Maintenance and Service Guide

SUMMARY

This guide provides information about spare parts, removal and replacement of parts, security, backing up, and more.

Legal information

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Product notice

This guide describes features that are common to most models. Some features may not be available on your computer.

To access the latest user guides, go to http://www.hp.com/support, and follow the instructions to find your product. Then select **Manuals**.

Software terms

By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a full refund subject to the refund policy of your seller.

For any further information or to request a full refund of the price of the computer, please contact your seller.

Safety warning notice

Reduce the possibility of heat-related injuries or of overheating the computer by following the practices described.

⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to come into contact with the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by applicable safety standards.

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1 Product description

This table provides detailed product information.

Table 1-1 Product components and their descriptions

Category	Description
Product Name	**HP Fortis 11 inch G9 Q Chromebook™**
Processor	**Qualcomm® SC7180 Snapdragon™**
Display	**29.5 cm (11.6 in). High Definition (HD) (1366 × 768), white light-emitting diode (WLED), antiglare, 220 nits**
	● Ultrawide viewing angle (UWVA), 50% NTSC
	● UWVA, eDP 1.2 without PSR, touch-on panel (TOP), 50% NTSC
	● Standard viewing angle (SVA), 45% NTSC
Memory	Integrated, not customer accessible or upgradeable, supporting up to 8 GB of RAM
	LPDDR4x
	Supports the following configurations:
	● 8 GB
	● 4 GB
Primary storage	**embedded MultiMedia Controller (eMMC) v5.0**
	64 GB
	32 GB
Audio	Dual speakers
Video	HD camera, dual-array digital microphone
Wireless	**Wireless Local Area Network (WLAN) with dual antennas**
	Qualcomm Atheros b/g/n/a/ac (2 × 2) Bluetooth® 5.0 WLAN
	Wireless Wide Area Network (WWAN)
	Qualcomm X15 LTE-M WWAN
Ports	Audio-out (headphone)/audio-in (microphone) combo jack
	USB 3.2 Gen 1 Type-A port
	(2) USB Type-C® port
	SIM card slot
	Nano security slot
Keyboard	**Full size, island-style, standard notebook keyboard**

Table 1-1 Product components and their descriptions (continued)

Category	Description
Power requirements	**Battery**
	2 cell, 47 Whr
	Long life
	Fast charge
	AC adapter
	45 W, USB Type-C, standard, non-power correction factor (nPFC)
	Power cord
	C5, 1.0 m (3.3 ft)
	C5, 1.0 m (3.3 ft), sticker, conventional, straight, HF
Security	H1 Secure Microcontroller
	Nano security lock
	Camera privacy door
Operating system	Chrome OS™
	Chrome with Chrome Education Upgrade
	Chrome with Chrome Enterprise Upgrade
Serviceability	AC adapter

2 Components

Your computer features top-rated components. This chapter provides details about your components, where they are located, and how they work.

Right

Use the illustration and table to identify the components on the right side of the computer.

Table 2-1 Right-side components and their descriptions

Component		Description
(1)	SIM card slot	Supports a wireless subscriber identity module (SIM) card.
(2)	AC adapter and battery light	• White: The AC adapter is connected and the battery is fully charged. • Amber: The AC adapter is connected and the battery is charging. • Blinking amber: The battery has an error. • Off: The battery is not charging.
(3)	USB Type-C® power connector and SuperSpeed port	Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device. – and – Connects a display device that has a USB Type-C connector, providing DisplayPort™ output.

Left

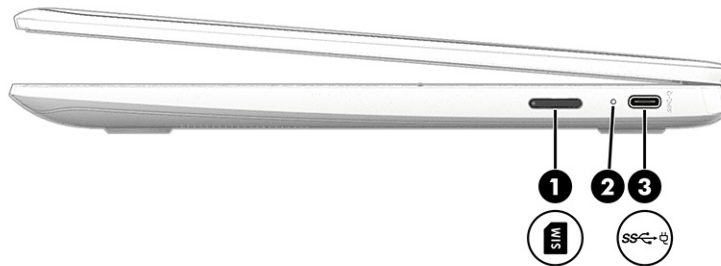Use the illustration and table to identify the components on the left side of the computer.

Table 2-2 Left-side components and their descriptions

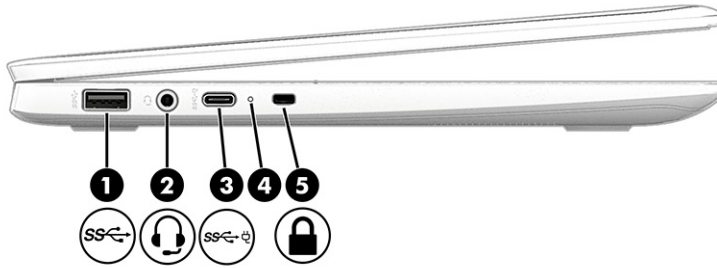| Component			Description
(1)	SS⟵	USB SuperSpeed port	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode.
			NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.
(2)	🎧	Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.
			WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*.
			NOTE: When a device is connected to the jack, the computer speakers are disabled.
(3)	SS⟵	USB Type-C® power connector and SuperSpeed port	Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery.
			– and –
			Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode.
			NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.
			– and –
			Connects a display device that has a USB Type-C connector, providing DisplayPort™ output.

Table 2-2 Left-side components and their descriptions (continued)

Component		Description
(4)	AC adapter and battery light	• White: The AC adapter is connected and the battery is fully charged.
		• Amber: The AC adapter is connected and the battery is charging.
		• Blinking amber: The battery has an error.
		• Off: The battery is not charging.
(5)	🔒 Security cable slot	Attaches an optional security cable to the computer.
		NOTE: The security cable is designed to act as a deterrent, but it might not prevent the computer from being mishandled or stolen.

Display

Use the illustration and table to identify the components on the display.
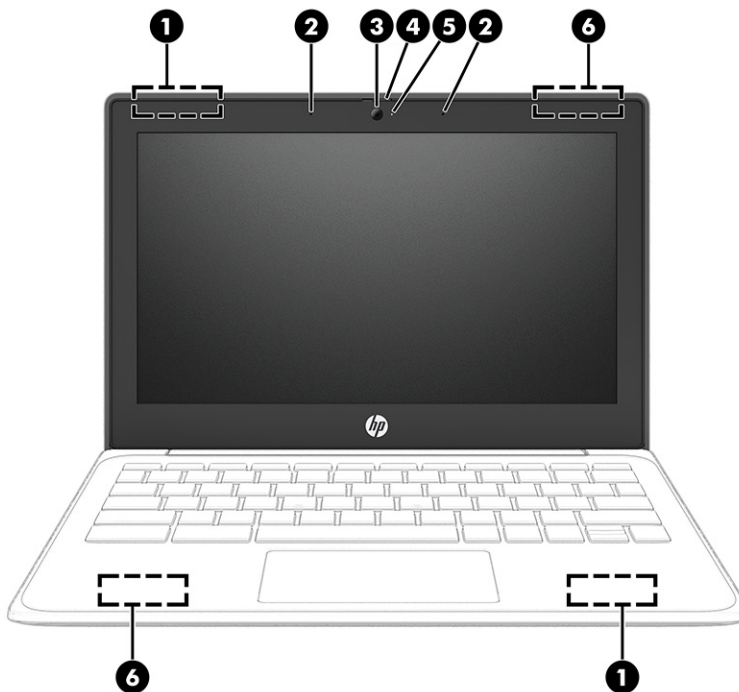
Table 2-3 Display components and their descriptions

Component		Description
(1)	WWAN antennas*	Send and receive wireless signals to communicate with wireless wide area networks (WWANs).
(2)	Internal microphones	Record sound.

Table 2-3 Display components and their descriptions (continued)

Component		Description
(3)	Camera	Allows you to video chat, record video, and record still images. NOTE: Camera functions vary depending on the camera hardware and software installed on your product.
(4)	Camera privacy cover	By default, the camera lens is uncovered, but you can slide the camera privacy cover to block the camera's view. To use the camera, slide the camera privacy cover in the opposite direction to reveal the lens.
(5)	Camera light	On: The camera is in use. Off: The camera is turned off by the software.
(6)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

Keyboard area

Keyboards can vary by language.

Touchpad

The touchpad settings and components are described here.
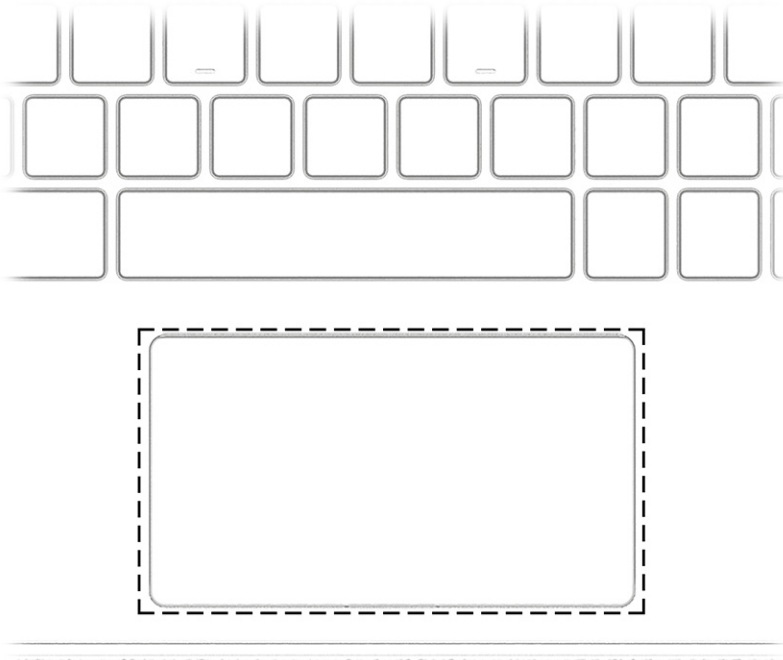
Table 2-4 Touchpad component and description

Component	Description
Touchpad zone	Reads your finger gestures to move the pointer or activate items on the screen.

Special keys

Use the illustration and table to locate the special keys.
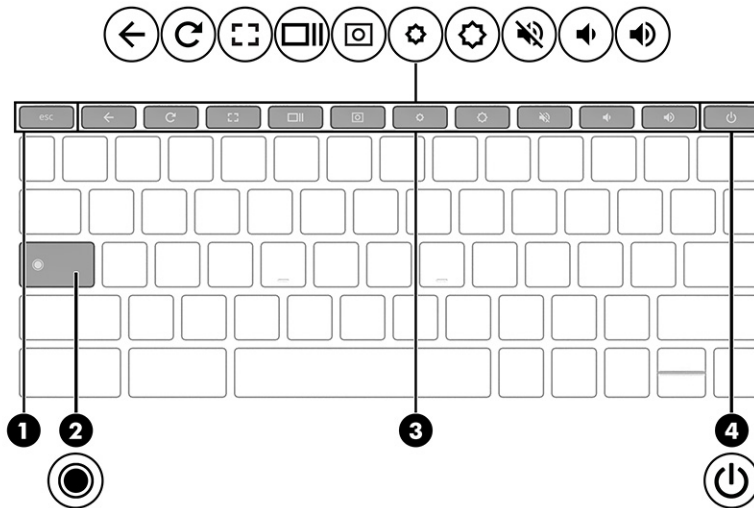
Table 2-5 Special keys and their descriptions

Component		Description
(1)	esc key	Activates certain computer functions when pressed in combination with other keys, such as tab or shift.
(2)	Search key	Opens a search box.
(3)	Action keys	Execute frequently used system functions.
(4)	Power key	● When the computer is off, press the key briefly to turn on the computer.
		● When the computer is on, press the key briefly to initiate Sleep.
		● When the computer is in the Sleep state, press the key briefly to exit Sleep (select products only).
		IMPORTANT: Pressing and holding down the power key results in the loss of unsaved information.
		If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power key for at least 10 seconds to turn off the computer.

Bottom

Use the illustration and table to identify the bottom component.

Table 2-6 Bottom component and description

Components	Description
Speakers	Produce sound.

Labels

The labels affixed to the computer provide information you might need when you troubleshoot system problems or travel internationally with the computer. Labels might be in paper form or imprinted on the product.

📝 **IMPORTANT:**   Check the following locations for the labels described in this section: the bottom of the computer, inside the battery bay, under the service door, on the back of the display, or on the bottom of a tablet kickstand.

● Service label—Provides important information to identify your computer. When contacting support, you might be asked for the serial number, the product number, or the model number. Locate this information before you contact support.

Your service label will resemble one of the following examples. Refer to the illustration that most closely matches the service label on your computer.
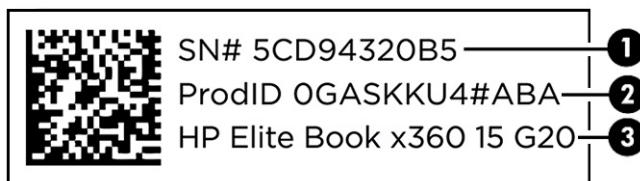
Table 2-7 Service label components

Component	
(1)	Serial number

Table 2-7 Service label components (continued)

Component	
(2)	Product ID
(3)	HP product name

HP Product Name — ❶
ProdID XXXXXXX — ❷
SN# XXXXXXXXXX — ❸
Warranty 1y1y0y — ❹
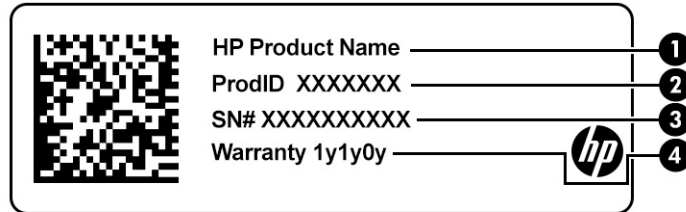
Table 2-8 Service label components

Component	
(1)	HP product name
(2)	Product ID
(3)	Serial number
(4)	Warranty period

XXXXXXXXXXXXXXXXXXXX   Warranty XXXXXX   www.hp.com
ProdID XXXXXXXXXX   SN# XXXXXXXXXX   输入/输入/ INPUT : xxxxxxxxxxxxxxxx
單計型電腦 / 便携式计算机   型號/型号/RMN:TPN-QXXX   Made in China   中國製造/中国制造
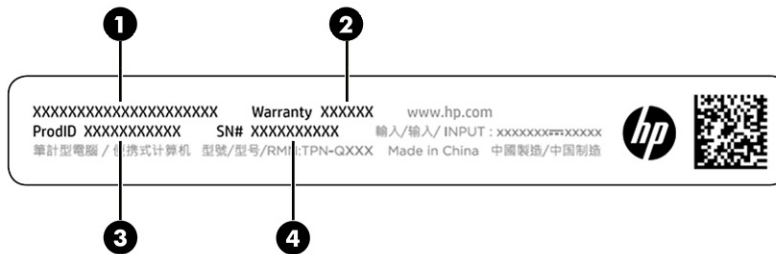
Table 2-9 Service label components

Component	
(1)	HP product name
(2)	Warranty period
(3)	Product ID
(4)	Serial number

● Regulatory labels—Provide regulatory information about the computer.

● Wireless certification labels—Provide information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

3 Illustrated parts catalog

Use this chapter to determine the spare parts that are available for the computer.

Computer major components

To identify the computer major components, use this illustration and table.

> **NOTE:** HP continually improves and changes product parts. For complete and current information about supported parts for your computer, go to http://partsurfer.hp.com, select your country or region, and then follow the on-screen instructions.

> **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer.
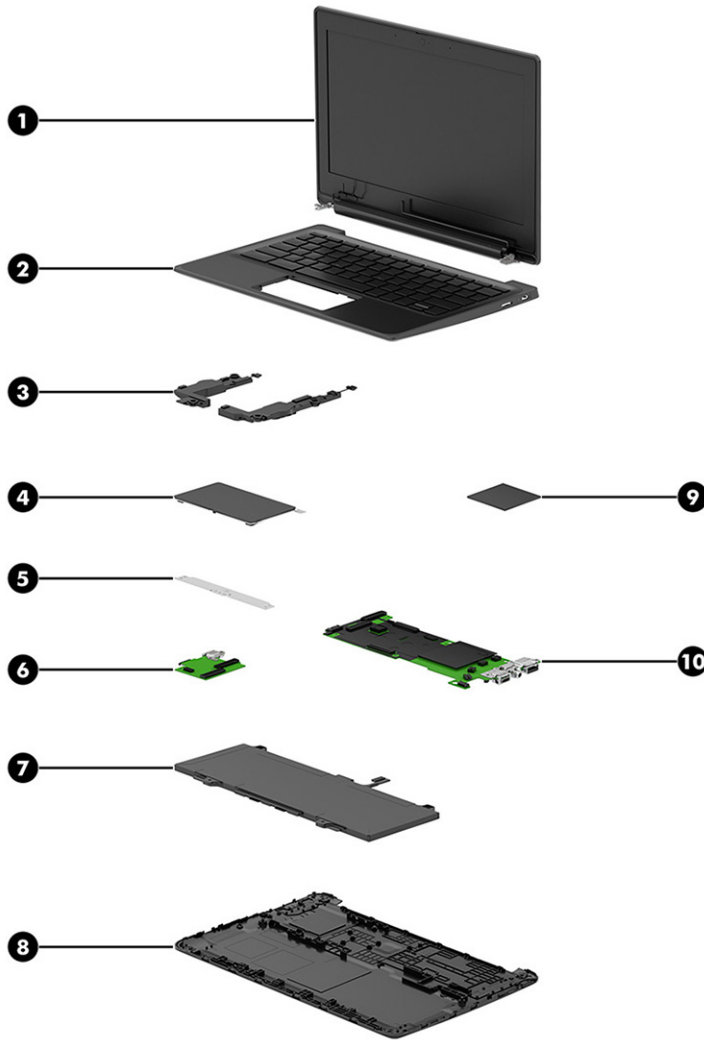
Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	**Display assembly**	
	NOTE: Display spare parts are available only as subcomponents. For spare part information, see Display assembly subcomponents on page 11.	
(2)	**Top cover with keyboard**	N17121-xxx
	NOTE: For a detailed list of country codes, see Top cover with keyboard on page 44.	
(3)	**Speakers**	N19725-001
(4)	**Touchpad**	N19727-001
	NOTE: The touchpad cable is available in the Cable Kit as spare part number N19718-001.	
(5)	**Touchpad bracket** (available in the Bracket Kit)	N19724-001
(6)	**USB board** (includes bracket)	N19728-001
	NOTE: The USB board cable is available in the Cable Kit as spare part number N19718-001. The USB bracket is available in the Bracket Kit as spare part number N19724-001	
(7)	**Battery** (2 cell, 47 Wh)	M25914-006
(8)	**Bottom cover**	N19726-001
(9)	**Thermal pad**	N19723-001
(10)	**System board**	
	Includes processor, 64 GB of eMMC storage, and 8 GB of RAM	N17117-001
	Includes processor, 32 GB of eMMC storage, and 8 GB of RAM	N17116-001
	Includes processor, 32 GB of eMMC storage, and 4 GB of RAM	N17115-001

Display assembly subcomponents

To identify the display assembly subcomponents, use this illustration and table.
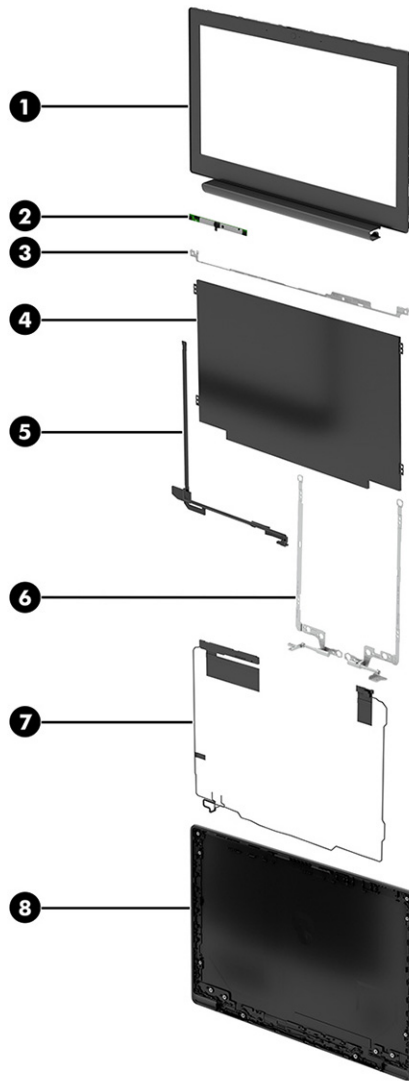
Table 3-2 Display component descriptions and part numbers

Item	Component	Spare part number
(1)	**Bezel**	N19714-001
(2)	**Camera module** (includes bezel adhesives)	N20114-001
(3)	**Display top bracket** (includes bezel adhesives)	N19715-001
(4)	**Display panel** (includes bezel adhesives)	
	SVA	N17118-001
	UWVA	N17119-001
	UWVA, touch-on panel (TOP)	N17120-001
(5)	**Display cable** (includes bezel adhesives)	
	Touch models	N19716-001
	Nontouch models	N19717-001

Table 3-2 Display component descriptions and part numbers (continued)

Item	Component	Spare part number
(6)	**Display hinges** (include bezel adhesives)	N19719-001
(7)	**WLAN/WWAN antenna kit** (includes bezel adhesives)	N20115-001
(8)	**Display back cover** (includes bezel adhesives)	N19712-001
*	**Antenna cable bracket and display cable bracket** (included in the Bracket Kit)	N19724-001

*not illustrated

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-3 Miscellaneous part descriptions and part numbers

Component	Spare part number
AC adapter (45 W, nPFC, 3 pin, 1.8 m [6 ft])	L43407-001
Plastics Kit (includes Mylar and fabric)	N19721-001
Rubber Kit	N19722-001
Bracket Kit (includes WWAN bracket, left and right I/O brackets, left and right USB-C® brackets, SIM bracket, antenna cable bracket, display cable bracket, and touchpad bracket)	N19724-001
USB-C-to-RJ-45 (network) adapter	918779-001
USB-C-to-VGA adapter	831751-001
USB-C-to-USB 3.0 adapter	814618-001
USB-C-to-DisplayPort adapter	831753-001
USB-C-to-USB-A hub	916838-001
USB-C travel hub	L72056-001
HP Prelude Pro 15.6-inch backpack	M03617-001
HP Prelude Pro 15.6-inch top load case	M03618-001
HP USB travel mouse	757770-001
HP Bluetooth travel mouse	L62043-001
HP nano lock	918431-001
HP Sure Key cable lock	L65088-001
Screw Kit	N19720-001
Power cord (C5, 1.0 m (3.3 ft), conventional)	
For use in Argentina	L19357-001
For use in Australia	L19358-001
For use in Brazil	L19359-001
For use in Denmark	L19360-001
For use in Europe	L19361-001

Table 3-3 Miscellaneous part descriptions and part numbers (continued)

Component	Spare part number
For use in Europe (bundle)	N16170-001
For use in India	L19363-001
For use in Israel	L19362-001
For use in Italy	L19364-001
For use in North America	L19367-001
For use in South Africa	L19369-001
For use in South Korea	L19366-001
For use in Switzerland	L19370-001
For use in Taiwan	L19372-001
For use in Thailand	L19371-001
For use in Thailand (bundle)	M85418-001
For use in the United Kingdom	L19373-001
Power cord (C5, 1.8 m (6 ft), conventional)	
For use in North America	L19367-002

4 Removal and replacement procedures preliminary requirements

Use this information to properly prepare to disassemble and reassemble the computer.

Tools required

You need the following tools to complete the removal and replacement procedures:

- Nonconductive, nonmarking pry tool
- Magnetic Phillips P1 screwdriver

Service considerations

The following sections include some of the considerations that you must keep in mind during disassembly and assembly procedures.

> **NOTE:** As you remove each subassembly from the computer, place the subassembly (and all accompanying screws) away from the work area to prevent damage.

Plastic parts

Using excessive force during disassembly and reassembly can damage plastic parts.

Cables and connectors

Handle cables with extreme care to avoid damage.

> **IMPORTANT:** When servicing the computer, be sure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Be sure that cables are routed so that they cannot be caught or snagged as you remove or replace parts. Handle flex cables with extreme care; these cables tear easily.

Drive handling

Note the following guidelines when handling drives.

> **IMPORTANT:** Drives are fragile components. Handle them with care. To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

- Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.

- Before removing an optical drive, be sure that a disc is not in the drive, and be sure that the optical drive tray is closed.

- Handle drives on surfaces covered with at least 2.54 cm (1 inch) of shock-proof foam.

- Avoid dropping drives from any height onto any surface.

- After removing a hard drive or an optical drive, place it in a static-proof bag.

- Avoid exposing an internal hard drive to products that have magnetic fields, such as monitors or speakers.

- Avoid exposing a drive to temperature extremes or liquids.

- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging, and label the package "FRAGILE."

Electrostatic discharge information

A sudden discharge of static electricity from your finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) might not appear to be affected at all and can work perfectly throughout a normal cycle. The device might function normally for a while, but it has been degraded in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

IMPORTANT: To prevent damage to the device when you remove or install internal components, observe these precautions:

- Keep components in their electrostatic-safe containers until you are ready to install them.

- Before touching an electronic component, discharge static electricity by using the guidelines described in Personal grounding methods and equipment on page 17.

- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.

- If you remove a component, place it in an electrostatic-safe container.

Generating static electricity

Follow these static electricity guidelines:

- Different activities generate different amounts of static electricity.

- Static electricity increases as humidity decreases.

Table 4-1 Static electricity occurrence based on activity and humidity

Event	Relative humidity		
	55%	40%	10%
Walking across carpet	7,500 V	15,000 V	35,000 V
Walking across vinyl floor	3,000 V	5,000 V	12,000 V
Motions of bench worker	400 V	800 V	6,000 V
Removing DIPs (dual in-line packages) from plastic tube	400 V	700 V	2,000 V
Removing DIPs from vinyl tray	2,000 V	4,000 V	11,500 V
Removing DIPs from polystyrene foam	3,500 V	5,000 V	14,500 V
Removing bubble pack from PCB (printed circuit board)	7,000 V	20,000 V	26,500 V
Packing PCBs in foam-lined box	5,000 V	11,000 V	21,000 V
Multiple electric components can be packaged together in plastic tubes, trays, or polystyrene foam.			

NOTE: As little as 700 V of static electricity can degrade a product.

Preventing electrostatic damage to equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity.

The following packaging and grounding precautions are necessary to prevent static electricity damage to electronic components:

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.

- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.

- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.

- Place items on a grounded surface before removing them from their container.

- Always be properly grounded when touching a sensitive component or assembly.

- Avoid contact with pins, leads, or circuitry.

- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Personal grounding methods and equipment

Using certain equipment can prevent static electricity damage to electronic components.

- **Wrist straps** are flexible straps with a maximum of 1 MΩ ±10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.

- You can use **heel straps, toe straps, and boot straps** at standing workstations. These straps are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of 1 MΩ ±10% resistance between the operator and ground.

Table 4-2 Static shielding protection levels

Static shielding protection levels	
Method	Voltage
Antistatic plastic	1,500
Carbon-loaded plastic	7,500
Metallized laminate	15,000

Grounding the work area

To prevent static damage at the work area, follow these precautions:

- Cover the work surface with approved static-dissipative material.

- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.

- Use static-dissipative mats, foot straps, or air ionizers to give added protection.

- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.

- Turn off power and input signals before inserting and removing connectors or test equipment.

- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.

- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and polystyrene foam.

- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.

- Avoid contact with pins, leads, or circuitry.

Recommended materials and equipment

HP recommends certain materials and equipment to prevent static electricity:

- Antistatic tape

- Antistatic smocks, aprons, or sleeve protectors

- Conductive bins and other assembly or soldering aids

- Conductive foam

- Conductive tabletop workstations with ground cord of 1 MΩ ±10% resistance

- Static-dissipative table or floor mats with hard tie to ground

- Field service kits

- Static awareness labels

- Wrist straps and footwear straps providing 1 MΩ ±10% resistance

- Material handling packages

- Conductive plastic bags

- Conductive plastic tubes

- Conductive tote boxes

- Opaque shielding bags

- Transparent metallized shielding bags

- Transparent shielding tubes

Cleaning your computer

Cleaning your computer regularly removes dirt and debris so that your device continues to operate at its best. Use the following information to safely clean the external surfaces of your computer.

Enabling HP Easy Clean (select products only)

HP Easy Clean helps you to avoid accidental input while you clean the computer surfaces. This software disables devices such as the keyboard, touch screen, and touchpad for a preset amount of time so that you can clean all computer surfaces.

1. Start HP Easy Clean in one of the following ways:

   - Select the **Start** menu, and then select **HP Easy Clean**.

     – or –

   - Select the **HP Easy Clean** icon in the taskbar.

     – or –

   - Select **Start**, and then select the **HP Easy Clean** tile.

2. Now that your device is disabled for a short period, see for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See for guidelines to help prevent the spread of harmful bacteria and viruses.

Removing dirt and debris from your computer

Here are the recommended steps to clean dirt and debris from your computer.

For computers with wood veneer, see .

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.

2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

   ⚠ **CAUTION:** To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with water. The cloth should be moist, but not dripping wet.

IMPORTANT: To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

IMPORTANT: Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

See for recommended steps to clean the high-touch, external surfaces on your computer to help prevent the spread of harmful bacteria and viruses.

Cleaning your computer with a disinfectant

The World Health Organization (WHO) recommends cleaning surfaces, followed by disinfection, as a best practice for preventing the spread of viral respiratory illnesses and harmful bacteria.

After cleaning the external surfaces of your computer using the steps in , , or both, you might also choose to clean the surfaces with a disinfectant. A disinfectant that is within HP's cleaning guidelines is an alcohol solution consisting of 70% isopropyl alcohol and 30% water. This solution is also known as rubbing alcohol and is sold in most stores.

Follow these steps when disinfecting high-touch, external surfaces on your computer:

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.

2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

CAUTION: To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with a mixture of 70% isopropyl alcohol and 30% water. The cloth should be moist, but not dripping wet.

CAUTION: Do not use any of the following chemicals or any solutions that contain them, including spray-based surface cleaners: bleach, peroxides (including hydrogen peroxide), acetone, ammonia, ethyl alcohol, methylene chloride, or any petroleum-based materials, such as gasoline, paint thinner, benzene, or toluene.

IMPORTANT: To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

IMPORTANT: Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly

on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

Caring for wood veneer (select products only)

Your product might feature high-quality wood veneer. As with all natural wood products, proper care is important for best results over the life of the product. Because of the nature of natural wood, you might see unique variations in the grain pattern or subtle variations in color, which are normal.

- Clean the wood with a dry, static-free microfiber cloth or chamois.

- Avoid cleaning products containing substances such as ammonia, methylene chloride, acetone, turpentine, or other petroleum-based solvents.

- Do not expose the wood to sun or moisture for long periods of time.

- If the wood becomes wet, dry it by dabbing with an absorbent, lint-free cloth.

- Avoid contact with any substance that might dye or discolor the wood.

- Avoid contact with sharp objects or rough surfaces that might scratch the wood.

See Removing dirt and debris from your computer on page 19 for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See Cleaning your computer with a disinfectant on page 20 for sanitizing guidelines to help prevent the spread of harmful bacteria and viruses.

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.

- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.

- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.

- Place items on a grounded surface before removing items from their containers.

- Always be properly grounded when touching a component or assembly.

- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.

- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Accessing support information

To find the HP support that you need, use this information.

Table 4-3 Support information locations

Service consideration	Path to access information

Records of reported failure incidents stored on the computer	**Windows:**
	
	Pre-operating system failures are logged in the BIOS Event Log. To view the BIOS Event Log:
	
	1. Press the power button.
	
	2. Immediately and repeatedly press esc when the power button light turns white.
	
	    NOTE: If you do not press esc at the appropriate time, you must restart the computer and again repeatedly press esc when the power button light turns white to access the utility.
	
	3. Press f10 to enter the BIOS setup.
	
	4. (On commercial products) Under the **Main** tab, select **BIOS event log**, and then select **View BIOS Event Log**.
	
	    - or -
	
	    (On consumer products) Under the **Main** tab, select **System Log**.
	
	Post-operating system failures are logged in the Event Viewer.
	
	1. Turn on the computer and allow the operating system to open.
	
	2. Select the search icon 🔍 in the taskbar.
	
	3. Type `Event Viewer`, and then press enter.
	
	4. Select the log from the left panel. Details display in the right panel.
	
	Chrome:
	
	1. Go to support.google.com/chrome.
	
	2. Search `collect Chrome device logs`.

Technical bulletins	To locate technical bulletins: 1. Go to www.hp.com. 2. Place the cursor over **Problem solving** to display more options. 3. Select **Support & Troubleshooting**. 4. Type the serial number, product number, or product name to go to the product support page. 5. Select **Advisories** to view technical bulletins.
Repair professionals	To locate repair professionals: 1. Go to www.hp.com. 2. Place the cursor over **Support resources** to display more options. 3. Select **Authorized service providers**.

Table 4-3 Support information locations (continued)

Service consideration	Path to access information
Component and diagnosis information, failure detection, and required action	To locate diagnosis information and actions: 1. Go to http://www.hp.com/go/techcenter/pcdiags. 2. Select **Get Support**. 3. Near the bottom of the window, select **Notebook PCs**, and then select your location.

5 Removal and replacement procedures for authorized service provider parts

This chapter provides removal and replacement procedures for authorized service provider parts.

IMPORTANT: Only an authorized service provider should access the components described in this chapter. Accessing these parts can damage the computer or void the warranty.

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer.

Component replacement procedures

To remove and replace computer components, use the procedures described in this section.

NOTE: HP continually improves and changes product parts. For complete and current information about supported parts for your computer, go to http://partsurfer.hp.com, select your country or region, and then follow the on-screen instructions.

Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

To remove and replace computer components, use these procedures:

For initial safety procedures, see .

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

Bottom cover

To remove the bottom cover, use this procedure and illustration.

**Table 5-1 Bottom cover description and part number**

Description	Spare part number
Bottom cover	N19726-001

Before removing the bottom cover, prepare the computer for disassembly (see).

Remove the bottom cover:

1. Close the computer and rest it upside down on a flat work surface.

2. Remove the two Phillips M2.5 × 7.5 screws **(1)** from the top corners of the bottom cover.

3. Loosen the two captive Phillips screws **(2)** from the middle of the bottom cover.

4. Remove the two Phillips M2.0 × 5.0 screws **(3)** from the bottom corners of the bottom cover.
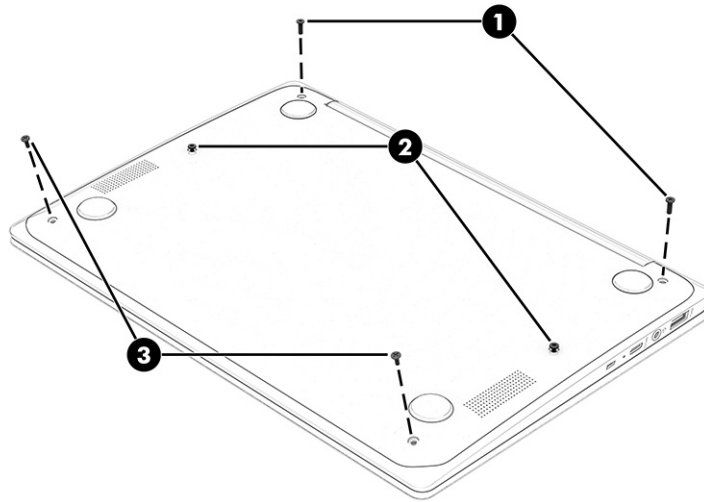
5. Open the computer **(1)**.

6. Hold the top cover at both bottom corners and press on the corners of the top cover with your thumbs to separate the covers **(2)**.

7. Remove the bottom cover **(3)**.

To replace the bottom cover, reverse the removal procedures.

Battery

To remove the battery, use this procedure and illustration.

Table 5-2 Battery description and part number

Description	Spare part number
Battery, 2 cell, 47 Whr (includes adhesive foil)	M25914-006

⚠ **WARNING!**   To avoid personal injury and damage to the product:

- Do *not* puncture, twist, or crack the battery.

- Do *not* cause an external puncture or rupture to the battery, which can cause a short inside the battery that can result in battery thermal runaway.

- Do *not* handle or touch the battery enclosure with sharp objects such as tweezers or pliers, which might puncture the battery.

- Do *not* compress or squeeze the battery case with tools or heavy objects stacked on top of the case. These actions can apply undue force on the battery.

- Do *not* touch the connectors with any metallic surface or object, such as metal tools, screws, or coins, which can cause shorting across the connectors.

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

⚠ **WARNING!**   To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

📝 **IMPORTANT:**   Removing a battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before you remove the battery.
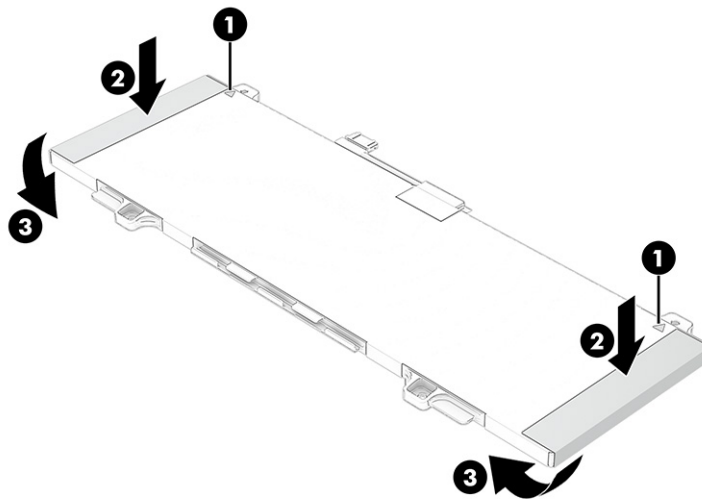
Remove the battery:

1. Disconnect the battery cable **(1)** from the system board.

2. Remove the four Phillips M2.0 × 4.0 screws **(2)** that secure the battery to the computer.

3. Remove the battery **(3)**.
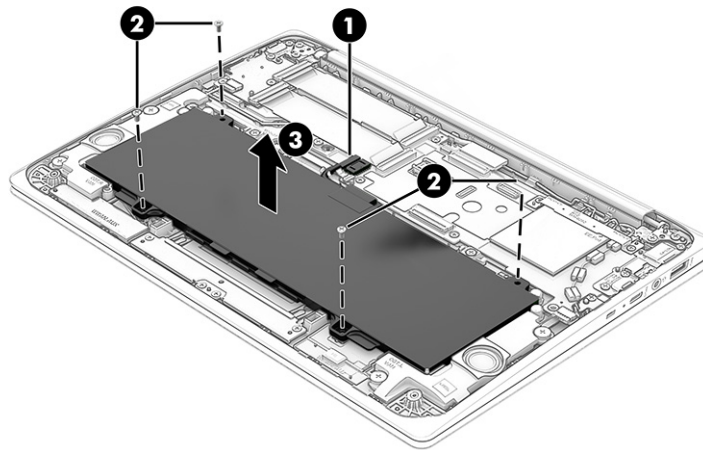
4. When installing a new battery, install one piece of adhesive foil at the arrow **(1)** on top of each side of the battery **(2)**, and then wrap the foil around the edge and back of both sides of the battery **(3)**.

To insert the battery, reverse the removal procedures.

Display subcomponents (without removing the display)

You can remove some display subcomponents without removing the entire display assembly from the computer. To remove the bezel, display panel, and camera module, use these procedures and illustrations.

Table 5-3 Display subcomponent descriptions and part numbers

Description	Spare part number
Bezel	N14102-001
Display panel, FHD, 250 nits, 144 Hz	N13805-001

Table 5-3 Display subcomponent descriptions and part numbers (continued)

| Description	Spare part number
Display panel, FHD, 300 nits	N13806-001
Display panel, FHD, 300 nits, 144 Hz	N13807-001
Display panel, QHD, 300 nits, 165 Hz	N13808-001
Top bracket	N14108-001
Camera module	N14112-001

Before removing the display subcomponents, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Disconnect the battery cable from the system board (see).

Remove the display subcomponents:

1. Open the computer to 180° **(1)**.

2. Use a tool to release the top, left and right sides, and then bottom of the bezel **(2)**.

3. Use a tool to release the hinge cover from the computer **(3)**.
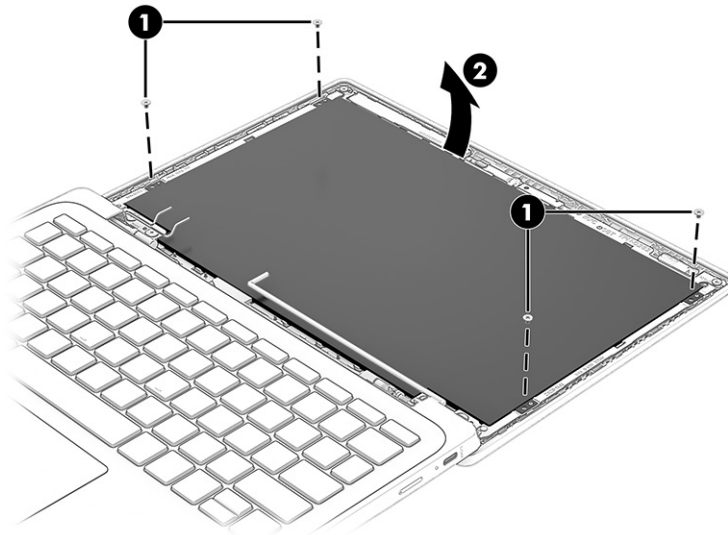
4. Remove the bezel **(4)**.

📝 **NOTE:** The bezel is secured with adhesive. When replacing the bezel, be sure to replace the adhesive, which is available in the display adhesive kit as spare part number N14114-001.
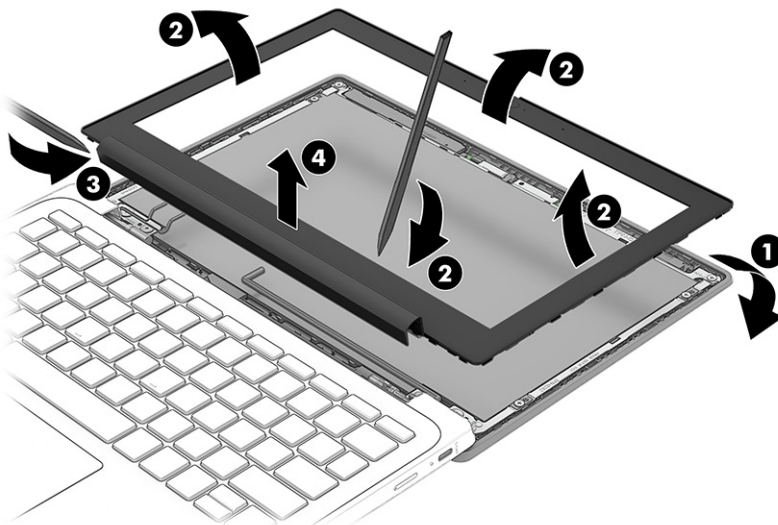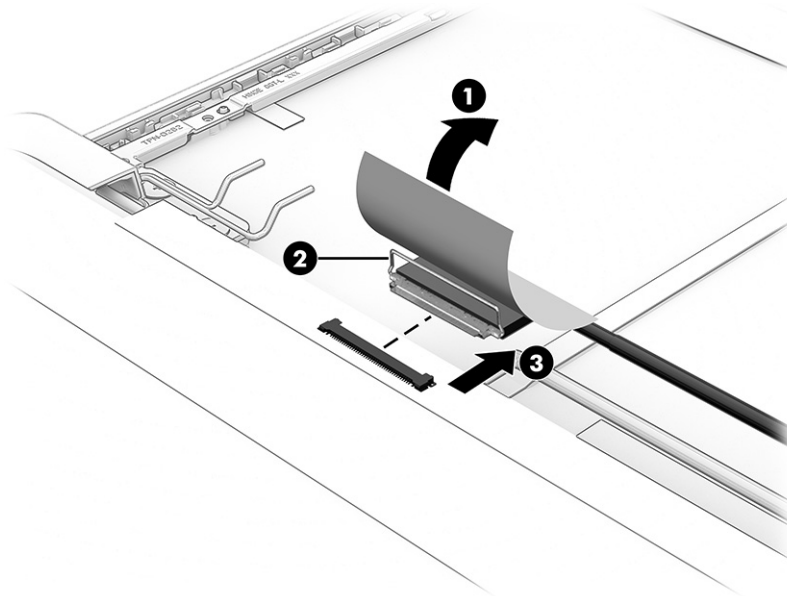

5. To remove the display panel:

   a. Remove the four Phillips M 2.0 × 2.5 screws **(1)** from the display side panel bracket.

**b.** Lift the top panel and rotate it onto the keyboard **(2)**.

c. Peel the tape off the connector on the back of the display panel **(1)**.

d. Rotate the wire retention latch off the connector **(2)**.

e. Pull the cable out of the connector **(3)**.

📝 **NOTE:** To replace the display cable, you have to remove the display assembly from the computer. For more information, see Display assembly on page 38.


6. To remove the camera module:

a. Remove the two Phillips M2.0 × 3.0 screws **(1)** from top bracket, and then remove the bracket from the display rear cover **(2)**.
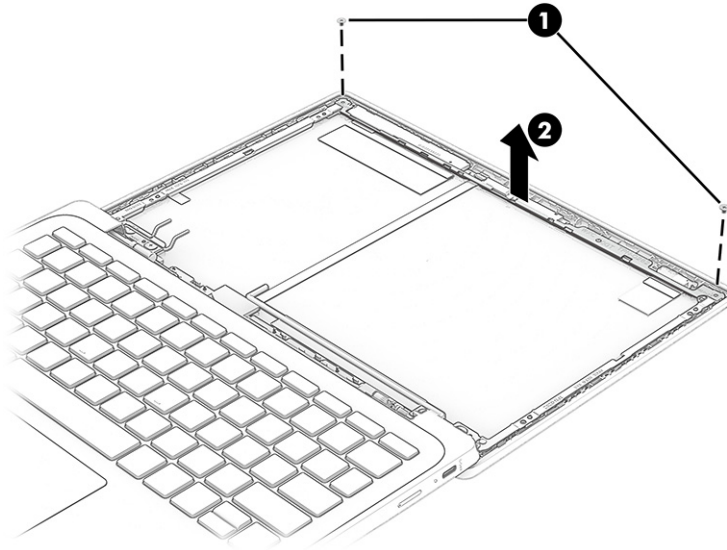
b. Use to tool to detach the module **(1)** from the display back cover. The module is attached to the display back cover with double-sided adhesive.

c. Disconnect the cable from the reverse ZIF connector on the camera module **(2)**. Note that the cable routes underneath the camera module.
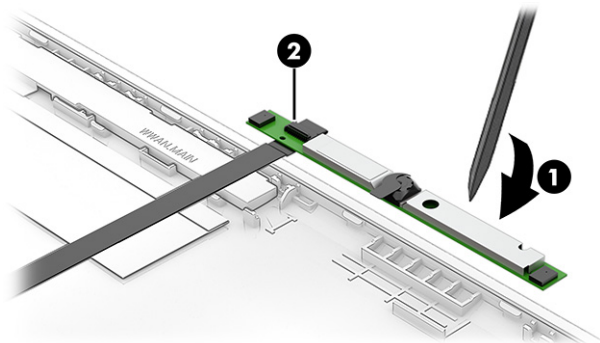
To install display subcomponents, reverse the removal procedures.

Speakers

To remove the speakers, use this procedure and illustration.

Table 5-4 Speaker description and part number

| Description	Spare part number
Speaker Kit	N19725-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Disconnect the battery cable from the system board (see).

Remove the speakers:

1. Disconnect the speaker cables from the system board **(1)**.

2. Remove the two Phillips M2.0 × 2.5 screws **(2)** that secure each speaker to the computer.

3. Remove the speakers from the computer **(3)** .
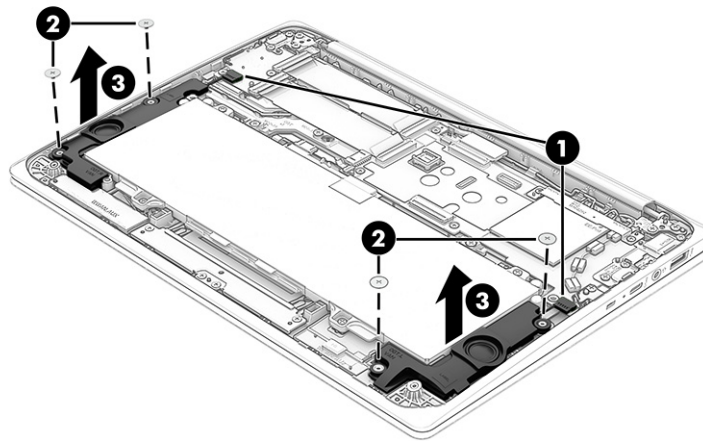
To install the speakers, reverse this procedure.

Touchpad

To remove the touchpad, use this procedure and illustration. Before removing the touchpad, you can remove the system board, heat sink, and fans as an assembly so you do not have to disturb the thermal material.

**Table 5-5** Touchpad description and part number

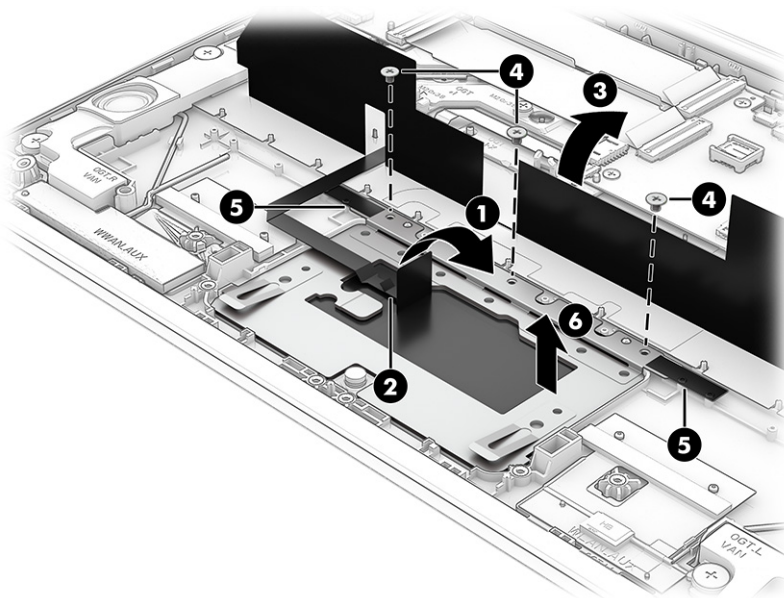| Description	Spare part number
Touchpad	N19727-001
Touchpad cable (included in the Cable Kit)	N19718-001
Touchpad bracket (included in the Bracket Kit)	N19724-001

Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the touchpad:

1. Remove the four Phillips M2.0 × 2.5 screws **(1)** that secure the touchpad bracket to the computer, and then remove the bracket **(2)**.
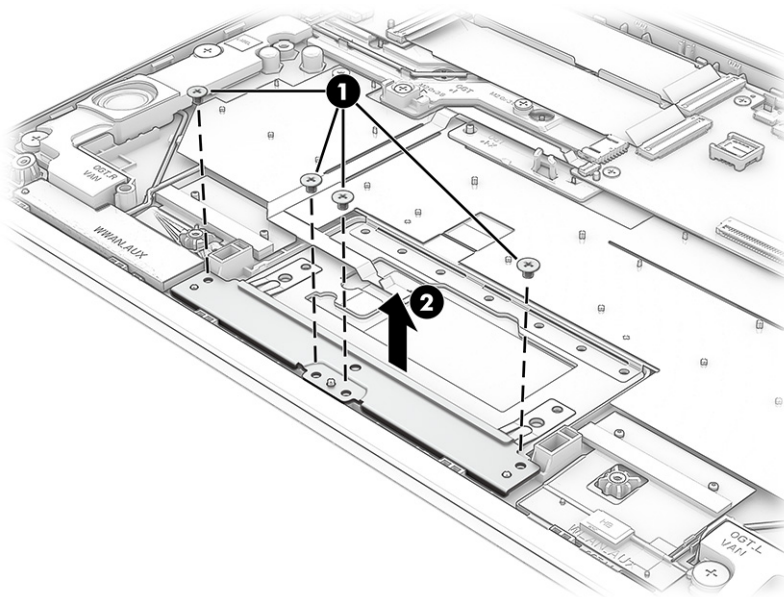
2. Remove the tape from the connector on the touchpad **(1)**, and then disconnect the touchpad cable **(2)** from the touchpad ZIF connector.

3. Lift the protective Mylar from the screws along the top of the touchpad **(3)**.

4. Remove the three Phillips M2.0 × 2.5 screws **(4)** that secure the touchpad to the computer.

5. Remove the grounding tape from the both sides of the top of the touchpad **(5)**.

6. Remove the touchpad from the computer **(6)**.

To install the touchpad, reverse this procedure.

USB board

To remove the USB board, use this procedure and illustration. Before removing the board, you can remove the system board, heat sink, and fans as an assembly so you do not have to disturb the thermal material.

Table 5-6 USB board description and part number

Description	Spare part number
USB board (includes bracket)	N19728-001
USB board cable (included in the Cable Kit)	N19718-001
USB bracket (included in the Bracket Kit)	N19724-001

Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 24).

2. Remove the bottom cover (see Bottom cover on page 24).

3. Disconnect the battery cable from the system board (see Battery on page 25).
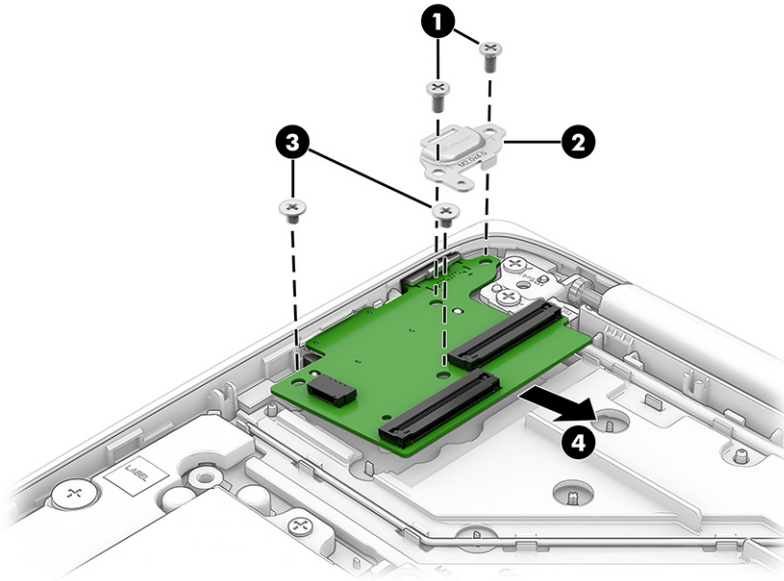
Remove the USB board:

1. Remove the SIM card holder from the slot on the side of the computer (1).

2. Lift the tape that covers the two ZIF connectors on the USB board (2).

3. Disconnect the two ribbon cables from the ZIF connectors on the USB board (3).

4. Disconnect the speaker cable from the connector on the USB board (4).
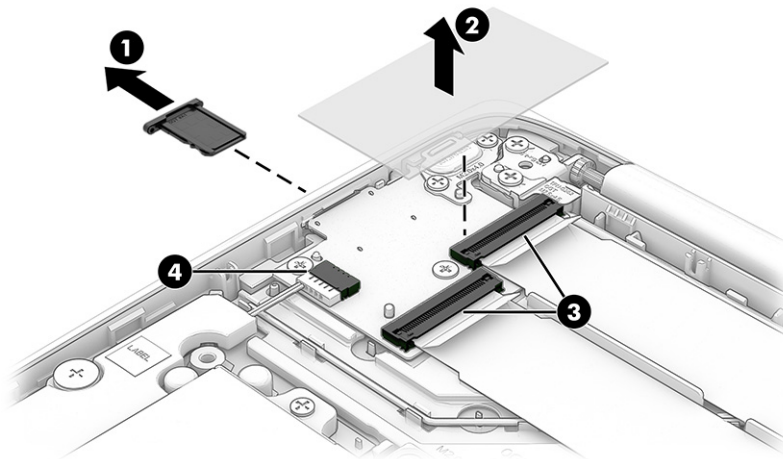
5. Remove the two Phillips M2.0 × 4.0 screws (1) that secure the USB bracket, and then remove the bracket (2).

6. Remove the two Phillips M2.0 × 2.5 screws (3) that secure the board to the computer.

7. Lift the back of the board up first, and then pull board into computer to remove it **(4)**.

To install the USB board, reverse this procedure.

System board

To remove the system board, use these procedures and illustrations.

Table 5-7 System board descriptions and part numbers

Description	Spare part number
System board with processor, 64 GB of eMMC storage, and 8 GB of RAM	N17117-001
System board with processor, 32 GB of eMMC storage, and 8 GB of RAM	N17116-001
System board with processor, 32 GB of eMMC storage, and 4 GB of RAM	N17115-001
Thermal pad	N19723-001

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 24).

2. Remove the bottom cover (see Bottom cover on page 24).

3. Remove the battery (see Battery on page 25).

4. Remove the WWAN module (see Wireless antennas, computer chassis on page 37).

Remove the system board:

1. Remove the three Phillips M2.0 × 4.0 screws **(1)** that secure the side USB bracket, and then remove the bracket **(2)**.
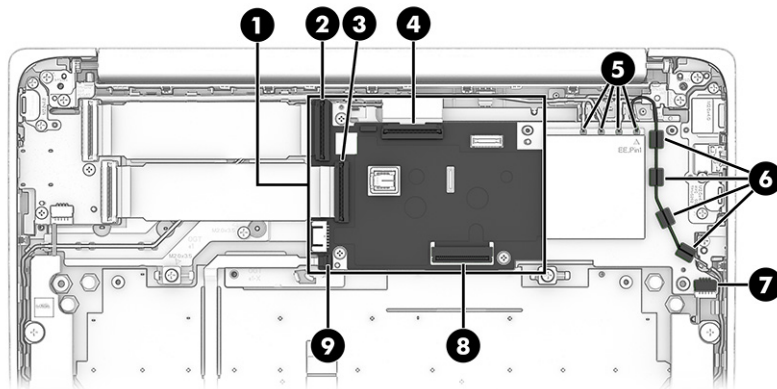
2. Remove the two Phillips M2.0 × 2.5 screws **(3)** that secure the antenna bracket, and then remove the bracket **(4)**.
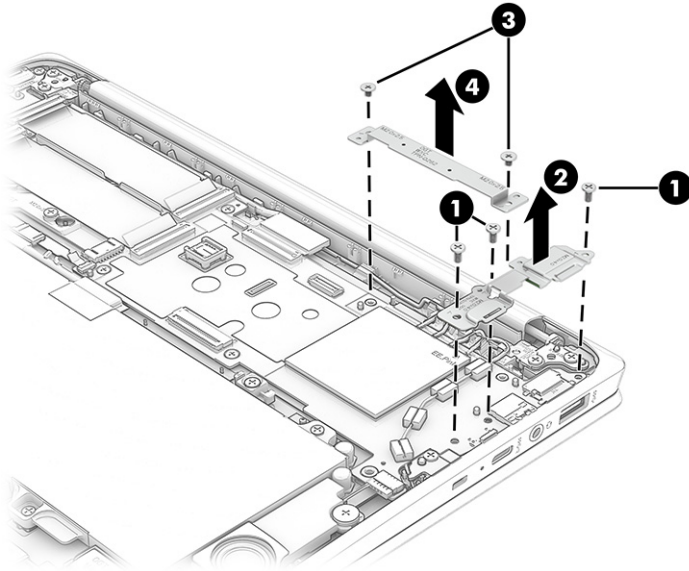

3. Lift the plastic cover that covers the connectors on system board **(1)**. Leave the cover connected as you remove the system board.

4. Disconnect the following components and cables from the system board:

   - Top USB board cable (ZIF) **(2)**

   - Bottom USB board cable (ZIF) **(3)**

   - Display cable (ZIF) **(4)**

   - Wireless antenna cables from the integrated WWAN module **(5)**

   - One right antenna cable from rubber routing paths **(6)**

   - Speaker cable (ZIF) **(7)**

   - Keyboard cable (ZIF) **(8)**

   - Touchpad cable (ZIF) **(9)**

5. Remove the three Phillips M2.0 × 2.5 screws **(1)** that secure the system board to the computer.

6. Lift the left edge of the system board up to approximately 30°, and then pull the board up and to the left to remove it from the computer **(2)**.
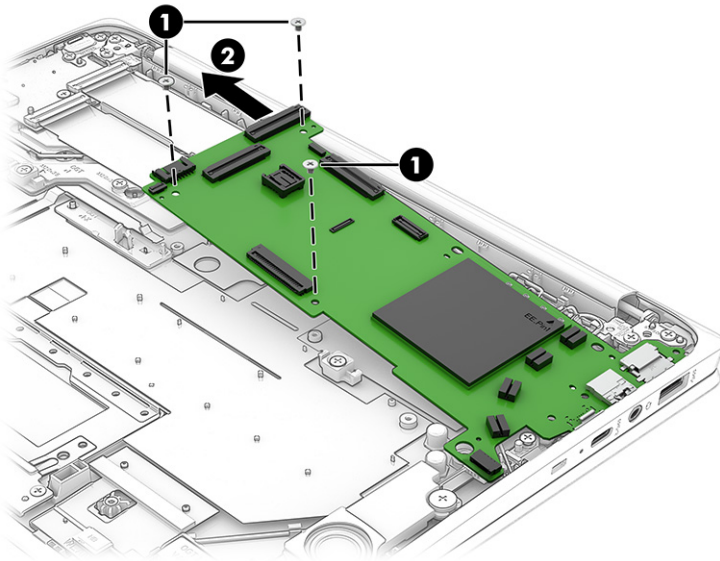
7. To remove touchpad cable, peel the cable off the computer **(1)** to remove it **(2)**. The cable is secured with adhesive.
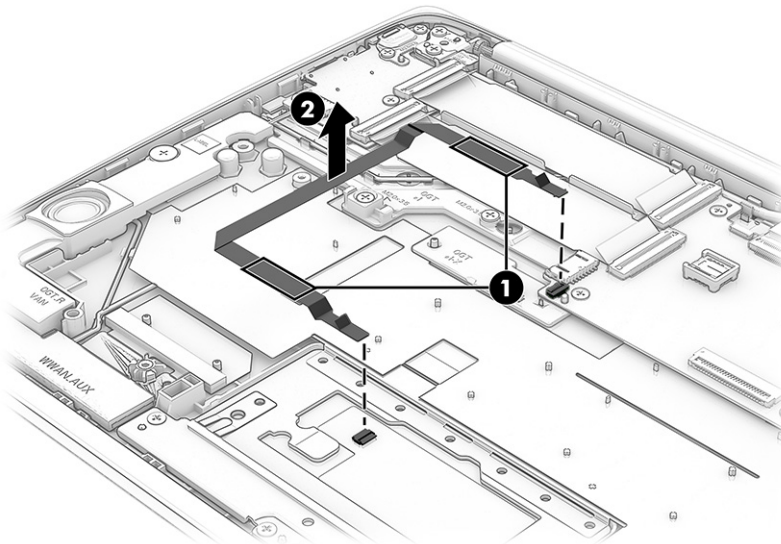
8. When installing a system board, be sure to install a thermal pad on the bottom of the board.
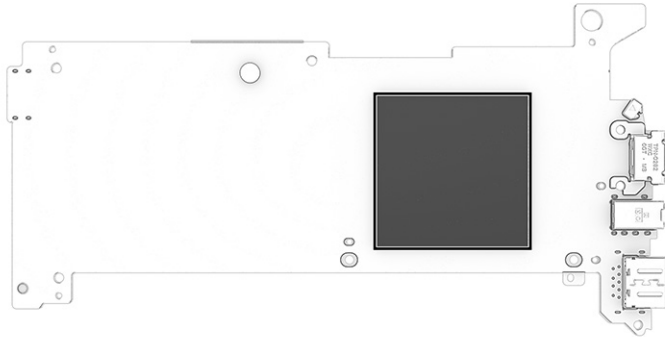
To install the system board, reverse this procedure.

Wireless antennas, computer chassis

Two wireless antennas are adhered to the computer on both sides of the touchpad. To remove the antennas, use this procedure and illustration.

Table 5-8 Wireless antennas descriptions and part numbers

Description	Spare part number
Intel XMM 7360 LTE-Advanced [Cat 9]	N13692-001

When you replace antennas, it is recommended that you replace the computer chassis and the display antennas at the same time. For more information about the display antennas, see Display assembly on page 38.

Before removing the wireless antennas, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 24).

2. Remove the bottom cover (see Bottom cover on page 24).

3. Remove the battery (see Battery on page 25).

4. Remove the speakers (see Speakers on page 30).

Remove the wireless antennas:

1. Disconnect the USB cables from the system board **(1)**, and then move the cables out of the way of the wireless antenna cables **(2)**.

2. Lift the clear tape that covers the left and right cables next to the speakers **(3)**.
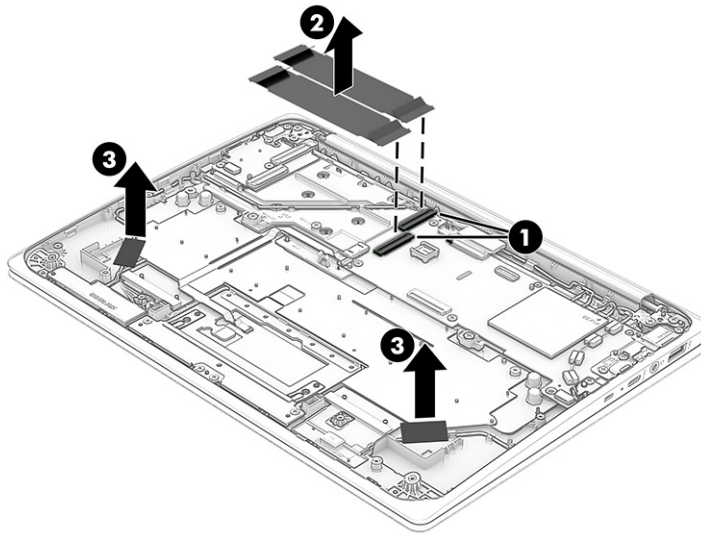
3. Remove the left cable from the routing clips along the left side of the system board, around the outside of the speaker, then under the speaker **(1)**.

4. Remove the right cable from the rubber routing pieces on the system board and under the speaker **(2)**.

5. Peel both antennas off the chassis **(3)**.
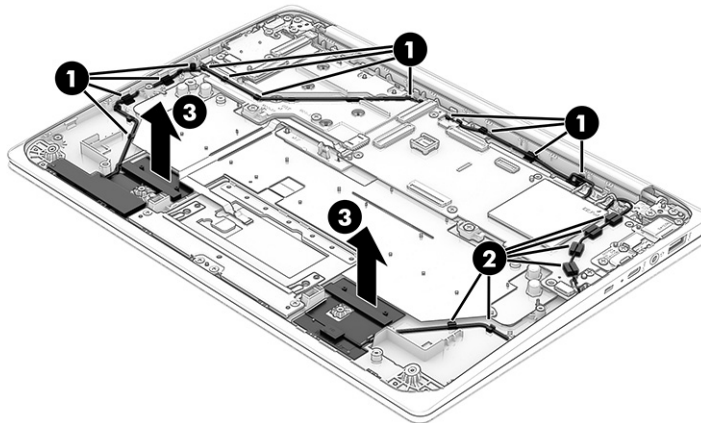
To install the wireless antennas and cables, reverse this procedure.

Display assembly

To remove and disassemble the display assembly, use these procedures and illustrations.

Full hinge-up displays are not available as spare parts. Spare parts for displays are available only at the subcomponent level.

📝 **NOTE:** You can remove the bezel, display panel, and camera module without removing the display assembly from the computer. For more information, see Display subcomponents (without removing the display) on page 27.

Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 24).

2. Remove the bottom cover (see Bottom cover on page 24).

3. Disconnect the battery cable from the system board (see Battery on page 25).

Remove the display assembly:

1. Lift the plastic from the display connector on the system board **(1)**, and then disconnect the display cable from the system board ZIF connector **(2)**.

2. Remove the two Phillips M 2.0 × 2.5 screws **(3)** from the bracket that covers the connectors, and then remove the bracket **(4)**.

3. Disconnect the four wireless antenna cables from the WWAN module integrated into the system board **(5)**. Note that you need to remove only the far left and third from the left antenna.
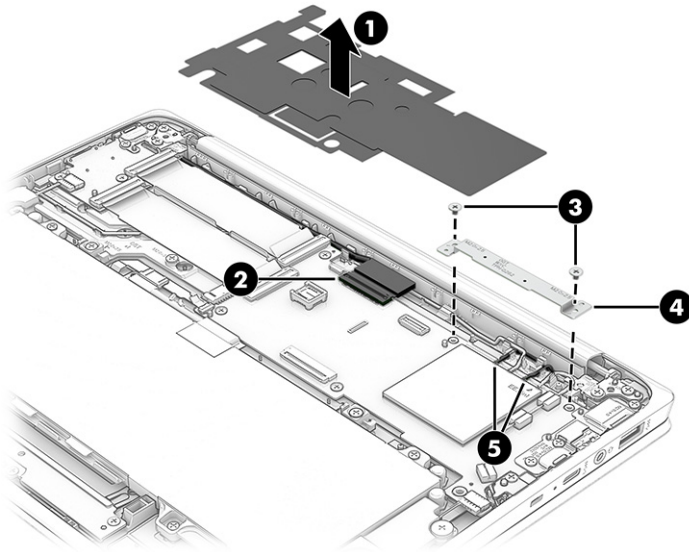
4. Remove the four Phillips M2.5 × 4.0 screws **(1)** that secure the display assembly to the computer.

5. Remove the bracket from each hinge **(2)**.

6. Open the computer to open the hinges to 90° **(3)**.

7. Remove the antenna cable from the clip in the right hinge cavity **(4)**.

8. Separate the display from the computer **(5)**.
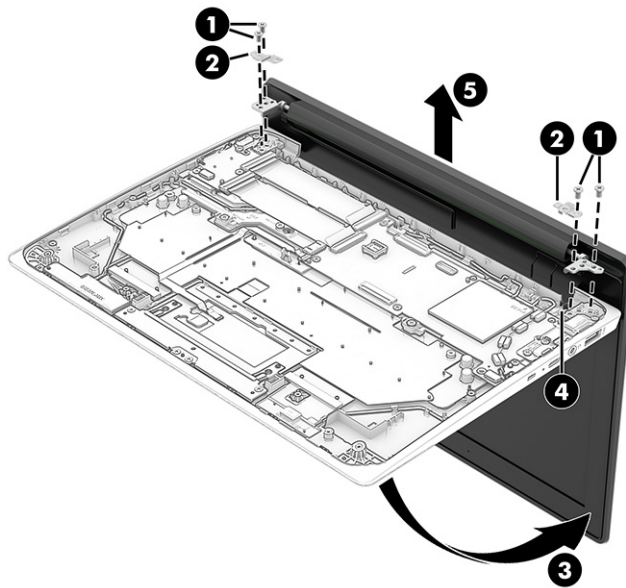
9. To remove the bezel:

    a. Open the computer to 180° **(1)**.

    b. Use a tool to release the top, left and right sides, and then bottom of the bezel **(2)**.

    c. Use a tool to release the hinge cover from the computer **(3)**.

    d. Remove the bezel **(4)**.

       The bezel is available as spare part number N19714-001.

       📝 NOTE: In this procedure, the display assembly will not be connected to the computer.
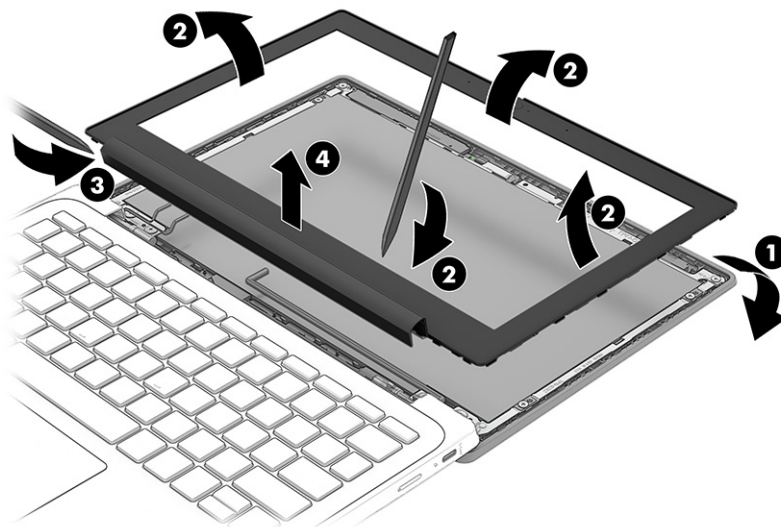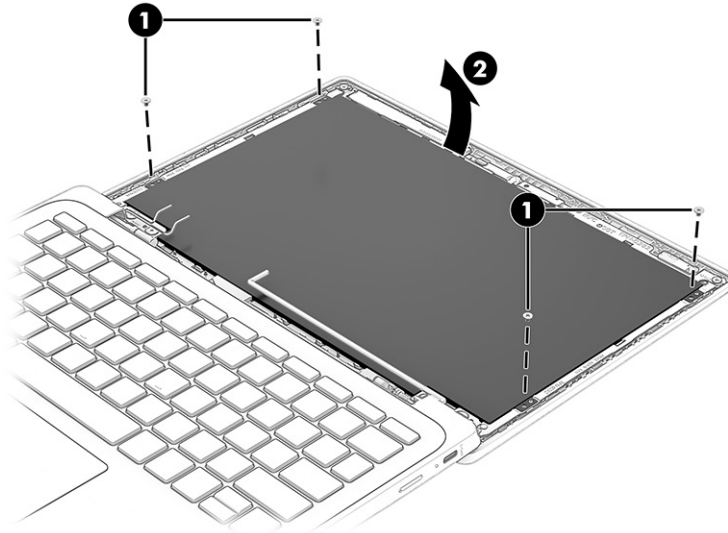
10. To remove the display panel:

a. Remove the four Phillips M 2.0 × 2.5 screws **(1)** from the display side panel brackets.

b. Lift the top panel and rotate it onto the keyboard **(2)**.

NOTE: In this procedure, the display assembly will not be connected to the computer.

c. Peel the tape off the connector on the back of the display panel **(1)**.

d. Rotate the wire retention latch off the connector **(2)**.

e. Pull the cable out of the connector **(3)**.
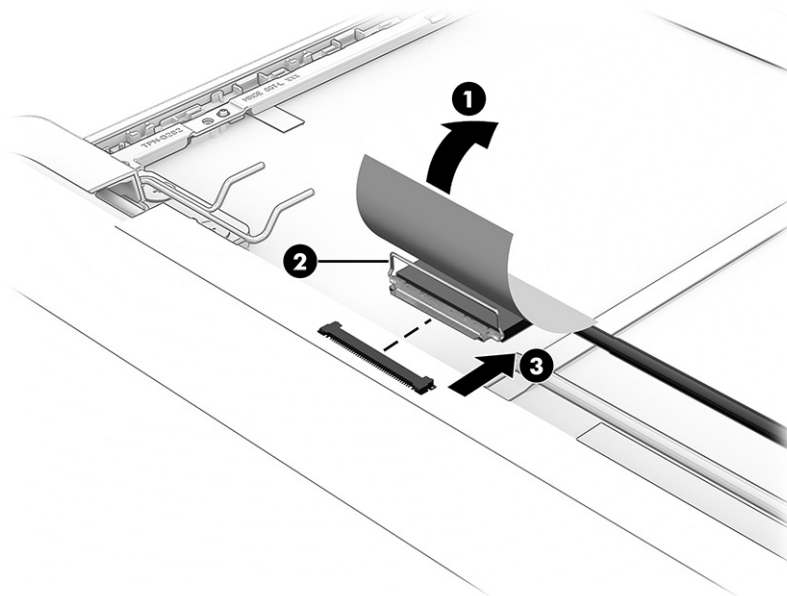
Display panels are available as the following spare part numbers:

N17118-001—SVA

N17119-001—UWVA

N17120-001—UWVA, touch-on panel (TOP)

Display panel adhesive is available as spare part number N12238-001.

11. To replace the camera module:

    a. Remove the two Phillips M2.0 × 3.0 screws **(1)** from top bracket, and then remove the bracket from the display rear cover **(2)**. The bracket is available as spare part number N19715-001.

> 📝 **NOTE:** In this procedure, the display assembly will not be connected to the computer.
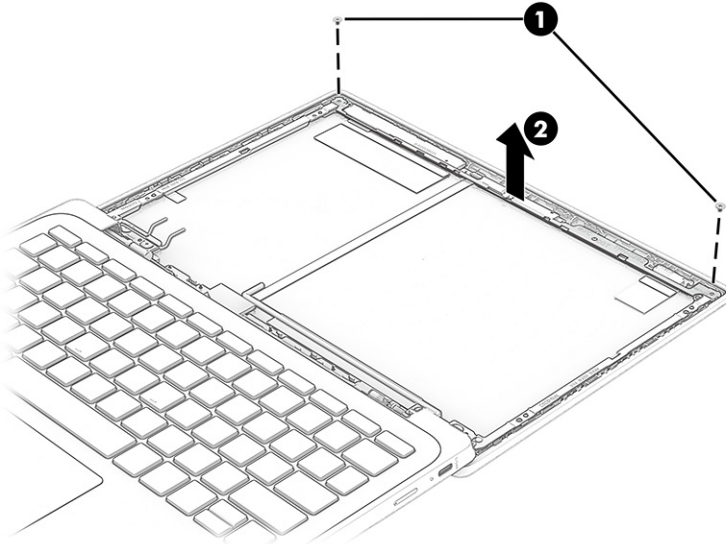
    b. Use to tool to detach the module **(1)** from the display back cover. The module is attached to the display back cover with double-sided adhesive.

    c. Disconnect the cable from the reverse ZIF connector on the camera module **(2)**. Note that the cable routes underneath the camera module.
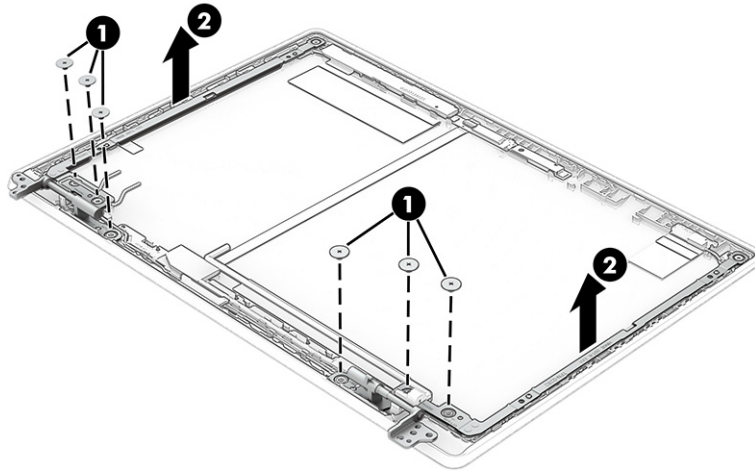
    The camera module is available as spare part number N20114-001.
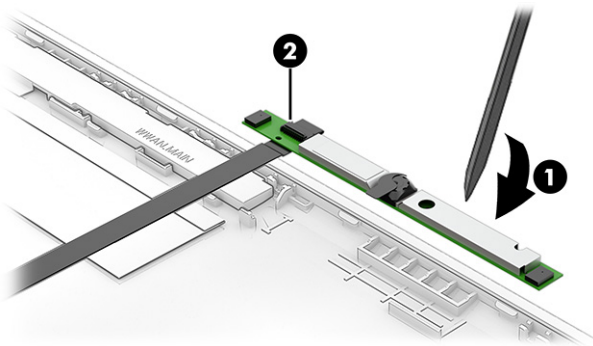
12. To remove the hinges from the display enclosure:

    a. Remove the three Phillips M2.5 × 2.5 screws **(1)** that secure each hinge to the display back cover.

    b. Remove the hinges **(2)**.

   The display hinges are available using spare part number N19719-001.

13. To remove the display panel/camera cable:

    a. Remove the cable from the routing along the bottom of the display rear cover **(1)**.

    b. Peel the cable off the inside of the display rear cover **(2)**.

    The display cable is available as the following spare part numbers:

    N19716-001: Touch models

    N19717-001: Nontouch models
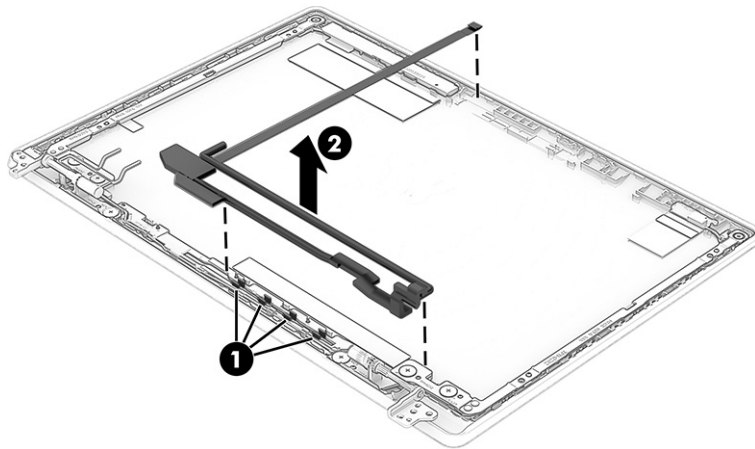
14. To remove the wireless antennas:

    📝 **NOTE:** When you replace antennas, it is recommended that you replace the computer chassis and the display antennas at the same time. For more information about the display antennas, see Wireless antennas, computer chassis on page 37.

    a. Remove the cables from the clips on the sides and bottom of display back cover **(1)**.

    b. Peel the antennas off the top of the display back cover **(2)**. The wireless antennas are available using spare part number N20115-001.
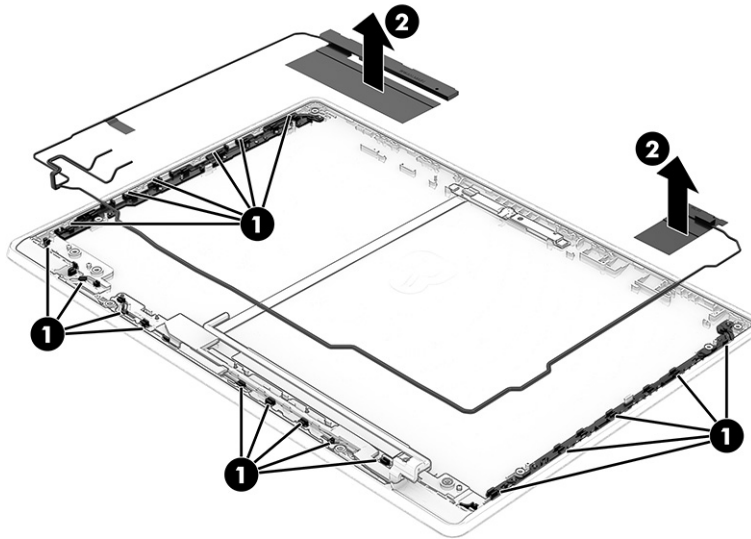
Display rear covers are available as spare part number N19712-001.

To reassemble and replace the display assembly, reverse this procedure.

Top cover with keyboard

The top cover with keyboard remains after removing all other spare parts from the computer. The first table provides the main spare part number for the top cover with keyboards. The second table provides the keyboard country codes.

Table 5-9 Top cover with keyboard descriptions and part numbers

Description	Spare part number
Top cover with keyboard	N17121-xxx

Table 5-10 Spare part country codes

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Belgium	–A41	Iceland	–DD1	Solvenia	–BA1
Brazil	–201	India	–D61	South Korea	–AD1
Bulgaria	–261	Israel	–BB1	Spain	–071
Chile	–161	Italy	–061	Switzerland	–BG1
Czech Republic/Slovakia	–FL1	Japan	–291	Taiwan	–AB1
Denmark, Finland, and Norway	–DH1	The Netherlands	–B31	Thailand	–281
French Canada	–DB1	Northern Africa	–FP1	Turkey	–141
France	–051	Portugal	–131	Ukraine	–BD1
Germany	–041	Romania	–271	United Kingdom	–031
Greece	–151	Russia	–251	United States	–001

Table 5-10 Spare part country codes (continued)

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Hungary	-211	Saudi Arabia	-171		

6 Backing up, resetting, and recovering

This chapter provides information about the standard procedures of backing up your personal data, resetting your computer to original factory conditions, and recovering your operating system with the Chromebook Recovery Utility.

Backing up

You can back up your data to an optional USB flash drive or SD memory card or through Google Drive™.

For detailed information about creating a backup, go to http://www.support.google.com.

Resetting

A factory reset erases the information on your computer hard drive, including files in the Downloads folder. Before you reset, back up your files to an optional USB flash drive, to an SD memory card, or through Google Drive. The factory reset will not delete your files at these locations.

You might want to reset your computer in the following circumstances:

- You see the message "Reset this Chrome device."

- You are having problems with your user profile or settings.

- You restarted your computer, and it still doesn't work properly.

- You want to change the owner of your computer.

To reset your computer:

1. Under the **Settings** menu, select **Advanced**.

2. In the **Powerwash** section, select **Powerwash**.

3. Select **Restart**.

4. In the window that appears, select **Powerwash**, and then select **Continue**.

5. Follow the on-screen instructions to reset your computer, and sign in with your Google™ account.

    NOTE: The account you sign in with after you reset your computer is recognized as the owner account.

6. After you complete the reset, you can set up your computer and check to see whether the problem is fixed.

Recovering

When your Chrome OS™ doesn't work properly, you can perform a recovery. A recovery reinstalls the operating system, software programs, and original factory settings. It deletes locally saved files and saved networks for all accounts. A system recovery does not affect Google Accounts and data synced to Google Drive.

IMPORTANT: Recovery permanently erases everything on your computer hard drive, including your downloaded files. If possible, back up your files before you recover your computer.

NOTE: For more information about performing a system recovery on your computer, go to http://www.support.google.com.

Before you begin the recovery process, you need the following prerequisites:

- A USB flash drive or SD memory card with a capacity of 4 GB or greater. All data is erased from this storage device when the recovery media is created, so back up all files from the device before you begin.

- A computer with internet access. You must also have administrative rights to the computer.

- Computer AC adapter. The computer must be plugged into AC power during recovery.

- The "Chrome OS is missing or damaged" screen displaying on your computer. If this message is not already displayed:

    - Turn on the computer, press and hold the esc+f3 keys, and then press the power button. The computer restarts, and the screen shows the "Chrome OS is missing or damaged" screen.

Installing the Chromebook Recovery Utility

The Chromebook™ Recovery Utility recovers the original operating system and software programs that were installed at the factory. You can install this utility from the Chrome Web Store on any computer.

To install the Chromebook Recovery Utility:

- Open the Chrome Web Store, search for `chrome recovery`, select **Chromebook Recovery Utility** from the Apps list, and follow the on-screen instructions.

Creating recovery media

You can use recovery media to recover the original operating system and software programs that were installed at the factory.

To create recovery media:

1. Turn on a computer that has internet access.

   NOTE: You must have administrative rights to the computer.

2. Select the **Launcher** icon, and then select **All Apps**.

3. In the Apps window, select **Recovery**, and then select **Get started**.

4. Follow the on-screen instructions to create the recovery media.

   NOTE: All data and partitions on your recovery media will be deleted. Do not remove the USB flash drive or SD memory card until the process is complete.

Recovering the Chrome operating system

Use these instructions to recover the Chrome operating system on your computer using the recovery media that you created.

1.	Disconnect any external devices connected to your computer, plug in the power cord, and then turn on the computer.

2.	To enter recovery mode, press and hold esc+f3, and then press the power button. When the "Chrome OS is missing or damaged" screen appears, insert the recovery media into your computer. The recovery process begins immediately.

3.	Wait while Chrome verifies the integrity of the recovery media.

📝 **NOTE:**	If you need to cancel the recovery during the verification process, press and hold the power button until the computer turns off. Do not disrupt the system recovery process after the verification step is complete.

📝 **NOTE:**	If an error message is displayed, you might need to run the Chrome Recovery Utility again or use a different USB flash drive or SD memory card.

4.	When the "System Recovery is complete" message appears, remove the recovery media.

The computer restarts with Chrome OS reinstalled.

Setting up your computer after a reset or recovery

After a reset or recovery is complete, perform the initial setup process.

For details about setting up the computer, go to http://www.support.google.com.

Erasing and reformatting the recovery media

When you create recovery media, the USB flash drive or SD memory card is formatted as a recovery tool. After recovery, you must erase the recovery media to reuse your storage device. Follow these steps to use the Chromebook Recovery Utility to erase the recovery media.

1.	Select the **Launcher** icon, and then select **All Apps**.

2.	In the apps window, select **Recovery**.

3.	Select the **Settings** icon, and then select **Erase recovery media**.

4.	Select the USB flash drive or SD memory card that you inserted, select **Continue**, and then select **Erase now**.

5.	After the recovery media is erased, select **Done** to close the Chromebook Recovery Utility, and then remove the USB flash drive or SD memory card.

The media is ready to be formatted using a formatting tool provided by your operating system.

7 Specifications

This chapter provides specifications for your computer system.

Computer specifications

This section provides specifications for your computer. When you travel with your computer, the computer dimensions and weights, input power ratings, and operating specifications provide helpful information.

Table 7-1 Computer specifications

	Metric	U.S.
Dimensions		
Width	**295.0 mm**	11.6 in
Depth	**205.5 mm**	8.1 in
Height	**19.1 mm**	0.75 in
Weight (one SSD)	**1360 g**	2.99 lb
Weight (two SSDs)	**2422.8 g**	5.34 lb
Input power		
Operating voltage and current	19.5 V dc @ 2.31 A – 45 W	
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**−20°C to 60°C**	−4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**−15 m to 3,048 m**	−50 ft to 10,000 ft
Nonoperating	**−15 m to 12,192 m**	−50 ft to 40,000 ft

NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.

Display specifications

This section provides specifications for your display.

Table 7-2 Display specifications

	Metric	U.S.
Active diagonal size	**29.5 cm**	11.6 in
Resolution	1366 × 768 (HD)	
Surface treatment	Antiglare	
Brightness	220 nits	
Viewing angle	UWVA	
	SVA	
Backlight	WLED	
Display panel interface	eDP	

8 Statement of memory volatility

For general information regarding nonvolatile memory in HP business computers, and to restore nonvolatile memory that can contain personal data after the system has been turned off and the hard drive has been removed, use these instructions.

HP business computer products that use Intel®-based or AMD®-based system boards contain volatile DDR memory. The amount of nonvolatile memory present in the system depends upon the system configuration. Intel-based and AMD-based system boards contain nonvolatile memory subcomponents as originally shipped from HP, with the following assumptions:

- No subsequent modifications were made to the system.

- No applications, features, or functionality were added to or installed on the system.

Following system shutdown and removal of all power sources from an HP business computer system, personal data can remain on volatile system memory (DIMMs) for a finite period of time and also remains in nonvolatile memory. Use the following steps to remove personal data from the computer, including the nonvolatile memory found in Intel-based and AMD-based system boards.

NOTE: If your tablet has a keyboard base, connect to the keyboard base before beginning steps in this chapter.

Current BIOS steps

Use these instructions to restore nonvolatile memory.

1. Follow these steps to restore the nonvolatile memory that can contain personal data. Restoring or reprogramming nonvolatile memory that does not store personal data is neither necessary nor recommended.

   a. Turn on or restart the computer, and then quickly press esc.

   NOTE: If the system has a BIOS administrator password, type the password at the prompt.

   b. Select **Main**, select **Apply Factory Defaults and Exit**, and then select **Yes** to load defaults. The computer restarts.

   c. During the restart, press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

   NOTE: If the system has a BIOS administrator password, type the password at the prompt.

   d. Select the **Security** menu, select **Restore Security Settings to Factory Defaults**, and then select **Yes** to restore security level defaults. The computer reboots.

   e. During the reboot, press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

   NOTE: If the system has a BIOS administrator password, type the password at the prompt.

f.   If an asset or ownership tag is set, select the **Security** menu and scroll down to the **Utilities** menu. Select **System IDs**, and then select **Asset Tracking Number**. Clear the tag, and then make the selection to return to the prior menu.

g.   If a DriveLock password is set, select the **Security** menu, and scroll down to **Hard Drive Utilities** under the **Utilities** menu. Select **Hard Drive Utilities**, select **DriveLock**, and then clear the check box for **DriveLock password on restart**. Select **OK** to proceed.

h.   Select the **Main** menu, and then select **Reset BIOS Security to factory default**. Select **Yes** at the warning message. The computer reboots.

i.   During the reboot, press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

> **NOTE:**   If the system has a BIOS administrator password, type the password at the prompt.

j.   Select the **Main** menu, select **Apply Factory Defaults and Exit**, select **Yes** to save changes and exit, and then select **Shutdown**.

k.   Reboot the system. If the system has a Trusted Platform Module (TPM), fingerprint reader, or both, one or two prompts will appear—one to clear the TPM and the other to Reset Fingerprint Sensor. Press or tap f1 to accept or f2 to reject.

l.   Remove all power and system batteries for at least 24 hours.

2.   Complete one of the following:

   ●   Remove and retain the storage drive.

      – or –

   ●   Clear the drive contents by using a third-party utility designed to erase data from an SSD.

      – or –

   ●   Clear the contents of the drive by using the following BIOS Setup Secure Erase command option steps:

> **NOTE:**   If you clear data using Secure Erase, you cannot recover it.

   a.   Turn on or restart the computer, and then quickly press esc.

   b.   Select the **Security** menu and scroll down to the esc menu.

   c.   Select **Hard Drive Utilities**.

   d.   Under **Utilities**, select **Secure Erase**, select the hard drive storing the data you want to clear, and then follow the on-screen instructions to continue.

      – or –

   Clear the contents of the drive using the following Disk Sanitizer commands steps:

   i.   Turn on or restart the computer, and then quickly press esc.

   ii.   Select the **Security** menu and scroll down to the **Utilities** menu.

   iii.   Select **Hard Drive Utilities**.

iv.   Under **Utilities**, select **Disk Sanitizer**, select the hard drive with the data that you want to clear, and then follow the on-screen instructions to continue.

NOTE: The amount of time it takes for Disk Sanitizer to run can take several hours. Plug the computer into an AC outlet before starting.

Nonvolatile memory usage

Use this table to troubleshoot nonvolatile memory usage.

Table 8-1 Troubleshooting steps for nonvolatile memory usage

Nonvolatile memory type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data entered into this memory?	How is this memory write-protected?
HP Sure Start flash (select models only)	8 MB	No	Yes	Provides protected backup of critical System BIOS code, EC firmware, and critical computer configuration data for select platforms that support HP Sure Start. For more information, see Using HP Sure Start (select products only) on page 57.	Data cannot be written to this device via the host processor. The content is managed solely by the HP Sure Start Embedded Controller.	This memory is protected by the HP Sure Start Embedded Controller.
Real Time Clock (RTC) battery backed-up CMOS configuration memory	256 bytes	No	Yes	Stores system date and time and noncritical data.	RTC battery backed-up CMOS is programmed using Computer Setup (BIOS), or by changing the Windows date & time.	This memory is not write-protected.
Controller (NIC) EEPROM	64 KB (not customer accessible)	No	Yes	Stores NIC configuration and NIC firmware.	NIC EEPROM is programmed using a utility from the NIC vendor that can be run from DOS.	A utility must be used to write data to this memory and is available from the NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC nonfunctional.

Nonvolatile memory type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data entered into this memory?	How is this memory write-protected?
DIMM Serial Presence Detect (SPD) configuration data	256 bytes per memory module, 128 bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	DIMM SPD is programmed by the memory vendor.	Data cannot be written to this memory when the module is installed in a computer. The specific write-protection method varies by memory vendor.
System BIOS	9 MB	Yes	Yes	Stores system BIOS code and computer configuration data.	System BIOS code is programmed at the factory. Code is updated when the system BIOS is updated. Configuration data and settings are entered using the Computer Setup (BIOS) or a custom utility.	**NOTE:** Writing data to this ROM in an inappropriate manner can render the computer nonfunctional. A utility must be used for writing data to this memory and is available on the HP website; go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.
Intel Management Engine Firmware (present only in select Elite or Z models. For more information, go to http://www.hp.com/support. Select **Identify your product for manuals and specific product information**, and then follow the on-screen instructions.)	1.5 MB or 7 MB	Yes	Yes	Stores Management Engine Code, Settings, Provisioning Data and iAMT third-party data store.	Management Engine Code is programmed at the factory. Code is updated via Intel secure firmware update utility. Unique Provisioning Data can be entered at the factory or by an administrator using the Management Engine (MEBx) setup utility. The third-party data store contents can be populated by a remote management console or local applications that have been registered by an administrator to have access to the space.	The Intel chipset is configured to enforce hardware protection to block all direct read-write access to this area. An Intel utility must be used for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
Bluetooth flash (select products only)	2 megabits	No	Yes	Stores Bluetooth configuration and firmware.	Bluetooth flash is programmed at the factory. Tools for writing data to this memory are not publicly available but can be obtained from the silicon vendor.	A utility must be used for writing data to this memory and is made available through newer versions of the driver whenever the flash requires an upgrade.

Nonvolatile memory type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data entered into this memory?	How is this memory write-protected?
802.11 WLAN EEPROM	4 kilobits to 8 kilobits	No	Yes	Stores configuration and calibration data.	802.11 WLAN EEPROM is programmed at the factory. Tools for writing data to this memory are not made public.	A utility must be used for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Camera (select products only)	64 kilobits	No	Yes	Stores camera configuration and firmware.	Camera memory is programmed using a utility from the device manufacturer that can be run from Windows.	A utility must be used for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Fingerprint reader (select products only)	512 KB flash	Yes	Yes	Stores fingerprint templates.	Fingerprint reader memory is programmed by user enrollment in HP ProtectTools Security Manager.	Only a digitally signed application can make the call to write to the flash.

Questions and answers

Use this section to answer your questions about nonvolatile memory.

1. **How can the BIOS settings be restored (returned to factory settings)?**

   IMPORTANT: The restore defaults feature does not securely erase any information on your hard drive. See question and answer 6 for steps to securely erase information.

   The restore defaults feature does not reset the Custom Secure Boot keys. See question and answer 7 for information about resetting the keys.

   a. Turn on or restart the computer, and then quickly press esc.

   b. Select **Main**, and then select **Apply Factory Defaults and Exit**.

   c. Follow the on-screen instructions.

   d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

2. **What is a UEFI BIOS, and how is it different from a legacy BIOS?**

   The Unified Extensible Firmware Interface (UEFI) BIOS is an industry-standard software interface between the platform firmware and an operating system (OS). It replaces the older BIOS architecture but supports much of the legacy BIOS functionality.

Like the legacy BIOS, the UEFI BIOS provides an interface to display the system information and configuration settings and to change the configuration of your computer before an OS is loaded. BIOS provides a secure runtime environment that supports a Graphic User Interface (GUI). In this environment, you can use either a pointing device (touch screen, touchpad, pointing stick, or USB mouse) or the keyboard to navigate and make menu and configuration selections. The UEFI BIOS also contains basic system diagnostics.

The UEFI BIOS provides functionality beyond that of the legacy BIOS. In addition, the UEFI BIOS works to initialize the computer's hardware before loading and executing the OS; the runtime environment allows the loading and execution of software programs from storage devices to provide more functionality, such as advanced hardware diagnostics (with the ability to display more detailed system information) and advanced firmware management and recovery software.

HP has provided options in Computer Setup (BIOS) to allow you to run in legacy BIOS, if required by the operating system. Examples of this requirement would be if you upgrade or downgrade the OS.

3. **Where is the UEFI BIOS located?**

   The UEFI BIOS is located on a flash memory chip. You must use a utility to write to the chip.

4. **What kind of configuration data is stored on the DIMM Serial Presence Detect (SPD) memory module? How would this data be written?**

   The DIMM SPD memory contains information about the memory module, such as size, serial number, data width, speed and timing, voltage, and thermal information. This information is written by the module manufacturer and stored on an EEPROM. You cannot write to this EEPROM when the memory module is installed in a computer. Third-party tools do exist that can write to the EEPROM when the memory module is not installed in a computer. Various third-party tools are available to read SPD memory.

5. **What is meant by "Restore the nonvolatile memory found in Intel-based system boards"?**

   This message relates to clearing the Real Time Clock (RTC) CMOS memory that contains computer configuration data.

6. **How can the BIOS security be reset to factory defaults and erase the data?**

   IMPORTANT: Resetting results in the loss of information.

   These steps do not reset Custom Secure Boot Keys. See question and answer 7 for information about resetting the keys.

   a. Turn on or restart the computer, and then quickly press esc.

   b. Select **Main**, and then select **Reset Security to Factory Defaults**.

   c. Follow the on-screen instructions.

   d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

7. **How can the Custom Secure Boot Keys be reset?**

   Secure Boot is a feature to ensure that only authenticated code can start on a platform. If you enabled Secure Boot and created Custom Secure Boot Keys, disabling Secure Boot does not clear the keys. You must also select to clear the Custom Secure Boot Keys. Use the same Secure Boot access procedure that you used to create the Custom Secure Boot Keys, but select to clear or delete all Secure Boot Keys.

   a. Turn on or restart the computer, and then quickly press esc.

b.	Select the **Security** menu, select **Secure Boot Configuration**, and then follow the on-screen instructions.

c.	At the **Secure Boot Configuration** window, select **Secure Boot**, select **Clear Secure Boot Keys**, and then follow the on-screen instructions to continue.

Using HP Sure Start (select products only)

Select computer models are configured with HP Sure Start, a technology that continuously monitors your computer's BIOS for attacks or corruption.

If the BIOS becomes corrupted or is attacked, HP Sure Start restores the BIOS to its previously safe state, without user intervention. Those select computer models ship with HP Sure Start configured and enabled. HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. Advanced users can customize the default configuration.

To access the latest documentation on HP Sure Start, go to http://www.hp.com/support.

9 Power cord set requirements

This chapter provides power cord requirements for countries and regions.

The wide-range input feature of the computer permits it to operate from any line voltage from 100 V ac to 120 V ac, or from 220 V ac to 240 V ac.

The three-conductor power cord set included with the computer meets the requirements for use in the country or region where the equipment is purchased.

Power cord sets for use in other countries or regions must meet the requirements of the country and region where the computer is used.

Requirements for all countries

These power cord requirements are applicable to all countries and regions.

- The length of the power cord set must be at least **1.0 m** (3.3 ft) and no more than **2.0 m** (6.5 ft).

- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.

- The power cord sets must have a minimum current capacity of 10 A and a nominal voltage rating of 125 V ac or 250 V ac, as required by the power system of each country or region.

- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

To determine power cord requirements for specific countries and regions, use this table.

Table 9-1 Power cord requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1

Country/region	Accredited agency	Applicable note number
India	BIS	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
United Kingdom	ASTA	1
United States	UL	2

1. The flexible cord must be Type HO5VV-F, three-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, three-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.

3. The appliance coupler, flexible cord, and wall plug must bear a T mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, three-conductor, 0.75 mm² or 1.25 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration.

4. The flexible cord must be Type RVV, three-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.

5. The flexible cord must be Type H05VV-F three-conductor, 0.75 mm² conductor size. KTL logo and individual approval number must be on each element. Approval number and logo must be printed on a flag label.

6. The flexible cord must be Type HVCTF three-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.

7. For 127 V ac, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F three-conductor, 0.75 mm² or 1.00 mm² conductor size, with plug BS 1363/A with BSI or ASTA marks.

10 Recycling

When a nonrechargeable or rechargeable battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for battery disposal.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, see the HP website at http://www.hp.com/recycle.

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