36
Integrated graphics		Intel Xe LPG	Intel Xe LPG

Chipset

The following table lists the details of the chipset that is supported in your Alienware 16 Area-51 AA16250.

Table 3. Chipset

Description	Values
Chipset	HM870
Processor	Intel Core Ultra 7 255HX or Intel Core Ultra 9 275HX
DRAM bus width	X64
Flash EPROM	32 MB + 16 MB
PCIe bus	Gen4 and Gen5

Operating System

Your Alienware 16 Area-51 AA16250 supports the following operating systems:

- Windows 11 Home
- Windows 11 Pro

Memory

The following table lists the memory specifications that are supported on your Alienware 16 Area-51 AA16250.

Table 4. Memory specifications

Description	Values
Memory slots	Two SODIMM slots
Memory type	DDR5
Memory speed	• 6400 MT/s • 7200 MT/s
Maximum memory configuration	64 GB
Minimum memory configuration	16 GB
Memory size per slot	8 GB, 16 GB, or 32 GB
Memory configurations supported	• 16 GB: 1 x 16 GB, DDR5, 6400 MT/s, Non-ECC, Non-XMP • 16 GB: 2 x 8 GB, DDR5, 6400 MT/s, Non-ECC, Non-XMP • 32 GB: 1 x 32 GB, DDR5, 6400 MT/s, Non-ECC, Non-XMP • 32 GB: 2 x 16 GB, DDR5, 6400 MT/s, Non-ECC, Non-XMP • 64 GB: 2 x 32 GB, DDR5, 6400 MT/s, Non-ECC, Non-XMP • 32 GB: 2 x 16 GB, DDR5, 7200 MT/s, Non-ECC, XMP

Table 4. Memory specifications (continued)

Description	Values
Extreme Memory Profile (XMP)	Enabled by default for configurations shipped with XMP memory. **NOTE:** When upgrading from a non-XMP memory to a Dell purchased XMP memory, enable XMP through Alienware Command Center (AWCC) or the BIOS.

External ports and slots

The following table lists the external ports and slots on your Alienware 16 Area-51 AA16250.

Table 5. External ports and slots

Description	Values
USB ports	• Two USB 3.2 Gen 1 (5 Gbps) ports • One USB 3.2 Gen 1 (5 Gbps) port with PowerShare • Two Thunderbolt 4 (40 Gbps) with DisplayPort Alt Mode/USB Type-C/USB4/Power Delivery (for computers that are shipped with NVIDIA GeForce RTX 5070 and below) • Two Thunderbolt 5 (80 Gbps) with DisplayPort Alt Mode/USB Type-C/USB4/Power Delivery (for computers that are shipped with NVIDIA GeForce RTX 5070Ti and above)
Audio port	One Universal Audio Jack
Video ports	One HDMI 2.1 port
Media-card reader	One SD-card slot
Power-adapter port	One 7.4 mm barrel
Security-cable slot	Not supported

Internal slots

The following table lists the internal slots of your Alienware 16 Area-51 AA16250.

Table 6. Internal slots

Description	Values
M.2	One M.2 2230 or three 2280 solid state drive slots **NOTE:** To learn more about the features of different types of M.2 cards, search in the Knowledge Base Resource at Dell Support Site.

Wireless module

The following table lists the Wireless Local Area Network (WLAN) module that is supported on your Alienware 16 Area-51 AA16250.

Table 7. Wireless module specifications

Description	Values
Model number	Intel Killer Wi-Fi 7 1750
Transfer rate	2400 Mbps
Frequency bands supported	2.4 GHz/5 GHz/6 GHz
Wireless standards	• WiFi 802.11a/b/g • Wi-Fi 4 (WiFi 802.11n) • Wi-Fi 5 (WiFi 802.11ac) • Wi-Fi 6E (WiFi 802.11ax) • Wi-Fi 7 (WiFi 802.11be)
Encryption	• 64-bit/128-bit WEP • AES-CCMP • TKIP
Bluetooth wireless card	Bluetooth 5.4 wireless card
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 Alienware 16 Area-51 AA16250.

Table 8. Audio specifications

Description	Values
Audio controller	Realtek ALC3329
Stereo conversion	Supported
Internal audio interface	Sound Wire
External audio interface	• One universal audio jack (RCA, 3.5 mm) • One HDMI 2.1 port
Number of speakers	Tweeter x 2 + Woofer x 2
Internal-speaker amplifier	Supported
External volume controls	Keyboard shortcut controls
Speaker output:	
Average	• 2 W + 2 W - Tweeter • 2 W + 2 W - Woofer
Peak	• 2.5 W + 2.5 W - Tweeter • 2.5 W + 2.5 W - Woofer
Subwoofer output	Not Supported
Microphone	Digital-array microphones in camera assembly

Storage

This section lists the storage options on your Alienware 16 Area-51 AA16250.

Your Alienware 16 Area-51 AA16250 supports up to two M.2 2280 SSD slots and one M.2 2230 or 2280 SSD slots.

Table 9. Storage specifications

Storage type	Interface type	Capacity
M.2 2230 solid state drive (supported on SSD-1 slot on your computer)	PCIe Gen 4 x4 NVMe, up to 64 Gbps	Up to 1 TB
M.2 2280 solid state drive (supported on SSD-1, SSD-2, and SSD-3 slots on your computer)	PCIe Gen 4 x4 NVMe, up to 64 Gbps	Up to 4 TB
M.2 2280 solid state drive **NOTE:** Gen 5 x4 NVMe is supported only on the SSD-2 slot (for computers that are shipped that are shipped with NVIDIA RTX 5070 and below) and on all the three slots (for computers with NVIDIA RTX 5070 Ti and above) on your computer.	PCIe Gen 5 x4 NVMe, up to 64 Gbps	2 TB

Media-card reader

The following table provides the specification of media cards that are supported by your Alienware 16 Area-51 AA16250.

Table 10. Media-card reader specifications

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

Keyboard

The following table lists the keyboard specifications of your Alienware 16 Area-51 AA16250.

Table 11. Keyboard specifications

Description	Values
Keyboard type	• AlienFX RGB backlit keyboard • CHERRY MX keyboard
Keyboard layout	QWERTY
Number of keys	• English US, French (Canadian): 85 keys • English UK, German, French: 86 keys • Japanese: 89 keys • Portuguese (Brazil): 87 keys

Table 11. Keyboard specifications (continued)

Description	Values
Keyboard size	• X = 19.05 mm key pitch • Y = 19.05 mm key pitch
Keyboard shortcuts	Some keys on your keyboard have two symbols on them. These keys can be used to type alternate characters or to perform secondary functions. To type the alternate character, press Shift and the desired key. To perform secondary functions, press Fn and the desired key. **NOTE:** You can define the primary behavior of the function keys (F1–F12) changing **Function Key Behavior** in BIOS setup program. For more information, see Keyboard shortcuts.

Keyboard shortcuts

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

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

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

However, if the function keys F1-F12 are needed for specific software applications, multimedia functionality can be disabled by pressing **fn** + **Esc**. Later, multimedia control can be enabled by pressing **fn** and the respective function key. For example, disable or enable performance boost by pressing **Fn** + **F6**.

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

Table 12. Function key primary behavior

Keys	Description
	Disable or enable Performance Boost.
	Take a screenshot and save it to the screenshots folder.
	Enable or disable Stealth mode. When Stealth mode is enabled, AlienFX lighting is turned off. Performance settings change to Quiet mode. **NOTE:** The AlienFX lighting zone varies depending on the configuration of your computer.
	Switch to an external display.
	Adjust keyboard backlight brightness.
	Decrease the display brightness.
	Increase the display brightness.

Table 12. Function key primary behavior (continued)

Keys	Description
	Use the snipping tool to capture an image on the computer screen and copy it to the clipboard.
	Disable or enable the touchpad.

Your computer comes with preprogrammable macro keys that enable you to perform multiple actions with a single keystroke.

Table 13. Macro keys

Keys	Description
	Macro keys **NOTE:** You can configure modes and assign multiple tasks for the macro keys on the keyboard.
	
	
	

Your computer comes with dedicated keys that enable you to control audio features of the computer with a single key press.

Table 14. Keys to control audio features

Keys	Description
	Mute speakers
	Increase volume
	Decrease volume.

Camera

The following table lists the camera specifications of your Alienware 16 Area-51 AA16250.

Table 15. Camera specifications

Description	FHD RGB+IR camera	4K HDR with RGB+IR camera
Number of cameras	Two	Two
Camera type	RGB+IR	RGB+IR
Camera location	Front	Front
Camera sensor type	CMOS sensor technology	CMOS sensor technology
Camera still image resolution	2.07 megapixels	8.29 megapixels
Camera video resolution	1920 x 1080 at 30 fps	3840 x 2160 at 30 fps
Infrared camera still image resolution	0.23 megapixels	0.23 megapixels
Infrared camera video resolution	640 x 360 at 15 fps	640 x 360 at 15 fps
Camera Diagonal viewing angle	80.2 degrees	88.1 degrees

Table 15. Camera specifications (continued)

Description	FHD RGB+IR camera	4K HDR with RGB+IR camera
Infrared Camera Diagonal viewing angle	86.6 degrees	86.6 degrees

Touchpad

The following table lists the touchpad specifications of your Alienware 16 Area-51 AA16250.

Table 16. Touchpad specifications

Description	Values
Touchpad resolution	>300 DPI
Touchpad horizontal dimension	112 mm (4.41 in.)
Touchpad vertical dimension	65 mm (2.56 in.)
Touchpad gestures	For more information about the touchpad gestures available on Windows, see the Microsoft Knowledge Base article at Microsoft Support Site.

Power adapter

The following table lists the power adapter specifications of your Alienware 16 Area-51 AA16250.

Table 17. Power-adapter specifications

Description		Option one	Option two
Type		280 W	360 W
Connector dimensions:			
	External diameter	7.40 mm (0.30 in.)	7.40 mm (0.30 in.)
	Internal diameter	5.10 mm (0.20 in.)	5.10 mm (0.20 in.)
Power-adapter dimensions:			
	Height	26.50 mm (1.04 in.)	25.40 mm (1 in.)
	Width	105 mm (4.12 in.)	86 mm (3.38 in.)
	Depth	206 mm (8.09 in.)	189 mm (7.42 in.)
Input voltage		• 100 V–120 V • 200 V–240 V	100 V–240 V
Input frequency		50-60 Hz	50-60 Hz
Input current (maximum)		4 A/2 A	4.8 A
Output current (continuous)		14.36 A	18.46 A
Rated output voltage		19.5 V	19.5 V
Temperature range:			
	Operating	0°C to 35°C (32°F to 95°F)	0°C to 35°C (32°F to 95°F)
	Storage	-40°C to 70°C (-40°F to 158°F)	-40°C to 70°C (-40°F to 158°F)

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

Power adapter requirements of Alienware 16 Area-51 AA16250

NOTE: The information in this topic is applicable only for customers who have purchased the Alienware 16 Area-51 AA16250 without a charger.

CAUTION: For safety and compatibility concerns, Dell recommends using only Dell-branded parts and peripherals. Not using a Dell-branded power adapter may void warranty and potentially increase the risk of damage to the computer.

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

The following table lists the power requirements to enable features on your Alienware 16 Area-51 AA16250. These power requirements will vary depending on the configuration of the Alienware 16 Area-51 AA16250 you have ordered.

Table 18. Feature power requirements

Feature	NVIDIA GeForce RTX 5060, RTX 5070, or RTX 5070 Ti	NVIDIA GeForce RTX 5080 or RTX 5090
Optimal perfomance **NOTE:** Using an adapter with less than the stated power rating will cause the computer to charge slower and may trigger a warning message.	280 W	360 W
Minimum power that is required from a power adapter to operate the computer and charge the battery **NOTE:** Depending on the power draw of the applications running on the computer this may lead to power drain from the battery.	90 W	90 W
ExpressCharge mode **NOTE:** ExpressCharge mode must also be enabled in the BIOS setup screen.	100 W	100 W
USB Power Delivery (PD) fast charging support for Type-C adapter	Supported	Supported

Battery

The following table lists the battery specifications of your Alienware 16 Area-51 AA16250.

Table 19. Battery specifications

Description		Values
Battery type		6-cell Lithium-Ion (96 Wh) ExpressCharge 2 **NOTE:** For computers shipped to the EU region, the battery supports only ExpressCharge.
Battery voltage		11.70 VDC
Battery weight (maximum)		351 g (0.77 lb)
Battery dimensions:		
	Height	7.71 mm (0.3 in.)
	Width	294.90 mm(11.61 in.)

Table 19. Battery specifications (continued)

Description		Values
	Depth	77.50 mm (3.05 in.)
Temperature range:		
	Operating	0°C~60°C
	Storage	-20°C~60°C
Battery operating time		Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.
Battery charging time (approximate) **NOTE:** You can control the charging time, duration, start and end time, and so on, from the BIOS settings in the BIOS Advanced menu.		• Standard charging: 3 hours, when the computer is turned off. • ExpressCharge: 2 hours, when the computer is turned off. • ExpressChargeBoost: 20 minutes, from 0% up to 35% when the computer is turned off. • ExpressCharge2: 35 minutes, from 0% up to 80% when the computer is turned off.
Coin-cell battery		Not supported

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 Technologies recommends that you charge the battery regularly for optimal power consumption.

Power requirements (for computers shipped with 6-cell, 96 Wh battery)

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

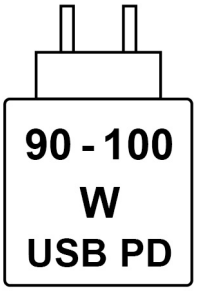


Figure 8. Pictogram for 96 Wh battery

The power that is delivered by the charger must be between a minimum of 90 Watts that is required by the radio equipment, and a maximum of 100 Watts in order to achieve the maximum charging speed.

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

Display

The following table lists the display specifications of your Alienware 16 Area-51 AA16250.

Table 20. Display specifications

Description	Values
Display type	16-inch, Wide Quad Extended Graphics Array (WQXGA)

Table 20. Display specifications (continued)

Description		Values
Touch options		Not supported
Display-panel technology		Wide-Viewing Angle (WVA)
Display-panel dimensions (active area):		
	Height	215.42 mm (8.48 in.)
	Width	344.68 mm (13.57 in.)
	Diagonal	406.46 mm (16 in.)
Display-panel native resolution		2560 x 1600
Luminance (typical)		500 nits
Megapixels		4.1
Color gamut		DCI-P3 100% (typical)
Pixels Per Inch (PPI)		188.7
Contrast ratio (typical)		1000:1
Response time		• 12 ms (maximum) • 3 ms (typical)
Refresh rate		240 Hz
Horizontal view angle		+/- 85 degrees (typical)
Vertical view angle		+/- 85 degrees (typical)
Pixel pitch		0.13464 mm
Power consumption (maximum)		8.67 W
Anti-glare vs glossy finish		Anti-Glare

GPU—Discrete

The following table lists the specifications of the discrete Graphics Processing Unit (GPU) supported by your Alienware 16 Area-51 AA16250.

Table 21. GPU—Discrete

Controller	Memory size	Memory type
NVIDIA GeForce RTX 5060	8 GB	GDDR7
NVIDIA GeForce RTX 5070	8 GB	GDDR7
NVIDIA GeForce RTX 5070 Ti	12 GB	GDDR7
NVIDIA GeForce RTX 5080	16 GB	GDDR7
NVIDIA GeForce RTX 5090	24 GB	GDDR7

External display support

The following table lists the external display support for your Alienware 16 Area-51 AA16250.

NOTE: To enable G-SYNC, connect the G-SYNC capable display to the USB-C or HDMI port on your computer.

NOTE: When connected through HDMI port, depending on the type of display that is used , you may encounter a reduced frame rate.

Table 22. External display support

Graphics card	Supported external displays with laptop display enabled	Supported external displays with laptop display disabled
NVIDIA GeForce RTX 5070	• USB-Cx2 (recommended) • HDMIx1	• USB-Cx2 (recommended) • HDMIx1
NVIDIA GeForce RTX 5070 Ti	• USB-Cx2 (recommended) • HDMIx1	• USB-Cx2 (recommended) • HDMIx1
NVIDIA GeForce RTX 5080	• USB-Cx2 (recommended) • HDMIx1	• USB-Cx2 (recommended) • HDMIx1
NVIDIA GeForce RTX 5090	• USB-Cx2 (recommended) • HDMIx1	• USB-Cx2 (recommended) • HDMIx1

Enabling G-SYNC

To enable G-SYNC, switch to the discrete graphics (dGPU) mode through the NVIDIA control panel or connect to a G-SYNC capable display. Once you are at the NVIDIA control panel, go to the settings to set up G-SYNC and follow the below steps.

1. From the NVIDIA Control Panel **navigation tree** pane, under **Display**, click **Set up G-SYNC**.

   NOTE: For more information about G-SYNC support, see External display support.

2. Select the **Enable G-SYNC, G-SYNC Compatible** check box, if not enabled earlier.
3. Select **Enable for full screen mode** or **Enable for windowed and full screen mode**, depending on the applications you want to run on your computer.
4. Select a display that you would like to enable the setting.
   a. At **Select a display**, by selecting the display model icon.
   b. At **Choose display specific setting**, check the **Enable settings for the selected display model** check box.

      NOTE: This step applies to either G-SYNC compatible displays or VRR displays that have not been validated by NVIDIA as G-SYNC Compatible.

Operating and storage environment

This table lists the operating and storage specifications of your Alienware 16 Area-51 AA16250.

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

Table 23. Computer environment

Description	Operating	Storage
Temperature range	0 °C–35°C (32 °F–95°F)	-40°C–65°C (-40°F–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 10,000 ft)	-15.2 m to 10,668 m (-49.87 ft to 35,000 ft)

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

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

† Measured using a 2 ms half-sine pulse.

Dell low blue light display

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

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

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

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

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

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

4

Alienware Command Center

Alienware Command Center (AWCC) provides a single interface to customize and enhance the gaming experience. The AWCC dashboard displays most recently played or added games, and provides game-specific information, themes, profiles, and access to computer settings. You can quickly access settings such as game-specific profiles and themes, lighting, macros, and audio that are critical to the gaming experience.

AWCC also supports AlienFX 2.0. AlienFX enables you to create, assign, and share game-specific lighting maps to enhance the gaming experience. It also enables you to create your own customized lighting effects and apply them to the computer or attached peripherals. AWCC embeds Peripheral Controls to ensure a unified experience and the ability to link these settings to your computer or game.

This computer features the following AlienFX lighting zones:

- Keyboard
- Touchpad (only on certain configurations)
- Alien head LED on the back of the display
- Fans
- Rear-I/O cover

NOTE: Information about the location of AlienFX lighting zones on your computer is available in AWCC.

AWCC supports the following features:

- FX: Create and manage the AlienFX zones.
- Fusion: Fusion includes the ability to adjust game-specific Power Management, Sound Management, and Thermal Management features.
- Peripheral Management: Peripheral Management enables peripherals to appear in and be managed in Alienware Command Center. Supports key peripheral settings and associates with other functions such as profiles, macros, AlienFX, and game library.

AWCC also supports Sound Management, Thermal Controls, CPU, GPU, and Memory (RAM) monitoring. For more information about AWCC, see the *Alienware Command Center Online Help* or search in the Knowledge Base Resource at Dell Support Site.

5

Working inside your computer

Safety instructions

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

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

WARNING: Disconnect your computer from all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting your computer to an electrical outlet.

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

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

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

CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity which could harm internal components.

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

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

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

Before working inside your computer

About this task

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

Steps

1. Save and close all open files and exit all open applications.
2. Shut down your computer. For Windows operating system, click **Start** > **Power** > **Shut down**.

   NOTE: If you are using a different operating system, see the documentation of your operating system for instructions.
3. Turn off all the attached peripherals.
4. Disconnect your computer from the electrical outlet.

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

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

8. Enter the Service Mode.

   Service Mode

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

   CAUTION: If you are unable to turn on the computer to put it into Service Mode, disconnect the battery cable. To disconnect the battery cable, follow the steps in Removing the battery.

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

   a. Press and hold the B key and the power button for 3 seconds, or until the Dell logo appears on the screen.
   b. If the **Owner Tag** is set, it is displayed on the screen. Press any key to continue.

      NOTE: If the **Owner Tag** information is not already set, the computer automatically skips this step and proceeds to enter Service Mode.

   c. If the power adapter is still connected, a message appears on the screen prompting you to disconnect it. Disconnect the power adapter, then press any key to continue.
   d. When the **System Ready For Service** message appears on the screen, press any key to proceed. The computer emits three short beeps and shuts down immediately.
      The computer shuts down and enters the Service Mode.

Safety precautions

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

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

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

Bonding

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

Electrostatic discharge—ESD protection

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

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

- **Catastrophic** – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory module that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code that is emitted for missing or nonfunctional memory.

- **Intermittent** – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The memory module receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms that are related to the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, and so on.

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

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. Wireless anti-static straps do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, use the anti-static wrist strap to discharge the static electricity from your body.

  NOTE: You can protect against ESD and discharge static electricity from your body by touching a metal-grounded object before you interact with anything electronic, for example, an unpainted metal surface on your computer's I/O panel. When connecting a peripheral (including handheld digital assistants) to your computer, you should always ground both yourself and the peripheral before connecting it to the computer. In addition, as you work inside the computer, periodically touch a metal-grounded object to remove any static charge that your body may have accumulated.

  For more information about the wrist strap and ESD wrist strap tester, see Components of an ESD Field Service Kit.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD Field Service kit

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

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

Working environment

Before the ESD Field Service kit is deployed, conduct an evaluation of the site to ensure proper setup and readiness. For example, deploying the kit for a server environment is different than for a desktop or laptop environment. Servers are typically installed in a rack within a data center; desktops or laptops are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of computer that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components.

ESD packaging

All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged component using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the anti-static mat, in the computer, or inside an ESD bag.

Components of an ESD Field Service kit

The components of an ESD Field Service kit are:

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

placed directly on the anti-static mat. ESD-sensitive items are safe in your hand, on the anti-static mat, in the computer, or inside an ESD bag.

- **Wrist Strap and Bonding Wire** – If an anti-static mat is not being used, the wrist strap and bonding wire should be connected directly between your wrist and an exposed metal part of the hardware. If you are using an anti-static mat, connect the wrist strap and bonding wire to the anti-static mat to ensure protection for any hardware placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the anti-static mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, anti-static mat, and bonding wire. Never use wireless wrist straps. Always be cautious that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.
- **ESD Wrist Strap Tester** – The wires inside an ESD strap are prone to damage over time. When using an unmonitored ESD kit, it is recommended to test the wrist strap regularly—ideally before each service session, and at a minimum, once per week. The most reliable method for testing is with a wrist strap tester. To perform the test, connect the bonding wire of the wrist strap to the tester while wearing the strap. Press the test button to initiate the check. A green LED indicates a successful test, while a red LED and audible alarm signal a failure.

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

Transporting sensitive components

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

After working inside your computer

About this task

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

Steps

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

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

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

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #0
- Plastic scribe

Screw list

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

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

NOTE: Screw color may vary depending on the configuration ordered.

Table 24. Screw list

Component	Screw type	Quantity	Screw image
Base cover	M2.5x6.5	4	
M.2 2230 SSD thermal shield	M2x3	1	
M.2 2230 SSD mounting bracket	M2x2	1	
M.2 2280 SSD thermal shield	M2x3	1	
Rear I/O-cover	M2.5x6	2	
Tron light cable	M2x1.8	2	
Battery	M2x5	8	
Fan	M2x5	2	
I/O board	M2x5	3	
Touchpad bracket	M2x3	2	
Touchpad assembly	M1.6x2	9	
Keyboard-controller board	M2x1.8	2	
Sensor board	M2x1.8	1	
Display-cable bracket	M2x5	2	
Display-cable holder	M2x5	4	
Display hinges	M2.5x3	9	
Power-adapter port	M2x5	2	
System-board assembly	M2x5	7	
Bottom-right fan	M2x5	2	

Table 24. Screw list (continued)

Component	Screw type	Quantity	Screw image
USB Type-C bracket	M2x3	1	
Fan and heat-sink assembly	M2x3	7	
Power button	M1.2x1.5	2	
WLAN main antenna	M2x5	2	
WLAN aux antenna	M2x5	2	
Woofers	M2x1.8	4	
Tweeters	M2x5	2	

Major components of Alienware 16 Area-51 AA16250

The following image shows the major components of Alienware 16 Area-51 AA16250.

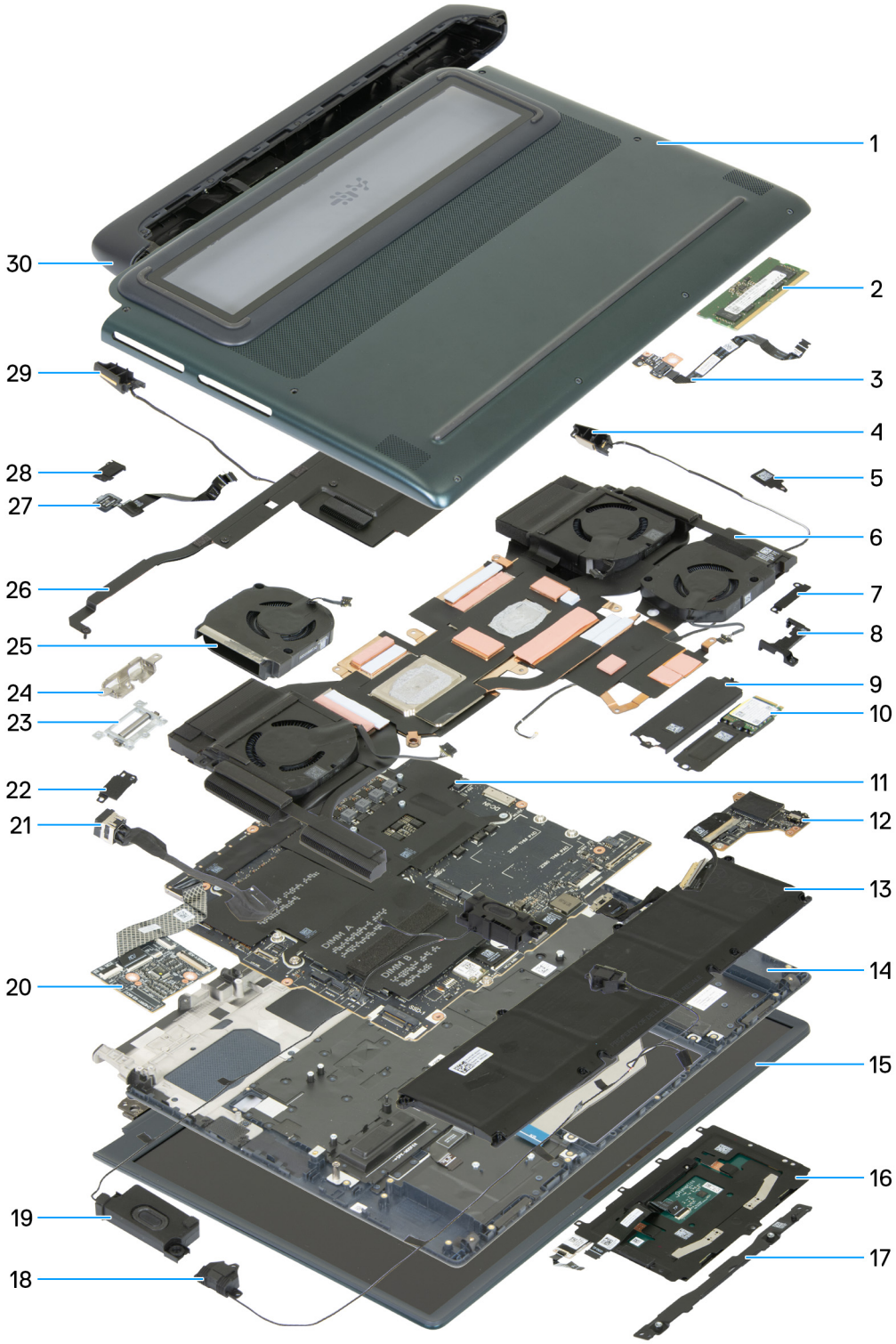


Figure 9. Major components of Alienware 16 Area-51 AA16250

1. Base cover
2. Memory module
3. Sensor board
4. WLAN main antenna cable
5. WLAN bracket
6. Fan and heat-sink assembly
7. Display-cable bracket
8. SSD slot bracket
9. SSD thermal shield
10. M.2 2230 SSD
11. System-board assembly
12. I/O board
13. Battery
14. Palm-rest and keyboard assembly
15. Display assembly
16. Touchpad assembly

17. Touchpad bracket
18. Tweeters
19. Woofers
20. Keyboard-controller board
21. Power-adapter port
22. Power-adapter port bracket
23. Display-cable holder
24. USB Type-C bracket
25. Fan
26. VR heat sink
27. Power button
28. Power button bracket
29. WLAN aux antenna cable
30. Rear I/O-cover

6

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.

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 Before working inside your computer.

   CAUTION: If the computer does not turn on, or does not support Service mode, disconnect the battery cable.

About this task

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

Figure 10. Removing the base cover screws

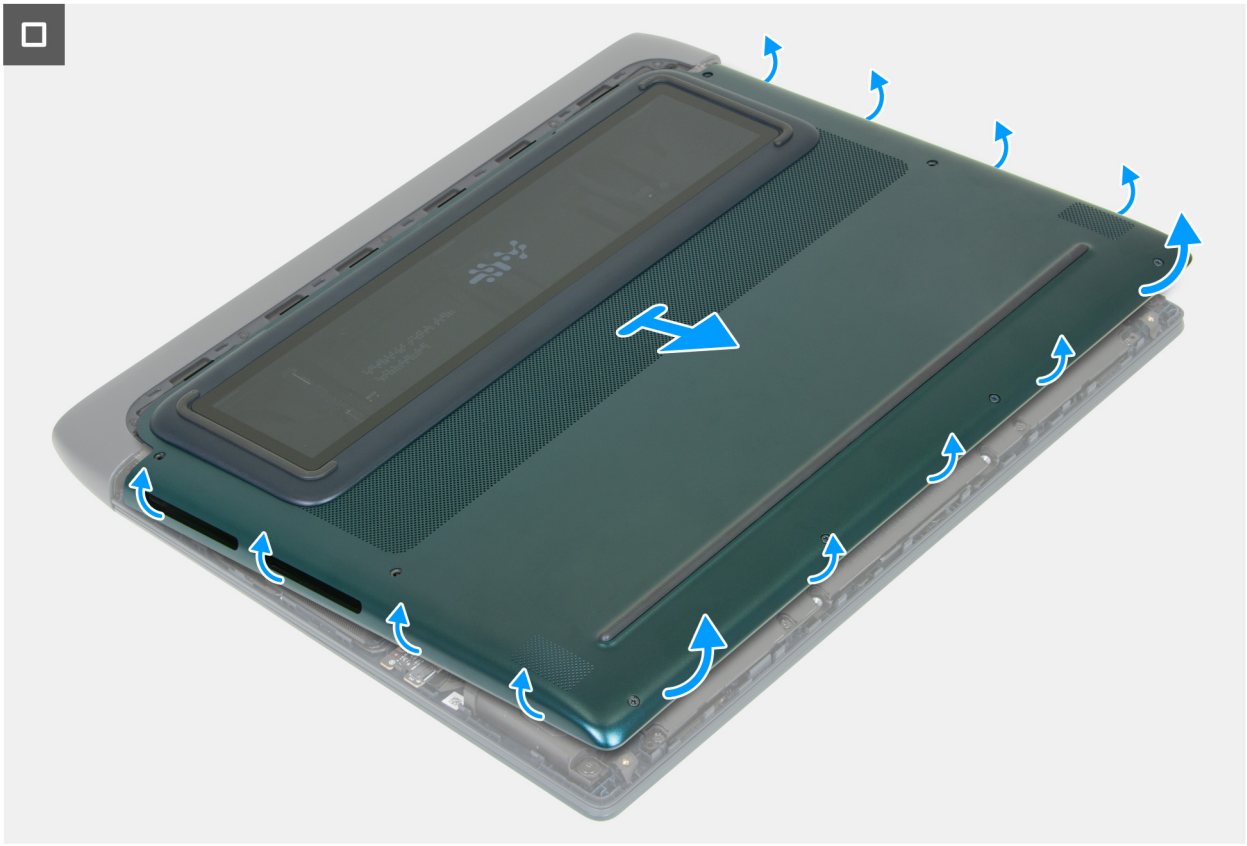


Figure 11. Lifting the base cover

NOTE: For computers shipped with a glass on the base cover, DO NOT scratch the glass with any sharp tools.

Steps

1. Remove the four screws (M2.5x6.5) that secure the base cover to the palm-rest and keyboard assembly.
2. Loosen the four captive screws that secure the base cover to the palm-rest and keyboard assembly.
3. Using your fingertips, pry the base cover from the gap that is created after loosening the captive screws in the bottom left and continue to work on the sides to open the base cover.
4. Lift the base cover by holding it in the center at the bottom and slide the base cover off the palm-rest and keyboard assembly.

   NOTE: Ensure that your computer is in Service Mode. If your computer is unable to enter Service Mode, disconnect the battery cable from the system board. To disconnect the battery cable, follow steps 5 and 6.

5. Disconnect the battery cable from the battery cable connector (PBATT1) on the system board.

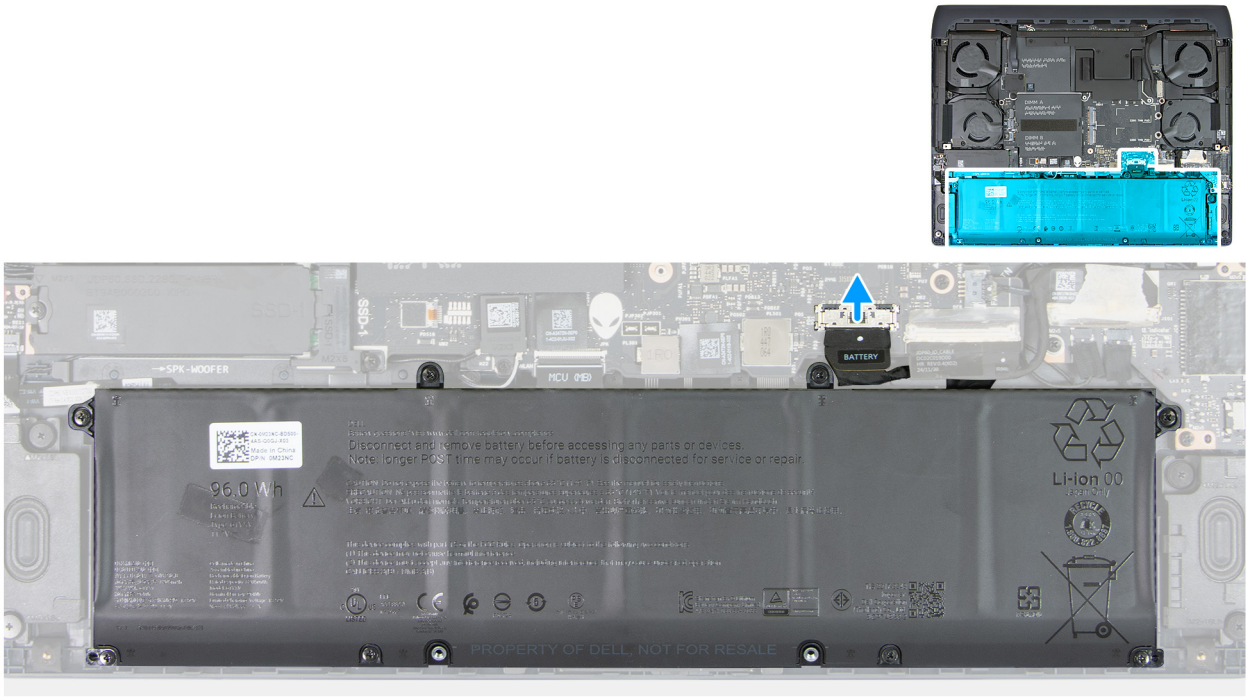


Figure 12. Disconnecting the battery cable

6. Press and hold the power button for five seconds to ground the computer and drain the flea power.

Installing the base cover

Prerequisites

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

About this task

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

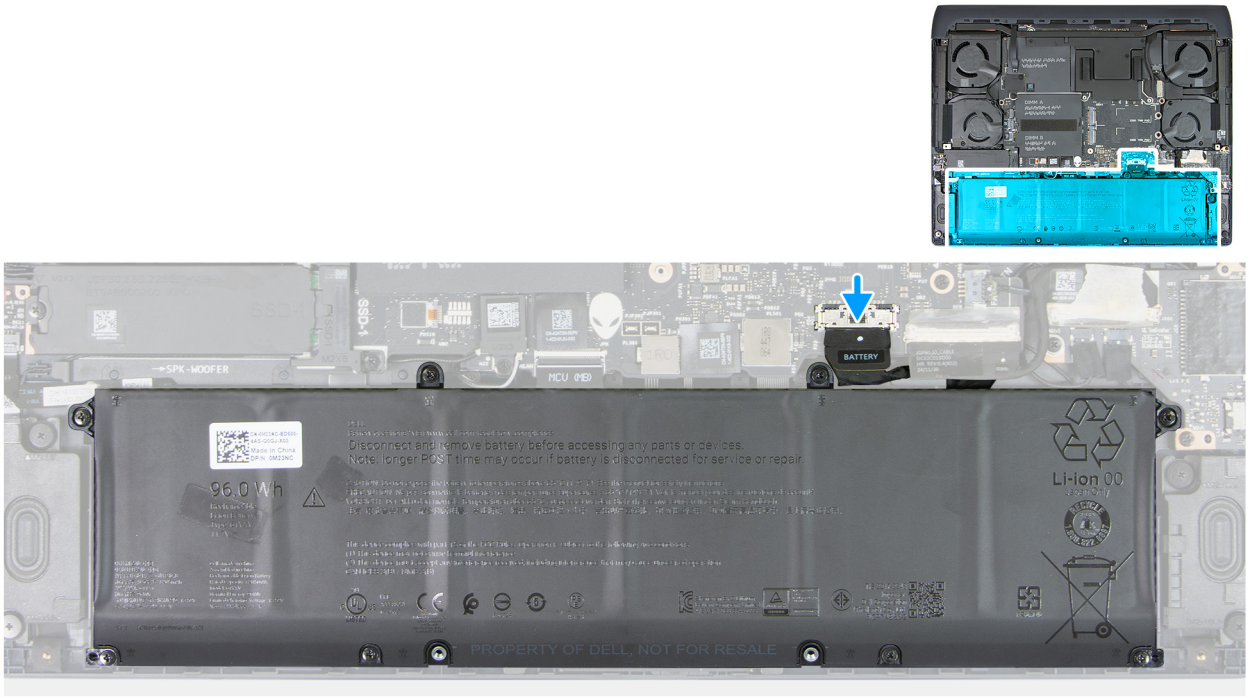


Figure 13. Connecting the battery cable

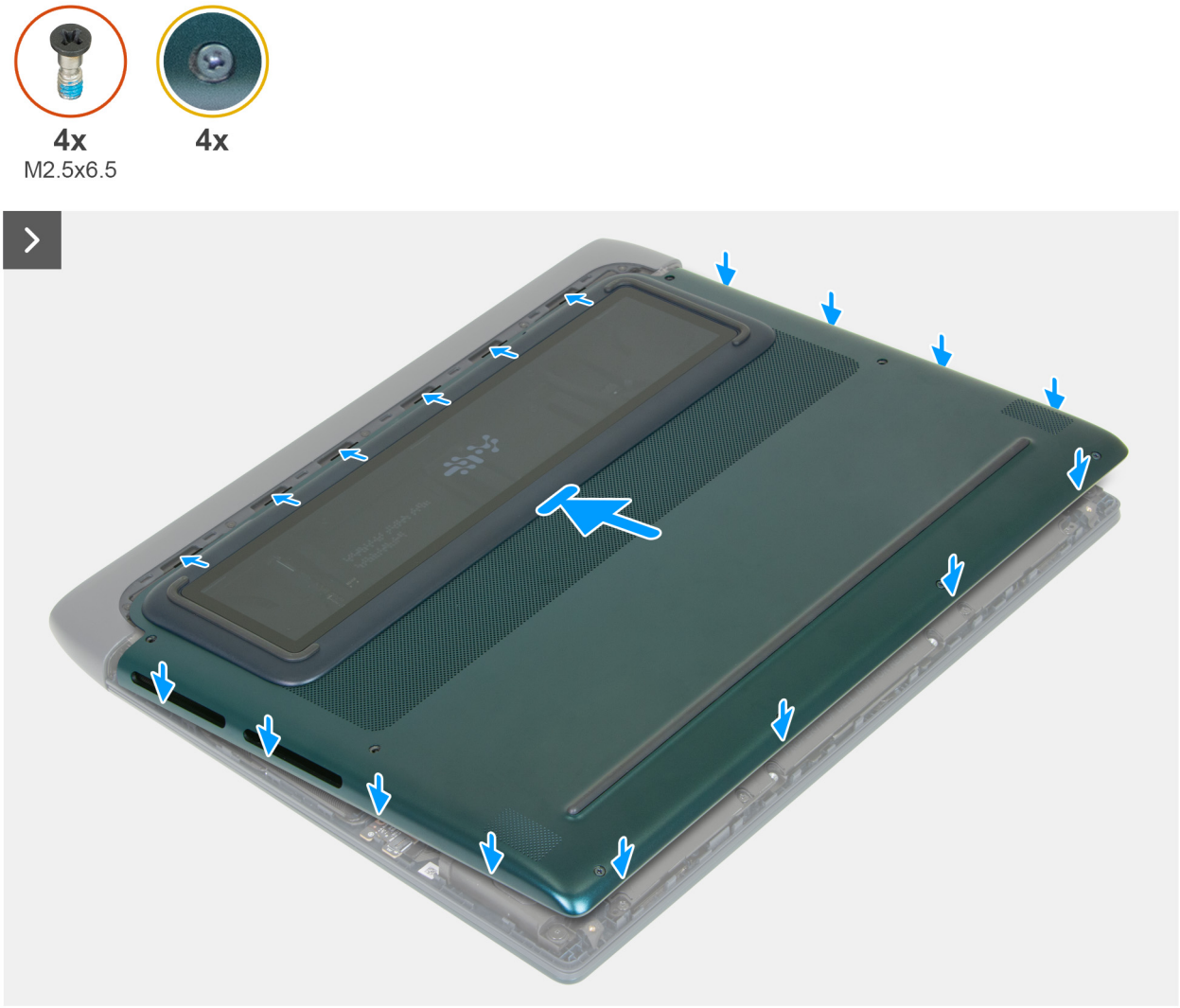


Figure 14. Slide the base cover

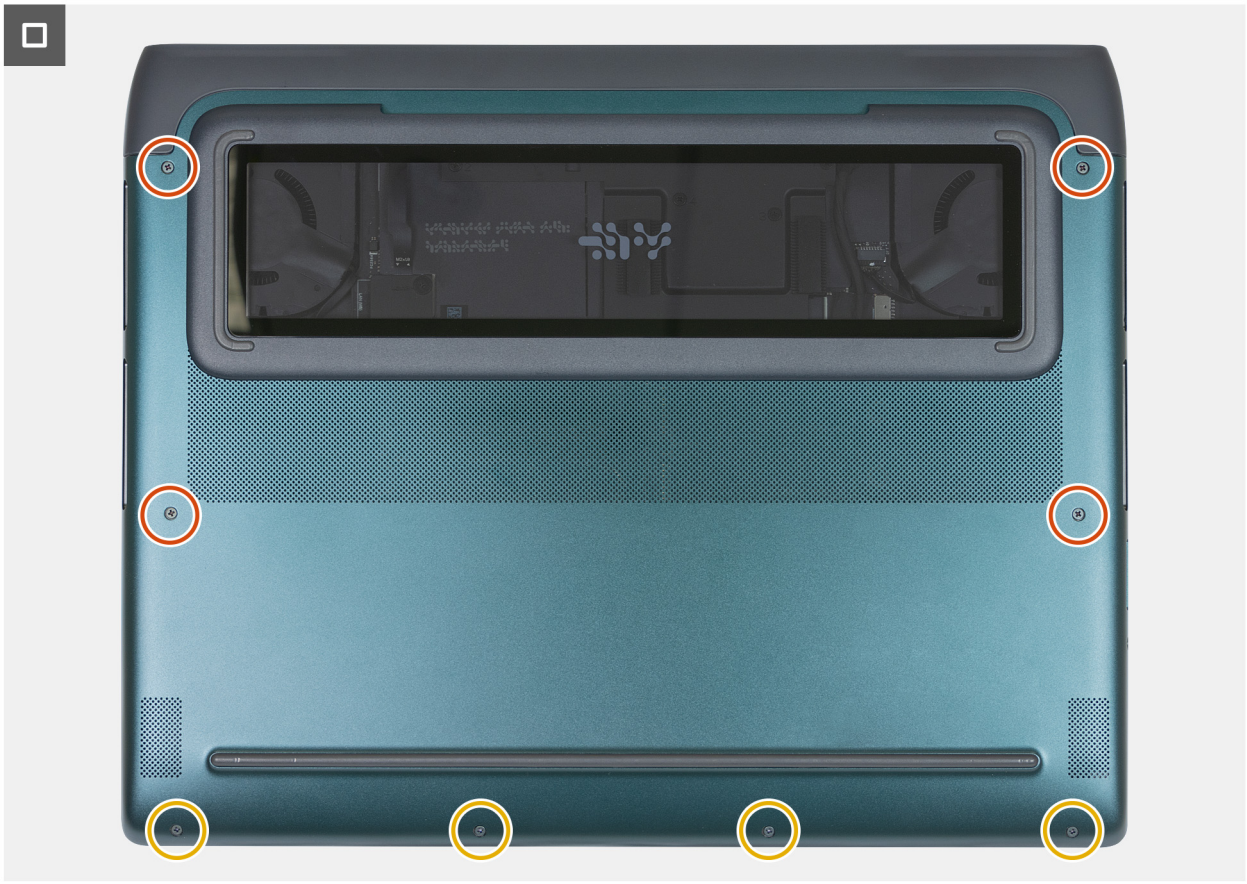


Figure 15. Replace the base cover screws

NOTE: For computers shipped with a glass on the base cover, DO NOT scratch the glass with any sharp tools.

Steps

1. Connect the battery cable to the battery cable connector (PBATT1) on the system board.
2. Align the screw holes on the base cover with the screw holes on the palm-rest and keyboard assembly, and then snap the base cover into place.
3. Tighten the four captive screws that secure the base cover to the palm-rest and keyboard assembly.
4. Replace the four screws (M2.5x6.5) that secure the base cover to the palm-rest and keyboard assembly.

Next steps

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

Battery

Rechargeable Li-ion battery precautions

WARNING:

- **Exercise caution when handling rechargeable Li-ion batteries.**
- **Discharge the battery completely before removing it. Disconnect the AC power adapter from the computer and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button is pressed.**
- **Do not crush, drop, mutilate, or penetrate the battery with foreign objects.**

- **Do not expose the battery to high temperatures, or disassemble battery packs and cells.**
- **Do not apply pressure to the surface of the battery.**
- **Do not bend the battery.**
- **Do not use tools of any kind to pry on or against the battery.**
- **To prevent accidental puncture or damage to the battery and other components, ensure that no screws are lost or misplaced during the servicing of the computer.**
- **Always purchase genuine batteries from Dell Site or authorized Dell partners and resellers.**
- **Swollen batteries should not be used and should be replaced and disposed properly. For guidelines on how to handle and replace swollen rechargeable Li-ion batteries, see Handling swollen rechargeable Li-ion batteries.**

Removing the battery

Prerequisites

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

About this task

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

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

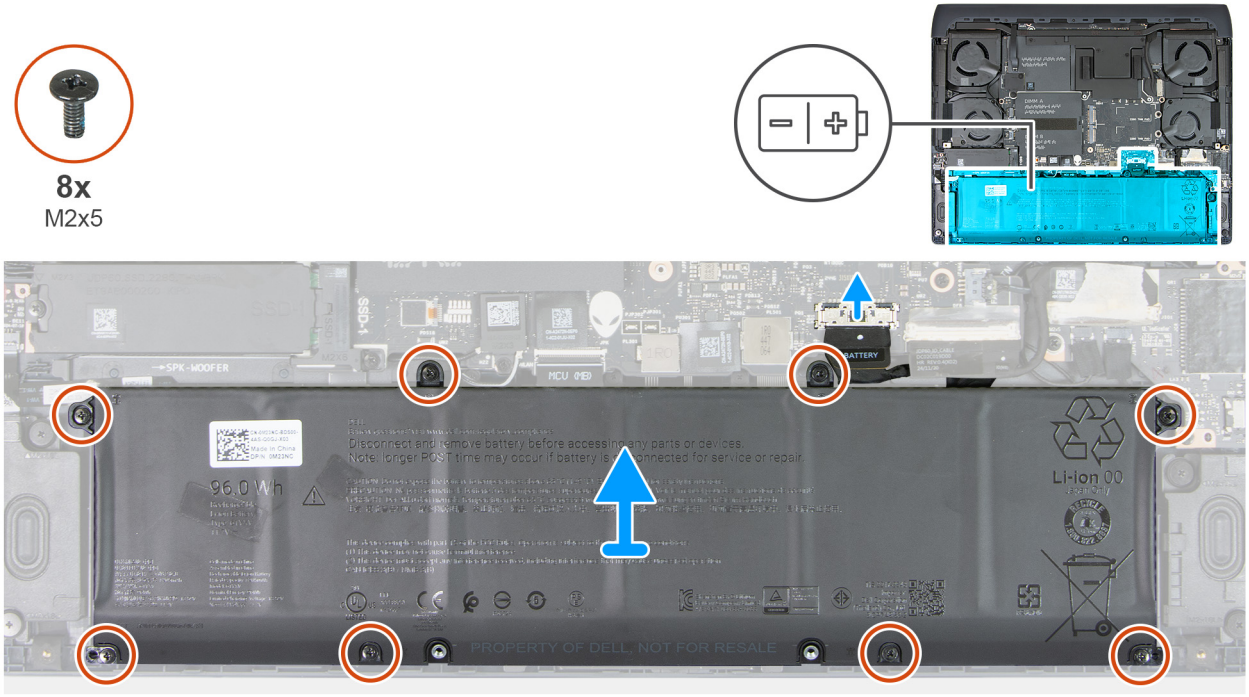


Figure 16. Removing the battery

Steps

1. Disconnect the battery cable from the battery cable connector (PBATT1) on the system board (if not disconnected earlier).
2. Remove the eight screws (M2x5) that secure the battery to the palm-rest and keyboard assembly.
3. Lift the battery off the palm-rest assembly.

Installing the battery

Prerequisites

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

About this task

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

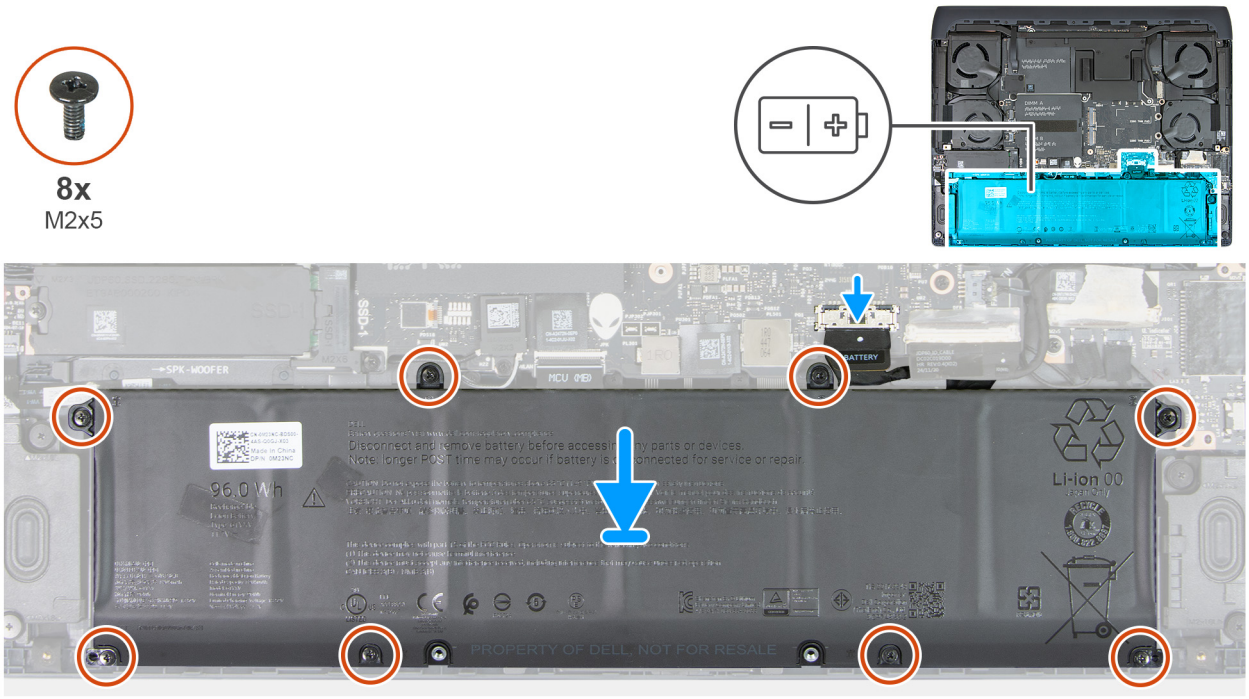


Figure 17. Replacing the battery

Steps

1. Using the alignment posts, place the battery on the palm-rest assembly.
2. Align the screw holes on the battery with the screw holes on the palm-rest and keyboard assembly.
3. Replace the eight screws (M2x5) that secure the battery to the palm-rest and keyboard assembly.
4. Connect the battery cable to the battery cable connector (PBATT1) on the system board.

Next steps

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

Battery cable

Removing the battery cable

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

About this task

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

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

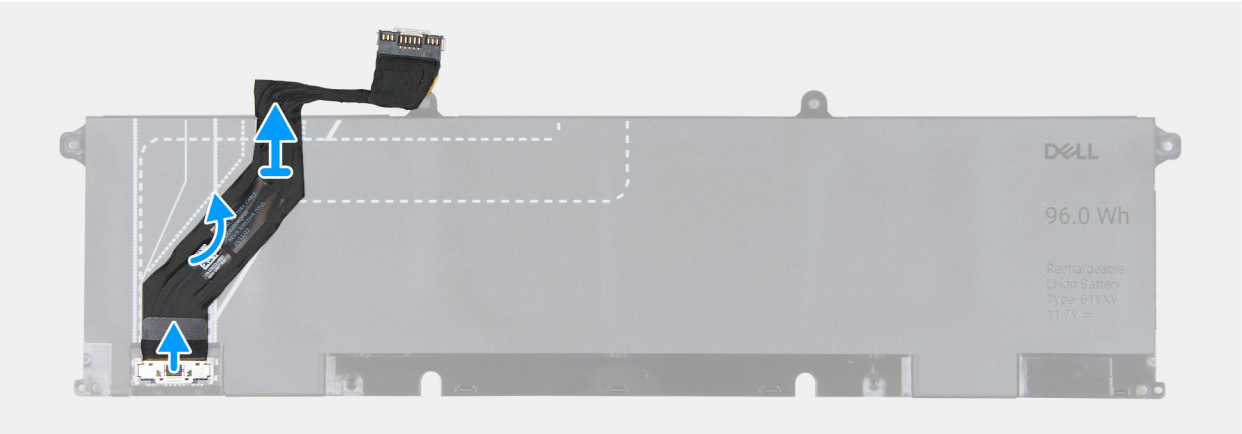


Figure 18. Removing the battery cable

Steps

1. Flip the battery and disconnect the battery cable from the connector on the battery.
2. Peel the battery cable from the battery.

Installing the battery cable

Prerequisites

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

About this task

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

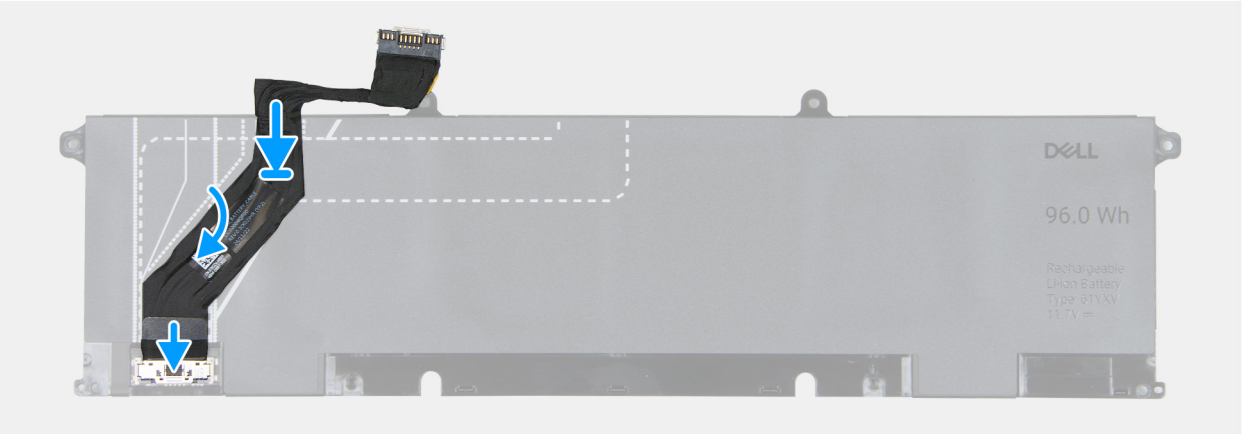


Figure 19. Installing the battery cable

Steps

1. Connect the battery cable to the connector on the battery.
2. Adhere the battery cable to the battery.

Next steps

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

Memory module

Removing the memory module

Prerequisites

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

About this task

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

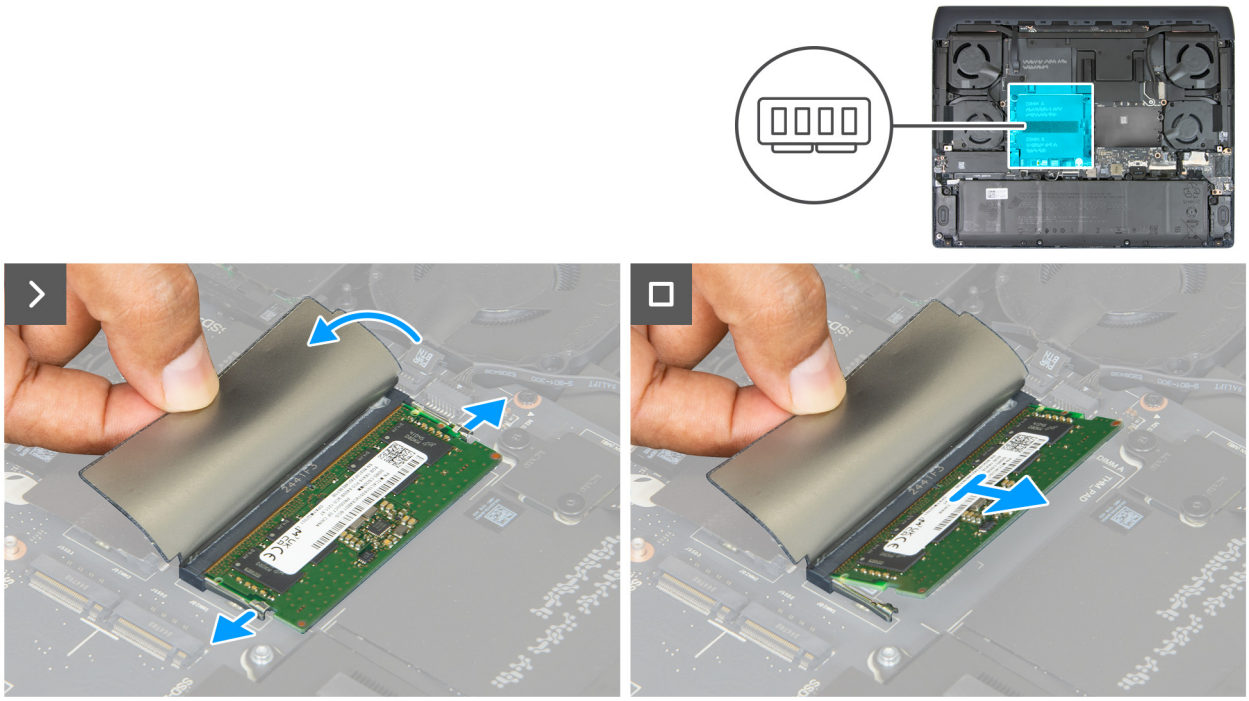


Figure 20. Removing the memory module

Steps

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

NOTE: Repeat step 1 and step 3 if there is more than one memory module installed on your computer.

CAUTION: To prevent damage to the memory module, hold the memory module by the edges. Do not touch the components or metallic contacts on the memory module as electrostatic discharge (ESD) can inflict severe damage on the components. To read more about ESD protection, see ESD protection.

Installing the memory module

Prerequisites

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

About this task

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

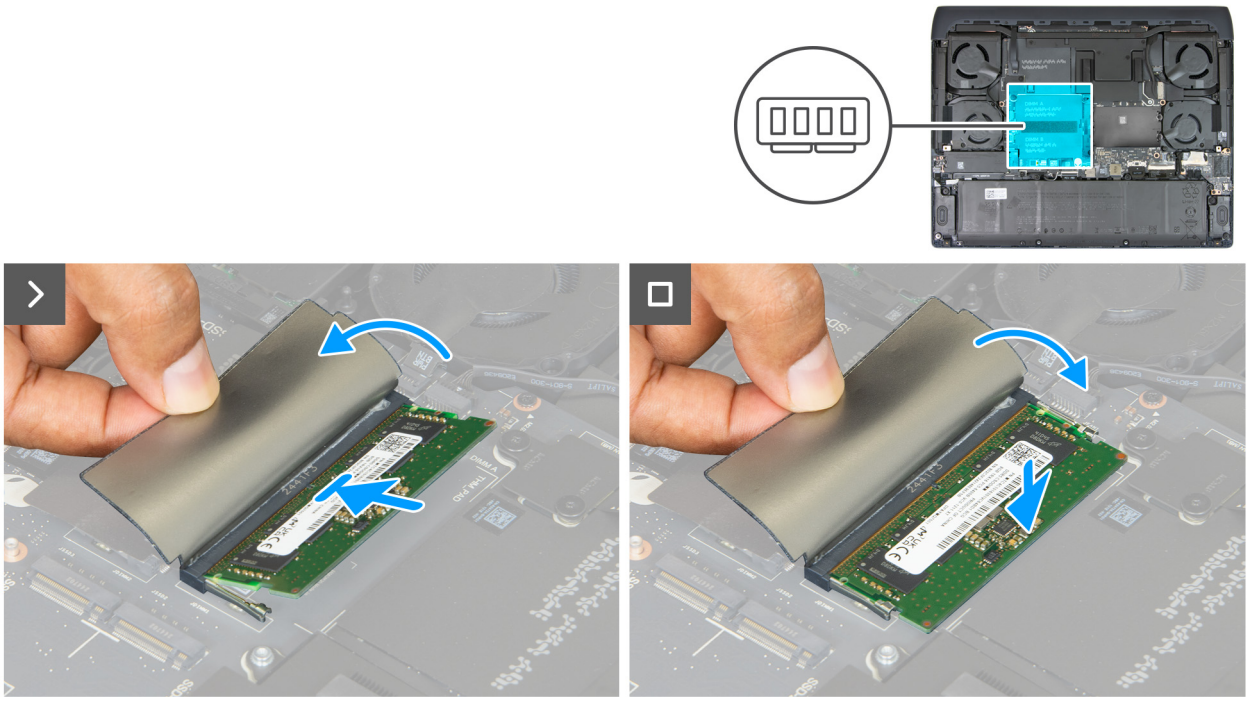


Figure 21. Replacing the memory module

Steps

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

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

CAUTION: To prevent damage to the memory module, hold the memory module by the edges. Do not touch the components or metallic contacts on the memory module as electrostatic discharge (ESD) can inflict severe damage on the components. To read more about ESD protection, see ESD protection.

Next steps

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

Solid-state drive

Removing the M.2 2230 SSD in slot 1

Prerequisites

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

About this task

NOTE: The following procedure applies only to computers shipped with an M.2 2230 SSD.

NOTE: Your computer has three slots (SSD-1, SSD-2 and SSD-3). The M.2 card that is installed on the M.2 slot depends on the configuration ordered. Supported card configurations:

- M.2 2230 SSD + 2230 mounting bracket
- M.2 2280 SSD

The following images indicate the location of the M.2 2230 SSD in SSD-1 and provide a visual representation of the removal procedure.

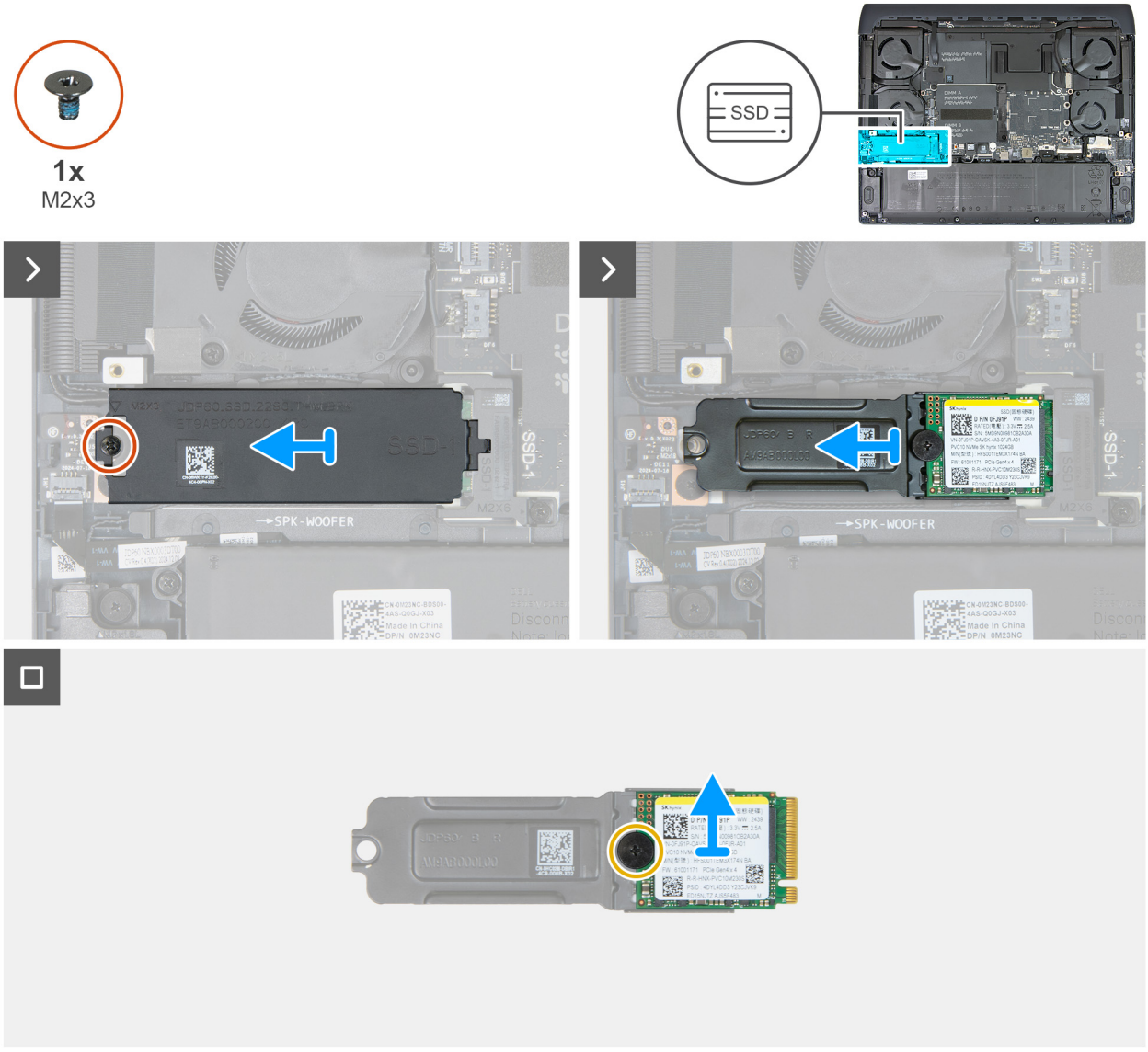


Figure 22. Removing the M.2 2230 SSD in slot 1

Steps

1. Remove the screw (M2x3) that secures the SSD thermal shield to the palm-rest and keyboard assembly.
2. Slide and remove the solid-state thermal shield off the SSD.
3. Slide and remove the SSD from the SSD slot.
4. Remove the screw (M2x2) that secures the SSD mounting bracket to the SSD.
5. Lift the SSD off the SSD mounting bracket.

Installing the M.2 2230 SSD in slot 1

Prerequisites

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

About this task

NOTE: The following procedure applies only to computers shipped with an M.2 2230 SSD.

NOTE: Your computer has three SSD slots (SSD-1, SSD-2 and SSD-3). The M.2 card that is installed on the M.2 slot depends on the configuration ordered. Supported card configurations:

- M.2 2230 SSD + 2230 mounting bracket
- M.2 2280 SSD

The following images indicate the location of the M.2 2230 SSD in SSD-1 and provide a visual representation of the installation procedure.

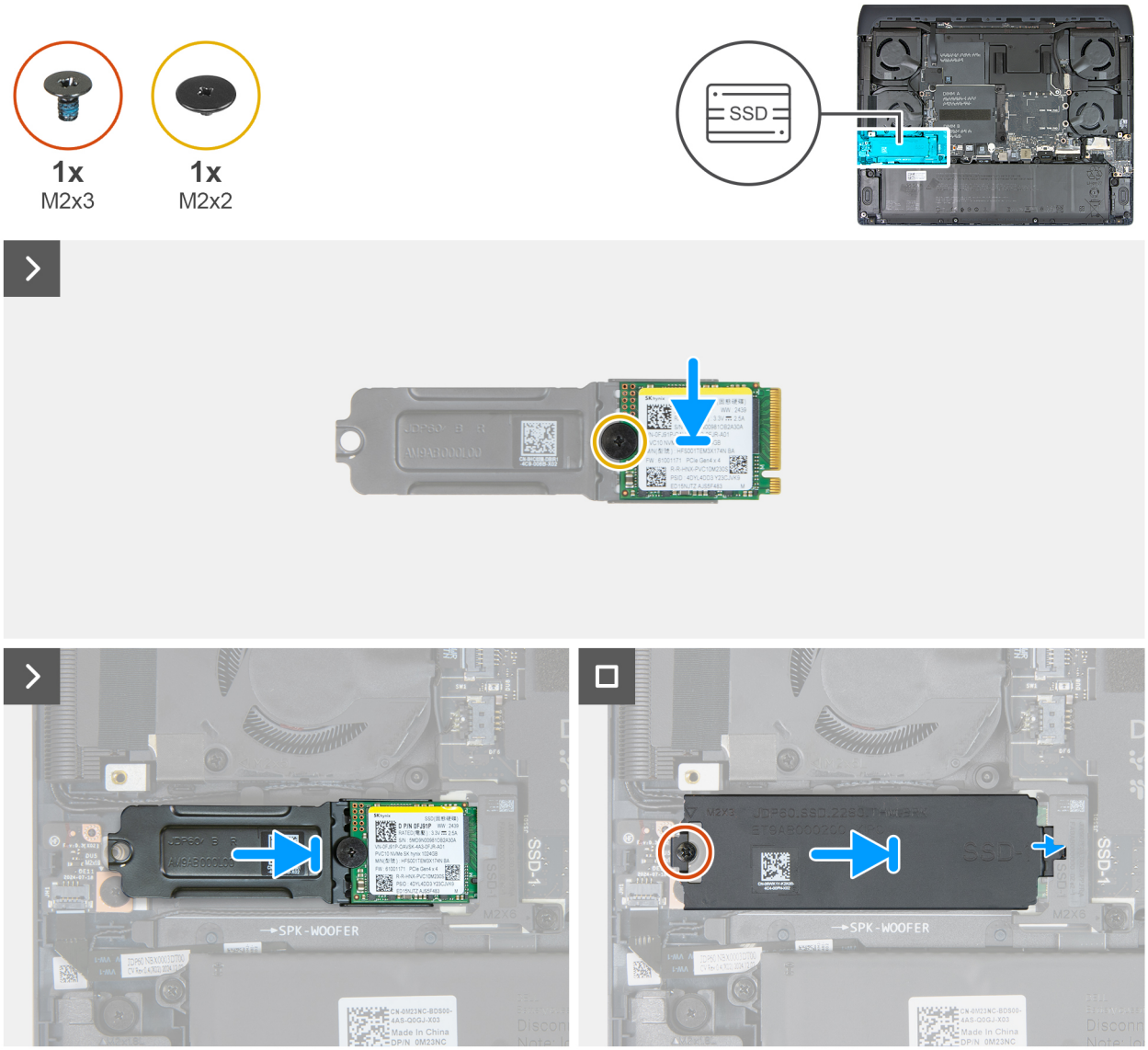


Figure 23. Installing the M.2 2230 SSD in slot 1

Steps

1. Align the screw hole on the SSD mounting bracket with the screw hole on the SSD.
2. Replace the screw (M2x2) that secures the M.2 2230 SSD mounting bracket to the SSD.
3. Align the notch on the SSD with the tab on the SSD slot and slide the SSD into the SSD slot.
4. Align and slide the SSD thermal shield on top of the SSD slot so that it holds the SSD in place.
5. Align the screw hole on the SSD thermal shield with the screw hole on the SSD and palm-rest and keyboard assembly.
6. Replace the screw (M2x3) that secures the M.2 2230 SSD thermal shield to the SSD and palm-rest and keyboard assembly.

Next steps

1. Install the base cover.

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

Removing the M.2 2280 SSD in slot 1

Prerequisites

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

About this task

NOTE: The following procedure applies only to computers shipped with an M.2 2280 SSD.

NOTE: Your computer has three SSD slots (SSD-1, SSD-2 and SSD-3). The M.2 card that is installed on the M.2 slot depends on the configuration ordered. Supported card configurations:

- M.2 2230 SSD + 2230 mounting bracket
- M.2 2280 SSD

The following images indicate the location of the M.2 2280 SSD in SSD-1 and provide a visual representation of the removal procedure.

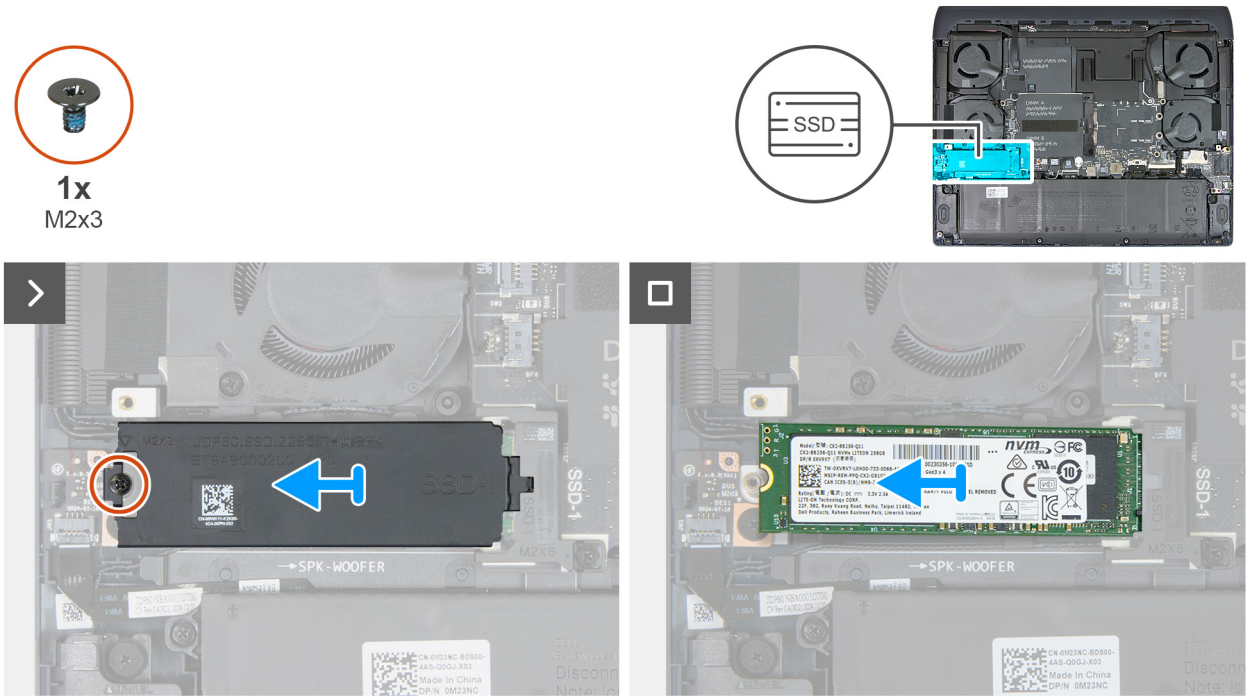


Figure 24. Removing the M.2 2280 SSD in slot 1

Steps

1. Remove the screw (M2x3) that secures the SSD thermal shield to the solid-state drive and palm-rest and keyboard assembly.
2. Slide and lift the SSD thermal shield off the SSD.
3. Slide and remove the SSD off the SSD slot.

Installing the M.2 2280 SSD in slot 1

Prerequisites

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

About this task

NOTE: The following procedure applies only to computers shipped with an M.2 2280 SSD.

NOTE: Your computer has three SSD slots (SSD-1, SSD-2 and SSD-3). The M.2 card that is installed on the M.2 slot depends on the configuration ordered. Supported card configurations:

- M.2 2230 SSD + 2230 mounting bracket
- M.2 2280 SSD

The following images indicate the location of the M.2 2280 SSD in SSD-1 and provide a visual representation of the installation procedure.

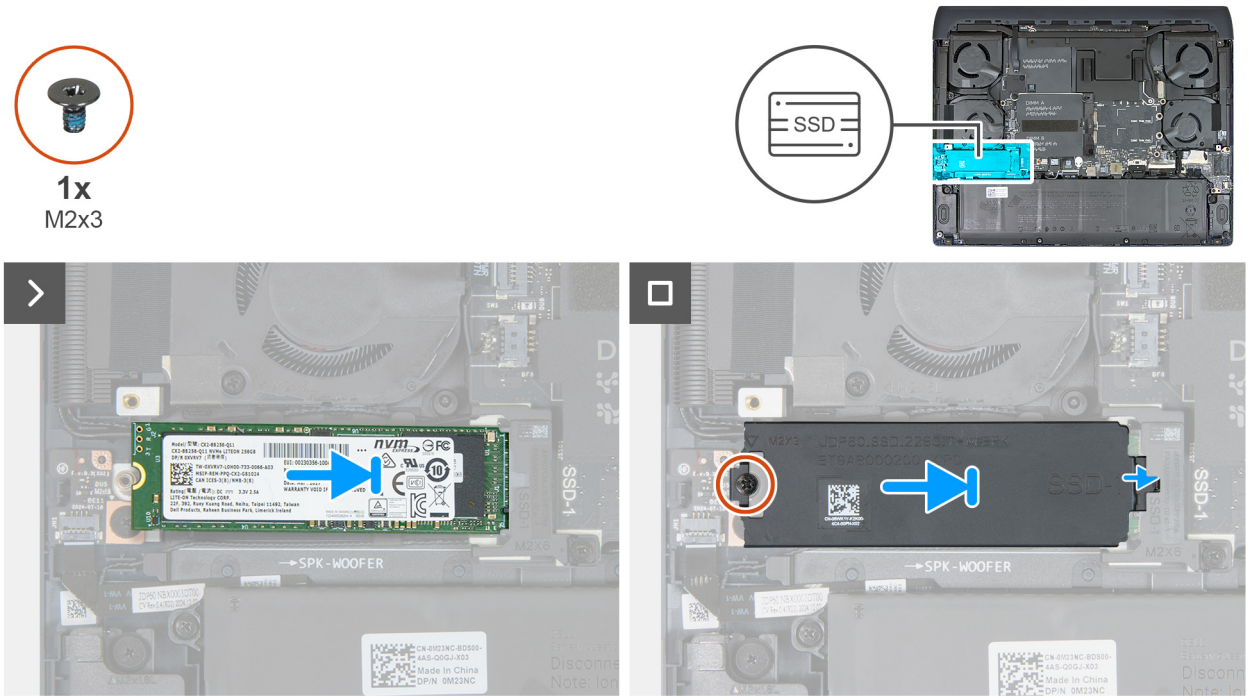


Figure 25. Replacing the M.2 2280 SSD in slot 1

Steps

1. Align the notch on the SSD with the tab on the SSD slot.
2. Slide the SSD into the SSD slot on the system board.
3. Slide the SSD thermal shield into the SSD slot.
4. Align the screw hole on the SSD thermal shield with the screw hole on the SSD and palm-rest and keyboard assembly.
5. Replace the screw (M2x3) that secures the M.2 2280 SSD thermal shield to the SSD and palm-rest and keyboard assembly.

Next steps

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

Removing the M.2 2230/2280 SSD in slot 2 and slot 3

Prerequisites

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

About this task

NOTE: The following procedure applies only if there is an M.2 2230/2280 SSD installed in slots 2 and slot 3.

NOTE: Your computer has three SSD slots (SSD-1, SSD-2, and SSD-3). The M.2 card that is installed on the M.2 slot depends on the configuration ordered. Supported card configurations:

- M.2 2230 SSD + 2230 mounting bracket
- M.2 2280 SSD

The following images indicate the location of the M.2 2230/2280 SSD in SSD-2 and SSD-3 and provide a visual representation of the removal procedure.

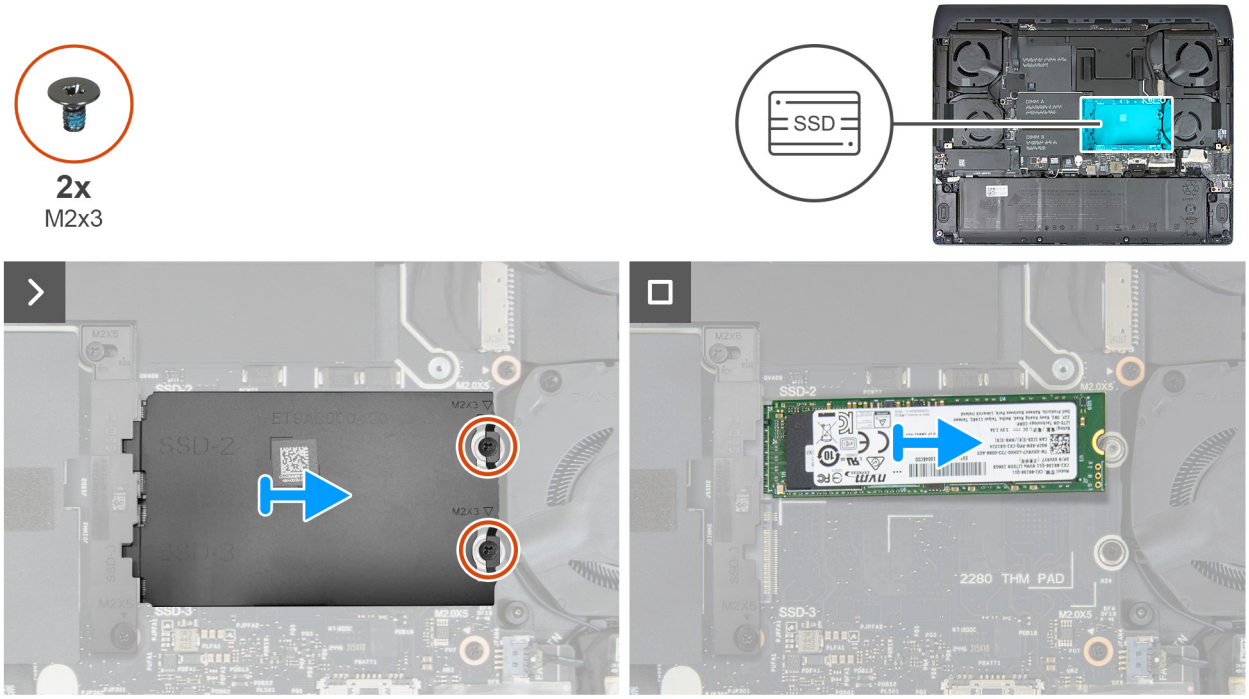


Figure 26. Removing the M.2 2280 SSD in slot 2 and slot 3

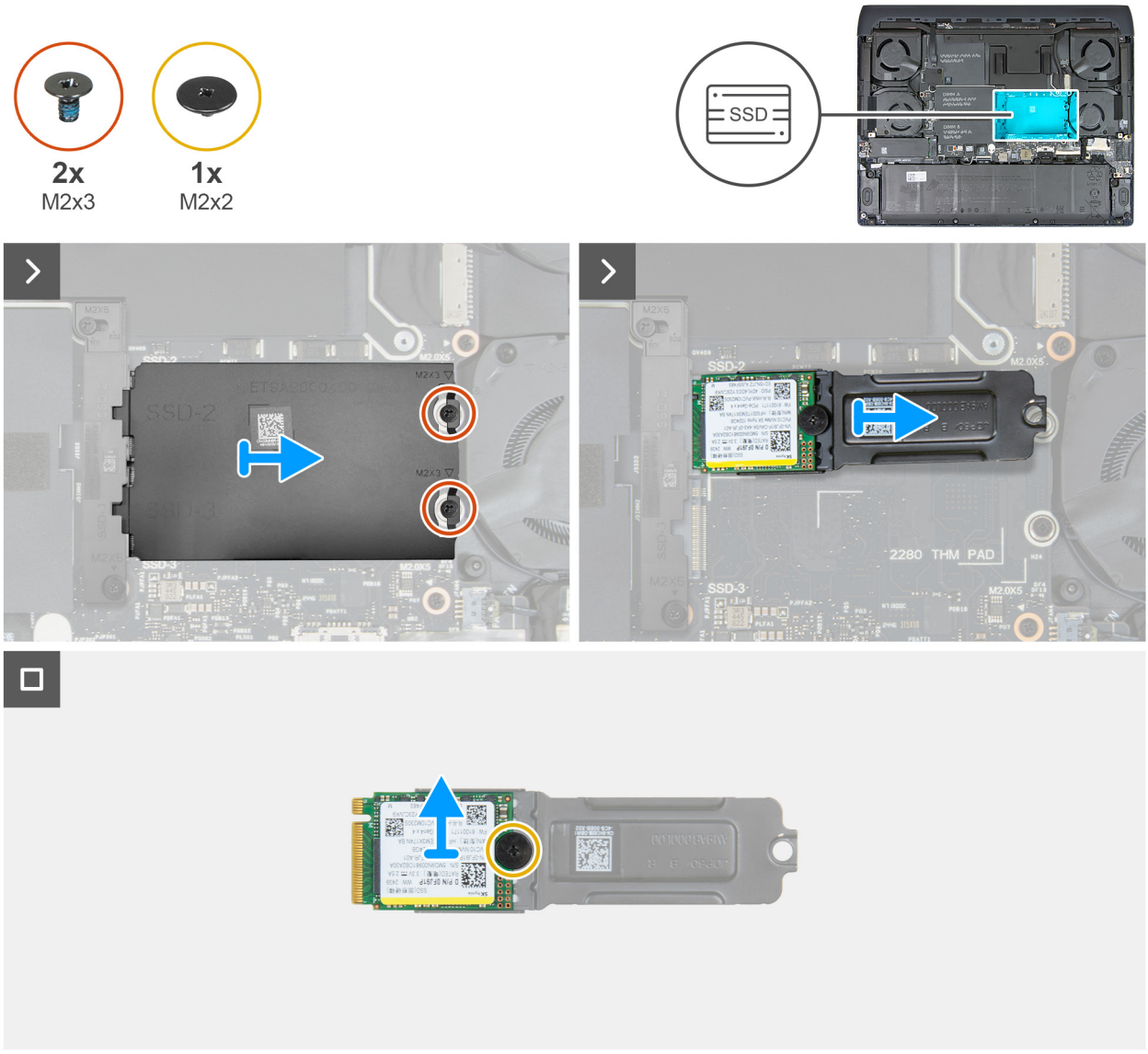


Figure 27. Removing the M.2 2230 SSD in slot 2 and slot 3

NOTE: The removal procedure for M.2 2230/2280 SSDs installed in slot 2 and slot 3 are the same. Follow the below procedure to remove the M.2 2230/2280 SSDs in slot 2 or slot 3.

Steps

1. Remove the two screws (M2x3) that secures the SSD thermal shield to the SSD and palm-rest and keyboard assembly.

   NOTE: The SSD thermal shield is only available on computers shipped with an SSD installed on slot 2 and 3.

2. Slide and lift the solid-state thermal shield off the SSD.
3. Slide and remove the SSD off the SSD slot.

   NOTE: The following procedures are only applicable for computers with M.2 2230 SSDs installed in slot 2 and slot 3.

4. Remove the screw (M2x2) that secures the SSD mounting bracket to the SSD.
5. Lift the SSD off the SSD mounting bracket.

Installing the M.2 2230/2280 SSD in slot 2 and slot 3

Prerequisites

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

About this task

NOTE: The following procedure applies only if you are installing a M.2 2230/2280 SSD into slots 2 and slot 3.

NOTE: To install an SSD in slot 2 and 3, contact Dell to purchase the SSD thermal shield if one was not previously installed in the computer.

NOTE: Your computer has three SSD slots (SSD-1, SSD-2 and SSD-3). The M.2 card that is installed on the M.2 slot depends on the configuration ordered. Supported card configurations:

- M.2 2230 SSD + 2230 mounting bracket
- M.2 2280 SSD

The following images indicate the location of the M.2 2230/2280 SSD in SSD-2 and SSD-3 and provide a visual representation of the installation procedure.

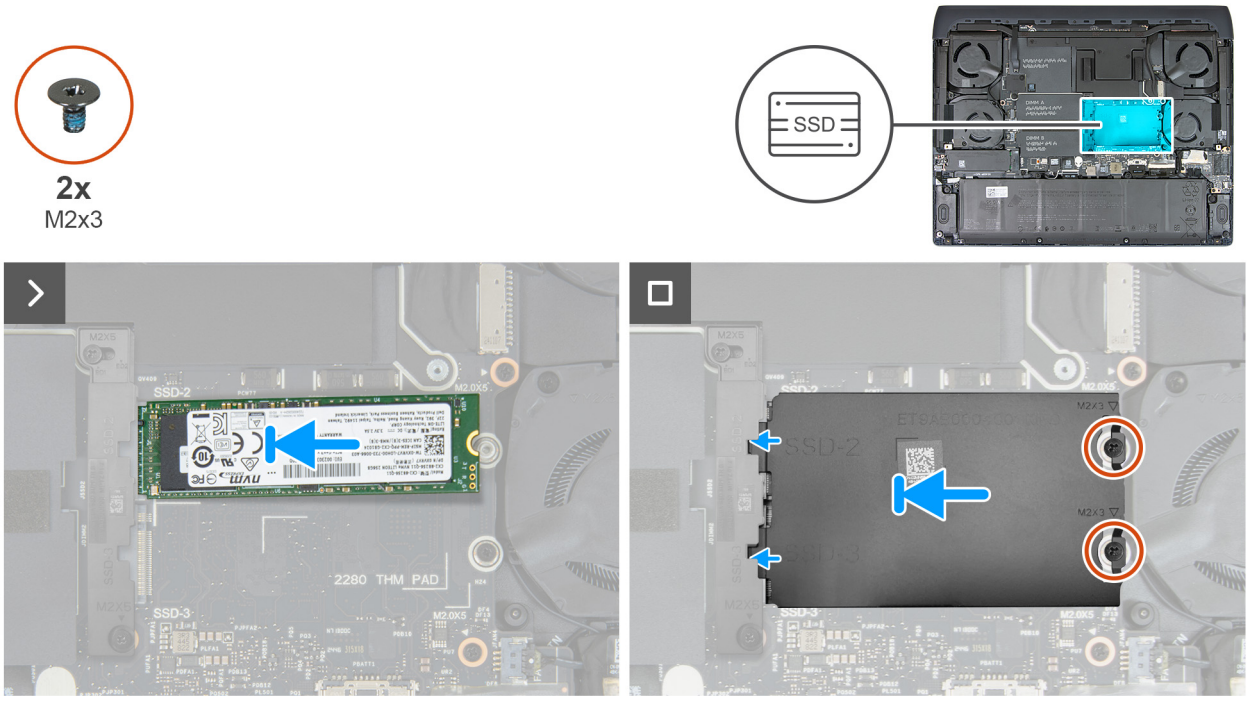


Figure 28. Installing the M.2 2280 SSD in slot 2 and slot 3

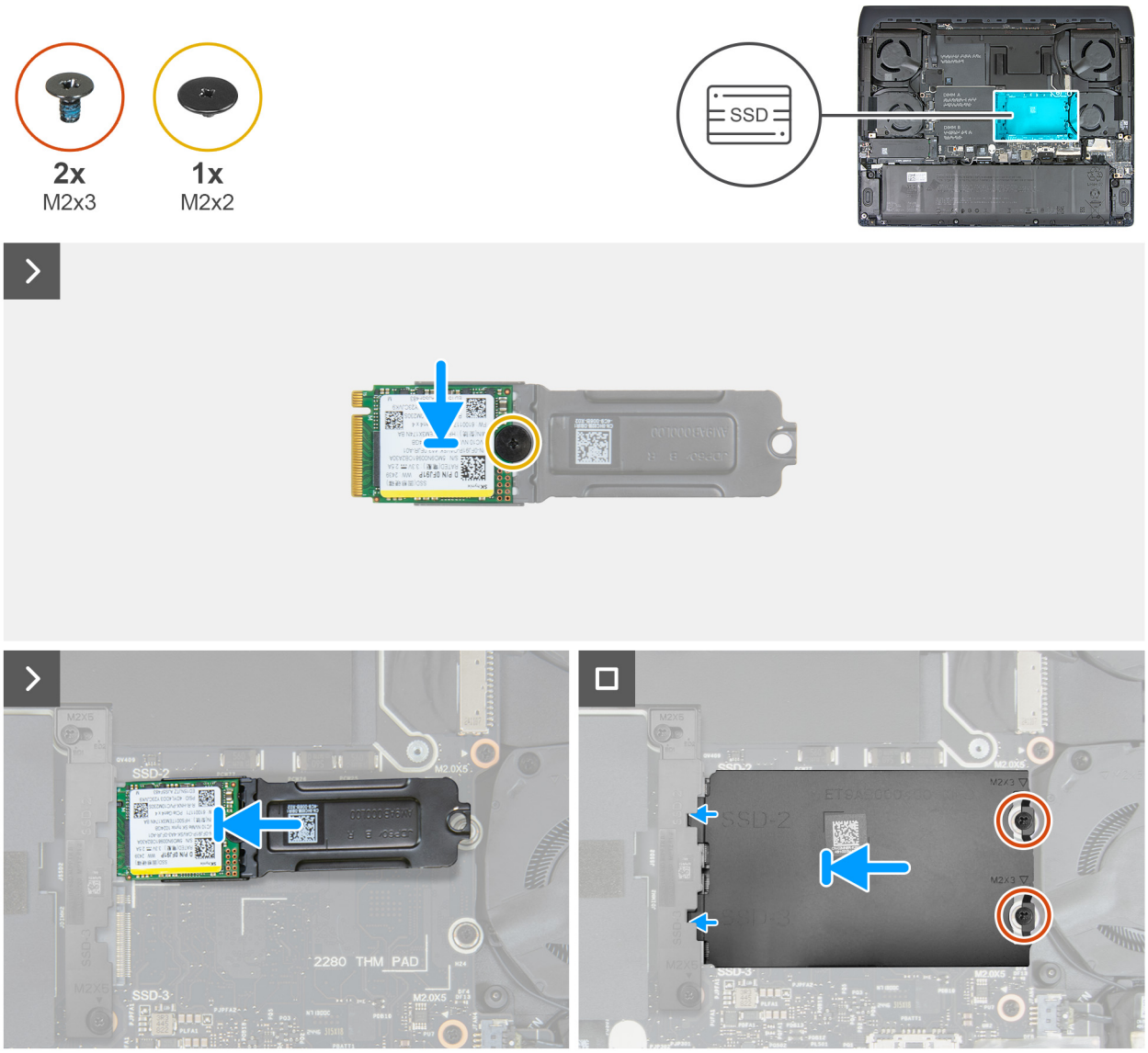


Figure 29. Installing the M.2 2230 SSD in slot 2 and slot 3

NOTE: The installation procedure for M.2 2230/2280 SSDs installed in slot 2 and slot 3 are the same. Follow the below procedure to install the M.2 2230/2280 SSDs in slot 2 or slot 3.

Steps

1. Align the screw hole on the SSD mounting bracket with the screw hole on the SSD.

   NOTE: Steps 1 and 2 are only applicable if you are installing a 2230 SSD into slots 1 and 2.

2. Replace the screw (M2x2) that secures the M.2 2230 SSD mounting bracket to the SSD.
3. Align the notch on the SSD with the tab on the SSD slot.
4. Slide the SSD into the SSD slot on the system board.
5. Slide the SSD thermal shield into the SSD slot.
6. Align the screw hole on the SSD thermal shield with the screw hole on the SSD and palm-rest and keyboard assembly.
7. Replace the two screws (M2x3) that secures the M.2 2280 SSD thermal shield to the SSD and palm-rest and keyboard assembly.

Next steps

1. Install the base cover.

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

Rear I/O-cover

Removing the rear I/O-cover

Prerequisites

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

About this task

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

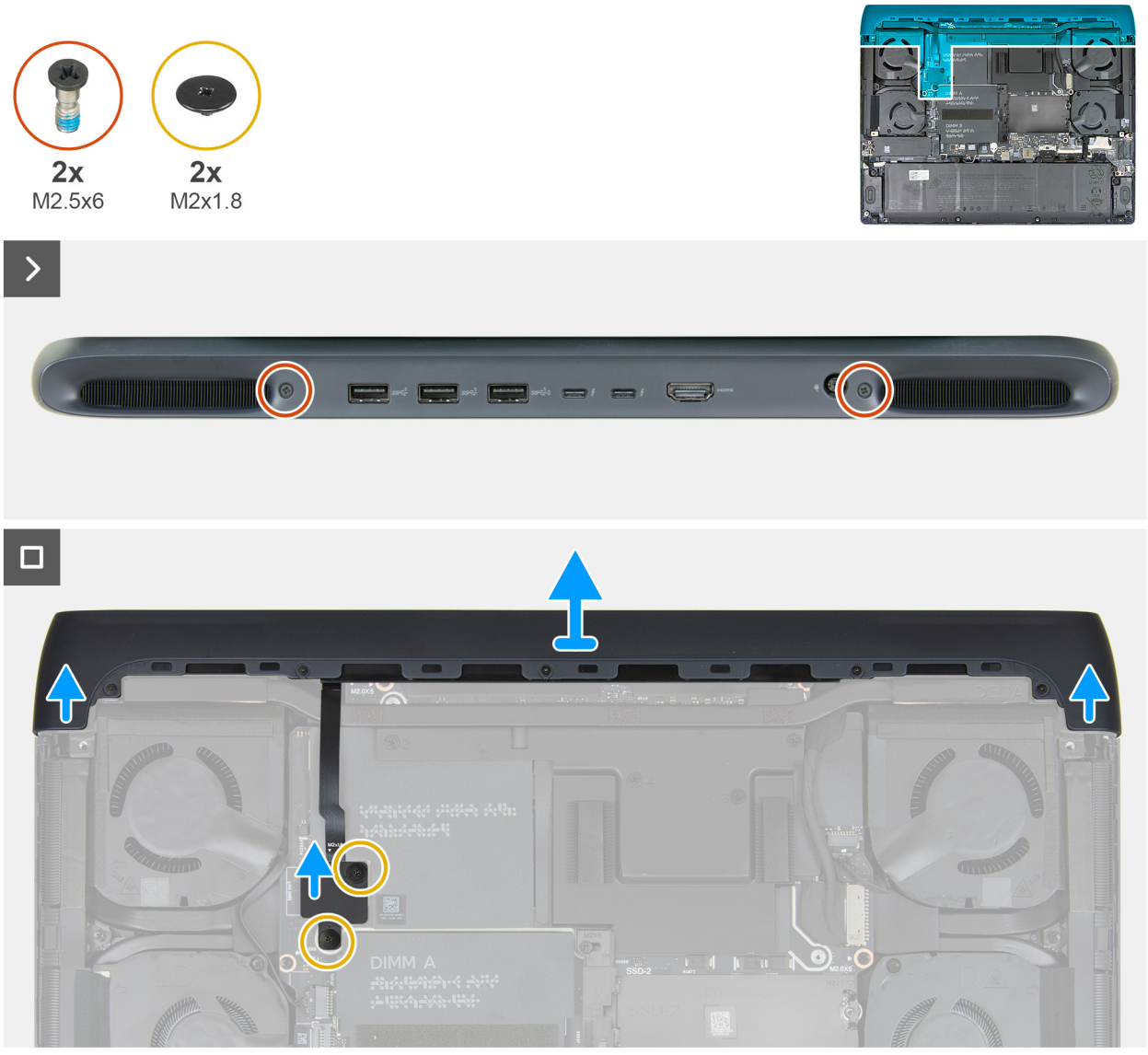


Figure 30. Removing the rear I/O-cover

Steps

1. Remove the two screws (M2.5x6) that secure the rear I/O-cover to the palm-rest and keyboard assembly.
2. Remove the two screws (M2x1.8) that secure theTron-light cable to the system board.

CAUTION: Do not pull at the bend points of the Tron-light cable and check for damage while removing and installing the rear I/O cover.

NOTE: Do not remove the smaller Torx screws that are securing the rear-I/O cover to the frame.

3. Disconnect the Tron-light cable from the connector (JPTRON5) on the system board.

   NOTE: To prevent damaging your computer, ensure that the Tron-light cable has been disconnected from the system board before removing the rear I/O-cover. To see the location of the Tron-light cable, see system board components in Removing the system board.

4. Firmly grasp the sides of your computer with both hands and push it outwards to remove the rear I/O-cover off the palm-rest and keyboard assembly.

Installing the rear I/O-cover

Prerequisites

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

About this task

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

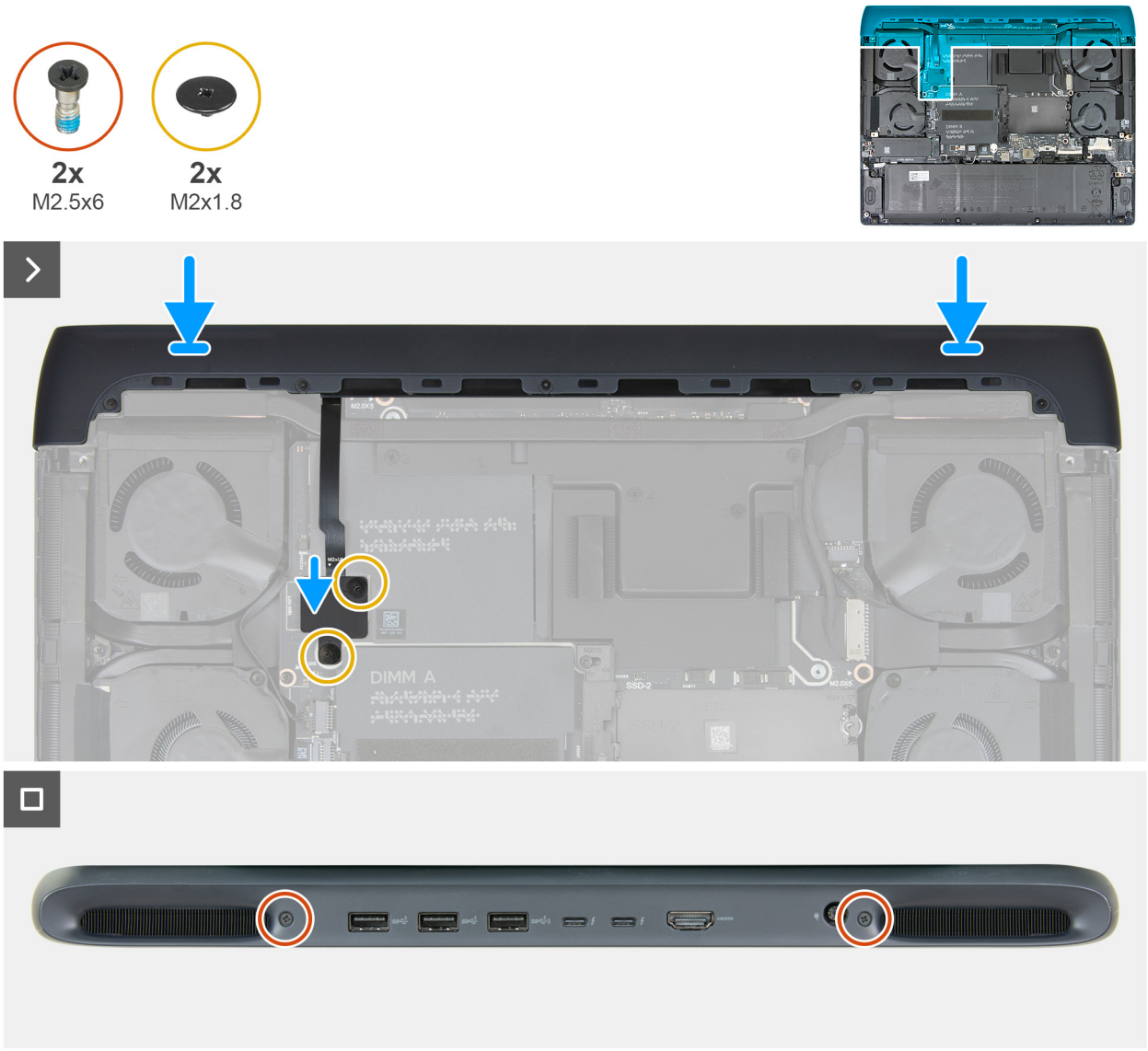


Figure 31. Installing the I/O-cover

NOTE: To avoid damaging your computer, ensure that the Tron-light cable is not pinched when sliding the rear I/O-cover into the palm-rest and keyboard assembly.

Steps

1. With the correct orientation, slide the rear I/O-cover into the palm-rest and keyboard assembly, and snap it into place.
2. Connect the Tron-light cable to the connector (JPTRON5) on the system board.
3. Replace the two screws (M2x1.8) that secure the Tron-light cable to the system board.

   CAUTION: Do not pull at the bend points of the Tron-light cable and check for damage while removing and installing the rear I/O cover.

4. Replace the two screws (M2.5x6) that secure the rear I/O-cover to the palm-rest and keyboard assembly.

Next steps

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

Fan

Removing the fan

Prerequisites

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

About this task

NOTE: This fan is only available in computers shipped with a NVIDIA GeForce RTX 5070 Ti, RTX 5080, or RTX5090 graphics card.

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

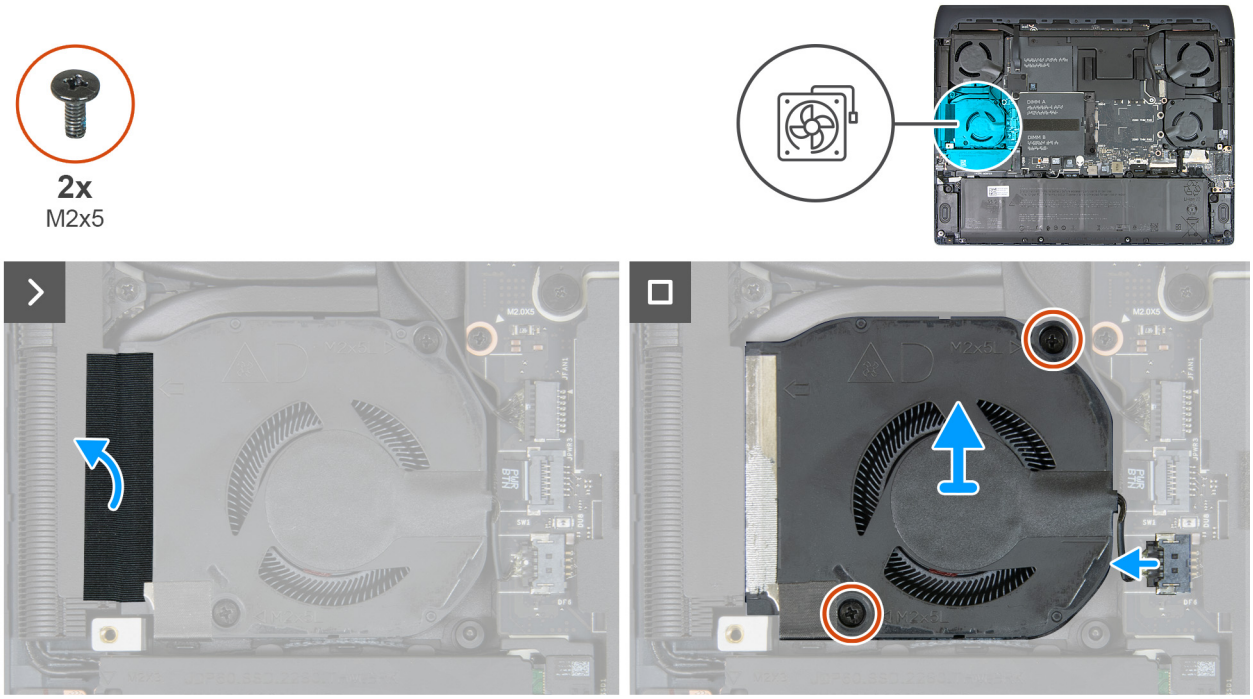


Figure 32. Removing the fan

Steps

1. Peel the tape that secures the fan to the palm-rest and keyboard assembly.
2. Disconnect the fan cable from the system board.
3. Remove the two screws (M2x5) that secure the fan to the heat-sink assembly.
4. Lift the fan off the palm-rest and keyboard assembly.

Installing the fan

Prerequisites

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

About this task

NOTE: This fan can only be installed on computers shipped with a NVIDIA GeForce RTX 5070 Ti, RTX 5080, or RTX5090 graphics card.

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

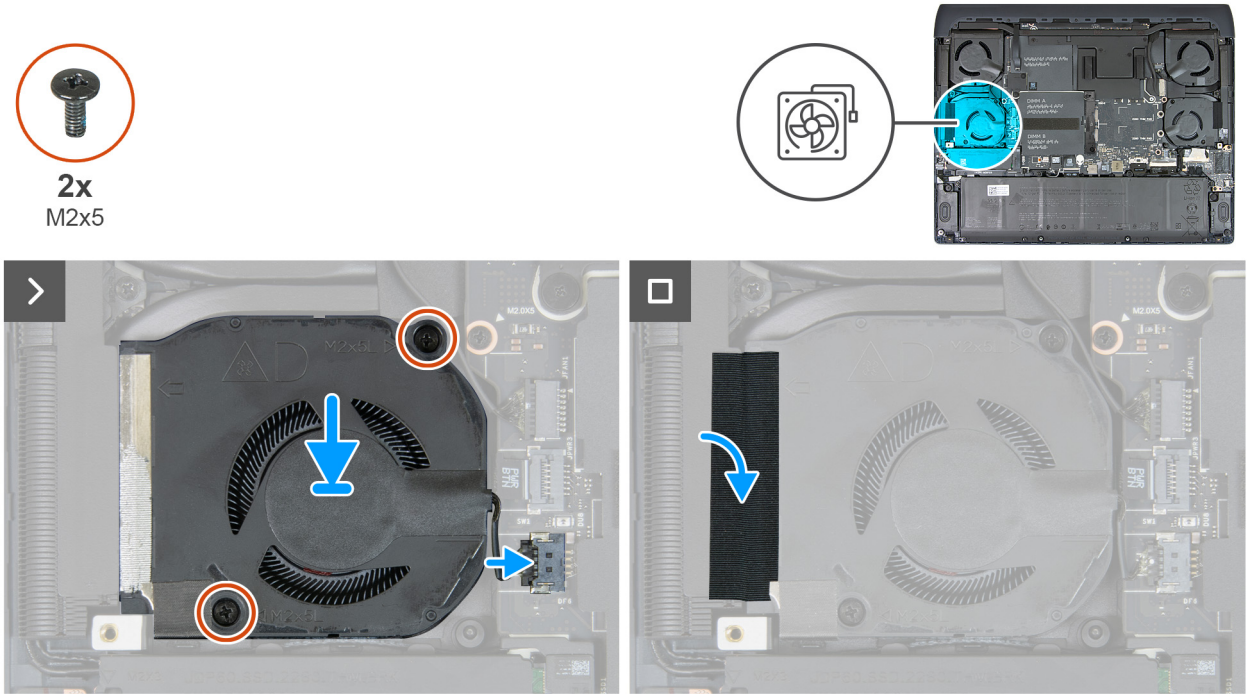


Figure 33. Installing the fan

Steps

1. Align and place the fan into the slot on the palm-rest and keyboard assembly.
2. Replace the two screws (M2x5) that secure the fan to the palm-rest and keyboard assembly.
3. Connect the fan cable to the system board.
4. Adhere the tape that secures the fan to the heat-sink assembly.

Next steps

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

7

Removing and installing Field Replaceable Units (FRUs)

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

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

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

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

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

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

I/O-board

NOTE: The I/O board consists of the SD-card, audio, and speaker connectors.

Removing the I/O-board

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

Prerequisites

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

About this task

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

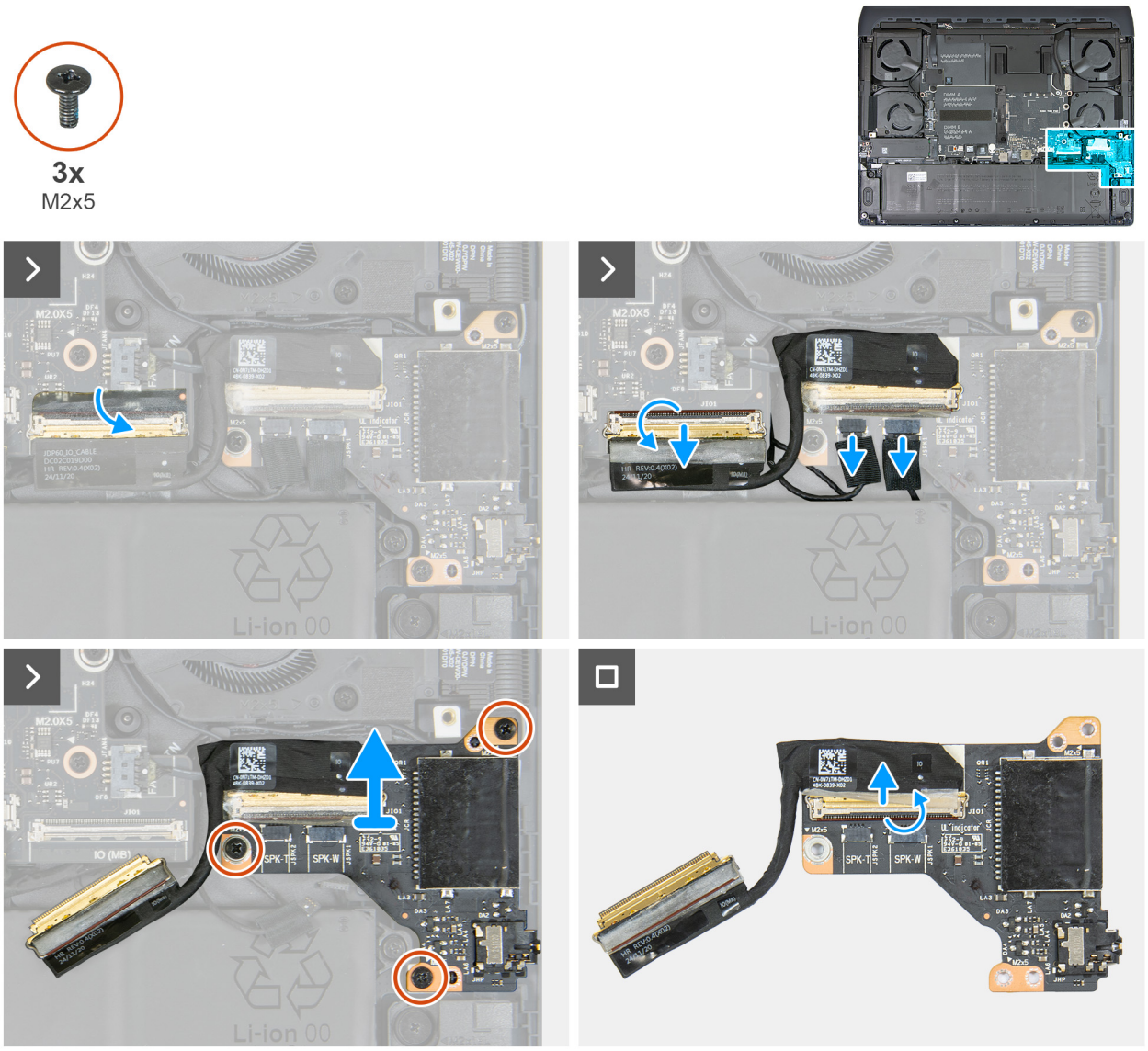


Figure 34. Removing the I/O-board

Steps

1. Peel the tape that secures the I/O cable to the connector on the system board.
2. Open the latch and disconnect the I/O cable from the I/O board connector ((JIO1) on the system board.
3. Disconnect the tweeter and woofer cables from the tweeter (JSPK2) and woofer (JSPK1) connectors on the I/O-board.
4. Remove the three screws (M2x5) that secures the I/O board to the palm-rest and keyboard assembly.
5. Remove the I/O board, along with its cable, off the palm-rest and keyboard assembly.
6. Peel the tape that secures the I/O cable to the connector on the I/O board.
7. Open the latch and disconnect the I/O cable from the connector (IO) on the I/O-board.

Installing the I/O board

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

Prerequisites

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

About this task

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

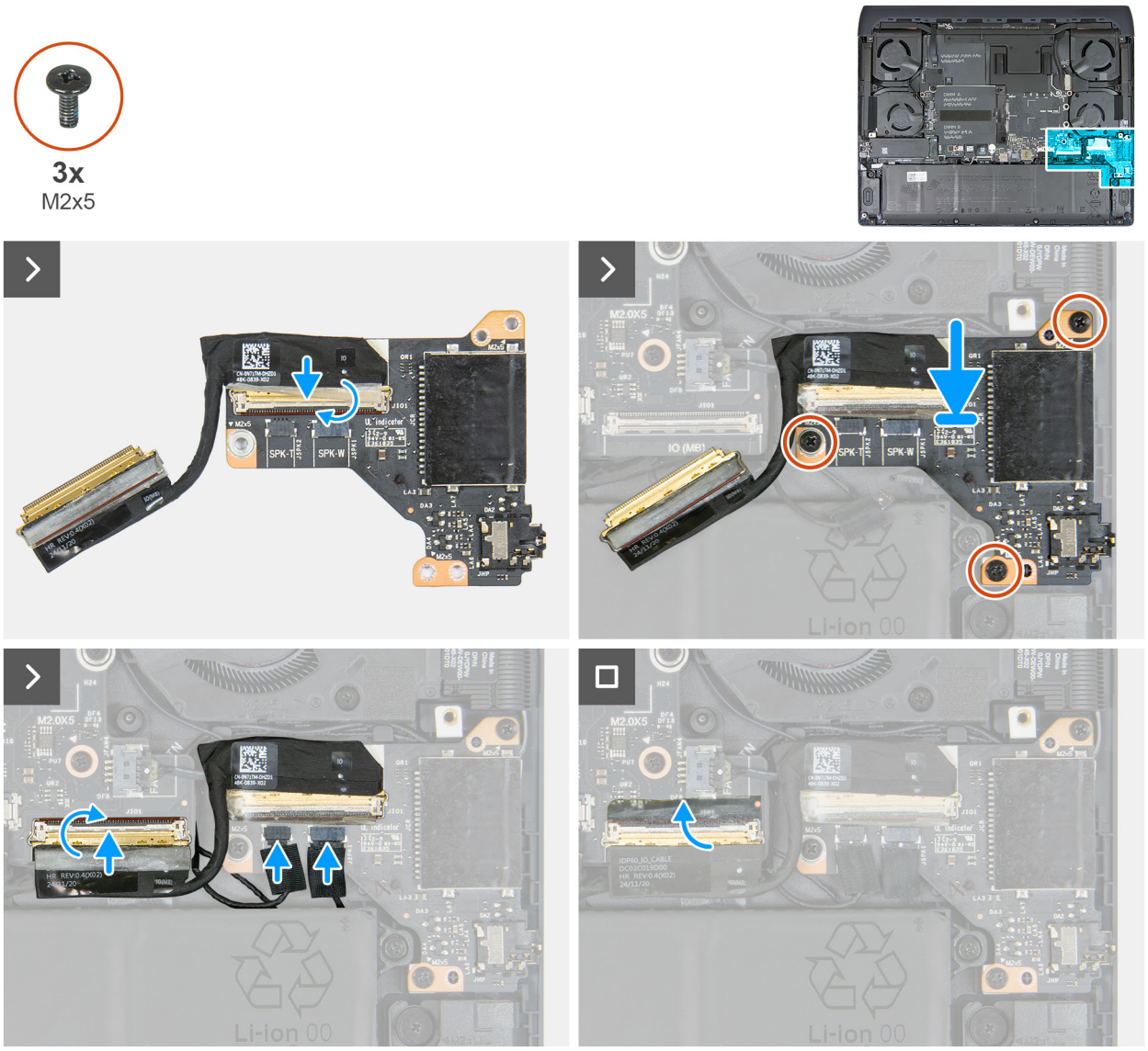


Figure 35. Installing the I/O board

Steps

1. Connect the I/O cable to the connector (IO) on the I/O board and close the latch to secure the cable.
2. Adhere the tape that secures the I/O cable to the connector on the I/O board.
3. Align the screw hole on the I/O board along with the screw hole on the palm-rest and keyboard assembly.
4. Replace the three screws (M2x5) that secure the I/O board to the palm-rest and keyboard assembly.
5. Connect the tweeter and woofer cables to the tweeter (JSPK2) and woofer (JSPK1) connectors on the I/O board.
6. Connect the I/O cable to the connector (JIO1) on the system board and close the latch to secure the cable.
7. Adhere the tape that secures the I/O cable to the connector on the system board.

Next steps

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

Touchpad assembly

Removing the touchpad assembly

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

About this task

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

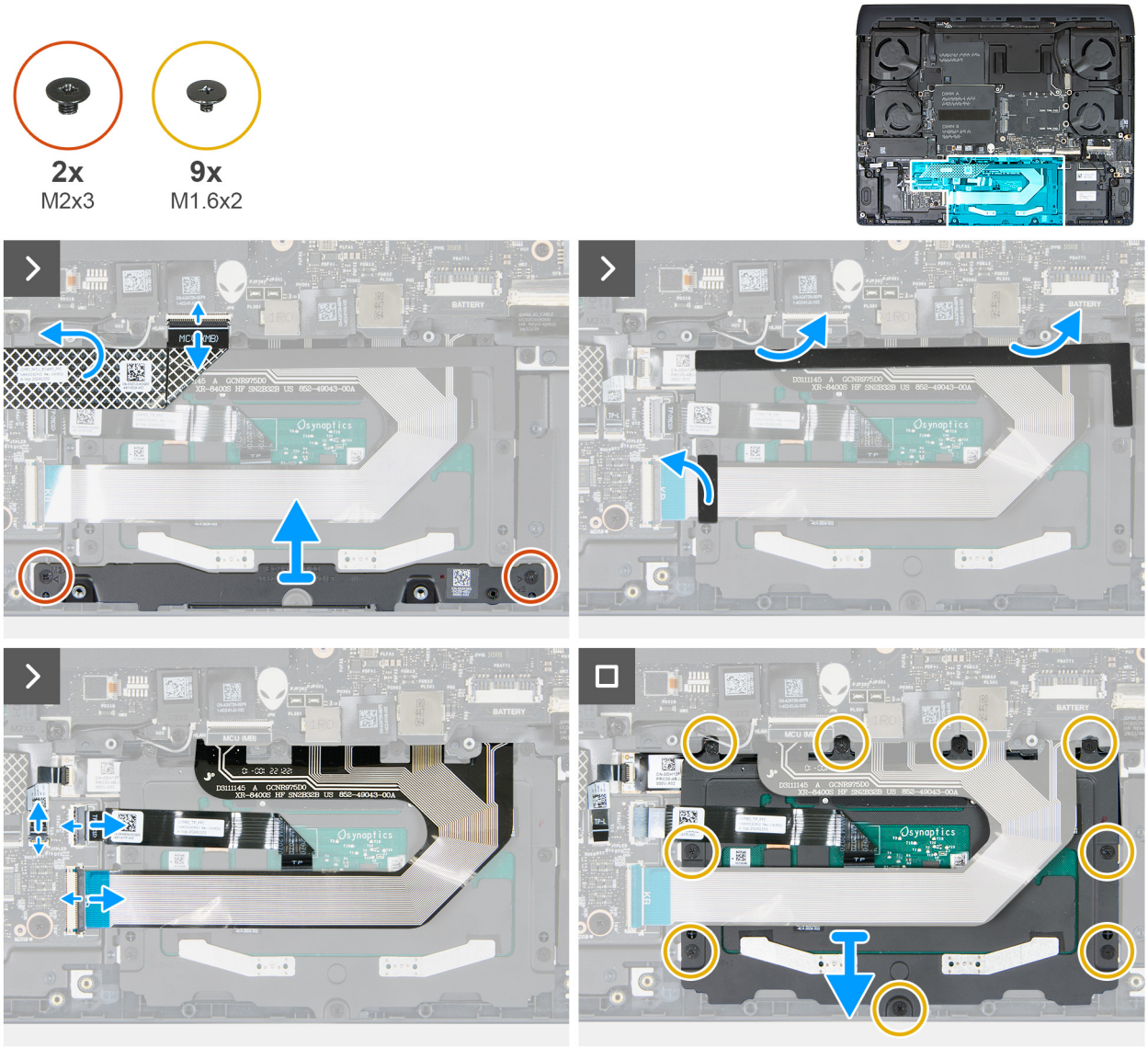


Figure 36. Removing the touchpad assembly

Steps

1. Open the latch and disconnect the keyboard-controller board cable from the connector (MCU MB JPK) on the system board.
2. Fold up the keyboard-controller board cable.
3. Peel the L-shaped rubber pad on the top-side and the smaller rubber-pad on the left side of the touchpad.

NOTE: For computers shipped with a CHERRY keyboard, both the rubber pads are adhered to the touchpad bracket. The touchpad bracket can be removed together with both the rubber pads attached.

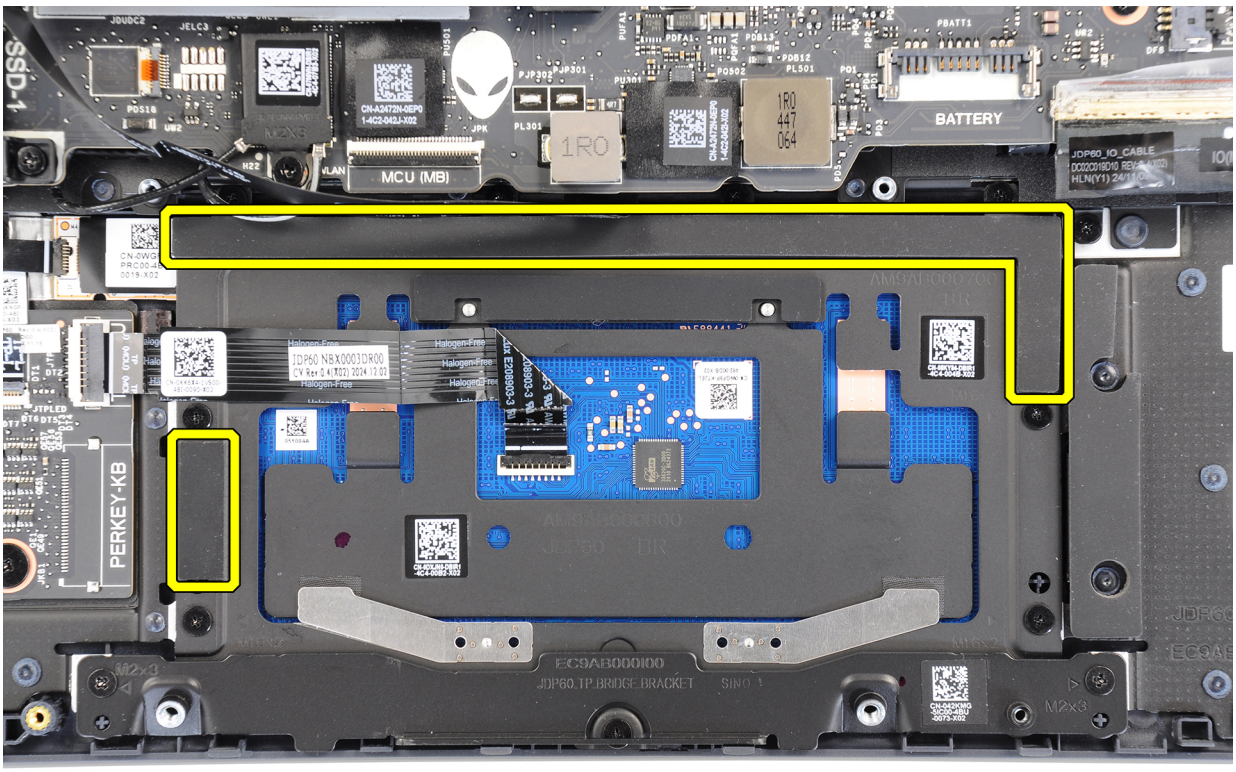


Figure 37. For computers shipped with a CHERRY keyboard

NOTE: For computers shipped with a per-key keyboard, ensure to peel the rubber pad before removing the keyboard cable.

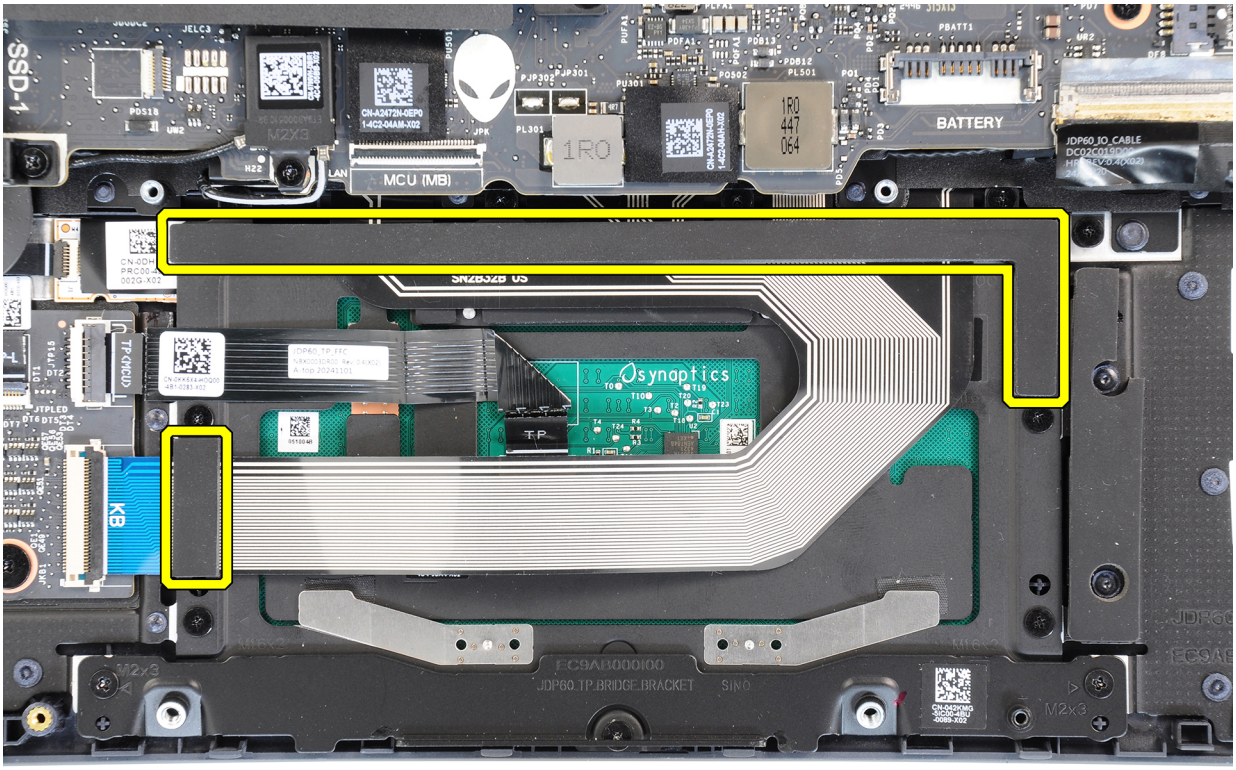


Figure 38. For computers shipped with per-key keyboard

4. Remove the two screws (M2x3) that secure the touchpad bracket to the palm-rest and keyboard assembly.
5. Open the latch and disconnect the touchpad-light cable from the connector (JTPLED) from the keyboard-controller board.

   NOTE: Your computer may be shipped with a touchpad-light cable depending on the configuration you have ordered.
6. Open the latch and disconnect the touchpad cable from the connector (JTP15) from the keyboard-controller board.
7. Open the latch and disconnect the keyboard cable from the connector (JKB1) from the keyboard-controller board.
8. Remove the nine screws (M1.6x2) that secure the touchpad to the palm-rest and keyboard assembly.
9. Slide and lift the touchpad, along with the cable at an angle, off the palm-rest and keyboard assembly.

Installing the touchpad assembly

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

Prerequisites

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

About this task

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

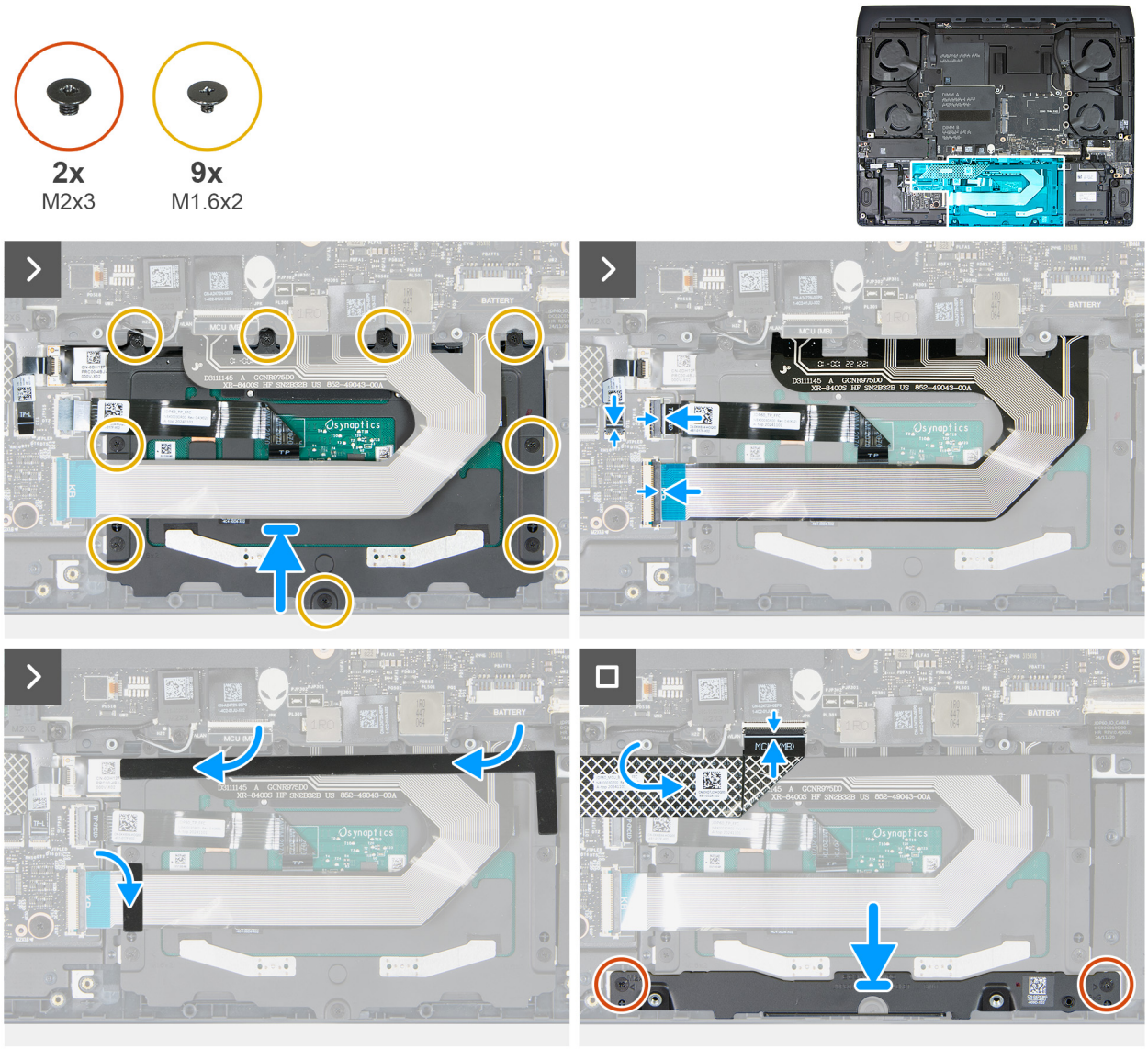
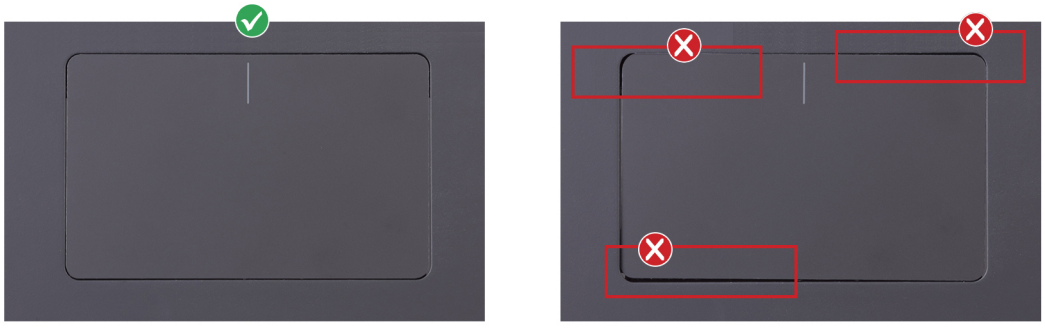


Figure 39. Installing the touchpad assembly

Steps

1. Align and place the touchpad into the slot on the palm-rest and keyboard assembly.

   NOTE: Turn the computer over and open the display. Ensure that the touchpad is equally aligned along all four sides.



2. Replace the nine screws (M1.6x2) that secure the touchpad to the palm-rest and keyboard assembly.
3. Slide the keyboard cable into its connector (JKB1) on the keyboard-controller board and close the latch to secure the cable.

4. Slide the keyboard cable into the connector (JTP15) on the keyboard-controller board and close the latch to secure the cable.
5. Slide the touchpad-light cable into its connector (JTPLED) on the keyboard-controller board and close the latch to secure the cable.

   NOTE: Your computer may be shipped with a touchpad-light cable depending on the configuration you have ordered.

6. Replace the two screws (M2x3) that secure the touchpad bracket to the palm-rest and keyboard assembly.
7. Adhere the L-shaped rubber pad on the top-side and the smaller rubber-pad on the left side of the touchpad.

   NOTE: For computers shipped with a CHERRY keyboard, both the rubber pads must be adhered directly on the touchpad bracket.

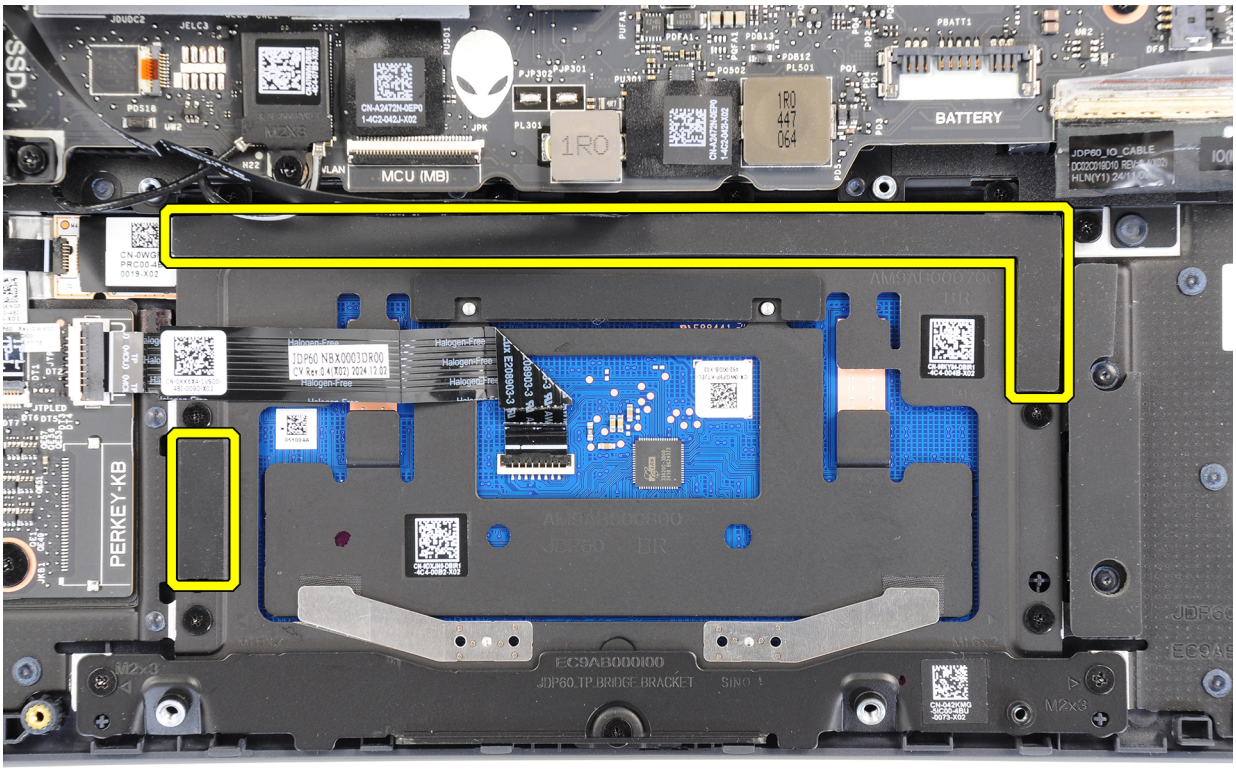


Figure 40. For computers shipped with a CHERRY keyboard

NOTE: For computers shipped with a per-key keyboard, ensure to adhere to the rubber pad after connecting the keyboard cable.

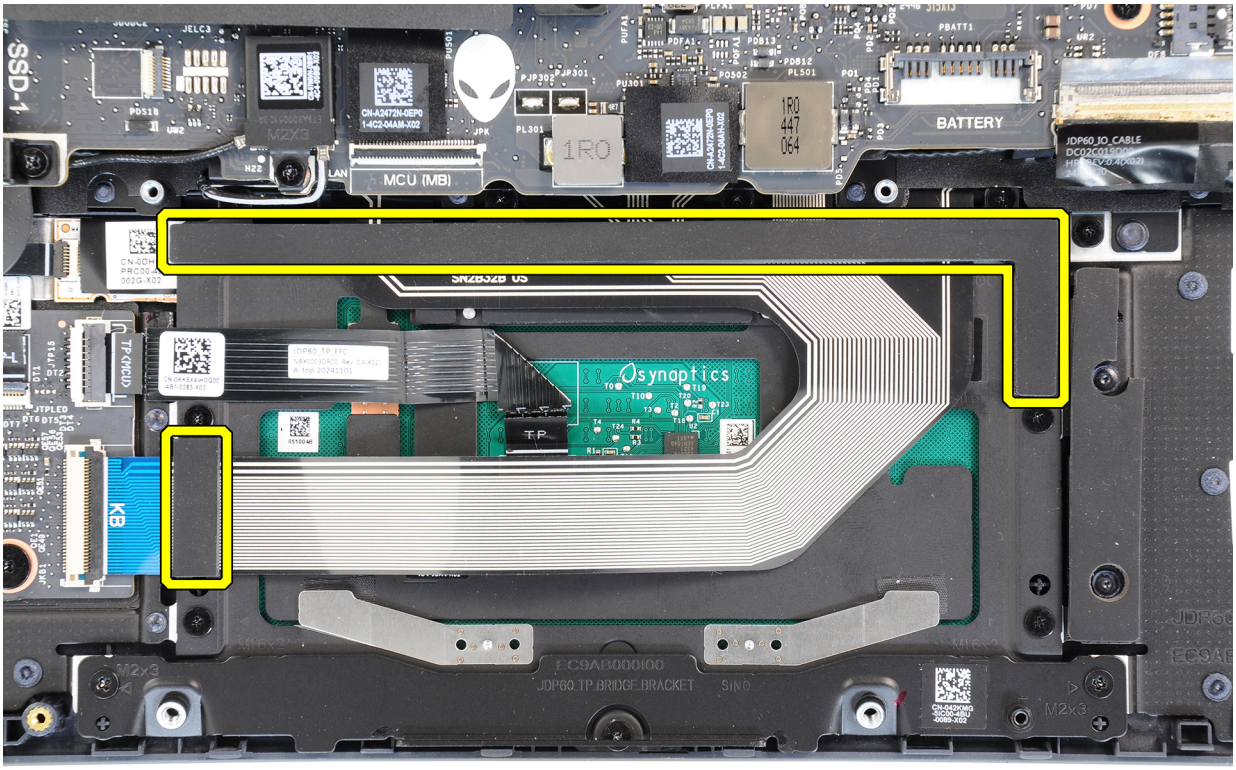


Figure 41. For computers shipped with per-key keyboard

8. Fold down the keyboard-controller board cable.
9. Slide the keyboard-controller board cable into the connector (MCU MB JPK) on the system board and close the latch to secure the cable.

Next steps

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

Keyboard-controller board

Removing the keyboard-controller board

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

About this task

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

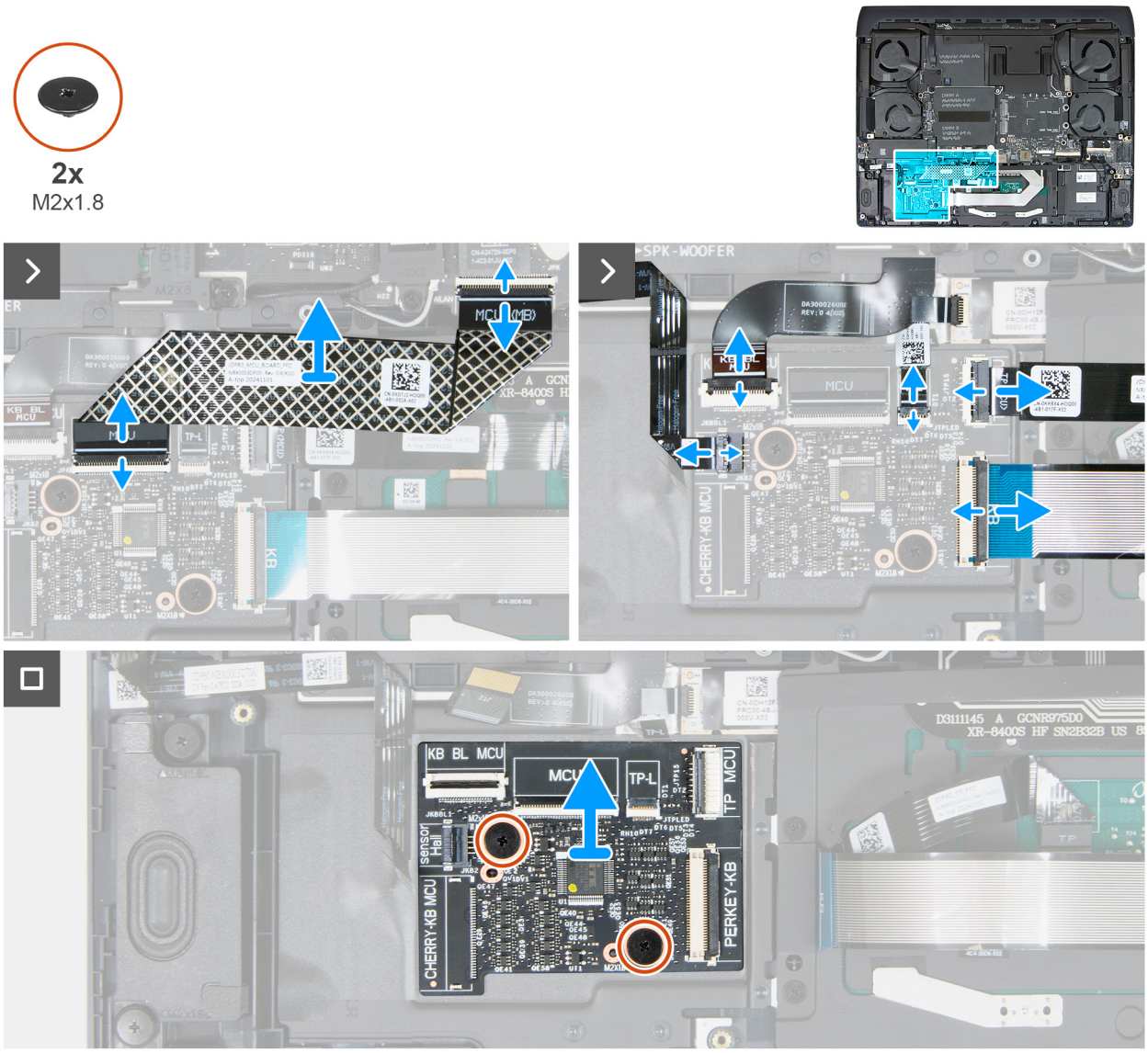


Figure 42. Removing the keyboard-controller board

NOTE: For models that are shipped with a per-key or mechanical keyboard, the computer will require a keyboard language and keyboard color setup after the keyboard-controller board is replaced. When the computer is reassembled and turned on, an error message is displayed. Press F2 to go to the Keyboard section of the BIOS Setup Utility to set up the keyboard language and keyboard color. See the bundled tech sheet for details on configuring the keyboard language.

Steps

1. Open the latch and disconnect the keyboard-controller board cable from the connector (JPL) on the keyboard-controller board.
2. Fold up the keyboard-controller board cable.
3. Open the latch and disconnect the sensor board cable from the connector (JKB2) on the keyboard-controller board.
4. Open the latch and disconnect the keyboard-backlight cable from the connector (JKBBL1) on the keyboard-controller board.
5. Open the latch and disconnect the touchpad-light cable from the connector (JTPLED) on the keyboard-controller board.

   NOTE: Your computer may be shipped with a touchpad-light cable depending on the configuration you have ordered.

6. Open the latch and disconnect the touchpad cable from the connector (JTP15) on the keyboard-controller board.
7. Open the latch and disconnect the keyboard cable from the connector (KB) on the keyboard-controller board.
8. Remove the two screws (M2x1.8) that secure the keyboard-controller board to the palm-rest and keyboard assembly.

9. Lift the keyboard-controller board off the palm-rest and keyboard assembly.

Installing the keyboard-controller board

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

Prerequisites

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

About this task

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

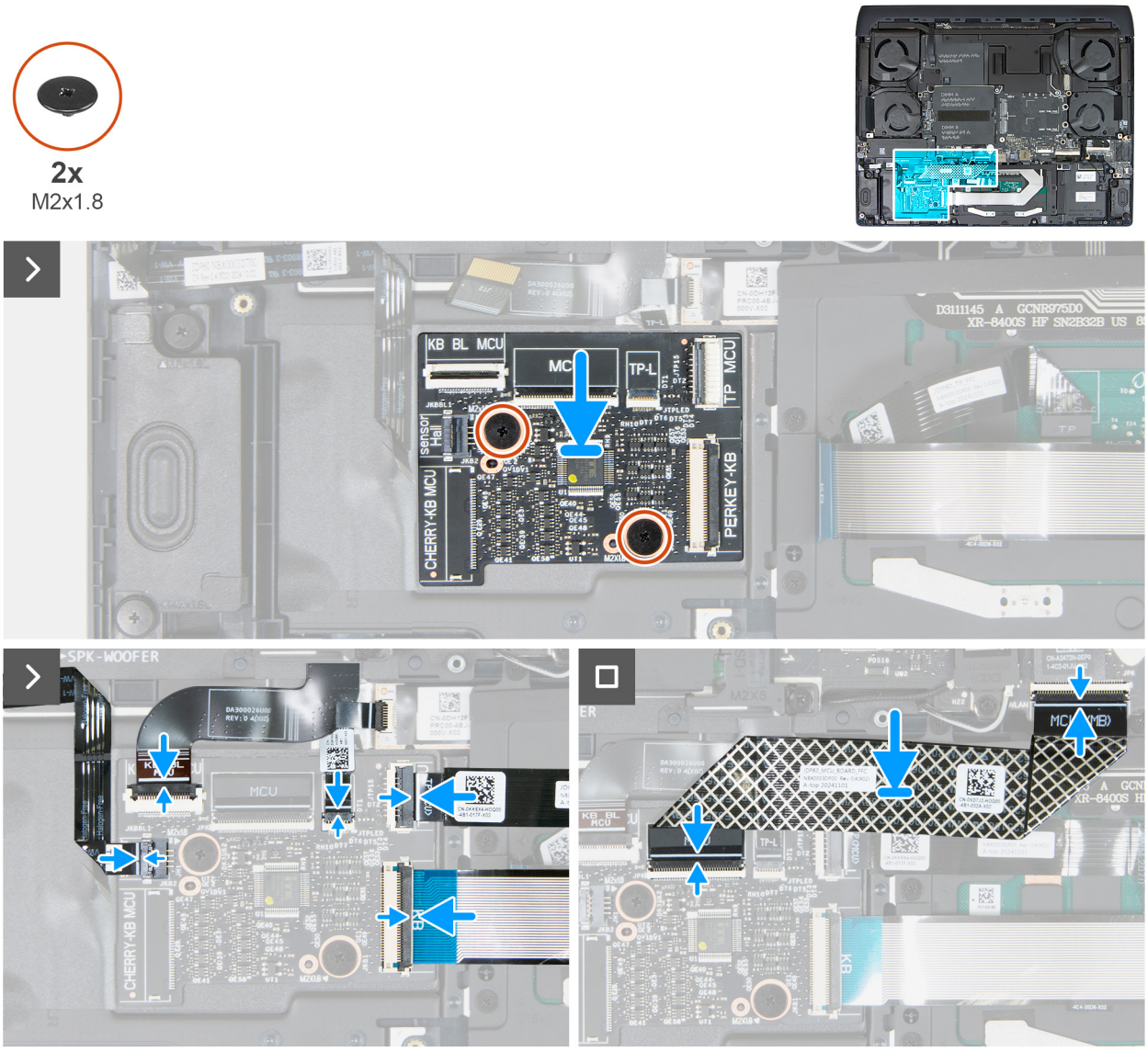


Figure 43. Installing the keyboard-controller board

Steps

1. Using the alignment posts, place the keyboard-controller board into the slot on the palm-rest and keyboard assembly.
2. Replace the two screws (M2x1.8) that secure the keyboard-controller board to the palm-rest and keyboard assembly.
3. Slide the keyboard cable into the connector (KB) on the keyboard-controller board and close the latch to secure the cable.

4. Slide the touchpad cable into the connector (JTP15) on the keyboard-controller board and close the latch to secure the cable.
5. Slide the touchpad-light cable into the connector (JTPLED) on the keyboard-controller board and close the latch to secure the cable.

   NOTE: Your computer may be shipped with a touchpad-light cable depending on the configuration you have ordered.

6. Slide the keyboard-backlight cable into the connector (JKBBL1) on the keyboard-controller board and close the latch to secure the cable.
7. Slide the sensor board cable into the connector (JKB2) on the keyboard-controller board and close the latch to secure the cable.
8. Fold down the keyboard-controller board cable.
9. Slide the keyboard-controller board cable into the connector (JPL) on the keyboard-controller board and close the latch to secure the cable.

Next steps

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

Hall sensor board

Removing the hall sensor board

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

About this task

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

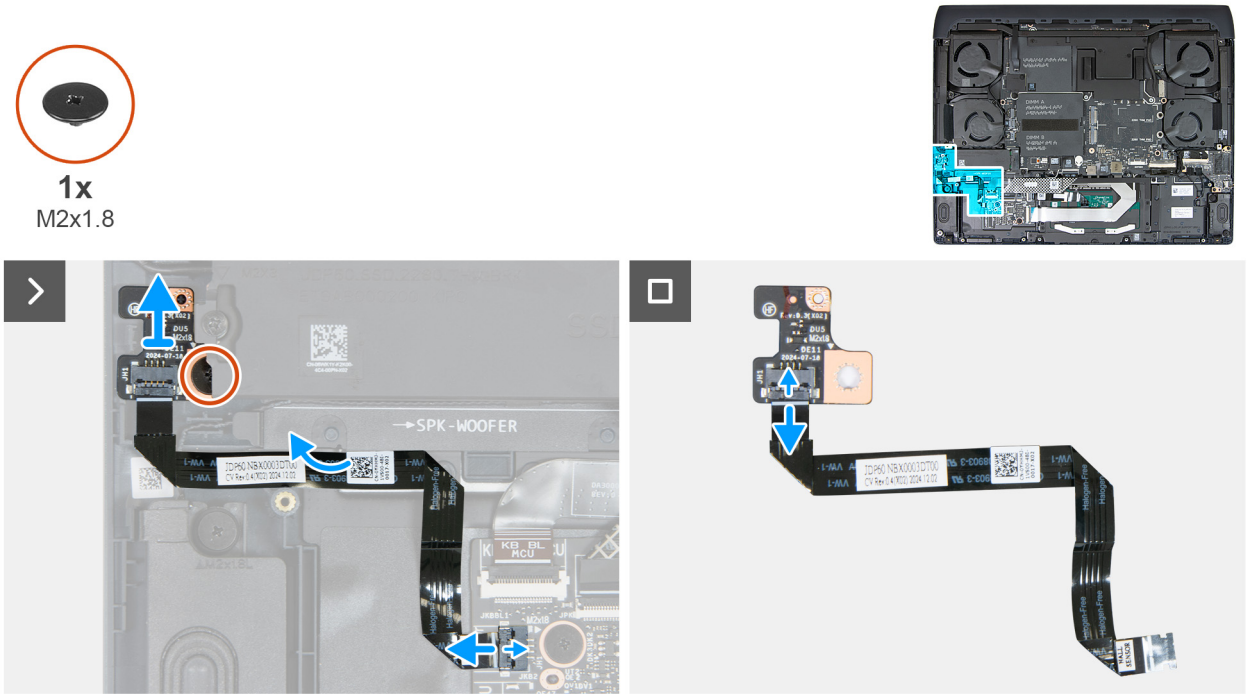


Figure 44. Removing the hall sensor board

Steps

1. Disconnect the hall sensor board cable from the connector (JKB2) on the keyboard-controller board.
2. Peel the hall sensor board cable from the palm-rest and keyboard assembly.
3. Remove the screw (M2x1.8) that secures the hall sensor board to the palm-rest and keyboard assembly.
4. Remove the hall sensor, along with its cable, off the system board.
5. Disconnect the hall sensor cable from the connector (JH1) on the hall sensor board and remove the hall sensor board.

Installing the hall sensor board

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

Prerequisites

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

About this task

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

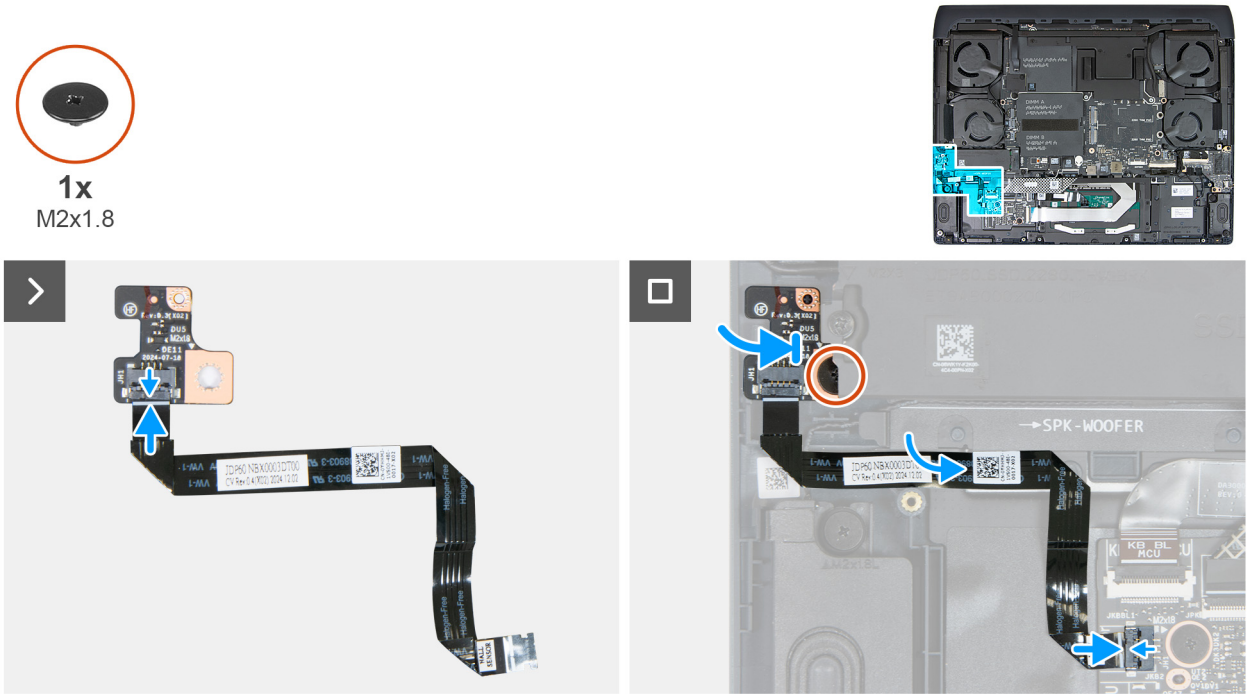


Figure 45. Installing the hall sensor board

Steps

1. Connect the hall sensor cable to the connector (JH1) on the hall sensor board.
2. Align the screw hole on the hall sensor board along with the screw hole on the palm-rest and keyboard assembly.
3. Replace the screw (M2x1.8) that secures the hall sensor board to the palm-rest and keyboard assembly.
4. Adhere the hall sensor board cable to the palm-rest and keyboard assembly.
5. Connect the hall sensor board cable to the connector (JKB2) on the keyboard controller-board.

Next steps

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

Voltage Regulator (VR) heat sink

Removing the VR heat sink

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the rear I/O-cover.

About this task

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

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

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

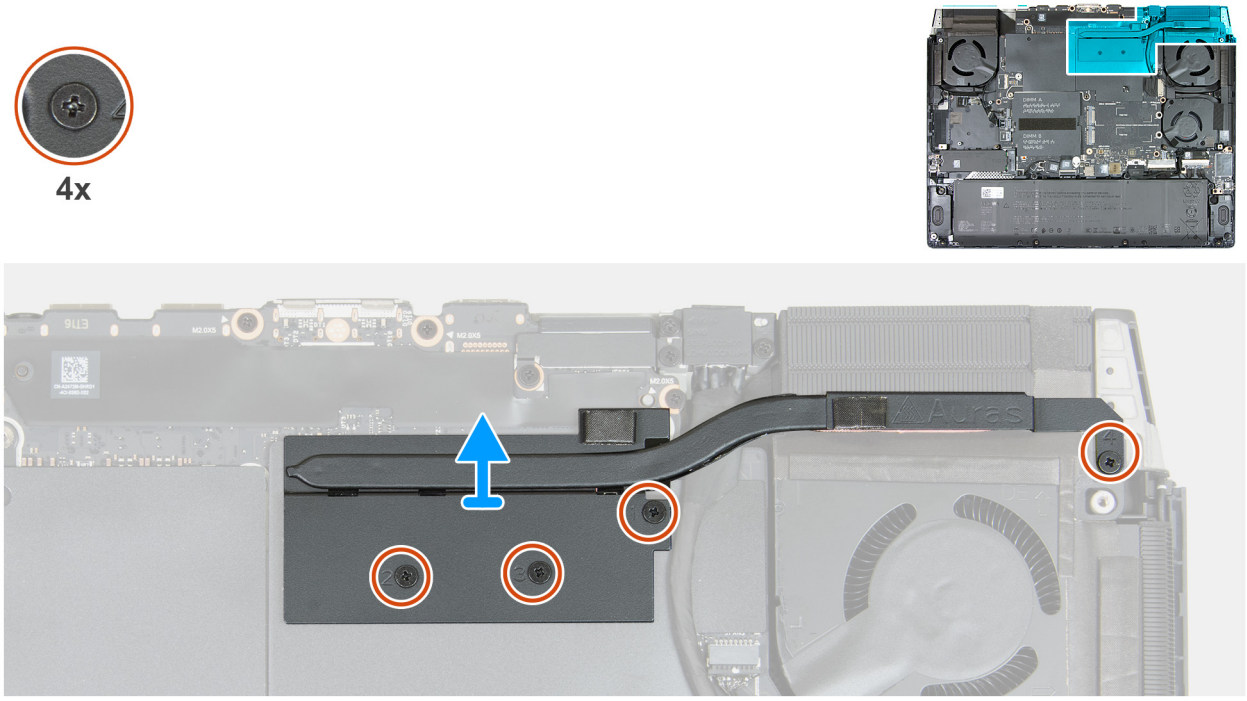


Figure 46. Removing the VR heat sink for computers shipped with a NVIDA GeForce RTX 5060 or RTX 5070 graphics card

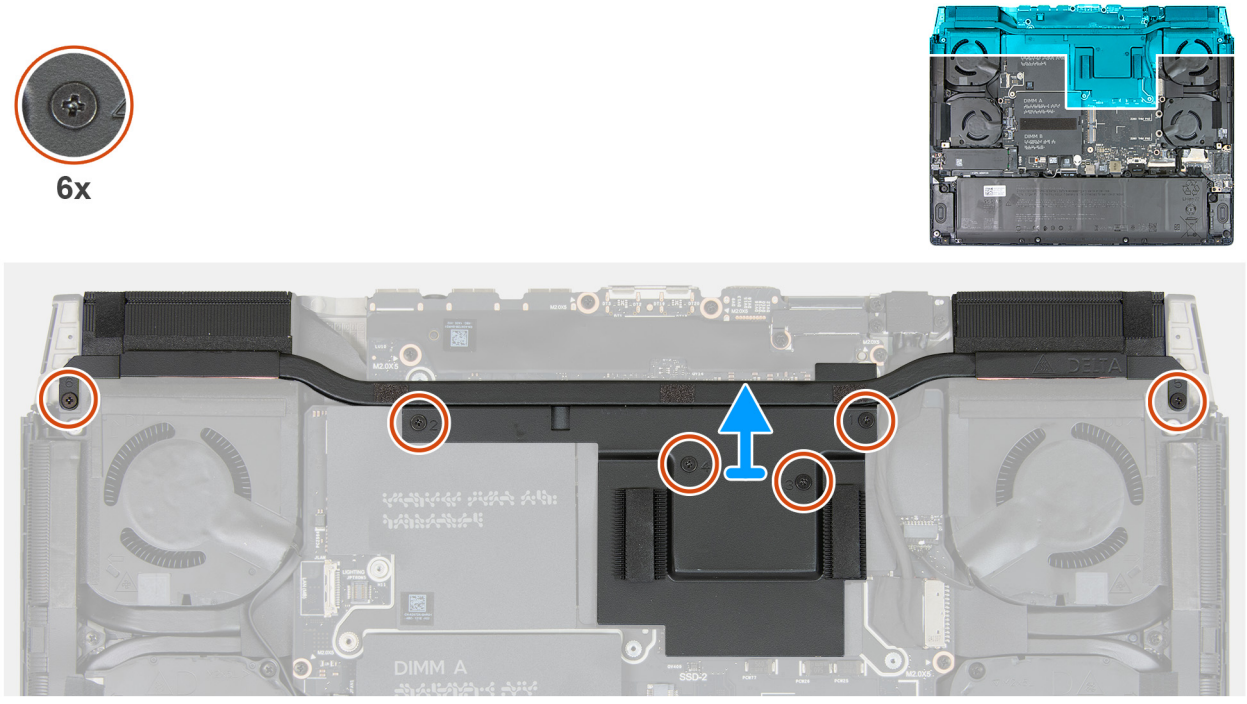


Figure 47. Removing the VR heat sink for computers shipped with a NVIDIA GeForce RTX 5070 Ti, RTX 5080, or RTX5090 graphics card

Steps

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

NOTE: Loosen the captive screws in the reverse sequential order mentioned on the heat sink [4 > 3 > 2 > 1]. This step is only applicable for computers shipped with a NVIDIA GeForce RTX 5060 or RTX 5070 graphics card.

2. Loosen the six captive screws that secure the VR heat sink to the system board.

   NOTE: Loosen the captive screws in the reverse sequential order mentioned on the heat sink [6 > 5 > 4 > 3 > 2 > 1]. This step is only applicable for computers shipped with a NVIDIA GeForce RTX 5070 Ti, RTX 5080, or RTX 5090 graphics card.

3. Lift the VR heat sink off the system board.

Installing the VR heat sink

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

Prerequisites

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

About this task

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

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

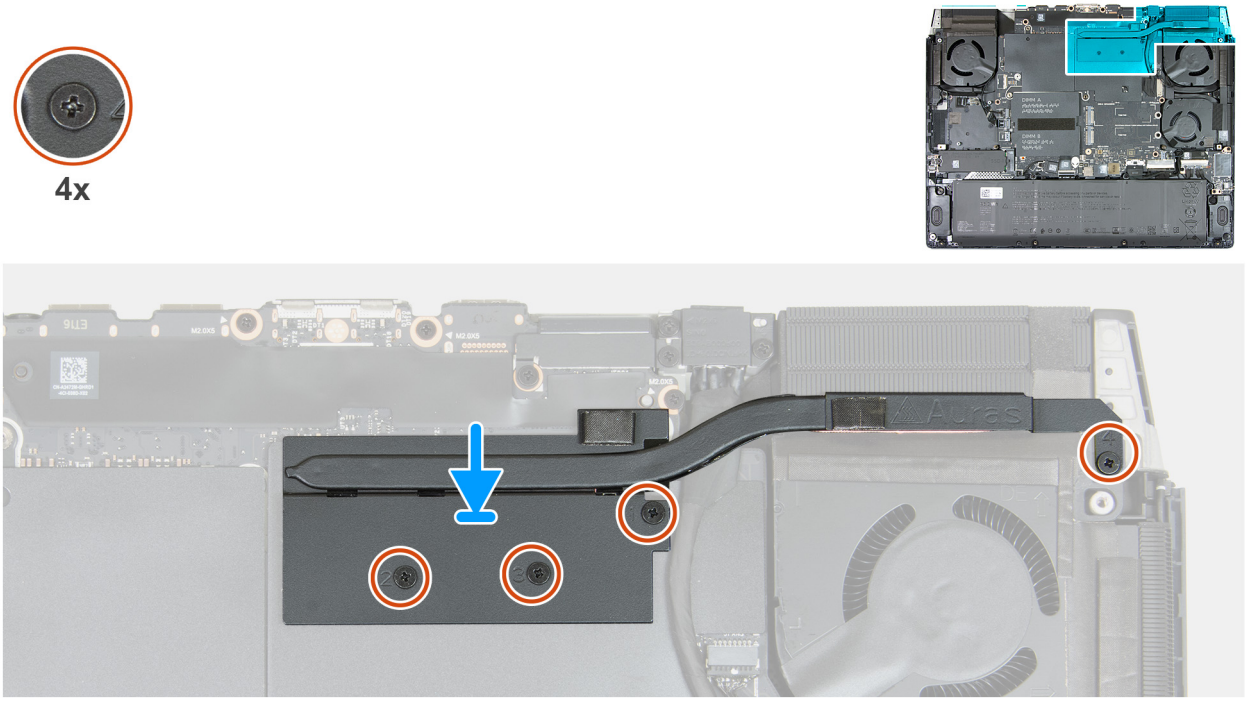


Figure 48. Installing the VR heat sink for computers shipped with a NVIDA GeForce RTX 5060 or RTX 5070 graphics card

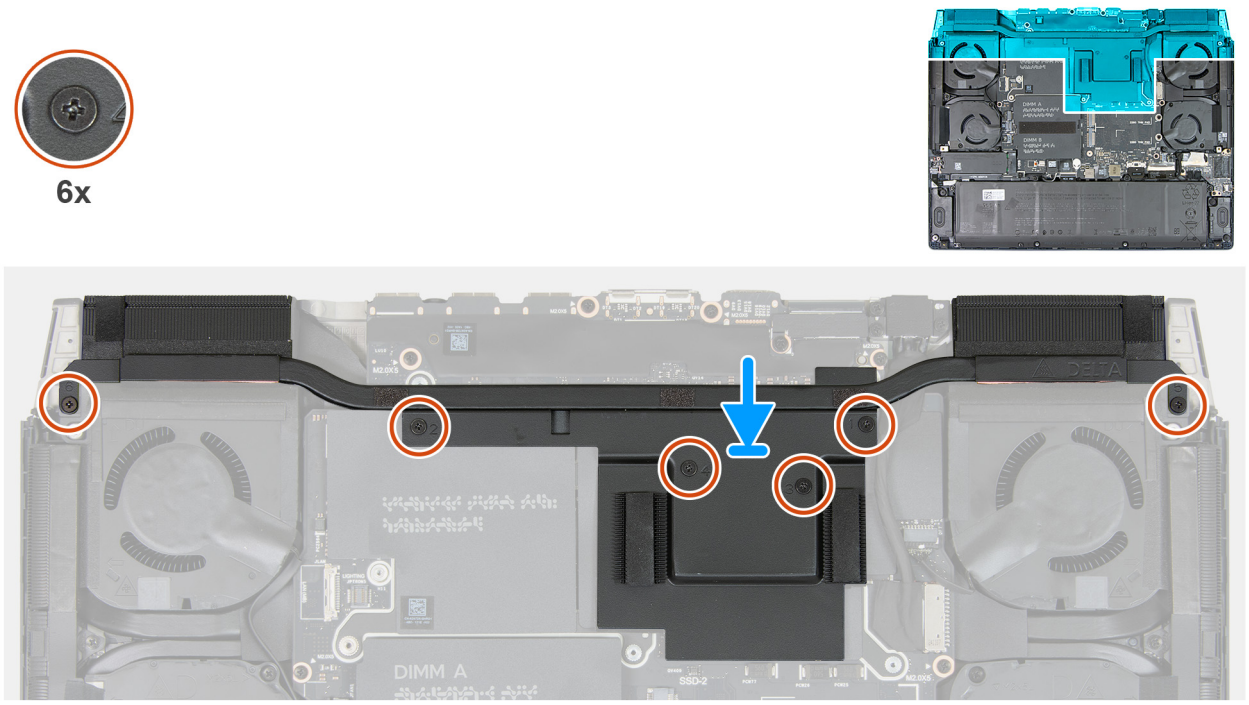


Figure 49. Installing the VR heat sink for computers shipped with a NVIDIA GeForce RTX 5070 Ti, RTX 5080, or RTX5090 graphics card

Steps

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

   NOTE: Tighten the captive screws in the sequential order mentioned on the heat sink [1 > 2 > 3 > 4]. This step is only applicable for computers shipped with a NVIDIA GeForce RTX 5060 or RTX 5070 graphics card.

3. Tighten the six captive screws that secure the VR heat sink to the system board.

   NOTE: Tighten the captive screws in the sequential order mentioned on the heat sink [1 > 2 > 3 > 4 > 5 > 6]. This step is only applicable for computers shipped with a NVIDIA GeForce RTX 5070 Ti, RTX 5080, or RTX 5090 graphics card.

Next steps

1. Install the rear I/O cover.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

Display assembly

Removing the display assembly

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the rear I/O-cover.

About this task

NOTE: The display assembly is a Hinge-Up Display (HUD) and cannot be further disassembled. If components within the display assembly must be replaced, the entire display assembly should be replaced.

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

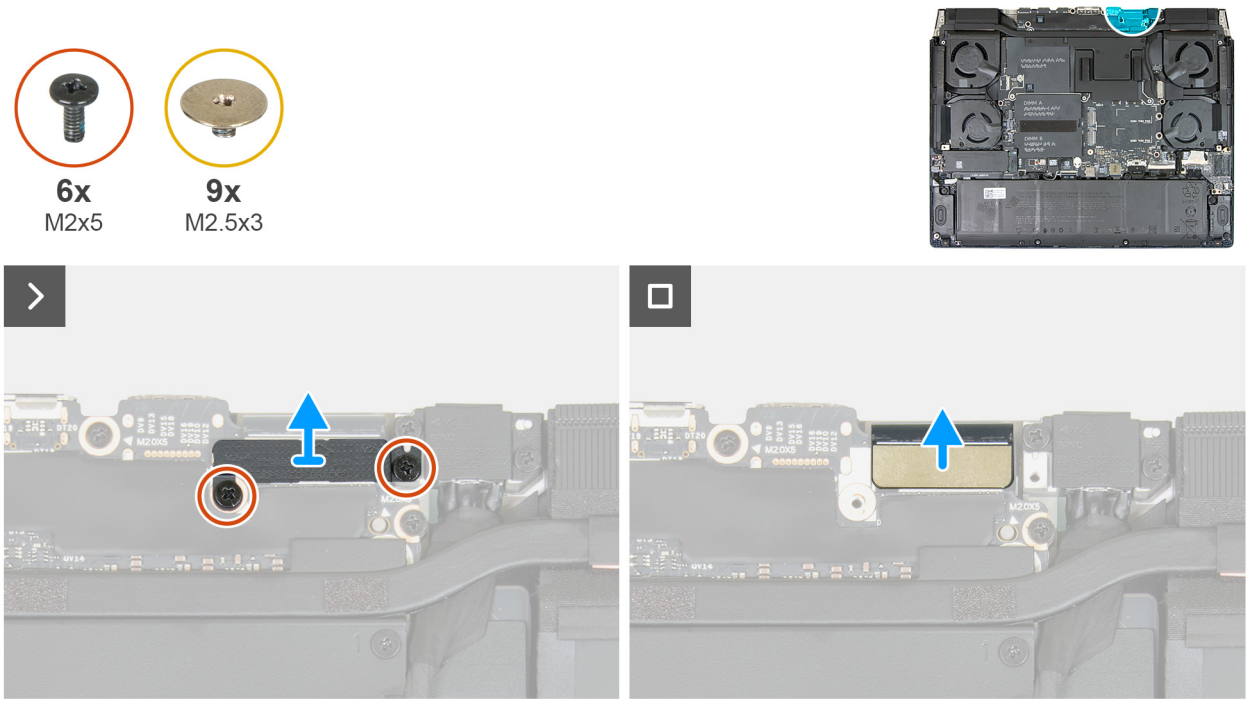


Figure 50. Removing the display assembly

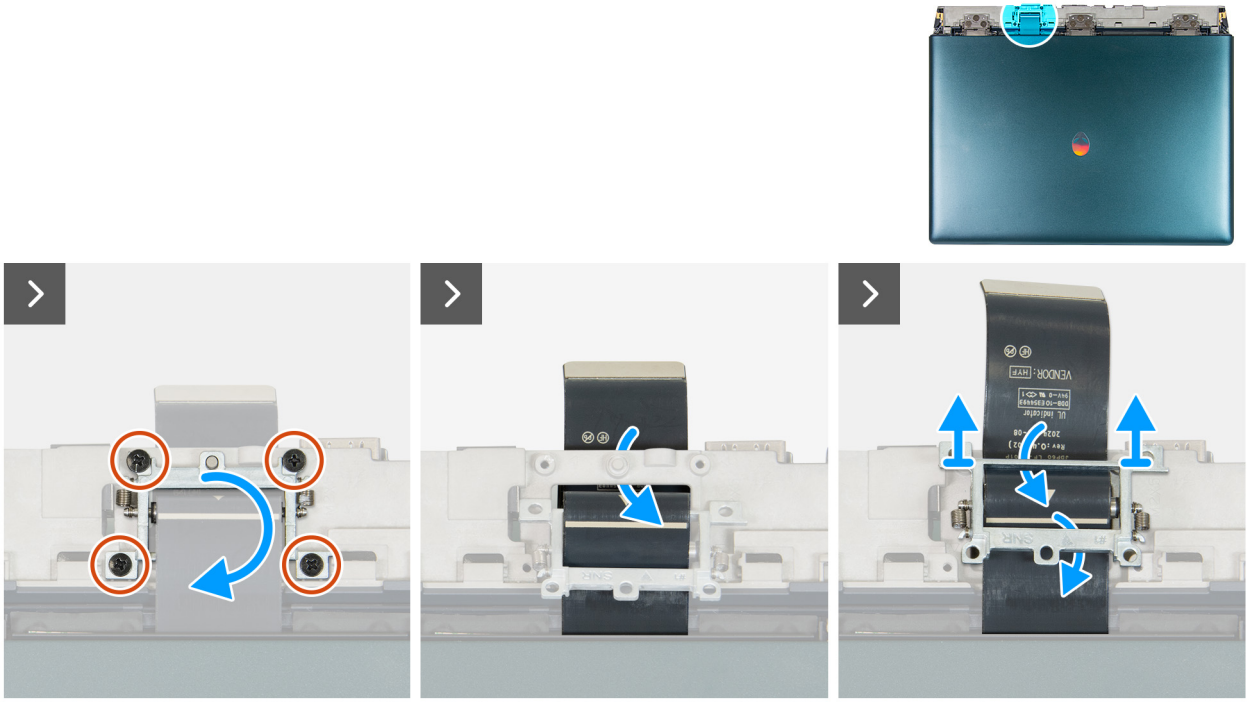


Figure 51. Removing the display assembly

Figure 52. Removing the display assembly

Steps

1. Remove the two screws (M2x5) that secure the display-cable bracket to the palm-rest and keyboard assembly.
2. Lift the display-cable bracket off the display cable.
3. Disconnect the display cable from the connector (eDP) on the system board.
4. Turn the computer over.
5. Remove the four screws (M2x5) that secure the display-cable holder to the palm-rest and keyboard assembly.
6. Lift the display-cable holder and rotate the display-cable holder 180 degrees.
7. Route the display cable from the slot between the palm-rest and keyboard assembly and rear I/O cover.
8. Slide and remove the display-cable holder off the palm-rest and keyboard assembly.

   NOTE: While removing the display cable from the display cable holder, push open the spring-loaded bar separating the two slits in the middle of the display holder.

9. Remove the nine screws (M2.5x3) that secure the display hinge to the top side of the palm-rest and keyboard assembly.
10. Slide the display assembly off the palm-rest and keyboard assembly.
11. After performing the steps above, you are left with the display assembly.

Installing the display assembly

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

Prerequisites

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

About this task

CAUTION: Place the computer on a soft and clean surface to avoid scratching the display.

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

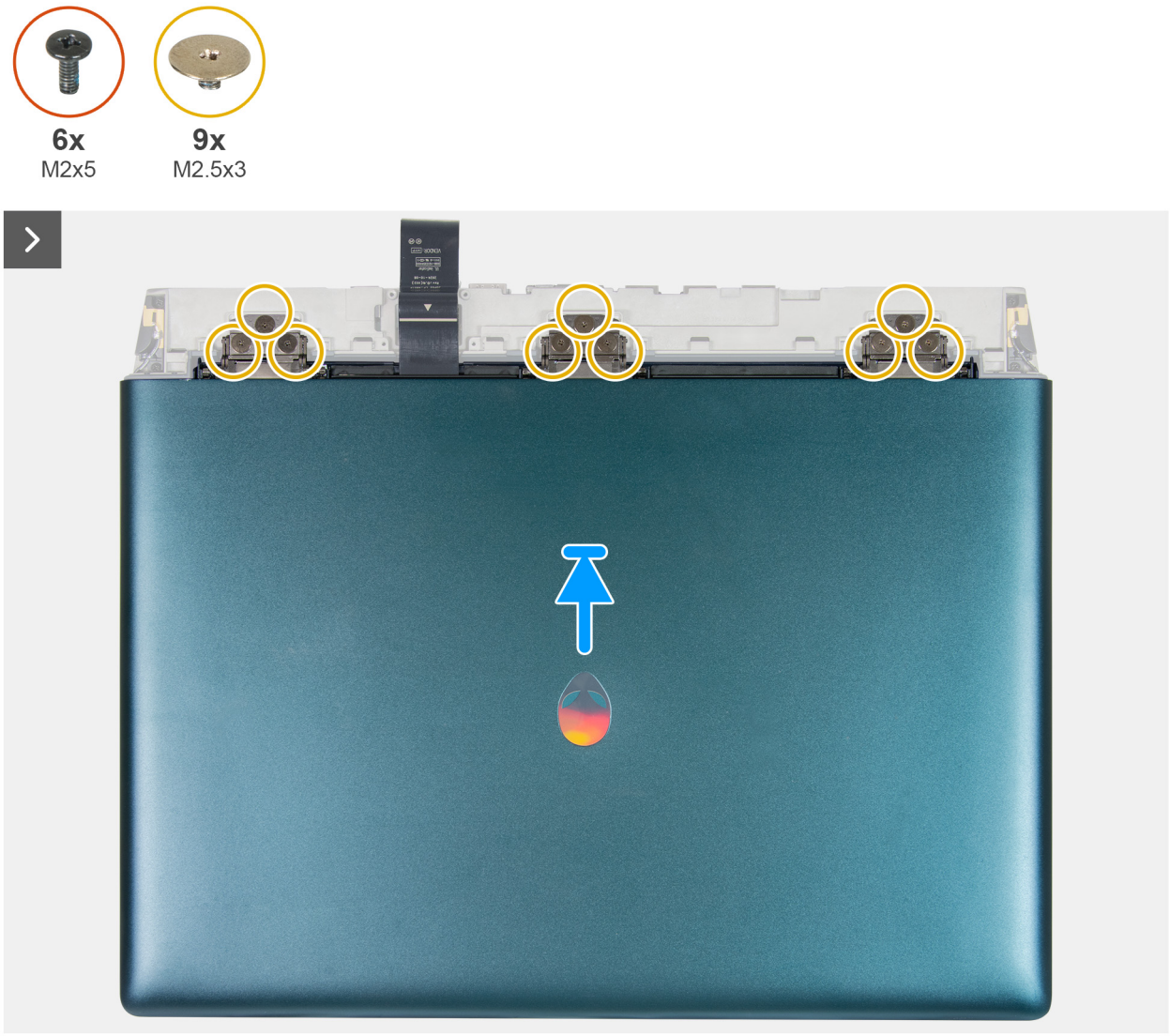


Figure 53. Installing the display assembly

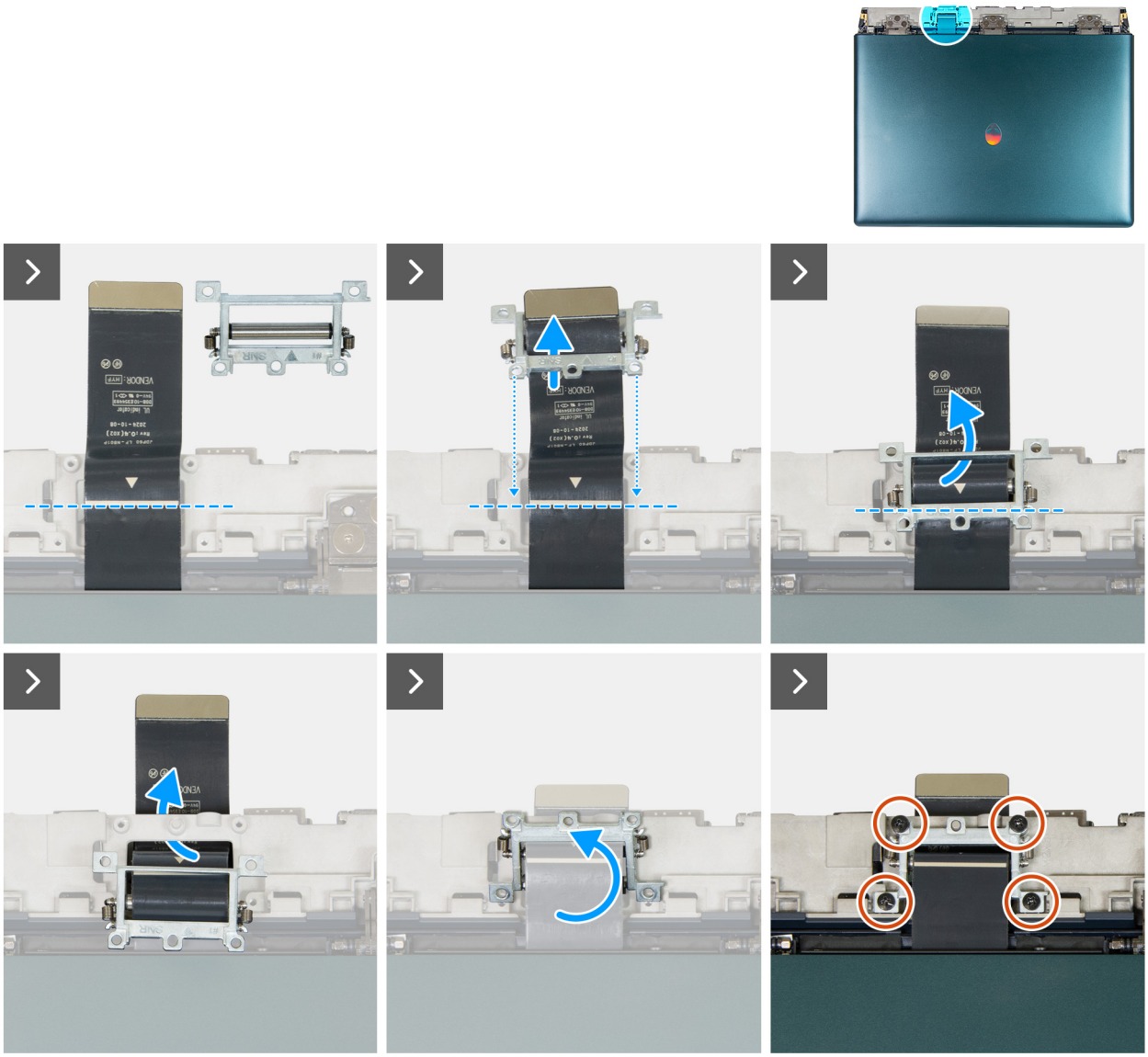


Figure 54. Installing the display assembly

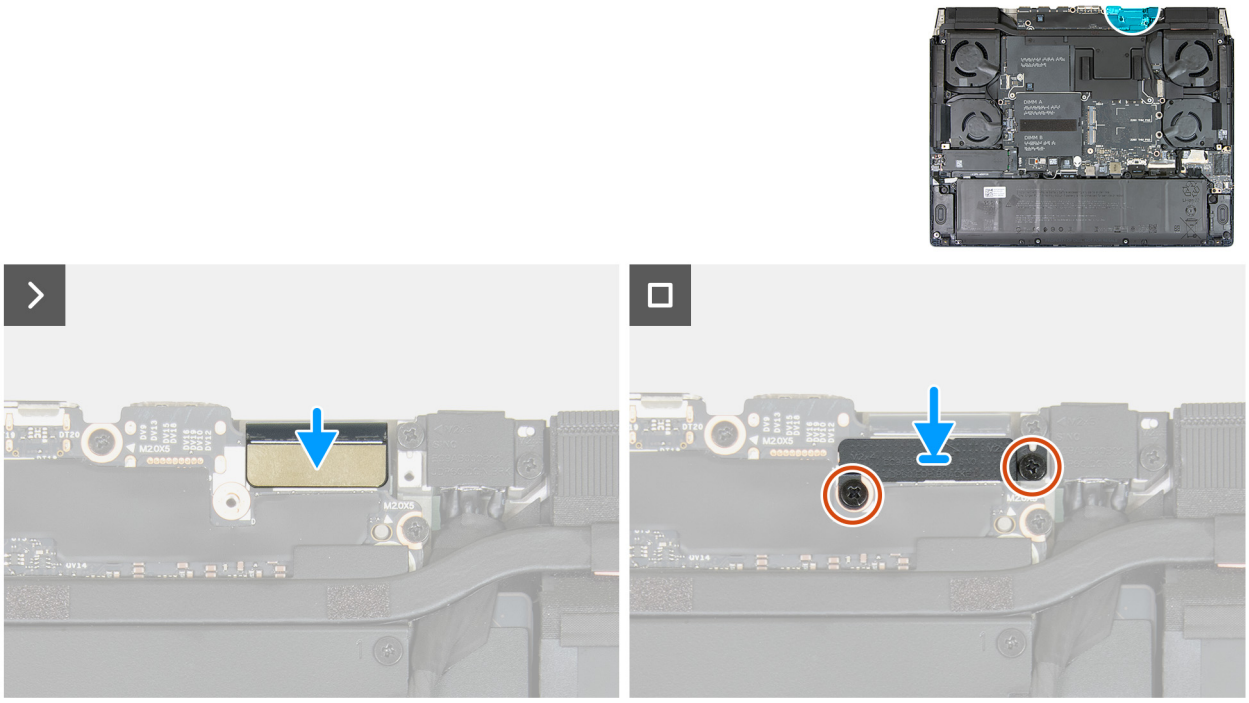


Figure 55. Installing the display assembly

NOTE: Place the computer on a soft and clean surface to avoid scratching the display.

Steps

1. Align the screw holes on the display assembly with the screw holes on the palm-rest and keyboard assembly.
2. Replace the twelve screws (M2.5x3) that secure the hinges to the top side of the palm-rest and keyboard assembly.

   NOTE: If the display is not fully closed, you cannot install the display-cable holder correctly.

3. Gently slide the display cable through the plastic strip between the palm-rest and keyboard assembly and rear-I/O cover.
4. Route the display cable through the slit on the other side of the rear-I/O cover.

   NOTE: The display cable must be routed under the rear-I/O cover in order to properly install the display assembly. Failing to do so will damage the display cable.

5. Slide the display-cable holder so that the triangle mark on the display cable aligns with the triangle mark on the display-cable holder.

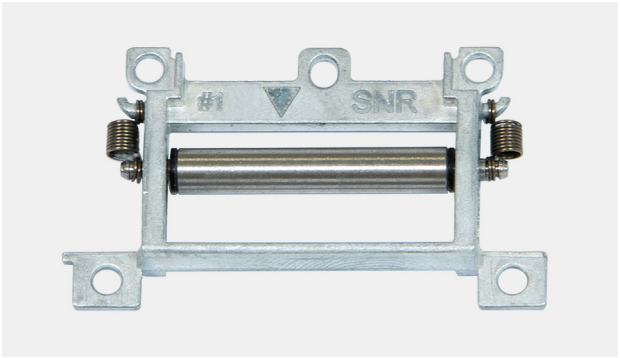


Figure 56. Display-cable holder

6. From the bottom of the display-cable holder, route the display cable into the opening that is next to the triangle mark.
7. Slide the display cable over the bar on the display-cable holder and into the opening on the other side of the holder.

8. Slide the display-cable holder towards the display assembly until the display-cable holder is aligned to the rear-I/O cover.
9. Route the display cable through the opening on the rear side of the palm-rest and keyboard assembly.
10. Rotate the display-cable holder 180 degrees and place the display-cable holder on the slot of the palm-rest and keyboard assembly and align the line on the cable with the line on the display-cable holder.
11. Replace the four screws (M2x5) that secure the display-cable holder to the palm-rest and keyboard assembly.
12. Turn the computer over.
13. Slide the display cable onto the connector on the system board.
14. Align the screw holes on the display-cable bracket with the screw holes on the palm-rest and keyboard assembly.
15. Replace the two screws (M2x5) that secure the display-cable bracket to the palm-rest and keyboard assembly.

Next steps

1. Install the rear I/O-cover.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

Power-adapter port

Removing the power-adapter port

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the rear I/O-cover.
4. Remove the VR heat sink.

About this task

The following images indicate the location of the power-adapter port and provide a visual representation of the removal procedure.

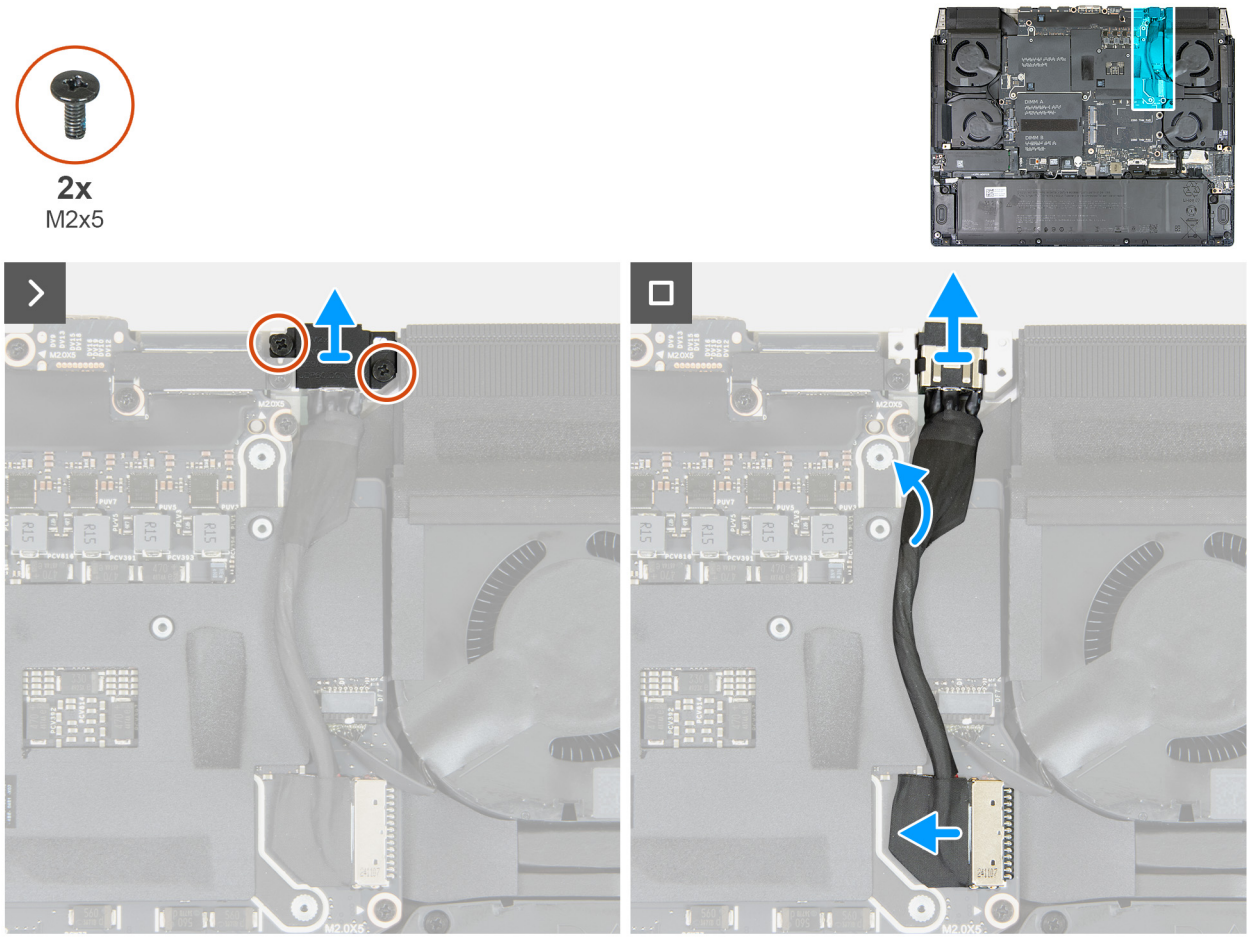


Figure 57. Removing the power-adapter port

Steps

1. Remove the two screws (M2x5) that secure the power-adapter port bracket to the palm-rest and keyboard assembly.
2. Lift the power-adapter port bracket off the power-adapter port.
3. Using the pull tab, disconnect the power-adapter port cable from the connector (PJPDC1) on the system board.
4. Lift the power-adapter port, along with its cable, off the palm-rest and keyboard assembly.

Installing the power-adapter port

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

Prerequisites

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

About this task

The following images indicate the location of the power-adapter port and provide a visual representation of the installation procedure.

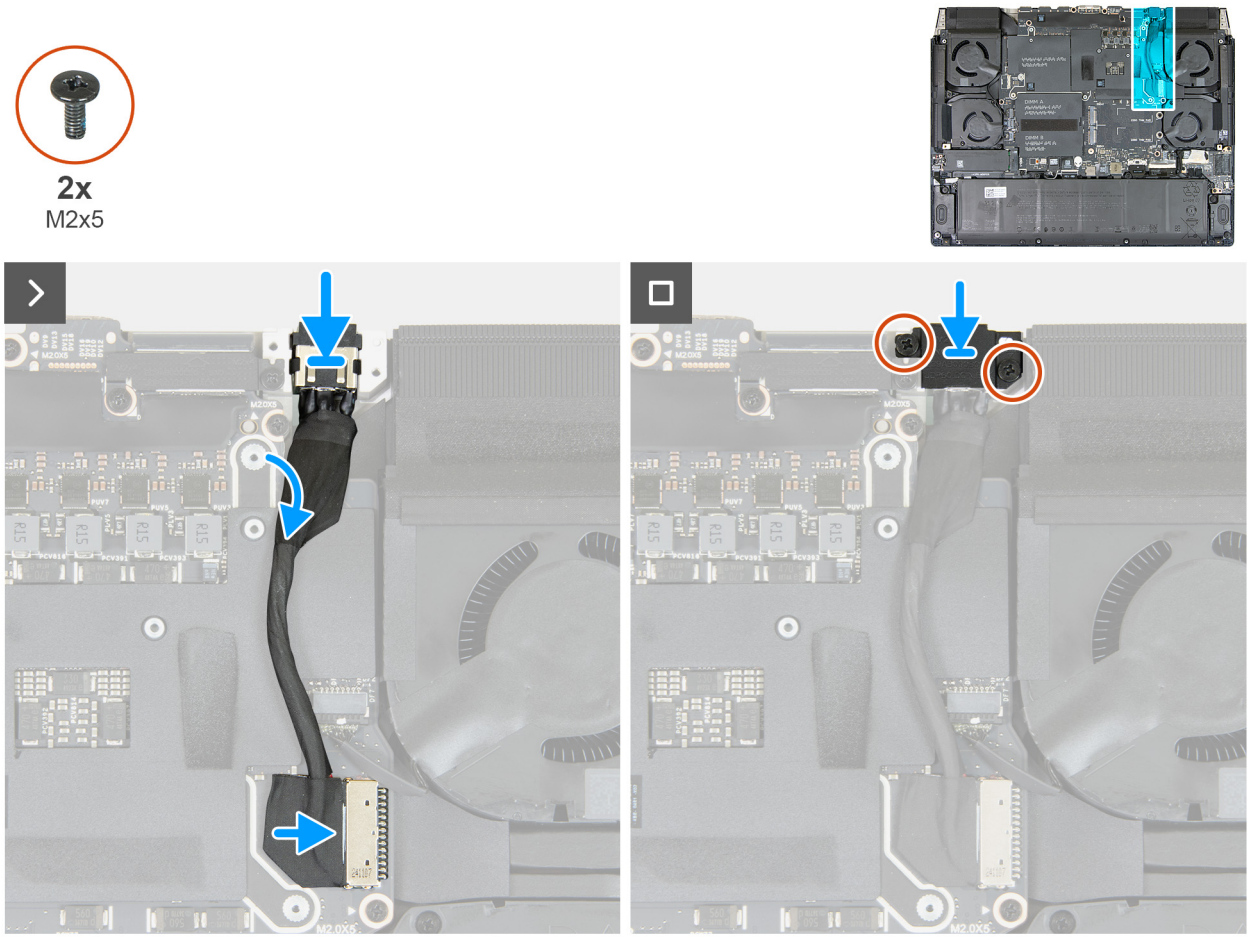


Figure 58. Installing the power-adapter port

Steps

1. Connect the power-adapter port cable to the connector (PJPDC1) on the system board.
2. Align and place the power-adapter port into the slot on the palm-rest and keyboard assembly.
3. Align and place the power-adapter port bracket on the power-adapter port.
4. Replace the two screws (M2x5) that secure the power-adapter port bracket to the palm-rest and keyboard assembly.

Next steps

1. Install the VR heat sink.
2. Install the rear I/O-cover.
3. Install the base cover.
4. Follow the procedure in After working inside your computer.

System board

Removing the system board

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

Prerequisites

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

3. Remove the memory module.
4. Remove the 2230 SSD or 2280 SSD in slot 1, as applicable.
5. Remove the 2280 SSD in slot 2 or slot 3, as applicable.
6. Remove the fan, if applicable.
7. Remove the rear I/O-cover.
8. Remove the VR heat sink.
9. Remove the power-adapter port.

About this task

NOTE: When installing this component, see the tech sheet that is bundled with the service kit. The presence of Element 31 grease in the computer depends on the discrete Graphics Processing Unit (GPU) configuration installed.

To determine if your computer has Element 31 grease applied on the CPU or GPU, see the following table.

Table 25. Element 31 grease

GPU	Element 31 grease
NVIDIA GeForce RTX 5060	Present in GPU only
NVIDIA GeForce RTX 5070	Present in GPU only
NVIDIA GeForce RTX 5070 Ti	Present in CPU only
NVIDIA GeForce RTX 5080	Present in CPU only
NVIDIA GeForce RTX 5090	Present in CPU only

The following image indicates the connectors on your system board.

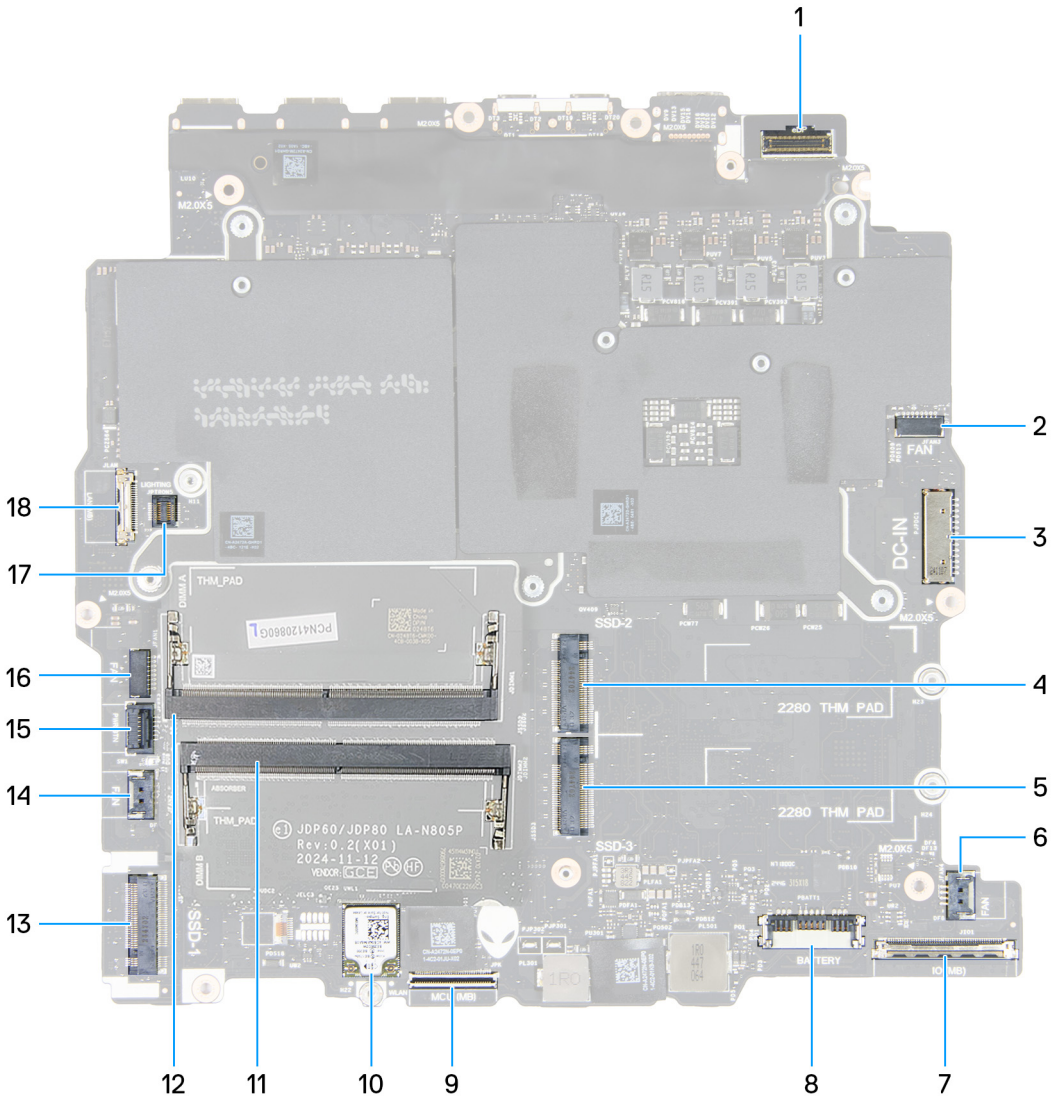


Figure 59. System board connectors

1. Display-cable connector (eDP)
2. Fan connector (JFAN3)
3. Power-adapter connector (PJPDC1)
4. SSD slot 2 (SSD-2)
5. SSD slot 3 (SSD-3)
6. Fan connector (JFAN4)
7. I/O board connector (JIO1)
8. Battery connector (PBATT1)
9. Keyboard-controller board connector (MCU MB JPK)
10. Integrated-wireless card (WLAN)
11. Memory module slot (JDIMM2)
12. Memory module slot (JDIMM1)
13. SSD slot 1 (SSD-1)
14. Fan connector (JFAN2)
15. Power button connector (PWR BTN)
16. Fan connector (JFAN1)
17. Tron-light cable (JPTRON5)
18. LAN cable connector (JLAN)

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

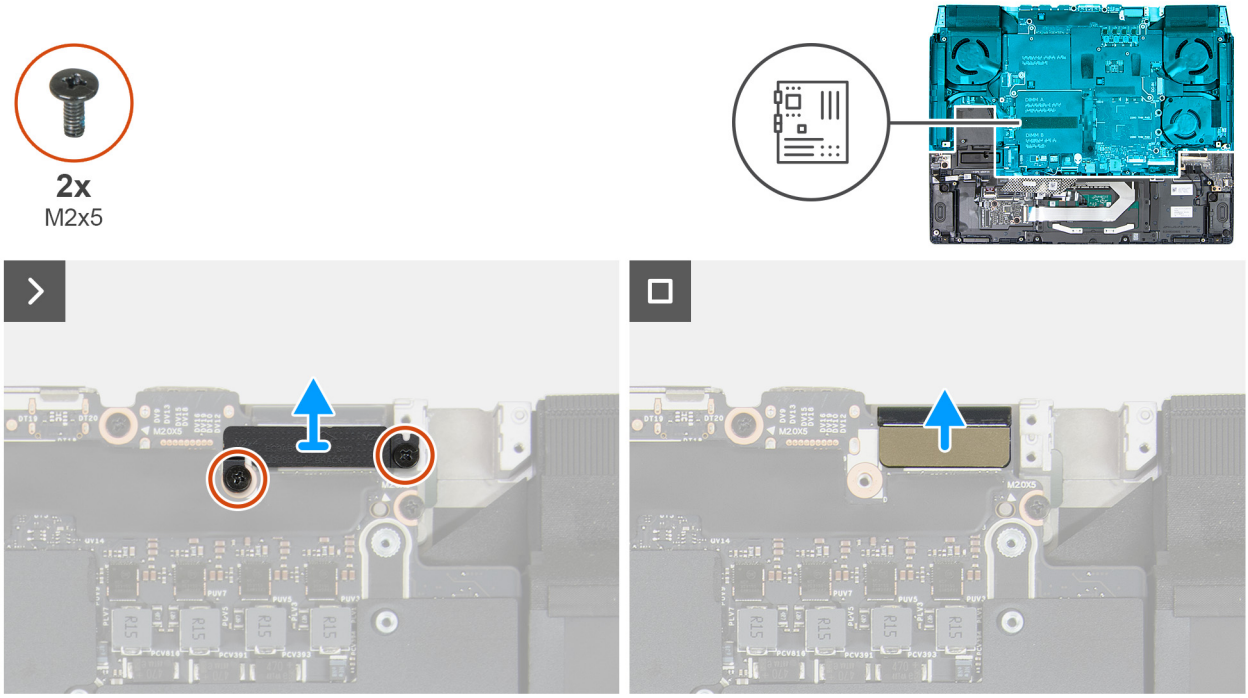


Figure 60. Removing the display cable

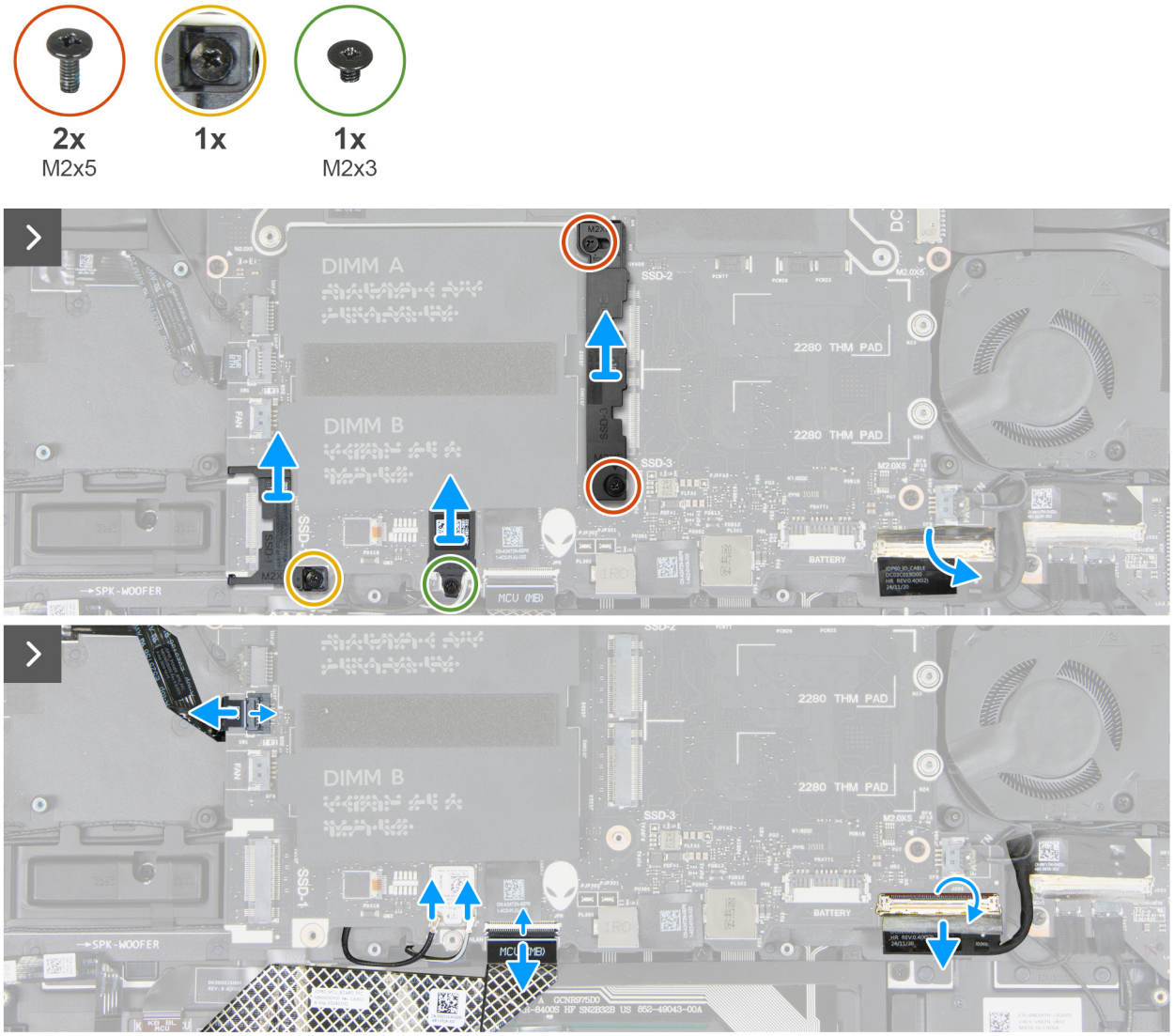


Figure 61. Disconnecting the cables from the system board

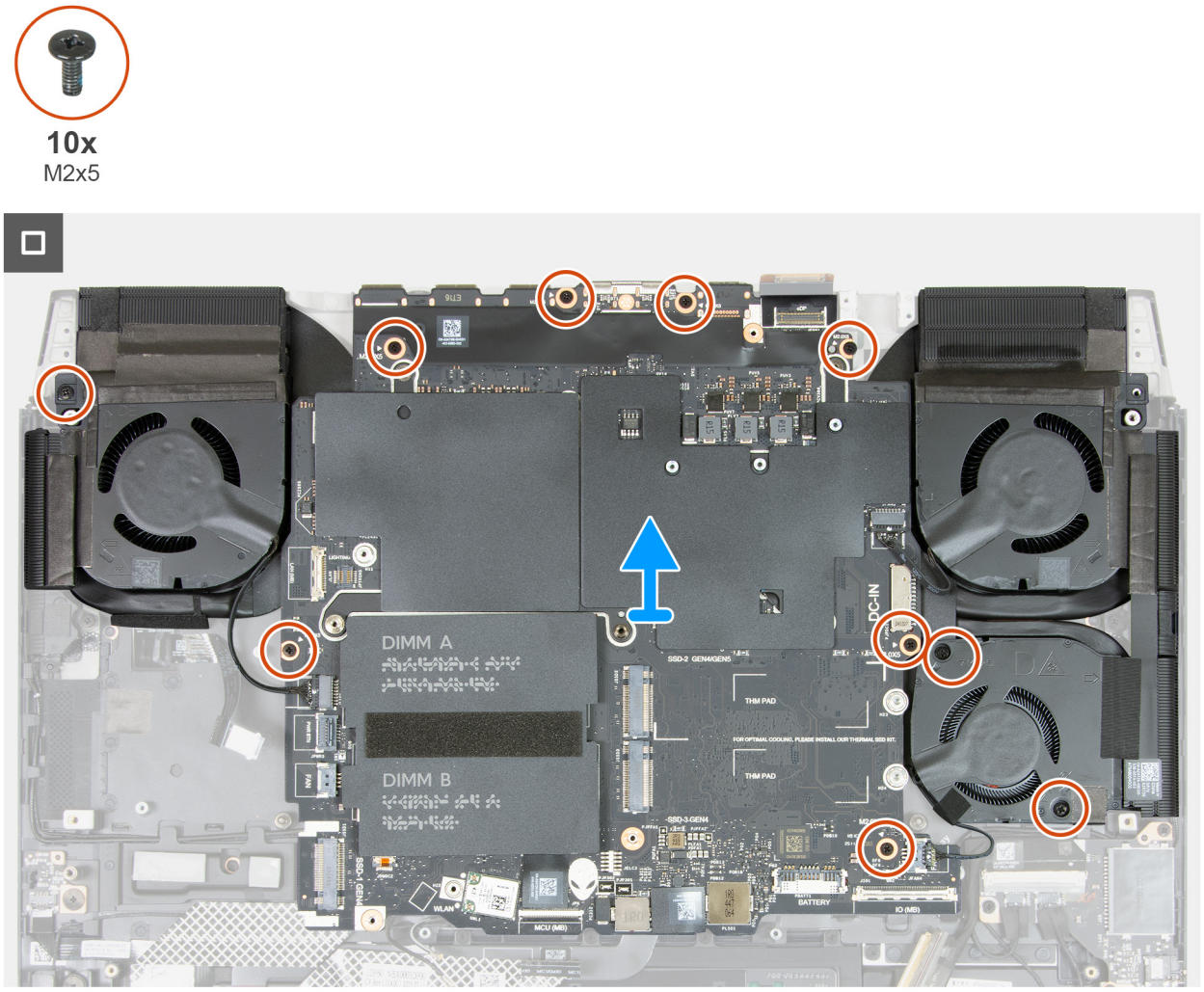


Figure 62. Removing the system board for computers shipped with a NVIDA GeForce RTX 5060 or RTX 5070 graphics card

9x
M2x5

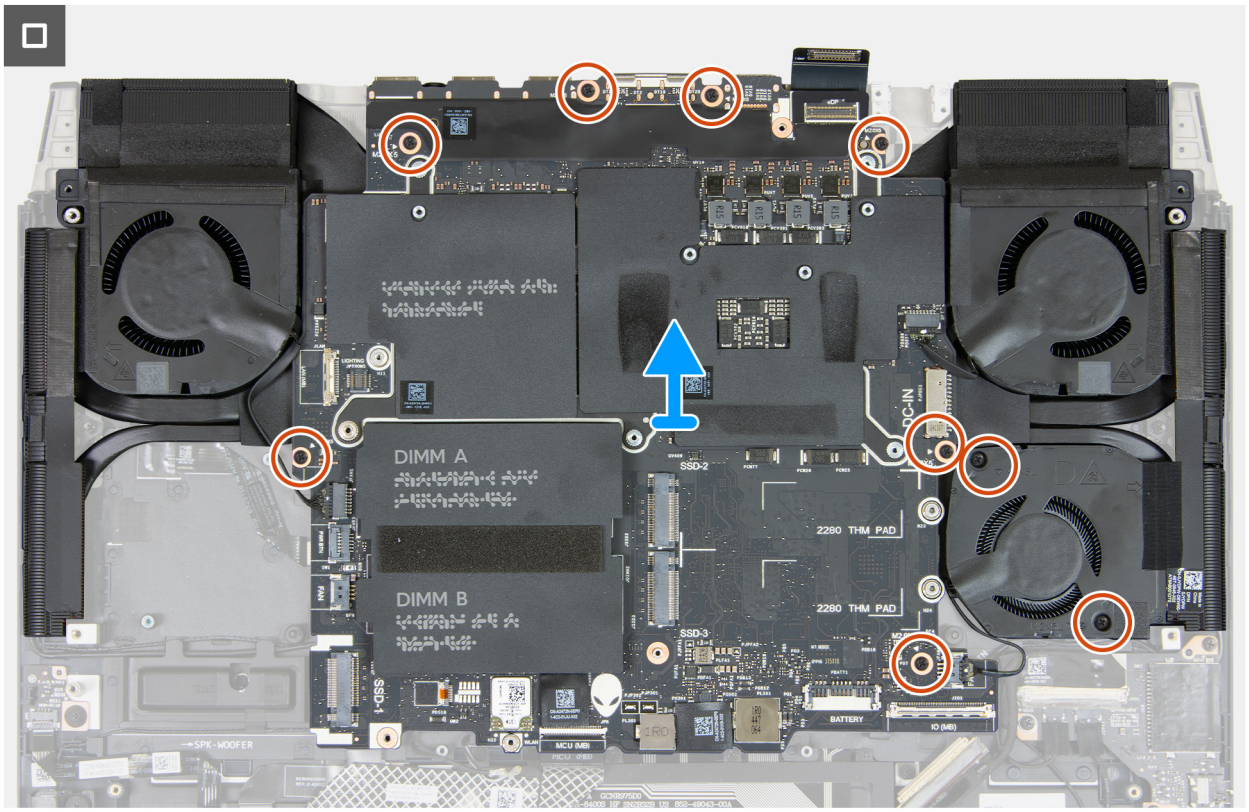


Figure 63. Removing the system board for computers shipped with a NVIDIA GeForce RTX 5070 Ti, RTX 5080, or RTX5090 graphics card

Steps

1. Remove the two screws (M2x5) that secure the display-cable bracket to the system board and palm-rest and keyboard assembly.
2. Remove the display-cable bracket off the system board and palm-rest and keyboard assembly.
3. Disconnect the display cable (eDP) from the system board.
4. Open the latch and disconnect the power button cable (PWR BTN) from the connector on the system board.
5. Loosen the captive screw from the SSD support bracket that secures the SSD slot.
6. Lift the SSD support bracket off the palm-rest and keyboard assembly.
7. Remove the screw (M2x3) from the WLAN antenna bracket that secures the antenna cables to the wireless card.
8. Lift the wireless bracket off the wireless card.
9. Disconnect the antenna cables from the wireless card.
10. Open the latch and disconnect the keyboard-controller cable (MCU MB JPK) from the system board.
11. Remove the two screws (M2x5) from the SSD support bracket that secures the SSD slot.
12. Lift the SSD support bracket off the palm-rest and keyboard assembly.
13. Peel the tape that secures the I/O cable to the I/O connector on the system board.
14. Open the latch and disconnect the I/O cable from the connector (JIO1) on the system board.
15. Remove the two screws (M2x5) that secures the bottom-right fan to the palm-rest and keyboard assembly.
16. Remove the screw (M2x5) that secures the top-left fan to the palm-rest and keyboard assembly.

NOTE: This step is only applicable for computers shipped with a NVIDIA GeForce RTX 5060 or RTX 5070 graphics card.

17. Remove the seven screws (M2x5) that secure the system-board assembly to the palm-rest and keyboard assembly.
18. Grab the system-board assembly from the upper left and right side of the heat sink and lift the system-board assembly off the palm-rest and keyboard assembly.
19. Place the system-board assembly on a clean and flat surface.
20. Turn the system-board assembly over.
21. Remove the fan and heat-sink assembly.
22. Remove the screw (M2x3) that secures the USB Type-C bracket to the system board.
23. Lift the USB Type-C bracket off the system board.
24. Transfer the spare screws from the SSD slot to the replacement system board.
25. Turn the system-board assembly over.
26. After performing all the above steps, you are left with the system board.

Installing the system board

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

Prerequisites

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

About this task

NOTE: When installing this component, see the tech sheet that is bundled with the service kit. The presence of Element 31 grease in the computer depends on the discrete Graphics Processing Unit (GPU) configuration installed.

To determine if your computer has Element 31 grease applied on the CPU or GPU, see the following table.

Table 26. Element 31 grease

GPU	Element 31 grease
NVIDIA GeForce RTX 5060	Present in GPU only
NVIDIA GeForce RTX 5070	Present in GPU only
NVIDIA GeForce RTX 5070 Ti	Present in CPU only
NVIDIA GeForce RTX 5080	Present in CPU only
NVIDIA GeForce RTX 5090	Present in CPU only

The following image indicates the connectors on your system board.

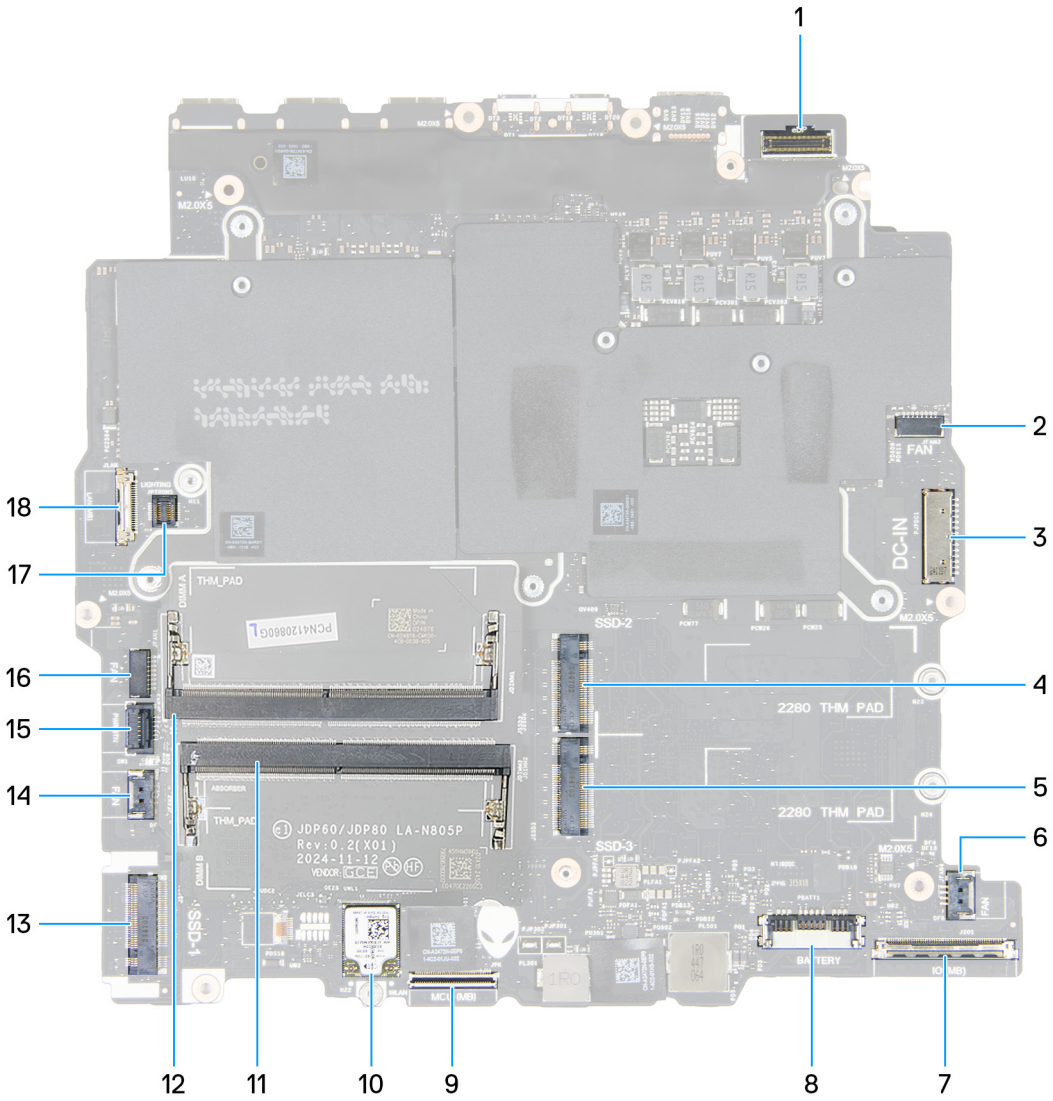


Figure 64. System board connectors

1. Display-cable connector (eDP)
2. Fan connector (JFAN3)
3. Power-adapter connector (PJPDC1)
4. SSD slot 2 (SSD-2)
5. SSD slot 3 (SSD-3)
6. Fan connector (JFAN4)
7. I/O board connector (JIO1)
8. Battery connector (PBATT1)
9. Keyboard-controller board connector (MCU MB JPK)
10. Integrated-wireless card (WLAN)
11. Memory module slot (JDIMM2)
12. Memory module slot (JDIMM1)
13. SSD slot 1 (SSD-1)
14. Fan connector (JFAN2)
15. Power button connector (PWR BTN)
16. Fan connector (JFAN1)
17. Tron-light cable (JPTRON5)
18. LAN cable connector (JLAN)

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

10x
M2x5

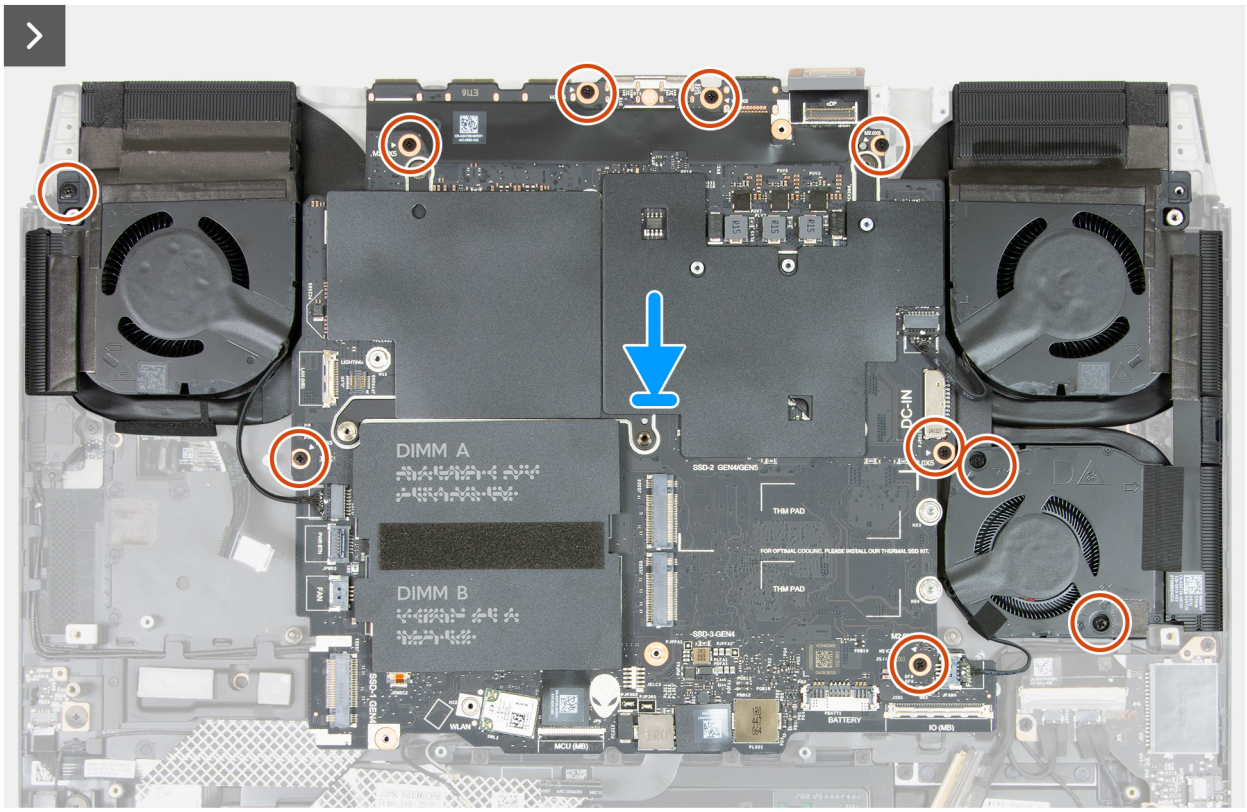


Figure 65. Installing the system board for computers with a NVIDIA RTX 5060 or RTX 5070 graphics card

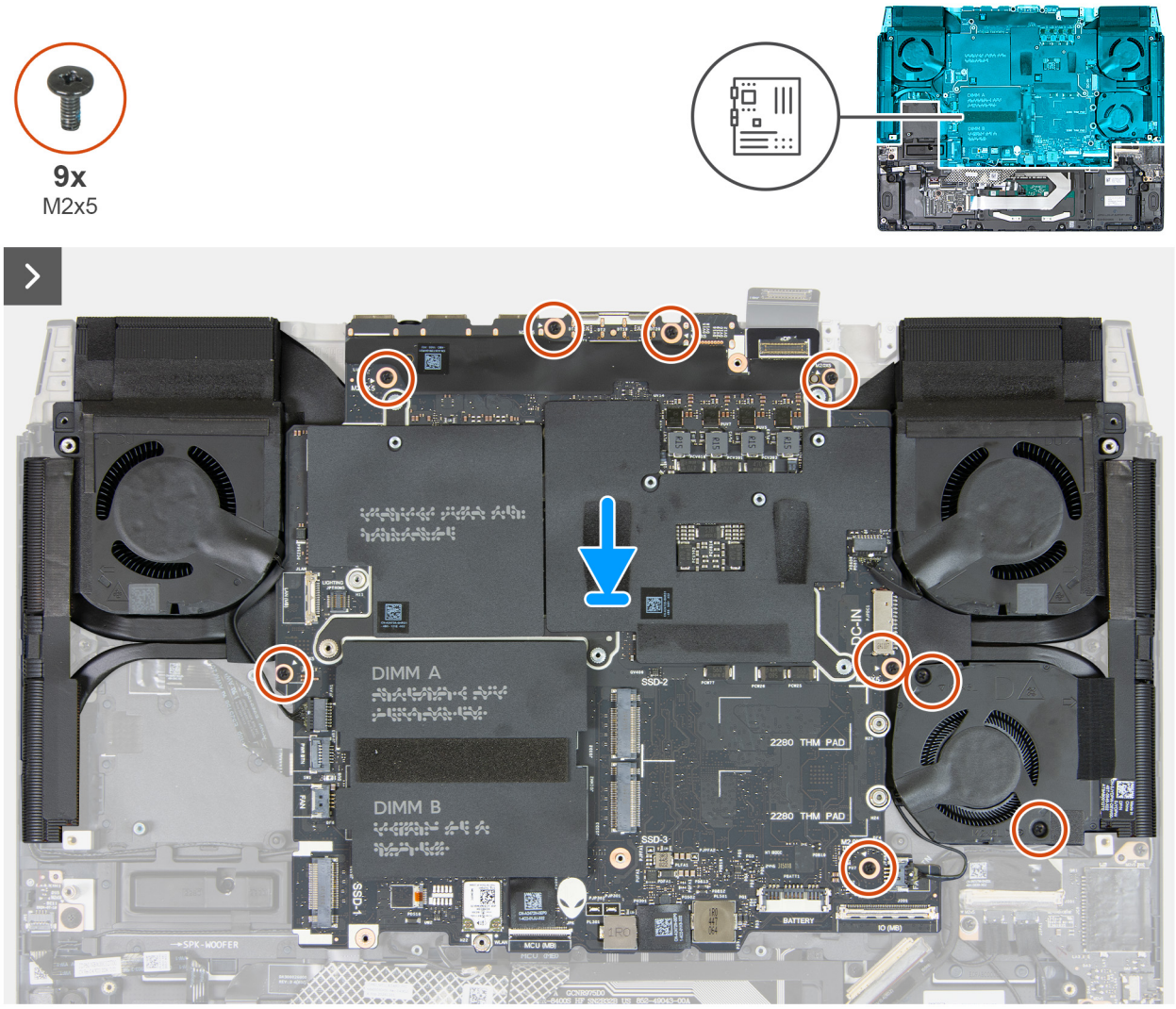


Figure 66. Installing the system board for computers with a NVIDIA RTX 5070 Ti, RTX 5080, or RTX 5090 graphics card

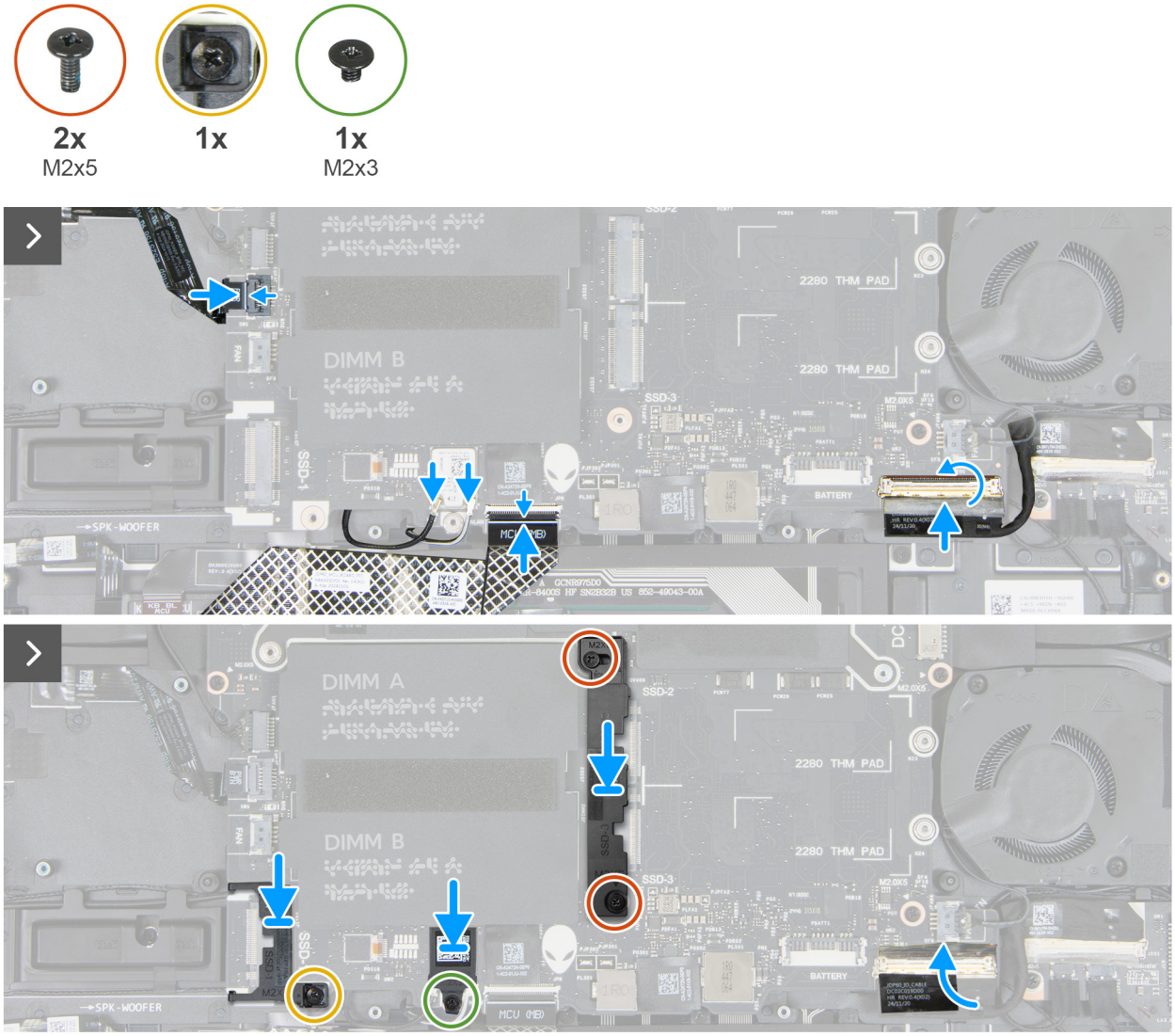


Figure 67. Connecting the cables to the system board

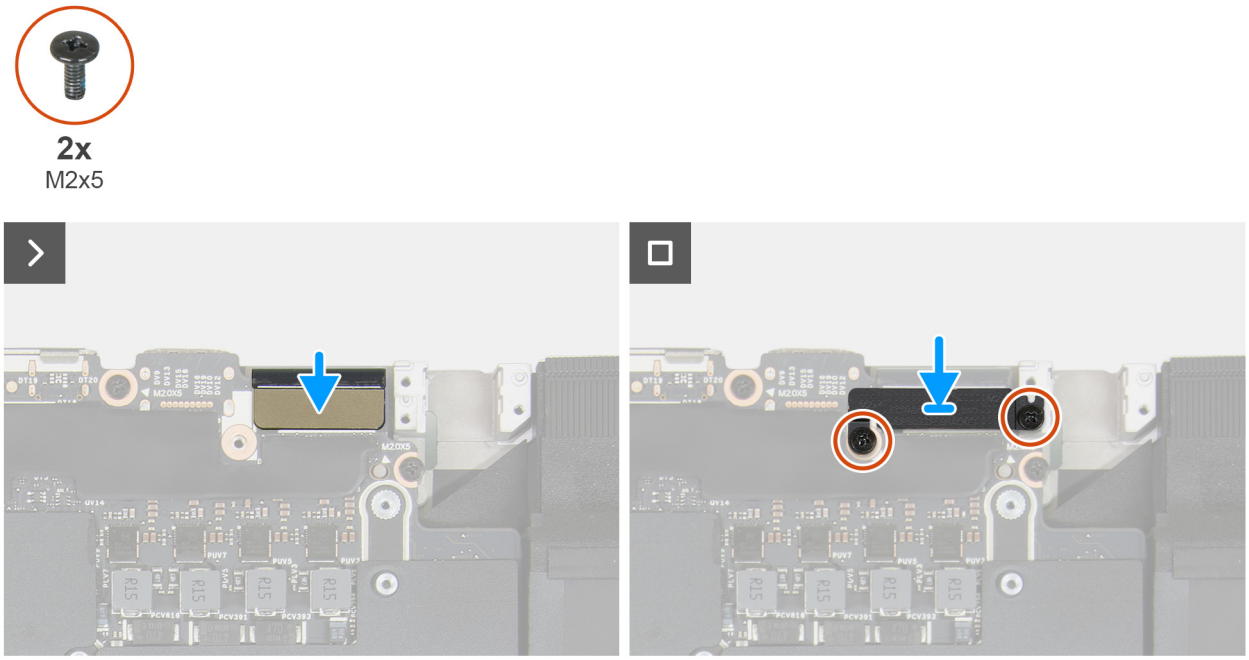


Figure 68. Installing the display-cable bracket

Steps

1. Turn the system board over.
2. Align the screw hole on the USB Type-C bracket with the screw hole on the system board.
3. Replace the two screws (M2x3) that secure the USB Type-C bracket to the system board.
4. Install the fan and heat-sink assembly.
5. Turn the system-board assembly over and place the system-board assembly on the palm-rest and keyboard assembly.

   NOTE: When installing the system-board assembly, align the system-board assembly to the positioning pins on the palm-rest and keyboard assembly and the extensions of the heat sink to the top edge of the palm-rest and keyboard assembly.

6. Align the screw holes on the system-board assembly with the screw holes on the palm-rest and keyboard assembly.
7. Replace the seven screws (M2x5) that secure the system-board assembly to the palm-rest and keyboard assembly.
8. Replace the two screws (M2x5) that secure the bottom-right fan to the palm-rest and keyboard assembly.
9. Replace the screw (M2x5) that secures the top-left fan to the palm-rest and keyboard assembly.

   NOTE: This step is only applicable for computers shipped with a NVIDIA RTX 5060 or RTX 5070 graphics card.

10. Connect the I/O cable to the connector (JIO1) on the system board and close the latch to secure the cable.
11. Adhere the tape that secures the I/O cable to the I/O connector on the system board.
12. Connect the battery cable to the battery cable connector (BATT1) on the system board.
13. Align and place the SSD support bracket on the SSD slot.
14. Replace the two screws (M2x5) that secure the SSD support bracket to the system board.
15. Connect the keyboard-controller cable (MCU MB JPK) to the connector on the system board and close the latch to secure the cable.
16. Connect the antenna cables to the wireless card.
17. Align and place the WLAN antenna bracket on the antenna cables.
18. Replace the screw (M2x3) that secures the WLAN antenna bracket secures the antenna cables to the wireless card.
19. Align and place the SSD support bracket on the system board.
20. Tighten the captive screw that secures the SSD support bracket to the system board.
21. Connect the power button cable (PWR BTN) to the connector on the system board and close the latch to secure the cable.
22. Connect the display cable (eDP) from the system board.

23. Align and place the display-cable bracket on the system board and palm-rest and keyboard assembly.
24. Replace the two screws (M2x5) that secure the display-cable bracket to the system board and palm-rest and keyboard assembly.

Next steps

1. Install the power adapter port.
2. Install the VR heat sink.
3. Install the rear I/O-cover.
4. Install the fan, if applicable.
5. Install the 2280 SSD in slot 2 or slot 3, as applicable.
6. Install the 2230 SSD or 2280 SSD in slot 1, as applicable.
7. Install the memory module.
8. Install the base cover.
9. Follow the procedure in After working inside your computer.

Fan and heat-sink assembly

Removing the fan and heat-sink assembly

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the memory module.
4. Remove the 2230 SSD or 2280 SSD in slot 1, as applicable.
5. Remove the 2280 SSD in slot 2 or slot 3, as applicable.
6. Remove the fan, if applicable.
7. Remove the rear I/O-cover.
8. Remove the VR heat sink.
9. Remove the power-adapter port.
10. Follow the procedure from step 1 to step 20 in Removing the system board.

NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

About this task

NOTE: When installing this component, see the tech sheet that is bundled with the service kit. The presence of Element 31 grease in the computer depends on the discrete Graphics Processing Unit (GPU) configuration installed.

To determine if your computer has Element 31 grease applied on the CPU or GPU, see the following table.

Table 27. Element 31 grease

GPU	Element 31 grease
NVIDIA GeForce RTX 5060	Present in GPU only
NVIDIA GeForce RTX 5070	Present in GPU only
NVIDIA GeForce RTX 5070 Ti	Present in CPU only
NVIDIA GeForce RTX 5080	Present in CPU only
NVIDIA GeForce RTX 5090	Present in CPU only

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

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

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

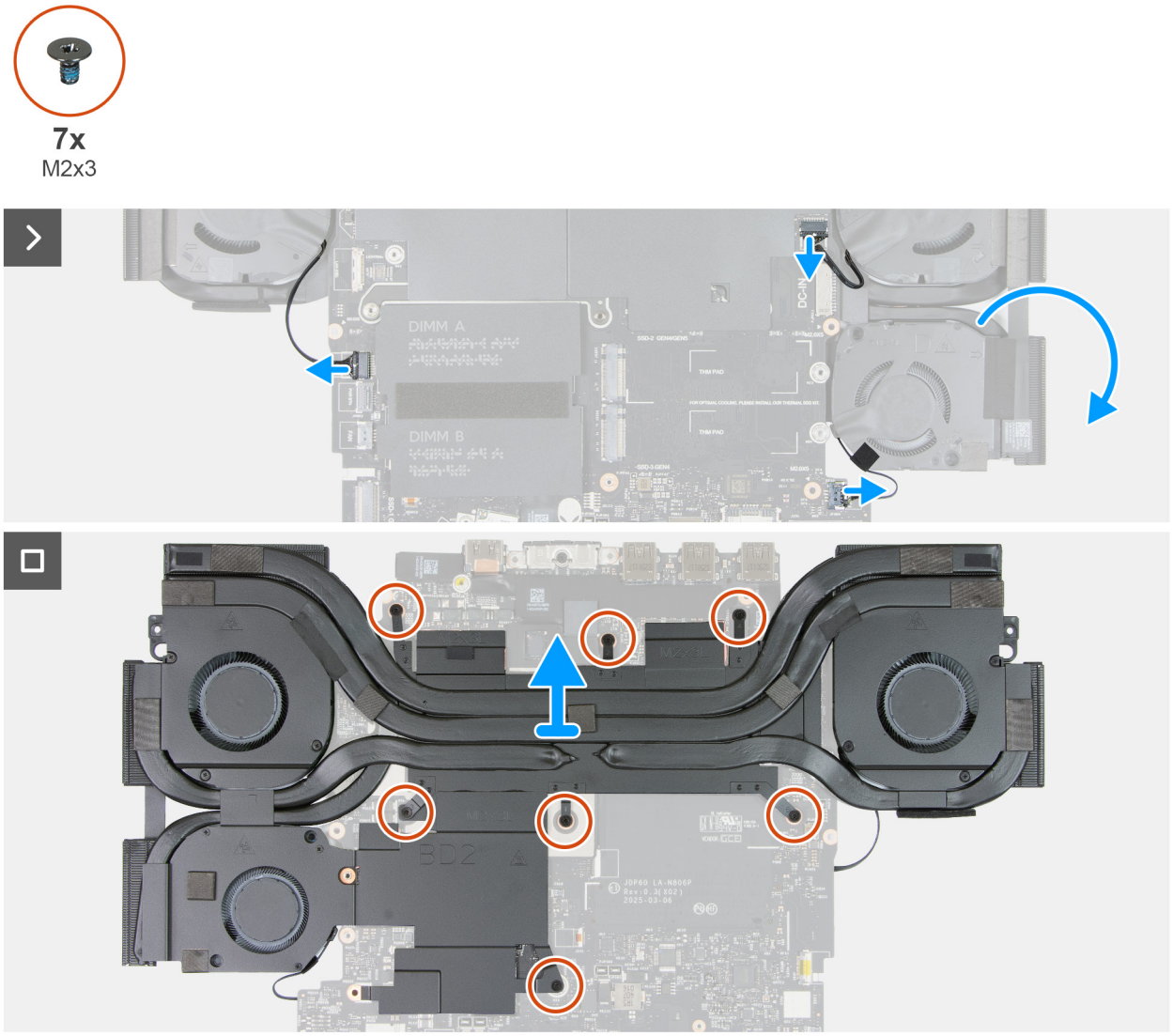


Figure 69. Removing the fan and heat-sink assembly for computers shipped with a NVIDA GeForce RTX 5060 or RTX 5070 graphics card

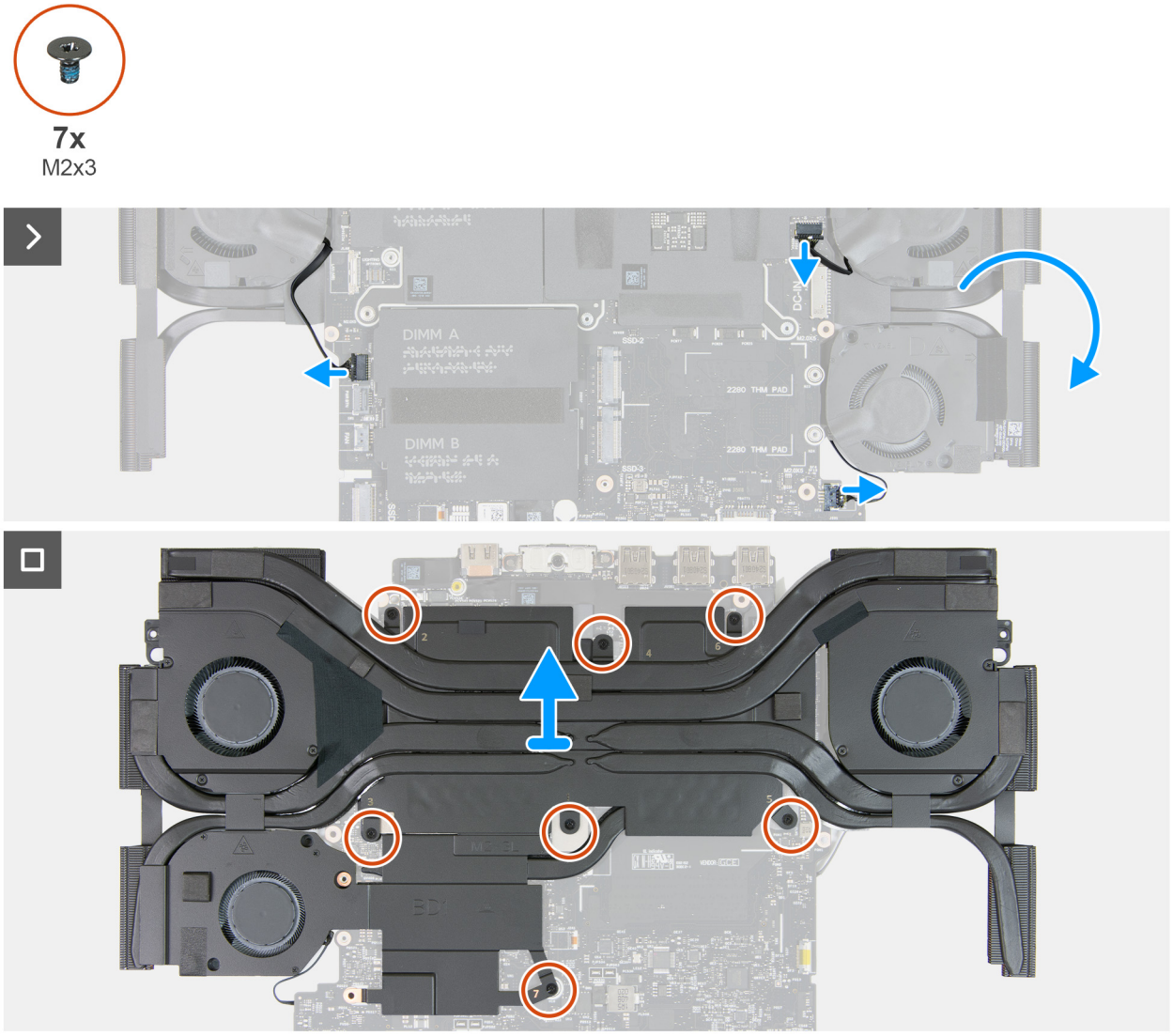


Figure 70. Removing the fan and heat-sink assembly for computers shipped with a NVIDIA GeForce RTX 5070 Ti, RTX 5080, or RTX5090 graphics card

Steps

1. Disconnect the fan cables from the connectors (JFAN1, JFAN3, and JFAN4) on the system board.
2. Turn the system-board assembly over.
3. Remove the seven screws (M2x3) that secure the fan and heat-sink assembly to the system board.
4. Lift the fan and heat-sink assembly off the system board.

CAUTION: Do not use an alcohol wipe to clean the Element 31 thermal grease off the surface of the CPU or GPU, the alcohol solution from the wipes dissolve the Element 31 grease into conductive metal particles. If these conductive metal particles come into contact with the surface of the system board, it causes an electrical short when your computer is turned on.

Installing the fan and heat-sink assembly

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

Prerequisites

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

About this task

NOTE: When installing this component, see the tech sheet that is bundled with the service kit. The presence of Element 31 grease in the computer depends on the discrete Graphics Processing Unit (GPU) configuration installed.

To determine if your computer has Element 31 grease applied on the CPU or GPU, see the following table.

Table 28. Element 31 grease

GPU	Element 31 grease
NVIDIA GeForce RTX 5060	Present in GPU only
NVIDIA GeForce RTX 5070	Present in GPU only
NVIDIA GeForce RTX 5070 Ti	Present in CPU only
NVIDIA GeForce RTX 5080	Present in CPU only
NVIDIA GeForce RTX 5090	Present in CPU only

NOTE: Thermal grease is already pre-applied to the new thermal assembly. DO NOT apply additional thermal grease.

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

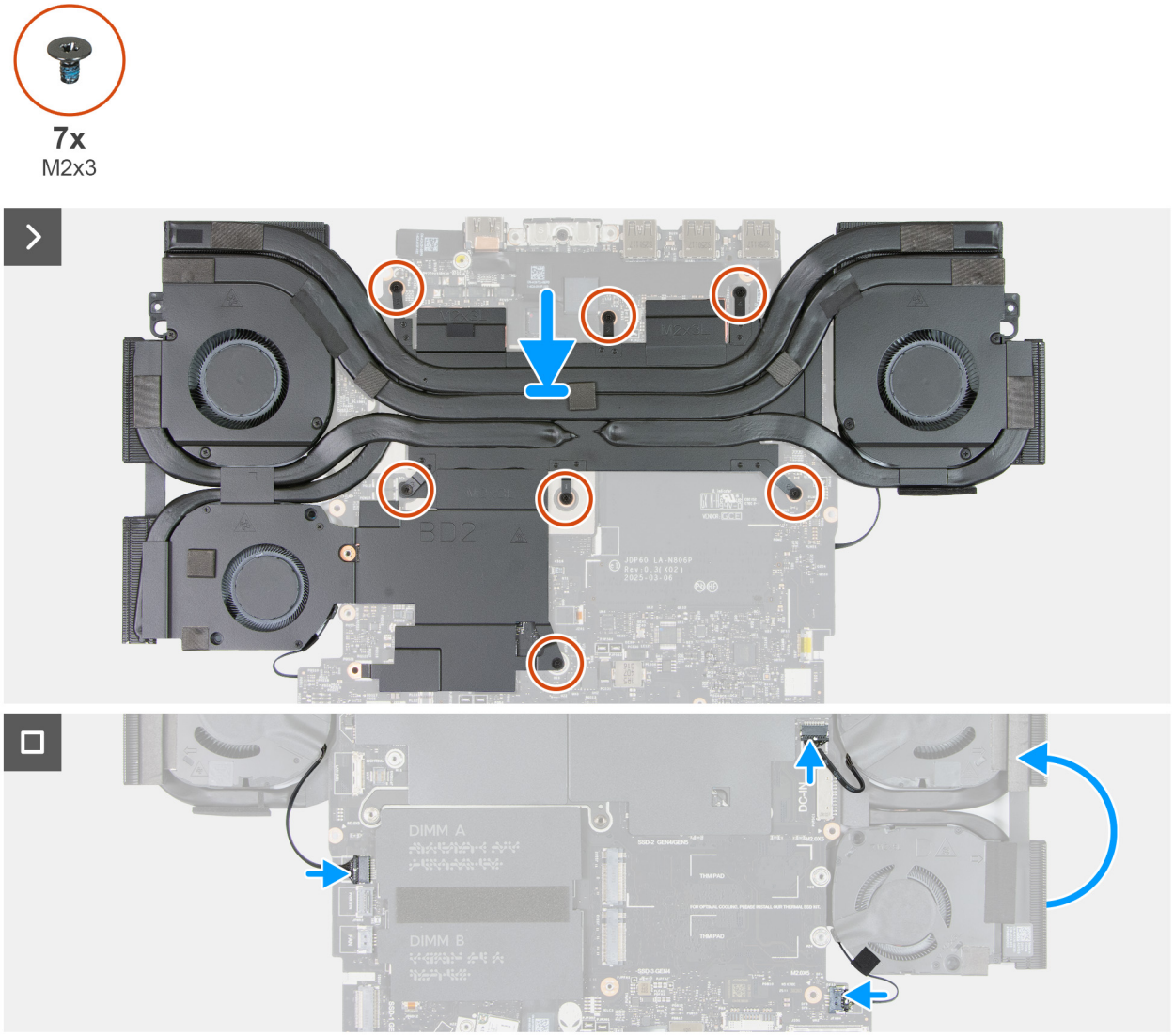


Figure 71. Installing the fan and heat-sink assembly for computers shipped with a NVIDA GeForce RTX 5060 or RTX 5070 graphics card

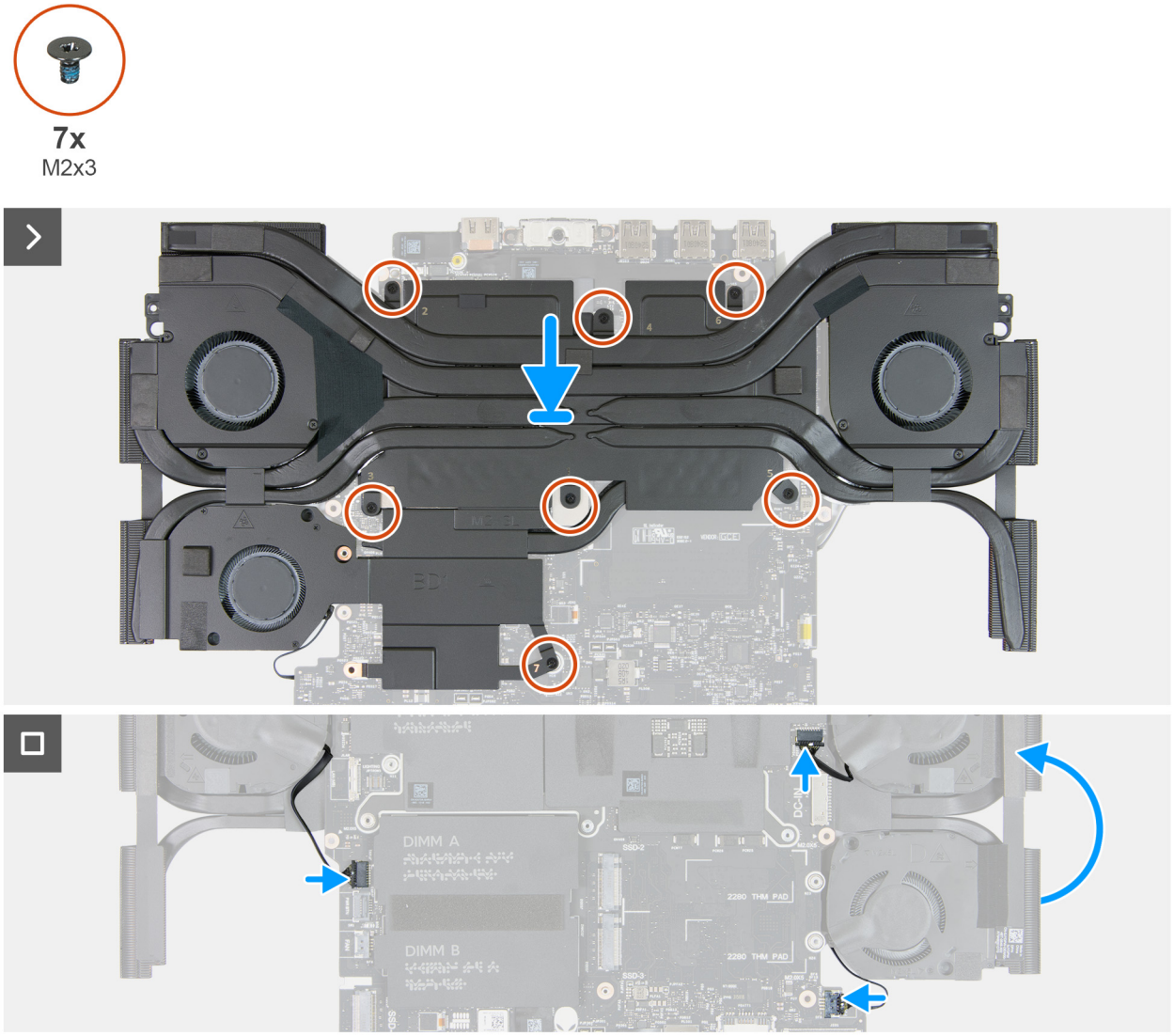


Figure 72. Installing the fan and heat-sink assembly for computers shipped with a NVIDIA GeForce RTX 5070 Ti, RTX 5080, or RTX5090 graphics card

Steps

1. **CAUTION: Do not use an alcohol wipe to clean the Element 31 thermal grease off the surface of the CPU or GPU, the alcohol solution from the wipes dissolve the Element 31 grease into conductive metal particles. If these conductive metal particles come into contact with the surface of the system board, it causes an electrical short when your computer is turned on.**

   Align and place the fan and heat-sink assembly on the system board.
2. Align the screw holes on the fan and heat-sink assembly to the screw holes on the system board.
3. Replace the seven screws (M2x3) that secure the fan and heat-sink assembly to the system board.
4. Turn the system-board assembly over.
5. Connect the fan cables to the connector (JFAN1, JFAN3, and JFAN4) on the system board.

Next steps

1. Follow the procedure from step 5 to step 24 in Replacing the system board.

NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

2. Install the power adapter port.
3. Install the VR heat sink.
4. Install the rear I/O-cover.
5. Install the fan, if applicable.
6. Install the 2280 SSD in slot 2 or slot 3, as applicable.
7. Install the 2230 SSD or 2280 SSD in slot 1, as applicable.
8. Install the memory module.
9. Install the base cover.
10. Follow the procedure in After working inside your computer.

Power button

Removing the power button

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the memory module.
4. Remove the 2230 SSD or 2280 SSD in slot 1, as applicable.
5. Remove the 2280 SSD in slot 2 or slot 3, as applicable.
6. Remove the rear I/O-cover.
7. Remove the battery.
8. Remove the fan, if applicable.
9. Remove the VR heat sink.
10. Remove the power-adapter port.
11. Follow the procedure from step 1 to step 20 in Removing the system board.

NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

About this task

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

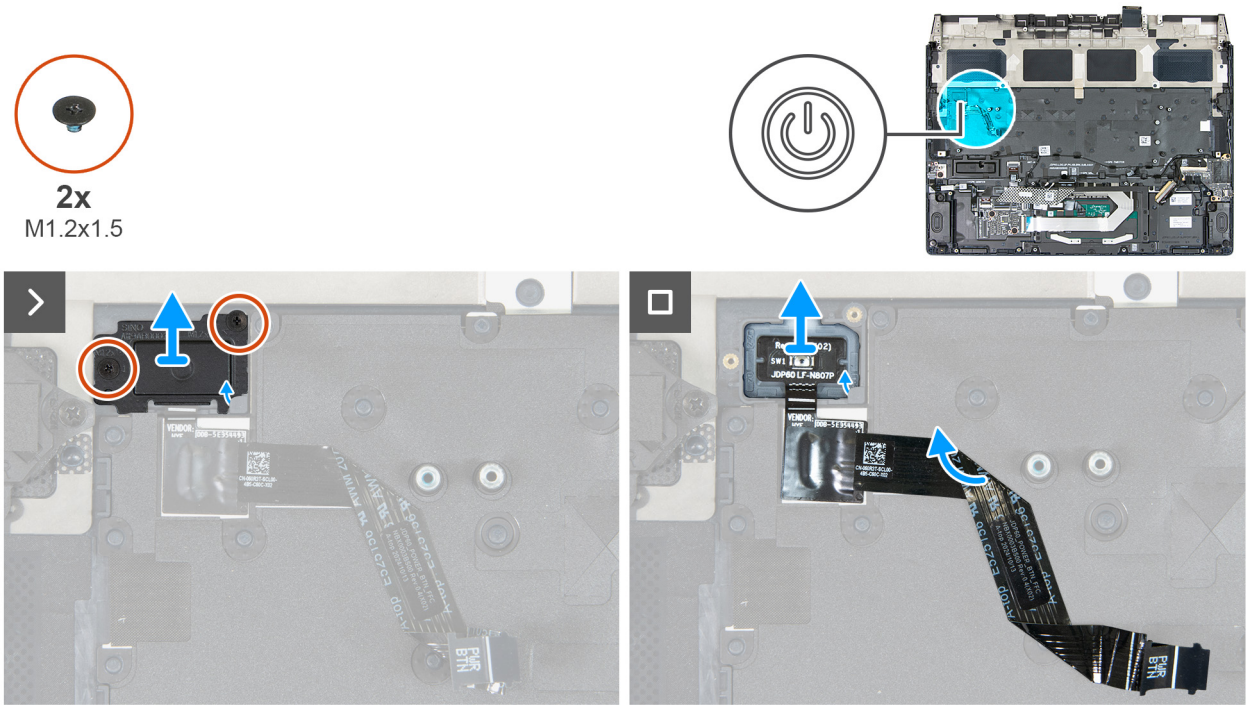


Figure 73. Removing the power button

Steps

1. Remove the two screws (M1.2x1.5) that secure the power button bracket to the palm-rest and keyboard assembly.
2. Lift the power button bracket of the power button.
3. Lift the power button, along with its cable, off the palm-rest and keyboard assembly.

Installing the power button

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

Prerequisites

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

About this task

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

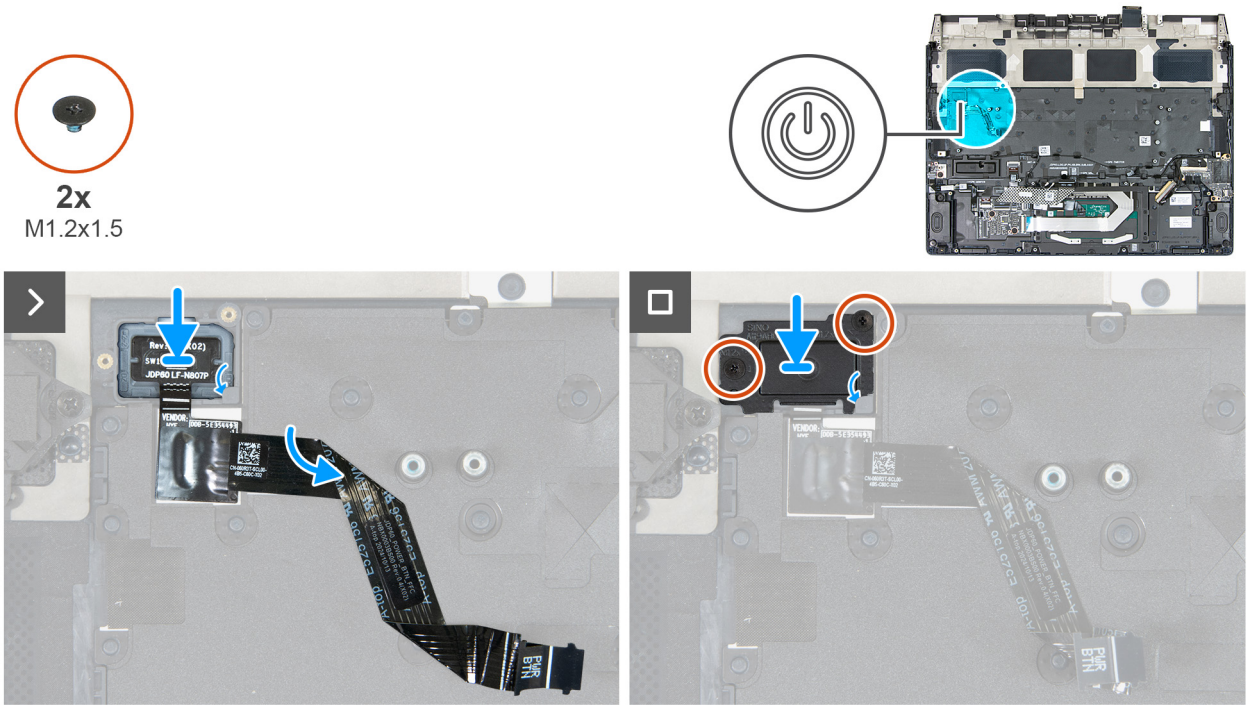


Figure 74. Installing the power button

Steps

1. Align and place the power button, along with its cable, into the slot on the palm-rest and keyboard assembly.
2. Align the screw hole on the power button bracket with the screw hole on the palm-rest and keyboard assembly.
3. Replace the two screws (M1.2x1.5) that secure the power button bracket to the palm-rest and keyboard assembly.

Next steps

1. Follow the procedure from step 5 to step 24 in Replacing the system board.

   NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

2. Install the power adapter port.
3. Install the VR heat sink.
4. Install the fan, if applicable.
5. Install the battery.
6. Install the rear I/O-cover.
7. Install the 2280 SSD in slot 2 or slot 3, as applicable.
8. Install the 2230 SSD or 2280 SSD in slot 1, as applicable.
9. Install the memory module.
10. Install the base cover.
11. Follow the procedure in After working inside your computer.

WLAN main antenna

Removing the WLAN main antenna

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the memory module.
4. Remove the 2230 SSD or 2280 SSD in slot 1, as applicable.
5. Remove the 2280 SSD in slot 2 or slot 3, as applicable.
6. Remove the rear I/O-cover.
7. Remove the battery.
8. Remove the fan, if applicable.
9. Remove the I/O board.
10. Remove the VR heat sink.
11. Remove the power-adapter port.
12. Follow the procedure from step 1 to step 20 in Removing the system board.

NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

About this task

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

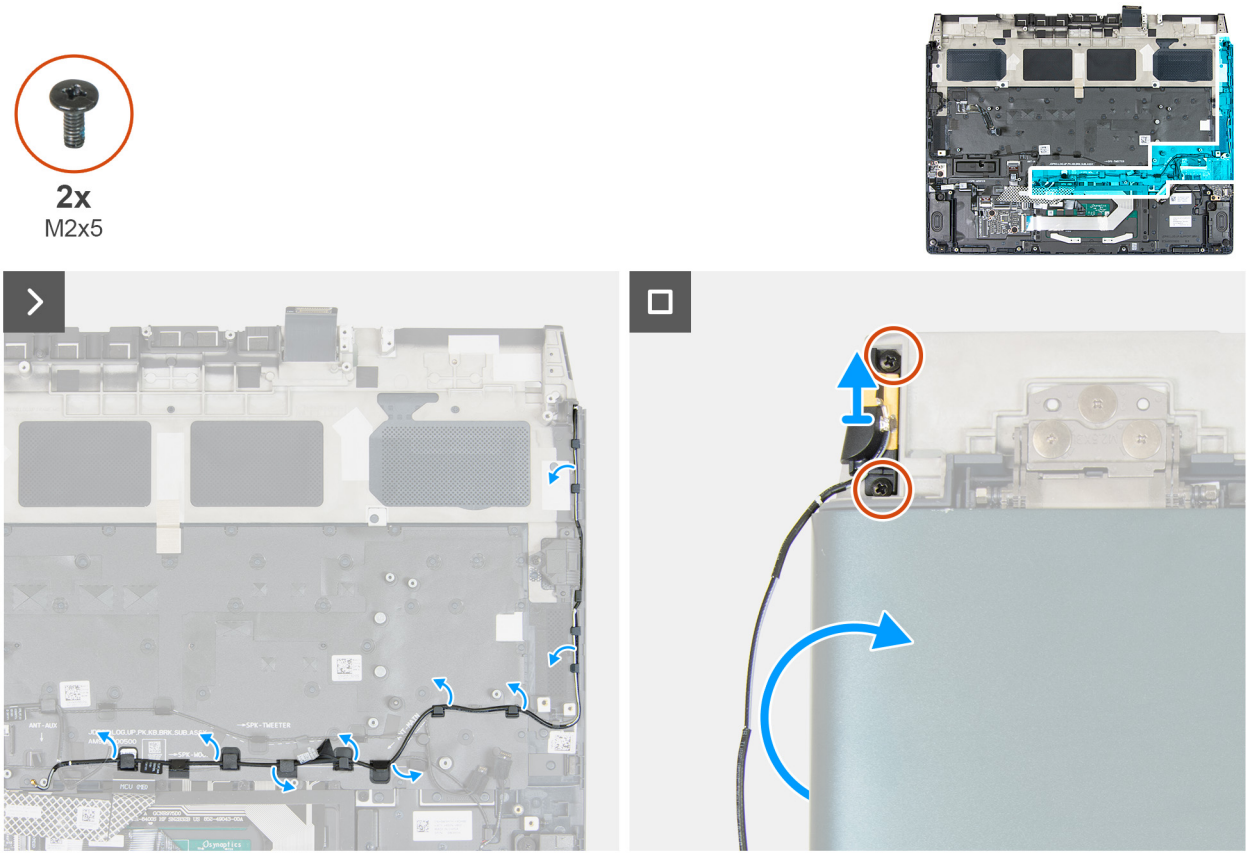


Figure 75. Removing the WLAN main antenna

Steps

1. Remove the WLAN main antenna cable from the routing guides on the palm-rest and keyboard assembly.
2. Turn the computer over.
3. Remove the two screws (M2x5) that secure the WLAN main antenna to the palm-rest and keyboard assembly.
4. Lift the WLAN main antenna, along with the cable, off the palm-rest and keyboard assembly.

Installing the WLAN main antenna

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

Prerequisites

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

About this task

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

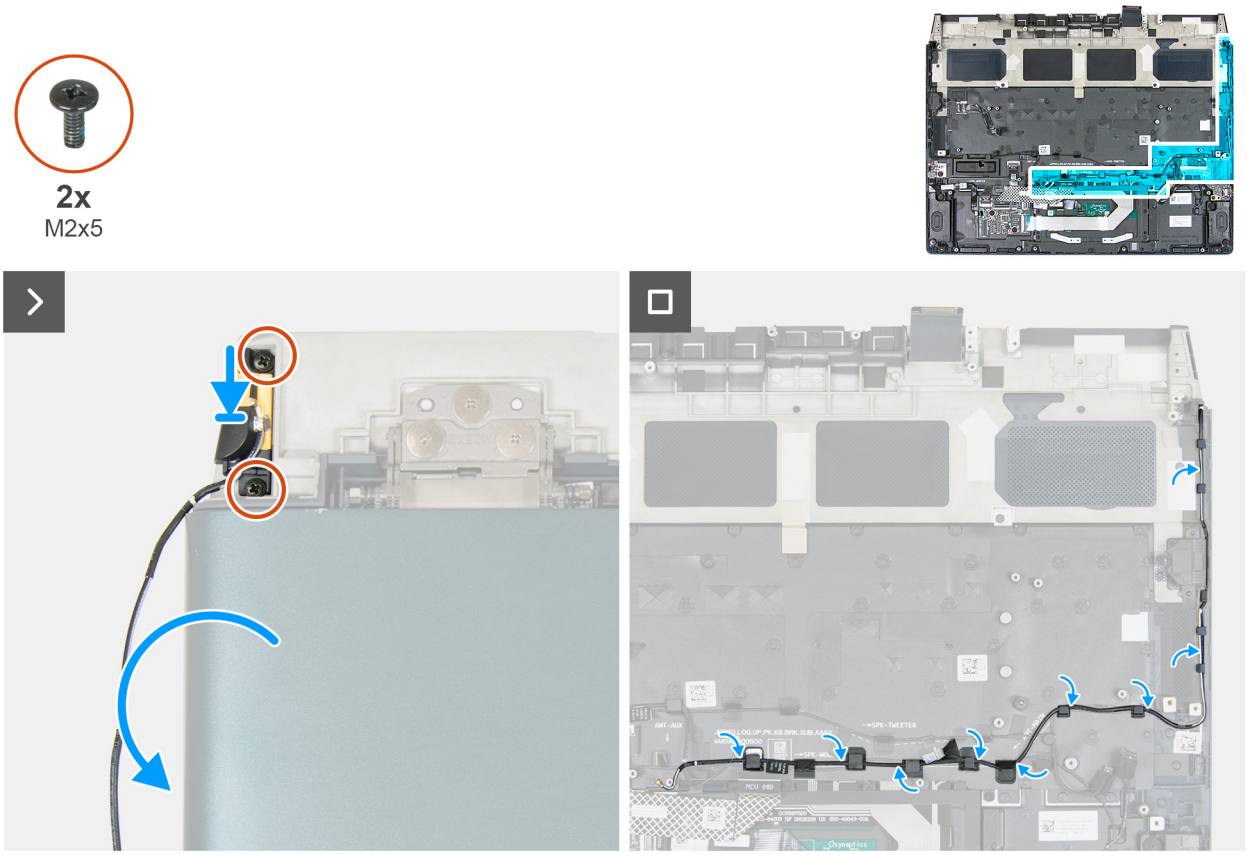


Figure 76. Installing the WLAN main antenna

Steps

1. Align and place the WLAN main antenna, along with its cable, into the slot on the palm-rest and keyboard assembly.
2. Replace the two screws (M2x5) that secure the WLAN main antenna to the palm-rest and keyboard assembly.
3. Turn the computer over.
4. Route the antenna cables through the routing guides on the palm-rest and keyboard assembly.

Next steps

1. Follow the procedure from step 5 to step 24 in Replacing the system board.

   NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

2. Install the power adapter port.
3. Install the VR heat sink.
4. Install the fan, if applicable.

5. Install the battery.
6. Install the battery.
7. Install the rear I/O-cover.
8. Install the 2280 SSD in slot 2 or slot 3, as applicable.
9. Install the 2230 SSD or 2280 SSD in slot 1, as applicable.
10. Install the memory module.
11. Install the base cover.
12. Follow the procedure in After working inside your computer.

WLAN aux antenna

Removing the WLAN aux antenna

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the memory module.
4. Remove the 2230 SSD or 2280 SSD in slot 1, as applicable.
5. Remove the 2280 SSD in slot 2 or slot 3, as applicable.
6. Remove the rear I/O-cover.
7. Remove the battery.
8. Remove the fan, if applicable.
9. Remove the VR heat sink.
10. Remove the power-adapter port.
11. Follow the procedure from step 1 to step 20 in Removing the system board.

NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

About this task

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

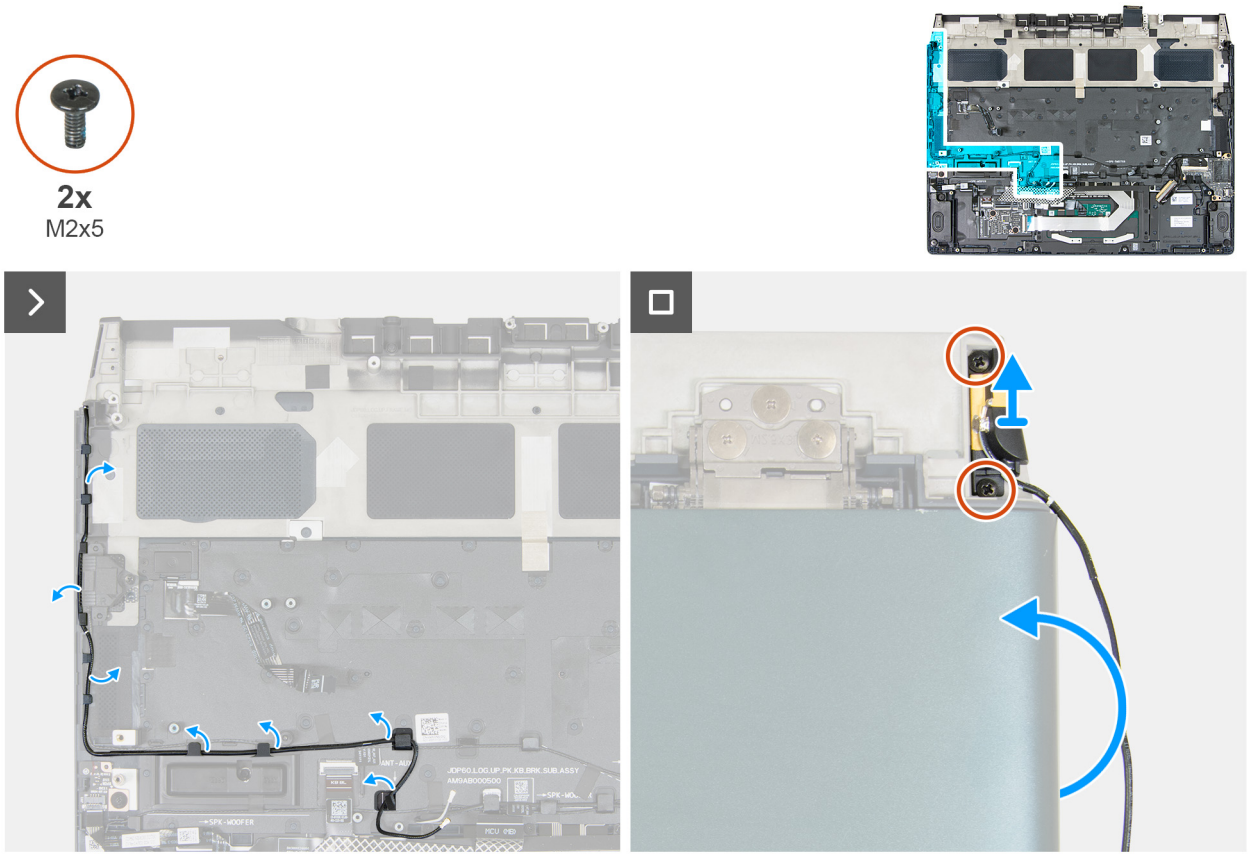


Figure 77. Removing the WLAN aux antenna

Steps

1. Remove the WLAN aux antenna cable from the routing guides on the palm-rest and keyboard assembly.
2. Turn the computer over.
3. Remove the two screws (M2x5) that secure the WLAN aux antenna to the palm-rest and keyboard assembly.
4. Lift the WLAN aux antenna, along with the cable, off the palm-rest and keyboard assembly.

Installing the WLAN aux antenna

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

Prerequisites

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

About this task

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

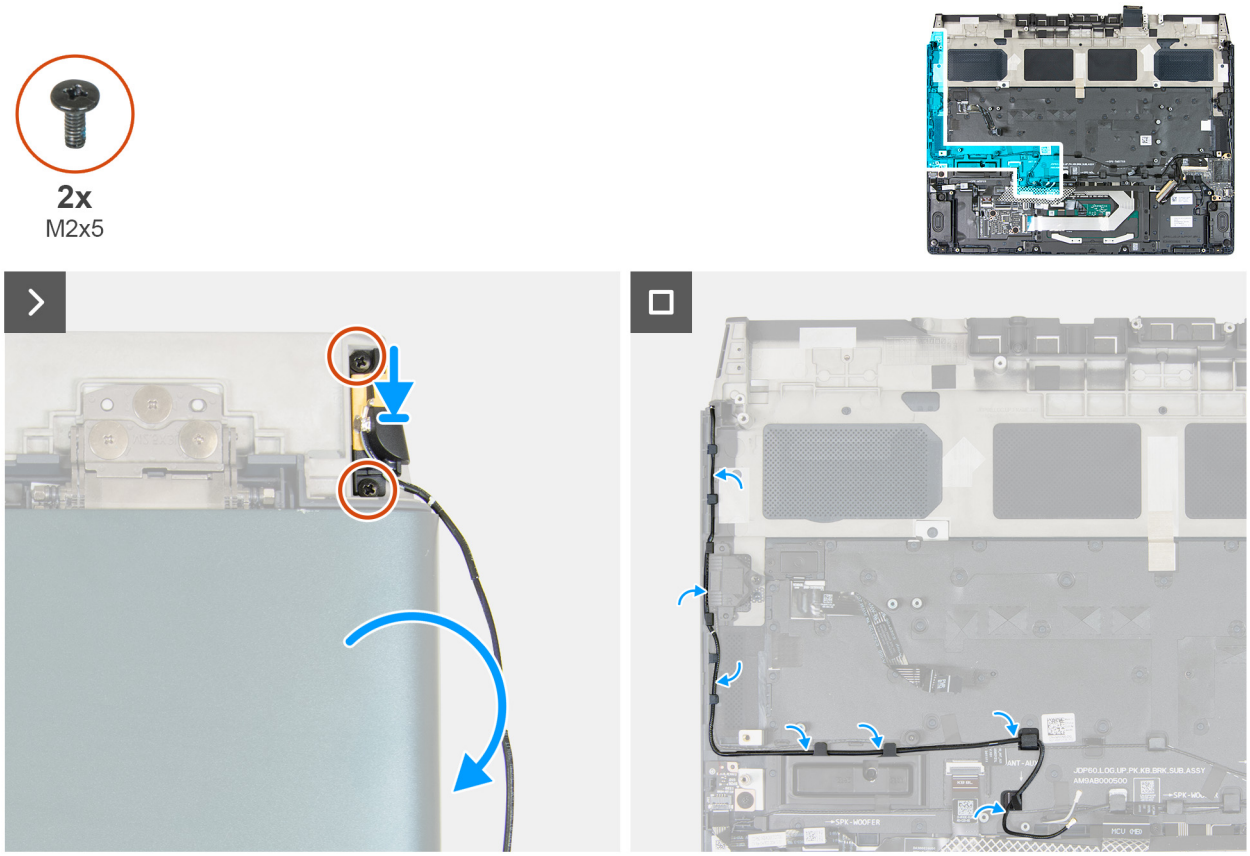


Figure 78. Installing the WLAN aux antenna

Steps

1. Align and place the WLAN aux antenna, along with its cable, into the slot on the palm-rest and keyboard assembly.
2. Replace the two screws (M2x5) that secure the WLAN aux antenna to the palm-rest and keyboard assembly.
3. Turn the computer over.
4. Route the WLAN aux antenna cable through the routing guides on the palm-rest and keyboard assembly.

Next steps

1. Follow the procedure from step 5 to step 24 in Replacing the system board.

   NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

2. Install the power adapter port.
3. Install the VR heat sink.
4. Install the I/O board.
5. Install the fan, if applicable.
6. Install the battery.
7. Install the rear I/O-cover.
8. Install the 2280 SSD in slot 2 or slot 3, as applicable.
9. Install the 2230 SSD or 2280 SSD in slot 1, as applicable.
10. Install the memory module.
11. Install the base cover.
12. Follow the procedure in After working inside your computer.

Speaker assembly

Removing the speaker assembly

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the memory module.
5. Remove the 2230 SSD or 2280 SSD in slot 1, as applicable.
6. Remove the 2280 SSD in slot 2 or slot 3, as applicable.
7. Remove the rear I/O-cover.
8. Remove the fan, if applicable.
9. Remove the I/O board.
10. Remove the keyboard-controller board.
11. Remove the sensor board.
12. Remove the VR heat sink.
13. Remove the power-adapter port.
14. Follow the procedure from step 1 to step 20 in Removing the system board.

NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

About this task

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

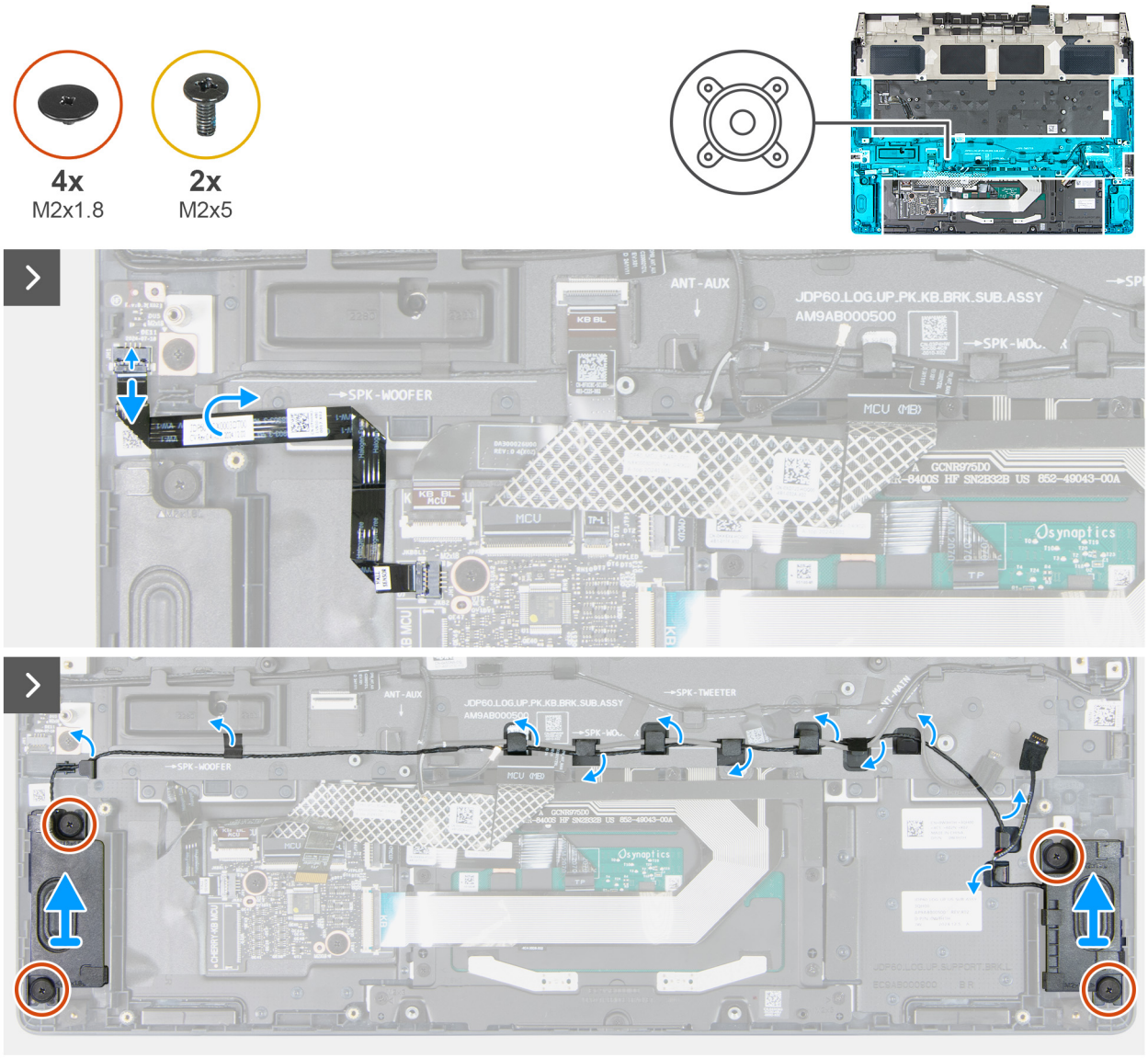


Figure 79. Removing the woofers

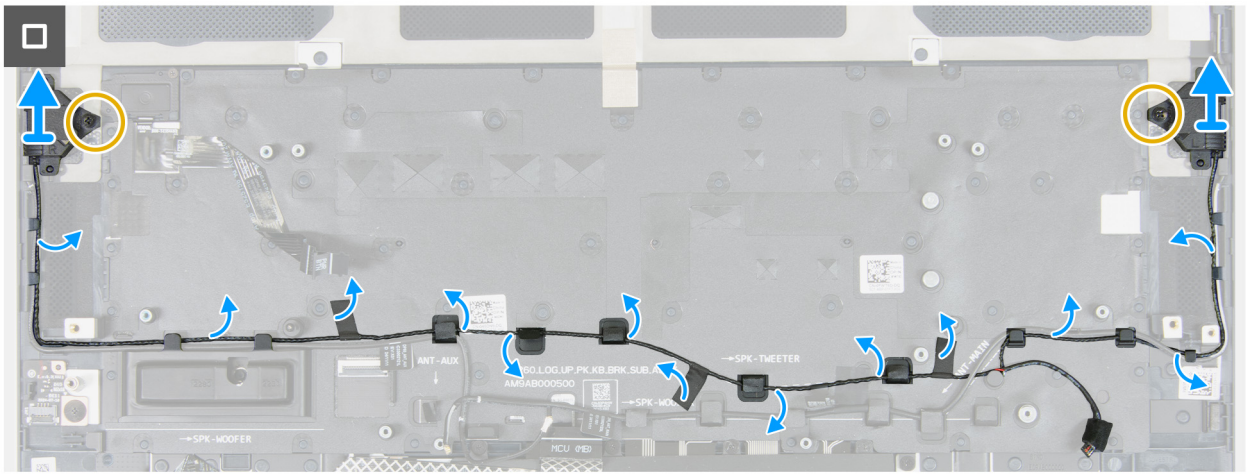


Figure 80. Removing the tweeters

Steps

1. Disconnect the woofer cable from the connector (JSPK1) on the I/O board.
2. Remove the four screws (M2x1.8) that secure the woofers to the palm-rest and keyboard assembly.
3. Remove the woofer cables from the routing guides on the palm-rest and keyboard assembly.
4. Lift the woofers, along with its cable, off the palm-rest and keyboard assembly.
5. Remove the two screws (M2x5) that secure the tweeters to the palm-rest and keyboard assembly.
6. Remove the tweeter cable from the routing guides on the palm-rest and keyboard assembly.
7. Lift the right and left tweeters, along with its cable, off the palm-rest and keyboard assembly.

Installing the speaker assembly

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

Prerequisites

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

About this task

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

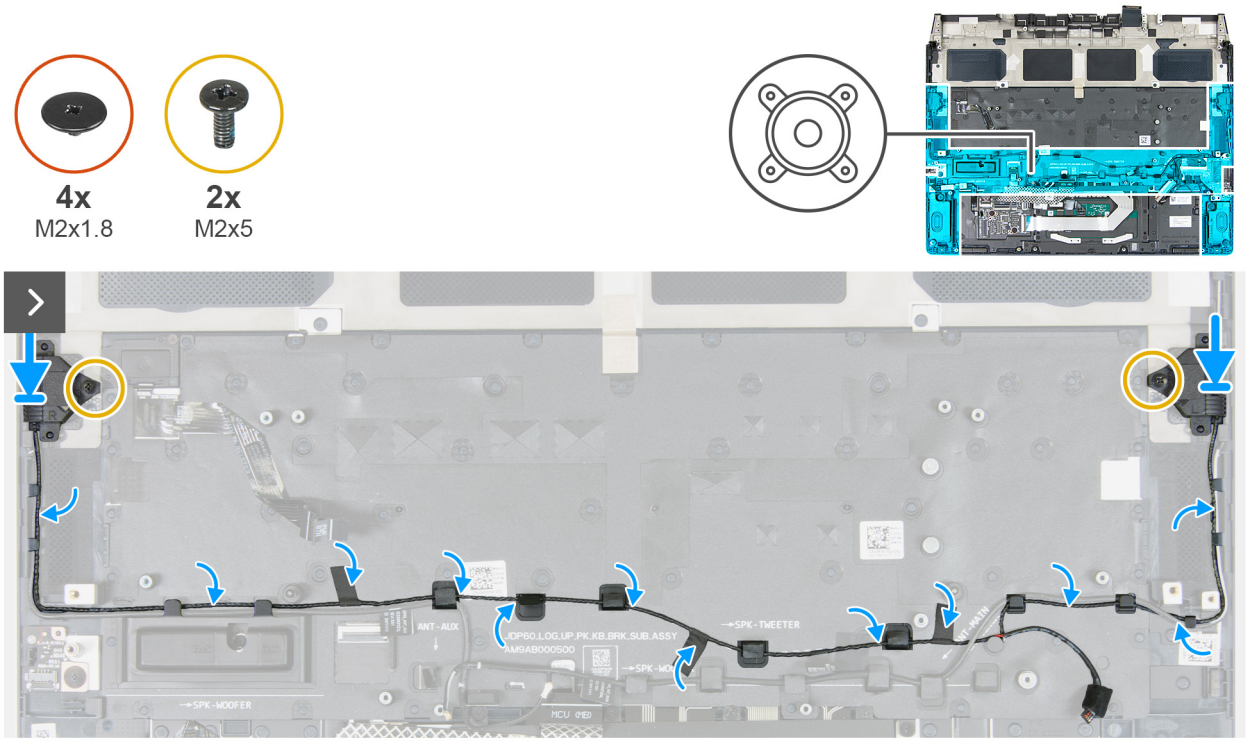


Figure 81. Installing the speaker assembly

Steps

1. Using the alignment posts, place the left and right tweeters into their slots on the palm-rest and keyboard assembly.
2. Route the tweeter cable through the routing guides on the palm-rest and keyboard assembly.
3. Replace the two screws (M2x5) that secure the tweeters to the palm-rest and keyboard assembly.
4. Using the alignment posts, place the woofers into their slots on the palm-rest and keyboard assembly.
5. Route the woofer cable through the routing guides on the palm-rest and keyboard assembly.
6. Replace the four screws (M2x1.8) that secure the woofers to the palm-rest and keyboard assembly.
7. Connect the woofer cable to the connector (JSPK1) on the I/O board.

Next steps

1. Follow the procedure from step 5 to step 24 in Replacing the system board.

   NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

2. Install the power adapter port.
3. Install the VR heat sink.
4. Install the sensor board.
5. Install the keyboard-controller board.
6. Install the I/O board.
7. Install the fan, if applicable.
8. Install the rear I/O-cover.
9. Install the 2280 SSD in slot 2 or slot 3, as applicable.
10. Install the 2230 SSD or 2280 SSD in slot 1, as applicable.
11. Install the memory module.
12. Install the battery.
13. Install the base cover.
14. Follow the procedure in After working inside your computer.

Palm-rest and keyboard assembly

Removing the palm-rest and keyboard assembly

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

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the memory module.
5. Remove the 2230 SSD or 2280 SSD in slot 1, as applicable.
6. Remove the 2280 SSD in slot 2 or slot 3, as applicable.
7. Remove the rear I/O-cover.
8. Remove the fan, if applicable.
9. Remove the I/O board.
10. Remove the touchpad assembly.
11. Remove the keyboard-controller board.
12. Remove the hall sensor board.
13. Remove the VR heat sink.
14. Remove the display assembly.
15. Remove the speaker assembly.
16. Remove the power-adapter port.
17. Follow the procedure from step 1 to step 20 in Removing the system board.

    NOTE: The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

18. Remove the power button.
19. Remove the WLAN main antenna.
20. Remove the WLAN aux antenna.

About this task

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

Steps

After performing the pre-requisites, you are left with the palm-rest and keyboard assembly.

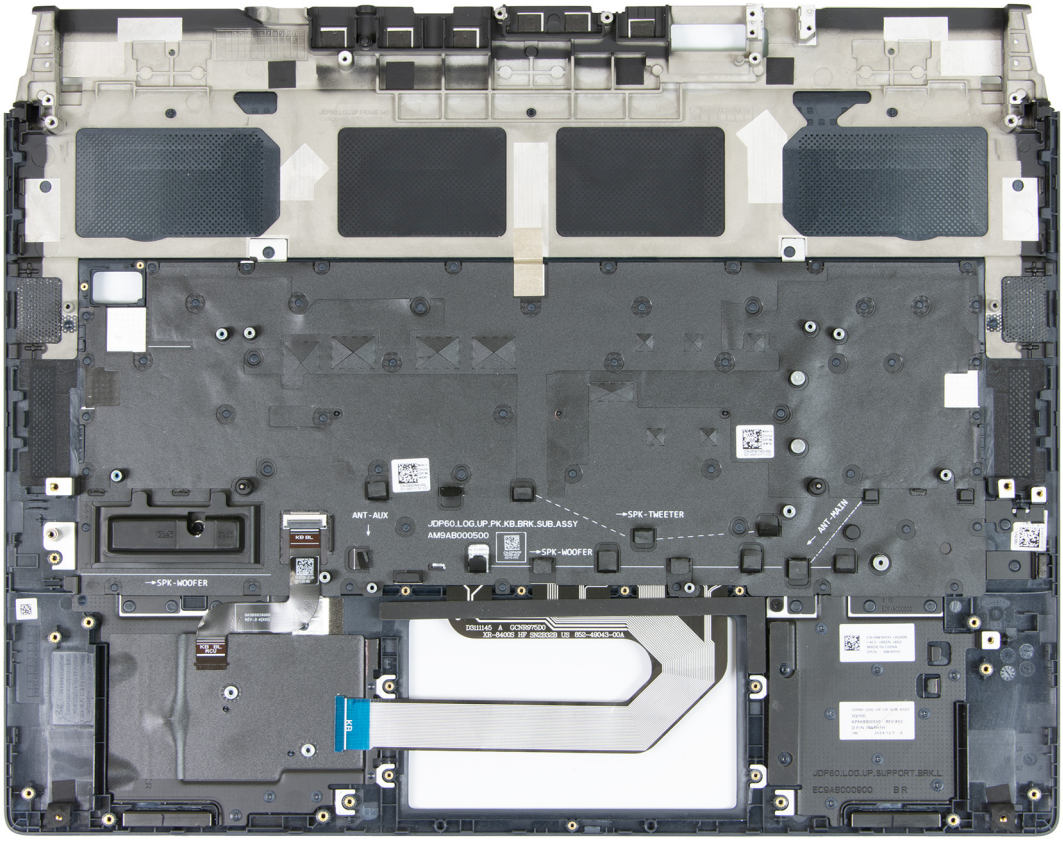


Figure 82. Removing the palm-rest and keyboard assembly

Installing the palm-rest and keyboard assembly

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

Prerequisites

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

About this task

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

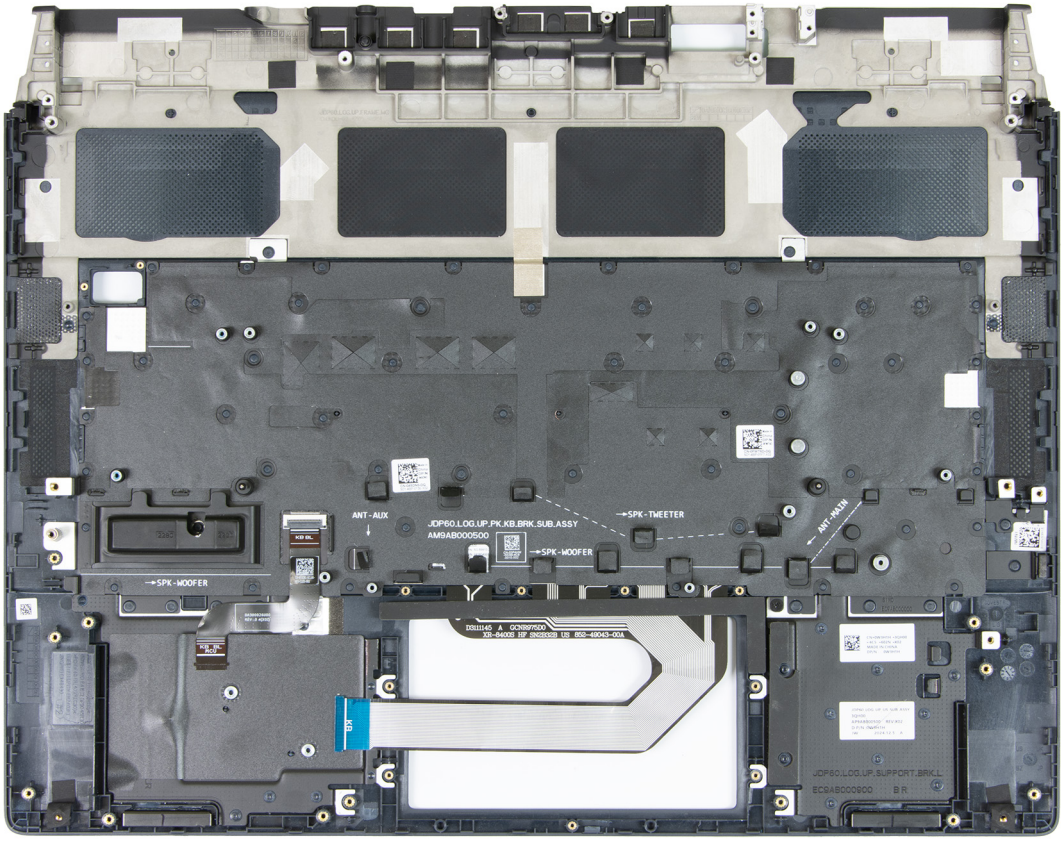


Figure 83. Installing the palm-rest and keyboard assembly

Steps

Place the palm-rest and keyboard assembly on a flat and clean surface and perform the postrequisites to install the palm-rest and keyboard assembly.

Next steps

1. Install the WLAN aux antenna.
2. Install the WLAN main antenna.
3. Install the power button.
4. Follow the procedure from step 5 to step 24 in Replacing the system board.

> **NOTE:** The system board can be removed and installed along with the heat sink. This simplifies the removal and installation procedure and avoids breaking the thermal bond between the system board and heat sink.

5. Install the power-adapter port.
6. Install the speaker assembly.
7. Install the display assembly.
8. Install the VR heat sink.
9. Install the hall sensor board.
10. Install the keyboard-controller board.
11. Install the touchpad assembly.
12. Install the I/O board.
13. Install the fan, if applicable.
14. Install the rear I/O-cover.
15. Install the 2280 SSD in slot 2 or slot 3, as applicable.
16. Install the 2230 SSD or 2280 SSD in slot 1, as applicable.
17. Install the memory module.

18. Install the battery.
19. Install the base cover.
20. Follow the procedure in After working inside your computer.

8

Software

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

Operating System

Your Alienware 16 Area-51 AA16250 supports the following operating systems:

- Windows 11 Home
- Windows 11 Pro

Drivers and downloads

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

9

BIOS Setup

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

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

Use BIOS Setup for the following purposes:

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

Entering BIOS Setup program

Turn on or restart your computer and press F2 immediately.

Navigation keys

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

Table 29. Navigation keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follows the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area.
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restart the computer.

F12 One Time Boot menu

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

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

The One Time Boot menu displays the devices that you can boot from and also display the options to start diagnostics. The boot menu options are:

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

NOTE: XXX denotes the SATA drive number.

- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

The One Time Boot menu screen also displays the option to access BIOS Setup.

View Advanced Setup options

About this task

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

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

To enable Advanced Setup:

Steps

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

View Service options

About this task

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

NOTE: Service options are described in BIOS Setup options.

To view Service options:

Steps

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

System Setup options

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

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

Table 30. System Setup options—Overview menu

Overview	
Alienware 16 Area-51 AA16250	
BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Displays the Asset Tag of the computer.

Table 30. System Setup options—Overview menu (continued)

Overview	
Manufacture Date	Displays the manufacture date of the computer.
Ownership Date	Displays the ownership date of the computer.
Express Service Code	Displays the Express Service Code of the computer.
Ownership Tag	Displays the Ownership Tag of the computer.
BATTERY Information	
Primary	Displays the primary battery of the computer.
Battery Level	Displays the battery level of the computer.
Battery State	Displays the battery state of the computer.
Health	Displays the battery health of the computer.
AC Adapter	Displays whether an AC adapter is connected. If connected, displays the type of AC adapter that is connected.
PROCESSOR Information	
Processor Type	Displays the processor type.
Maximum Clock Speed	Displays the maximum processor clock speed. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
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 information.
Processor L3 Cache	Displays the processor L3 cache information.
Microcode Version	Displays the microcode version. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Intel Hyper-Threading Capable	Displays whether the processor is Hyper-Threading (HT) capable. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Intel vPro Technology	Displays whether the computer supports vPro or Non-vPro technology.
MEMORY Information	
Memory Installed	Displays the total memory that is installed on the computer.
Memory Available	Displays the total memory available on the computer.
Memory Speed	Displays the memory speed. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Memory Technology	Displays the technology that is used for the memory.
DIMM_SLOT A	Display the memory DIMM1 slot information.
DIMM_SLOT B	Display the memory DIMM2 slot information.
DEVICES Information	
Panel Type	Displays the type of display panel available on the computer.
Panel Revision	Displays the panel revision information of your computer.
Video Controller	Displays the type of video controller available on the computer.

Table 30. System Setup options—Overview menu (continued)

Overview	
Video Memory	Displays the video memory information of the computer.
Wi-Fi Device	Displays the wireless device information of the computer.
Native Resolution	Displays the native resolution of the computer.
Video BIOS Version	Displays the video BIOS version of the computer. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Audio Controller	Displays the audio controller information of the computer.
Bluetooth Device	Displays the Bluetooth device information of the computer.
dGPU Video Controller	Displays the dGPU video controller information of your computer.

Table 31. System Setup options—Boot Configuration menu

Boot Configuration	
Boot Sequence	
Boot Sequence	Displays the boot sequence.
Enable PXE Boot Priority	If a new PXE boot option is detected, it will be added to the top of the Boot Sequence. By default, the **Enable PXE Boot Priority** option is disabled.
UEFI Network Boot Order	It is used to select the IPv4 or IPv6 option boot order.
Secure Digital (SD) Card Boot	Enables or disables read-only boot from Secure Digital (SD) card. By default, the **Secure Digital (SD) Card Boot** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Secure Boot	Secure Boot is a method of guaranteeing the integrity of the boot path by performing additional validation of the operating system and PCI add-in cards. The computer stops booting to the operating system when a component is not authenticated during the boot process. Secure Boot can be enabled in BIOS setup or using management interfaces like Dell Command|Configure, but can only be disabled from BIOS setup.
Enable Secure Boot	Enables the computer to boot using only validated boot software. By default, the **Enable Secure Boot** option is disabled. For additional security, Dell Technologies recommends keeping the **Secure Boot** option enabled to ensure that the UEFI firmware validates the operating system during the boot process. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options. **NOTE:** To enable Secure Boot, the computer must be in UEFI boot mode and the Enable Legacy Option ROMs option must be turned off.
Secure Boot Mode	Enables or disables the Secure Boot operation mode. By default, the **Deployed Mode** is selected. **Deployed Mode** should be selected for normal operation of Secure Boot. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Expert Key Management	

Table 31. System Setup options—Boot Configuration menu (continued)

Boot Configuration	
Enable Custom Mode	Enables or disables the keys in the PK, KEK, db, and dbx security key databases to be modified. By default, the **Enable Custom Mode** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Custom Mode Key Management	Selects the custom values for expert key management. By default, the **PK** option is selected. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 32. System Setup options—Integrated Devices menu

Integrated Devices	
Date/Time	
Date	Sets the computer date in MM/DD/YYYY format. Changes to the date format take effect immediately.
Time	Sets the computer time in HH/MM/SS 24-hour format. You can select between a 12-hour or 24-hour clock. Changes to the time format take effect immediately.
Camera	
Enable Camera	Enables the camera. By default, the **Enable Camera** option is enabled. **NOTE:** Depending on the configuration ordered, the camera setup option may not be available.
Audio	
Enable Audio	Enables all integrated audio controller. By default, all the options are enabled.
Enable Microphone	Enables the microphone. By default, the **Enable Microphone** option is enabled. **NOTE:** Depending on the configuration ordered, the microphone setup option may not be available.
Enable Internal Speaker	Enables the internal speaker. By default, the **Enable Internal Speaker** option is enabled.
USB/Thunderbolt Configuration	
Enable Thunderbolt Boot Support	Enables the Thunderbolt adapter-peripheral device and USB devices that are connected to the Thunderbolt adapter to be used during BIOS Preboot. By default, the **Enable Thunderbolt Boot Support** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Enable Thunderbolt (and PCIe behind TBT) pre-boot modules	Enables the PCIe devices that are connected through a Thunderbolt adapter to run the PCIe devices UEFI Option ROM (if present) during preboot. By default, the **Enable Thunderbolt (and PCIe behind TBT) pre-boot modules** option is disabled.

Table 32. System Setup options—Integrated Devices menu (continued)

Integrated Devices	
	NOTE: To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 33. System Setup options—Storage menu

Storage	
SATA/NVMe Operation	
SATA/NVMe Operation	Sets the operating mode of the integrated SATA hard drive controller. By default, the **Raid On** option is selected.
Storage Interface	Displays the information of various onboard drives.
Port Enablement	Enables or disables the M.2 PCIe SSD option. By default, the **M.2 PCIe SSD-1, M.2 PCIe SSD-2**, and **M.2 PCIe SSD-3** option is enabled.
SMART Reporting	
Enable SMART Reporting	Enables or disables the Smart reporting option. By default, the **Enable SMART Reporting** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Drive Information	Displays the information of onboard drives.
Enable MediaCard	
Secure Digital (SD) Card	Enables or disables the SD card. By default, the **Secure Digital (SD) Card** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Secure Digital (SD) Card Read-Only Mode	Enables or disables the SD card read-only mode. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options. By default, the **Secure Digital (SD) Card Read-Only Mode** option is disabled.

Table 34. System Setup options—Display menu

Display	
Display Brightness	
Brightness on battery power	By default, the screen brightness is set to 50 when the computer is running on battery power. Set the screen brightness when the computer is running on battery power. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Brightness on AC power	By default, the screen brightness is set to 100 when the computer is running on AC power. Set the screen brightness when the computer is running on AC power. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Full Screen Logo	Enables or disables the computer to display a full-screen logo, if the image matches screen resolution.

Table 34. System Setup options—Display menu (continued)

Display	
	By default, the **Full Screen Logo** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Hybrid Graphics/Advanced Optimus	
Enable Hybrid Graphics /Advanced Optimus(when available)	When ON, the computer enables both the integrated and discrete graphics controllers to work together for optimized capability and battery life. By default, the **Enable Hybrid Graphics /Advanced Optimus(when available)** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 35. System Setup options—Connection menu

Connection	
Wireless Device Enable	
WLAN	Enables or disables the internal WLAN device. By default, the **WLAN** option is enabled.
Bluetooth	Enables or disables the internal Bluetooth device. By default, the **Bluetooth** option is enabled.
Enable UEFI Network Stack	
Enable UEFI Network Stack	Enables or disables the UEFI Network Stack and controls the onboard LAN Controller. By default, the **Enable UEFI Network Stack** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
IPv4 PXE Boot	IPv4 PXE Boot option is available when ON. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
IPv6 PXE Boot	IPv6 PXE Boot option is available when ON. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
HTTP(s) Boot Feature	
HTTP(s) Boot	When enabled, supports HTTP(s) boot on the client BIOS, which offers wired or wireless and HTTP/HTTPS connection options. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
HTTP(s) Boot Modes	In Auto Mode, the boot URL is obtained from the DHCP response; the boot URL specifies the HTTP Boot Server and location of the Network Boot Program (NBP) file. In Manual mode, the user enters the URL in the text box, which must start with `http://` or `https://` and end with the NBP file name. By default, **Auto Mode** is selected. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
CA Certificate	Upload or delete the CA certificate.

Table 35. System Setup options—Connection menu (continued)

Connection	
	NOTE: To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 36. System Setup options—Power menu

Power	
Battery Configuration	
Battery Configuration	Enables or disables the computer to run on battery during peak power usage hours. Use the table **Custom Charge Start** and **Custom Charge Stop**, to prevent AC power usage between certain times of each day. By default, the **Adaptive** option is selected. Battery settings are adaptively optimized based on your typical battery usage pattern.
Advanced Configuration	
Enable Advanced Battery Charge Configuration	Enables Advanced Battery Charge Configuration from the beginning of the day to a specified work period. When enabled, Advanced Battery Charged maximizes battery health while still supporting heavy use during the work day. By default, the **Enable Advanced Battery Charge Configuration** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
USB PowerShare	
Enable USB PowerShare	Enables or disables the USB PowerShare on the computer. By default, the **USB PowerShare** option is disabled.
Thermal Management	
Thermal Management	This setting allows for cooling of fan and processor heat management to adjust system performance, noise, and temperature. By default, the **Optimized** option is selected.
USB Wake Support	
Wake on Dell USB-C Dock	When enabled, connecting a Dell USB-C Dock wakes the computer from Standby, Hibernate, and Power Off. By default, the **Wake on Dell USB-C Dock** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Block Sleep	
Block Sleep	Enables or disables the computer from entering Sleep (S3) mode in the operating system. By default, the **Block Sleep** option is disabled. **NOTE:** When enabled, the computer does not go to Sleep, Intel Rapid Start is disabled automatically, and the operating system power option is blank if it was set to Sleep. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Lid Switch	
Enable Lid Switch	Enables or disables the Lid Switch.

Table 36. System Setup options—Power menu (continued)

Power	
	By default, the **Enable Lid Switch** option is enabled.
Power On Lid Open	When enable, it allows the computer to turn on from the off state whenever the lid is opened. By default, the **Power On Lid Open** option is enabled.

Table 37. System Setup options—Security menu

Security	
Intel Platform Trust Technology	
Intel Platform Trust Technology On	Enables or disables the Intel Platform Trust Technology feature (PTT) to the operating system. By default, the **Intel Platform Trust Technology On** option is enabled. For additional security, Dell Technologies recommends keeping the Trusted Platform Module (TPM) enabled to allow these security technologies to fully function.
PPI Bypass for Clear Commands	The PPI Bypass for Clear Commands option allows the operating system to manage certain aspects of PTT. When enabled, you are not prompted to confirm changes to the PTT configuration. By default, the **PPI Bypass for Clear Commands** option is disabled. For additional security, Dell Technologies recommends keeping the **PPI Bypass for Clear Commands** option disabled.
Clear	When enabled, the **Clear** option clears information that is stored in the TPM after exiting the system's BIOS. This option returns to the disabled state when the computer restarts. By default, the **Clear** option is disabled. Dell Technologies recommends enabling the **Clear** option only when TPM data is required to be cleared. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Absolute	
Absolute	Absolute Software provides various cyber security solutions, some requiring software preloaded on Dell computers and integrated into the BIOS. To use these features, you must enable the Absolute BIOS setting and contact Absolute for configuration and activation. By default, the **Absolute** option is enabled. For additional security, Dell Technologies recommends keeping the **Absolute** option enabled. **WARNING: The Permanently Disabled option can only be selected once. When Permanently Disabled is selected, Absolute Persistence cannot be reenabled. No further changes to the Enable/Disable states are allowed.** **NOTE:** The Enable/Disable options are unavailable while the computer is in the activated state. **NOTE:** When the Absolute features are activated, the Absolute integration cannot be disabled from the BIOS Setup screen.
UEFI Boot Path Security	

Table 37. System Setup options—Security menu (continued)

Security	
UEFI Boot Path Security	Enables or disables the computer to prompt the user to enter the Administrator password (if set) when booting to a UEFI boot path device from the F12 boot menu. By default, the **Always Except Internal HDD** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 38. System Setup options—Passwords menu

Passwords	
Admin Password	The Admin Password prevents unauthorized access to the BIOS Setup options. Once the administrator password is set, the BIOS Setup options can only be modified after providing the correct password. The following rules and dependencies apply to the Administrator Password - ● The administrator password cannot be set if system and/or internal storage passwords are previously set. ● The administrator password can be used in place of the system and/or internal storage passwords. ● When set, the administrator password must be provided during a firmware update. ● Clearing the administrator password also clears the system password (if set). Dell Technologies recommends using an administrator password to prevent unauthorized changes to BIOS Setup options.
System Password	The System Password prevents the computer from booting to an operating system without entering the correct password. The following rules and dependencies apply when the System Password is used - ● The computer shuts down when idle for approximately 10 minutes at the system password prompt. ● The computer shuts down after three incorrect attempts to enter the system password. ● The computer shuts down when the **Esc** key is pressed at the **System Password** prompt. ● The system password is not prompted when the computer resumes from standby mode. Dell Technologies recommends using the system password in situations where it is likely that a computer may be lost or stolen.
Password Configuration	The Password configuration page includes several options for changing the requirements of BIOS passwords. You can modify the minimum and maximum length of the passwords as well as require passwords to contain certain character classes (upper case, lower case, digit, special character). When the **Upper Case Letter** option is enabled, the password requires at least one upper case letter. When the **Lower Case Letter** option is enabled, the password requires at least one lower case letter. When the **Digit** option is enabled, the password requires at least one numeric digit. When the **Special Character** option is enabled, the password requires at least one special character from the set: !"#$%&'()*+,-./:;<=>?@[\]^_`{|}~. When setting **Minimum Characters** for password length, Dell Technologies recommends setting the minimum password length to at least eight characters.

Table 38. System Setup options—Passwords menu (continued)

Passwords	
	NOTE: To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Password Bypass	The **Password Bypass** option allows the computer to reboot from the operating system without entering the system or hard drive password. If the computer has already booted to the operating system, it is presumed that the user has already entered the correct system or hard drive password. **NOTE:** This option does not remove the requirement to enter the password after shutting down. By default, the **Password Bypass** option is disabled. For additional security, Dell Technologies recommends keeping the **Password Bypass** option enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Password Changes	
Allow Non-Admin Password Changes	The **Allow Non-Admin Password Changes** option in BIOS Setup allows an end user to set or change the system or hard drive passwords without entering the administrator password. This gives an administrator control over the BIOS settings but enables an end user to provide their own password. By default, the **Allow Non-Admin Password Changes** option is enabled. For additional security, Dell Technologies recommends keeping the **Allow Non-Admin Password Changes** option disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Admin Setup Lockout	
Enable Admin Setup Lockout	The **Admin Setup Lockout** option prevents an end user from even viewing the BIOS Setup configuration without first entering the administrator password (if set). By default, the **Enable Admin Setup Lockout** option is disabled. For additional security, Dell Technologies recommends keeping the **Admin Setup Lockout** option disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Master Password Lockout	
Enable Master Password Lockout	The **Master Password Lockout** option allows you to disable the Recovery Password feature. If the system, administrator, or hard drive password is forgotten, the computer becomes unusable. **NOTE:** When the owner password is set, the Master Password Lockout option is not available. **NOTE:** When an internal hard drive password is set, it must first be cleared before Master Password Lockout can be changed. By default, the **Enable Master Password Lockout** option is disabled. Dell Technologies does not recommend enabling the **Master Password Lockout** unless you have implemented your own password recovery system. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 39. System Setup options—Update, Recovery menu

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

Table 40. System Setup options—System Management menu

System Management	
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Creates a computer Asset Tag that an IT administrator can use to uniquely identify a particular computer. **NOTE:** Once set in the BIOS, the Asset Tag cannot be changed.
AC Behavior	
Wake on AC	Enables or disables the computer to turn on and go to boot when AC power is supplied to the computer. By default, the **Wake on AC** option is disabled.

Table 40. System Setup options—System Management menu (continued)

System Management	
	NOTE: To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Wake on LAN/WLAN	Enables or disables the computer to turn on by a special LAN signal. By default, the **Wake on LAN/WLAN** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Auto On Time	
Auto On Time	Enable to set the computer to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays, or Selected Days. By default, the **Auto On Time** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
First Power On Date	
Set Ownership Date	Enables you to set the Ownership date. By default, the **Set Ownership Date** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Diagnostics	
OS Agent Requests	Enable or disable the option for applications running in the operating system to run with preboot diagnostics on subsequent boots. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Power-On-Self-Test Automatic Recovery	
Power-On-Self-Test Automatic Recovery	Enable or disable the automatic recovery of the computer from no power or no-POST failure by applying mitigation steps. By default, the **Power-On-Self-Test Automatic Recovery** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 41. System Setup options—Keyboard menu

Keyboard	
Fn Lock Options	
Fn Lock Options	Enables or disables the Fn Lock option. By default, the **Fn Lock Options** option is enabled.
Lock Mode	By default, the **Lock Mode Secondary** option is enabled. With this option, the F1-F12 keys scan the code for their secondary functions.
RGB Per Key Keyboard Language	Select the language that matches the keyboard installed on your system. By default, the **English US** option is selected.

Table 42. System Setup options—Pre-boot Behavior menu

Pre-boot Behavior	
Adapter Warnings	
Enable Adapter Warnings	Enables the warning messages during boot when the adapters with less power capacity are detected. By default, the **Enable Adapter Warnings** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Warnings and Errors	
Warnings and Errors	Enables or disables the action to be taken when a warning or error is encountered. By default, the **Prompt on Warnings and Errors** option is selected. **NOTE:** Errors deemed critical to the operation of the computer hardware stop the functioning of the computer. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
USB-C Warnings	
Enable Dock Warning Messages	Enables the warning messages during boot when the USB-C adapters with less power capacity are detected. By default, the **Enable Dock Warning Messages** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Extend BIOS POST Time	
Extend BIOS POST Time	Sets the BIOS POST (Power-On Self-Test) load time. By default, the **0 seconds** option is selected. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Sign of Life	
Early Audio Beep	Enables or disables Audio Sign of Life. By default, the **Early Audio Beep** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Early Logo Display	Displays the Logo Sign of Life. By default, the **Early Logo Display** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Early Keyboard Backlight	Enables or disables the Keyboard Backlight Sign of Life. By default, the **Early Keyboard Backlight** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 43. System Setup options—Virtualization menu

Virtualization Support	
Intel Trusted Execution Technology (TXT)	
Intel Trusted Execution Technology (TXT)	Specifies whether a measured Virtual Machine Monitor (MVMM) can use the additional hardware capabilities provided by Intel Trusted Execution Technology. The following must be enabled in order to enable Intel TXT - • Trusted Platform Module (TPM) • Intel Hyper-Threading • All CPU cores (Multi-Core Support) • Intel Virtualization Technology • Intel VT for Direct I/O By default, the **Intel Trusted Execution Technology (TXT)** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
DMA Protection	
Enable Pre-Boot DMA Support	Allows you to control the Pre-Boot DMA protection for both internal and external ports. This option does not directly enable DMA protection in the operating system. **NOTE:** This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the **Enable Pre-Boot DMA Support** option is enabled. For additional security, Dell Technologies recommends keeping the **Enable Pre-Boot DMA Support** option enabled. **NOTE:** This option is provided only for compatibility purposes, since some older hardware is not DMA capable. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Enable OS Kernel DMA Support	Allows you to control the Kernel DMA protection for both internal and external ports. This option does not directly enable DMA protection in the operating system. For operating systems that support DMA protection, this setting indicates to the operating system that the BIOS supports the feature. **NOTE:** This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the **Enable OS Kernel DMA Support** option is enabled. **NOTE:** This option is provided only for compatibility purposes, since some older hardware is not DMA capable. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 44. System Setup options—Performance menu

Performance	
Intel SpeedStep	
Enable Intel SpeedStep Technology	Enables the computer to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production. By default, the **Enable Intel SpeedStep Technology** option is enabled. **NOTE:** To view this option, enable **Service** options as described in View Service options.

Table 44. System Setup options—Performance menu (continued)

Performance	
Enable Adaptive C-States for Discrete Graphics	Enables or disables the ability of the computer to detect high usage of discrete graphics and adjust the parameters for higher performance during that time period. By default, the **Enable Adaptive C-States for Discrete Graphics** option is enabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
OverClocking feature	
OverClocking feature	Enables or disables global overclocking functions. By default, the **Enable Intel Turbo Boost Technology** option is disabled. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Core OverClocking Level #	When this option is enabled, it allows the processor to adjust the Flex Ratio and Voltage in a Turbo Mode environment.
TCC Activation Offset	
TCC Activation Offset	Allows you to adjust processor TCC offset. Increasing the TCC offset moderates processor performance. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Table 45. System Setup options—System Logs menu

System Logs	
BIOS Event Log	
Clear BIOS Event Log	Select the option to keep or clear BIOS events logs. By default, the **Keep Log** option is selected. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Thermal Event Log	
Clear Thermal Event Log	Select the option to keep or clear thermal events logs. By default, the **Keep Log** option is selected. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.
Power Event Log	
Clear Power Event Log	Select the option to keep or clear power events logs. By default, the **Keep Log** option is selected. **NOTE:** To view this option, enable **Advanced Setup** mode as described in View Advanced Setup options.

Updating the BIOS

Updating the BIOS in Windows

About this task

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

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

Steps

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

   NOTE: If you do not have the Service Tag, click **Detect This PC**. The site automatically detects your device, and you can then click **Explore Product Support** to go to the support page for your device. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**.
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, navigate to the folder where the BIOS update file has been saved.
8. Double-click the BIOS update file and follow the on-screen instructions.
   For more information, search in the Knowledge Base Resource at Dell Support Site.

Updating the BIOS using the USB drive in Windows

About this task

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

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

Steps

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

   NOTE: If you do not have the Service Tag, click **Detect This PC**. The site automatically detects your device, and you can then click **Explore Product Support** to go to the support page for your device. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**.

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

Updating the BIOS from the One-Time boot menu

To update the BIOS from the One-Time boot menu, see Knowledge base article 000128928 at Dell Support Site.

System and setup password

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

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

Table 46. System and setup password

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

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

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

Assigning a System Setup password

Prerequisites

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

Steps

1. To enter the **System Setup**, press **F2** immediately after a power-on or reboot.
2. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
   The **Security** screen is displayed.
3. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to create the system password:
   - Password can be up to 32 characters.
   - Password must contain at least one special character: "(! " # $ % & ' * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | })"
   - The password can contain numbers from 0 to 9.
   - The password can contain alphabets A to Z and a to z.
4. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.

5. Press Y to save the changes.
   The computer restarts.

Deleting or changing an existing system password or setup password

Prerequisites

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

Steps

1. To enter the **System Setup**, press **F2** immediately after a power-on or reboot.
2. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
   The **System Security** screen is displayed.
3. In the **System Security** screen, verify that the **Password Status** is Unlocked.
4. Select **System Password**. Update or delete the existing system password, and press Enter or Tab.
5. Select **Setup Password**. Update or delete the existing setup password, and press Enter or Tab.

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

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

Clearing CMOS settings

About this task

CAUTION: Clearing CMOS settings resets the BIOS settings on your computer.

Steps

1. Turn off your computer.
2. Locate the power button.
3. Press and hold down the power button for 25s.

Clearing system and setup passwords

About this task

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

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

10

Troubleshooting

Handling swollen rechargeable Li-ion batteries

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

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

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

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

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

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

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

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

- Run tests automatically or in an interactive mode.
- Repeat the tests.
- Display or save test results.
- Run thorough tests to add more options and obtain details about any failed devices.

- View status messages that inform you when the tests are completed successfully.
- View error messages that inform you of problems encountered during testing.

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

For more information, see How to Run Dell Preboot Diagnostics and Hardware Tests on Your Dell Computer.

Running the SupportAssist Pre-Boot System Performance Check

Steps

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

Built-in self-test (BIST)

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

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

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

How to run M-BIST

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

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

Table 47. LED error codes

Blinking Pattern		Possible Problem
Red	**Blue**	
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 cycles through the solid color screens (that are described in the LCD-BIST) for 30 seconds and then turn off.

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

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

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

How to invoke the L-BIST

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

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

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

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

How to invoke the LCD-BIST

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

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

System-diagnostic lights

This section lists the system-diagnostic lights of your Alienware 16 Area-51 AA16250.

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

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

Table 48. Diagnostic light codes

Diagnostic light codes (Red, Blue)	Problem description
1,1	TPM Detection Failure
1,2	Unrecoverable SPI Flash Failure
1,5	EC unable to program i-Fuse
1,6	Generic catch-all for ungraceful EC code flow errors
1,7	Non-RPMC Flash on Boot Guard fused system
1,8	Chipset “Catastrophic Error” signal has tripped
2,1	CPU configuration or CPU failure
2,2	System board: BIOS or Read-Only Memory (ROM) failure
2,3	No memory or Random-Access Memory (RAM) detected
2,4	Memory or Random-Access Memory (RAM) failure
2,5	Invalid memory installed
2,6	System board/Chipset Error
2,7	LCD failure SBIOS message
2,8	Display power-rail failure on the system board
3,1	CMOS battery failure
3,2	PCI of Video card/chip failure
3,3	Recovery image not found
3,4	Recovery image found but invalid
3,5	EC power-rail error
3,6	Flash corruption detected by SBIOS
3,7	Timeout waiting on ME to reply to HECI message
4,1	Temporary battery failure

Recovering the operating system

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

Dell SupportAssist OS Recovery is a stand-alone tool that is preinstalled on Dell computers running the Windows operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, and restore your computer to its factory state.

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

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at Serviceability Tools at the Dell Support Site. Click **SupportAssist** and then click **SupportAssist OS Recovery**.

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

Real-Time Clock (RTC) Reset

NOTE: The Real-Time Clock (RTC) Reset clears CMOS settings and resets the BIOS settings on your computer.

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

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

Backup media and recovery options

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

Network power cycle

About this task

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

Steps

1. Turn off the computer.
2. Turn off the modem.

   NOTE: Some Internet service providers (ISPs) provide a modem and router combo device.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on the computer.

Drain flea power (perform hard reset)

About this task

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

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

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

Perform the following steps to drain the flea power:

Steps

1. Turn off the computer.
2. Disconnect the power adapter from the computer.
3. Remove the base cover.
4. Remove the battery.

   CAUTION: The battery is a Field Replaceable Unit (FRU) and the removal and installation procedures are intended for authorized service technicians only.
5. Press and hold the power button for 20 seconds to drain the flea power.
6. Install the battery.
7. Install the base cover.

8. Connect the power adapter to the computer.
9. Turn on the computer.

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

11

Getting help and contacting Alienware

Self-help resources

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

Table 49. Alienware products and online self-help resources

Self-help resources	Resource location
Information about Alienware products and services	Alienware Support Site
Contact Support	In Windows search, type **Contact Support**, and press **Enter**.
Online help for operating system	Windows Support Site
Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals, and documents.	Your Alienware 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 Dell Support Site. For more information about how to find the Service Tag for your computer, see Instructions on how to find your Service Tag or Serial Number.
Videos providing step-by-step instructions to service your computer.	Alienware Support Channel

Contacting Alienware

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

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

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

12

Revision history

Tracks all updates that are made to the document. It typically includes the date of change, version number, and a brief description of the modification. This log helps maintain transparency, accountability, and a clear timeline of progress.

Table 50. Revision history

Revision	Date	Description
A00	04-22-2025	Original publish date.
A05	07-28-2025	• Refined solid-state drive specification support. • Refined clear window support on the bottom of the computer.
A06	08-20-2025	Updated F9 and HOME key function behavior in keyboard shortcuts.