



Surface Laptop 5 Service Guide



Disclaimer of Warranties and Limitation of Damages

All information, content, materials, and products made available in or in conjunction with this Guide are provided by Microsoft on “as-is” and “as available” basis, unless otherwise specified by Microsoft in writing. Microsoft makes no representations or warranties of any kind, express or implied, as to the information, content, materials, and products included or otherwise made available to you or accompanying this Guide unless specified in writing. You expressly agree that your use of the information, content, materials, and product in or accompanying this Guide is at your sole risk.

To the fullest extent permissible by law, Microsoft disclaims all warranties, express or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose. To the fullest extent permissible by law, Microsoft shall not be liable for damages of any kind arising from the use of information, content, materials, or product made available in or in conjunction with this Guide, including but not limited to direct, indirect, incidental, consequential, and/or punitive damages unless otherwise specified in writing.

Notice

Microsoft and its suppliers may have patents, patent applications, trademarks, copyrights, trade secrets and/or other intellectual property rights covering subject matter in this document. Microsoft’s furnishing of this document to recipient does not grant or imply any license to any patents, trademarks, copyrights, trade secrets or other intellectual property rights, and recipient’s permitted use of any such intellectual property rights, if any, is solely governed by the Agreements.

This document and the information it contains are subject to change without notice. You can find the latest information on Surface device servicing and repair at <https://aka.ms/surfaceservicing>. Always consult the most up-to-date information available before performing device servicing or repair.

©2023 Microsoft Corporation. All rights reserved.

Document Part Number: M1237924_RevC



TABLE OF CONTENTS

INTRODUCTION	6
DEVICE IDENTITY INFORMATION	6
• SURFACE LAPTOP MODELS	6
• GLOSSARY OF TERMS	7
GENERAL INFORMATION, PRECAUTIONS, WARNINGS	8
• SERVICE TOOLS:.....	8
• GENERAL SAFETY PRECAUTION	10
• REPAIR-SPECIFIC PRECAUTIONS AND WARNINGS	11
BATTERY SAFETY	12
LITHIUM-ION BATTERY INSPECTION	13
• HANDLING USED, DAMAGED, OR DEFECTIVE LITHIUM-ION BATTERIES:.....	13
• REPORT BATTERY THERMAL EVENTS TO MICROSOFT	13
• ACTIONS TO TAKE:.....	14
• STOP REPAIR AND CONTACT MICROSOFT	14
ILLUSTRATED SERVICE PARTS LIST	15
SERVICE DIAGNOSTICS/TROUBLESHOOTING OVERVIEW	19
• SOFTWARE TOOLS:	19
• HARDWARE TROUBLESHOOTING APPROACH	19
COMPONENT REMOVAL AND REPLACEMENT PROCEDURES	20
• PRIOR TO DEVICE DISASSEMBLY:	20
• BATTERY WARNING.....	20
NON-SKID FEET REPLACEMENT PROCESS	21
• PRELIMINARY REQUIREMENTS	21
• REQUIRED TOOLS AND COMPONENTS	21
• PREREQUISITE STEPS:	21
• PROCEDURE – REMOVE (FEET).....	22
• PROCEDURE – INSTALL (FEET)	22



KEYBOARD ASSEMBLY REPLACEMENT PROCESS (METAL, FABRIC)	23
· PRELIMINARY REQUIREMENTS	23
· REQUIRED TOOLS AND COMPONENTS	23
· PREREQUISITE STEPS:	23
· PROCEDURE – REMOVAL (KEYBOARD ASSEMBLY, METAL)	24
· PROCEDURE – INSTALLATION (KEYBOARD ASSEMBLY, METAL)	27
PROCEDURE – REMOVAL (KEYBOARD ASSEMBLY, FABRIC)	29
· PROCEDURE – INSTALLATION (KEYBOARD ASSEMBLY, FABRIC)	32
RSSD REPLACEMENT PROCESS	34
· PRELIMINARY REQUIREMENTS	34
· REQUIRED TOOLS AND COMPONENTS	34
· PREREQUISITE STEPS:	34
· PROCEDURE – REMOVAL (RSSD)	35
· PROCEDURE – INSTALLATION (RSSD)	36
RSSD SWAP TO A NEW DEVICE PROCESS	38
· PRELIMINARY REQUIREMENTS	38
· REQUIRED TOOLS AND COMPONENTS	38
· PREREQUISITE STEPS:	38
· PROCEDURE – SWAP (RSSD)	39
SURFLINK REPLACEMENT PROCESS	42
· PRELIMINARY REQUIREMENTS	42
· REQUIRED TOOLS AND COMPONENTS	42
· PREREQUISITE STEPS:	42
· PROCEDURE – REMOVAL (SURFLINK)	43
· PROCEDURE – INSTALLATION (SURFLINK)	45
THERMAL MODULE REPLACEMENT PROCESS	47
· PRELIMINARY REQUIREMENTS	47
· REQUIRED TOOLS AND COMPONENTS	47
· PREREQUISITE STEPS:	47



· PROCEDURE – REMOVAL (THERMAL MODULE).....	48
· PROCEDURE – INSTALLATION (THERMAL MODULE)	50
SPEAKER REPLACEMENT PROCESS.....	53
· PRELIMINARY REQUIREMENTS	53
· REQUIRED TOOLS AND COMPONENTS	53
· PREREQUISITE STEPS:	53
· PROCEDURE – REMOVAL (SPEAKERS).....	54
· PROCEDURE – INSTALLATION (SPEAKERS)	55
DISPLAY REPLACEMENT PROCESS.....	56
· PRELIMINARY REQUIREMENTS	56
· REQUIRED TOOLS AND COMPONENTS	56
· PREREQUISITE STEPS:	57
· PROCEDURE – REMOVAL (DISPLAY).....	58
· PROCEDURE – INSTALLATION (DISPLAY)	60
MOTHERBOARD REPLACEMENT PROCESS.....	64
· PRELIMINARY REQUIREMENTS	64
· REQUIRED TOOLS AND COMPONENTS	64
· PREREQUISITE STEPS:	64
· PROCEDURE – REMOVAL (MOTHERBOARD)	65
· PROCEDURE – INSTALLATION (MOTHERBOARD).....	67
CHASSIS + BATTERY REPLACEMENT PROCESS	69
· PRELIMINARY REQUIREMENTS	69
· REQUIRED TOOLS AND COMPONENTS	69
· PREREQUISITE STEPS:	70
· PROCEDURE – REMOVAL (CHASSIS + BATTERY).....	71
· PROCEDURE – INSTALLATION (CHASSIS + BATTERY)	73
ENVIRONMENTAL COMPLIANCE REQUIREMENTS	76



Introduction

This Service Guide (Guide) provides instructions for repairing Microsoft Surface devices using genuine Microsoft parts. It is intended for technically inclined individuals with the knowledge, experience, and specialized tools required to repair Microsoft devices.

-
- ✍ **IMPORTANT:** Read this Guide in its entirety before starting any repairs. If at any point you are unsure or uncomfortable about performing the repairs, as detailed in this Guide, **DO NOT** proceed. Contact [Microsoft](#) for additional support options.
 - ⚠ **WARNING:** Failure to follow the instructions in this Guide; use of non-Microsoft (non-genuine), incompatible, or modified replacement parts; and/or failure to use proper tools could result in serious personal injury, death, and/or damage to the product or other property.
-

Device Identity Information

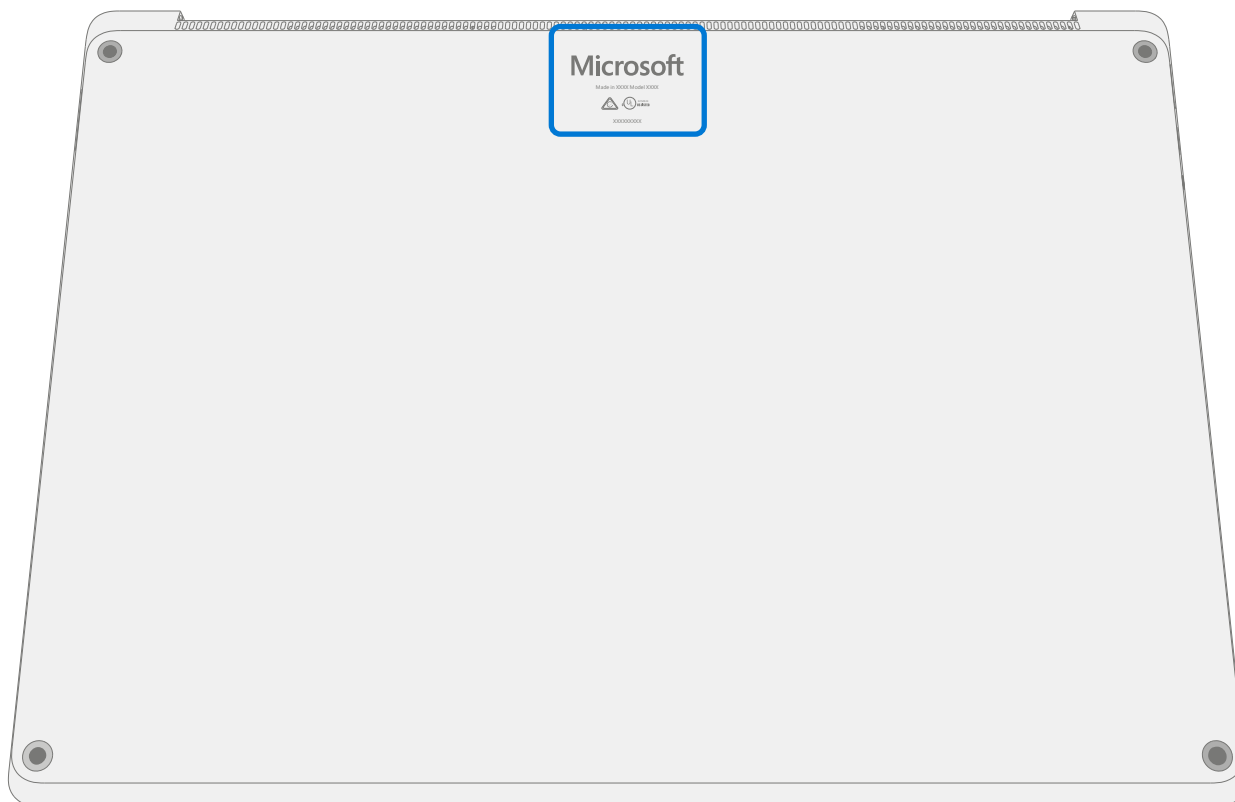
Surface Laptop Models

- 1950 – Surface Laptop 5 13.5" (Fabric)
- 1951 – Surface Laptop 5 13.5" (Metal)
- 1958 – Surface Laptop 5 15" (Fabric)
- 1959 – Surface Laptop 5 15" (Metal)

Surface Support - Laptop: [Link](#)

Surface Laptop Technical Specifications: [Surface Laptop 5](#)

The model and serial number for Surface Laptop 5 is on the bottom of the device in the upper middle.



Glossary of Terms

The following terms are used throughout this guide.

- **ASP** – Authorized Service Provider. Companies that have received clearance to repair or maintain a product that is still under warranty by Microsoft.
- **BMR** – Bare Metal Recovery refers to the clean imaging process
- **Chassis** – Bottom case of the device
- **CPU** – Central Processing Unit
- **CRU or Commercial Spares** – Customer Replaceable Units. Service parts that can be removed and replaced by the customer.
- **Display or TDM** – The Touch Display Module, the complete screen with all layers
- **ESD** – Electro-Static Discharge
- **FPC** – Flexible Printed Circuit Connections
- **FRU** – Field Replaceable Units. FRUs are available only to ASPs. Some replaceable units will only be available as FRUs and therefore are only supported at an ASP.
- **IPA** – Isopropyl alcohol which should be used to clean adhesive from device as detailed within process steps. Use 70% IPA in all cases.
- **Motherboard or PCBA** – Primary circuit board assembly
- **OS** – Operating System
- **PSA** – Pressure Sensitive Adhesive
- **rSSD** – Removable Solid-State Drive
- **SDT** – Surface Diagnostic Toolkit
- **SoC** – System-on-a-chip, a microchip with several electronic circuits and parts in a single integrated circuit.
- **Spudger** – A tool that is used to assist with opening, prying, installing, and removing components from objects such as electronics. Usually plastic.
- **Thermal Module or THM** – An assembly with heat spreaders and electric fan
- **TIM** – Thermal interface material used between the THM and PCBA



General Information, Precautions, Warnings

 This symbol identifies important safety and health information in this guide.

 This symbol identifies important information in this guide.

! This symbol identifies important cautions in this guide.

Service Tools:

Microsoft Recommended Service Tools

- [ESD-safe battery cover](#)

Microsoft Provided Software Tools / References

- Surface Power Supply
- How To: [Update Surface device firmware and OS](#)
- How To: [Surface Tools Video](#)
- Download: [Surface drivers and firmware](#)
- Download: [Surface Diagnostic Toolkit \(SDT\)](#)
- Download: [Surface Data Eraser](#)
- Download: [Surface Imaging Tools](#)

Standard Service Tools:

- Anti-static wrist strap (1 MOhm resistance)
- ESD-safe benchtop
- Gloves
- Safety Glasses
- Spudger tool
- Plastic Opening Pick (example [iFixit Opening Picks](#))
- Bucket (1 gallon)
- Clean, dry, untreated sand (0.5 gallon)
- Exterior monitor (with HDMI connection)
- UDB-C to HDMI adapter
- Non-metallic ruler
- Isopropyl alcohol Dispenser bottle (use 70% IPA)
- Goo Gone
- Cleaning swabs
- ESD-safe tweezers
- USB keyboard
- 0.2mm thickness gauge
- 0.2mm thickness gauge
- 0.25mm thickness gauge



Standard Service Tools (continued)

- 3IP (Torx-plus) driver
- 5IP (Torx-plus) driver
- 6IP (Torx-plus) driver
- USB drive
- Wired Ethernet connection to the Internet
- Microfiber / lint free cloth
- USB Thumb drive
- Heavy duty suction cups (2) – 57.15mm (2.25 in)

The tools identified on this list can be purchased from many different commercial sources, including but not limited to Amazon.com; iFixit; Chemdex, and other vendors. ASP's please refer to the ASP Guidebook for Microsoft tools.



General Safety Precaution

 Always observe the following, general safety precautions:


- Opening and/or repairing any electronic device can present a risk of electric shock, fire, serious personal injury, death, damage to the device or other property, and/or other hazards. Exercise caution when undertaking the repair activities described in this Guide. The repair activities identified in this Guide should only be undertaken by technically inclined individuals with the knowledge, experience, and specialized tools required to repair Microsoft devices.
- Improper use or handling of devices or their batteries may result in fire or explosion. Only open the enclosure on a device as outlined in this Guide.
- Do not heat, puncture, mutilate, or dispose of devices or their batteries in fire. Do not leave or charge devices in direct sunlight or expose devices or their batteries to temperatures outside the recommended operating range of 0°C to 60°C/32°F to 140°F for an extended period. Doing so can result in battery failure, electric shock, fire, serious personal injury, death, and/or damage to the device or other property.
- We recommend wearing protective eyewear and gloves when disassembling/re-assembling a device.

For additional product safety information relevant to Microsoft Surface devices, see aka.ms/surface-safety or the Surface app. To open the Surface app, select the Start button, enter Surface into the search box, then select the Surface app.




Repair-Specific Precautions and Warnings

- For Autopilot managed Surface Products refer to the following guidelines posted [here](#).


 **WARNING:** Before opening a device, ensure it is powered off and disconnected from its power source. Disconnect the device charger or power cord from mains power.

- For devices with rechargeable lithium-ion batteries that power on, fully discharge the battery before beginning repair. To expedite the battery discharge process:
 - Disconnect the charger from the device.
 - Increase display brightness to the highest level.
 - Turn on wi-fi and Bluetooth.
 - Open the Camera app in Windows.
 - Play music or video files from a local drive or streaming service.

Operate the device in this mode until the battery is fully discharged and the device powers off.

 **WARNING:** For Surface devices where the battery is affixed to the back cover, place the back cover with the battery in a location where it will be protected from possible punctures, impacts, crushing, or drops during the repair process. Refer to the [Battery Safety](#) section in this guide for more information.

- Ensure your work surface is level/flat and covered with ESD-safe, soft, non-marring material.
- We recommend wearing protective eyewear as a safety precaution when disassembling/re-assembling a device.
- Clean your work surface regularly to remove debris and abrasive particles.
- Review and follow the general guidelines and ESD compliance steps in this Guide prior to beginning work. Refer to the [Prior to Device Disassembly](#) section in this Guide for more information.
- Before opening a device, always wear an anti-static wrist strap and confirm your work area is properly grounded to protect vulnerable electronics from electrostatic discharge (ESD).
- Parts removed from a device during the repair process should be stored in ESD-safe bags and packaged for return or recycling in the same packaging that the new replacement part came in.
- If battery damage (e.g., leaking, expansion, folds or other) is discovered during device repair or if the battery is impacted or damaged during replacement, DO NOT proceed. Refer to the ASP Guidebook or contact Microsoft directly for proper device disposition.
- As you remove each subassembly from the device, place the subassembly (and all accompanying screws) away from the work area to prevent damage to the device or to the subassembly.
- During all activities (excluding feet-only replacement) check to ensure that no loose articles are on the back cover or remain inside the device before reassembling it.

 **IMPORTANT:** Remove rSSD (removable Solid-State Drive) whenever C-cover is removed from device. rSSD removal disconnects the battery from all device logical components for safety purposes. Refer to [Procedure-Removal \(rSSD\)](#) section for details.

 **IMPORTANT:** Whenever the rSSD has been removed, powering on the device requires that the rSSD and C-cover are installed. Refer to [Procedure - Installation \(rSSD\)](#) section for details.

- Review the [General Safety Precautions](#) and [Battery Safety](#) Sections of this Guide before beginning work. Refer to the “Prior to Device Disassembly” section of the Guide for additional details.
- Check to make sure that general guidelines and ESD compliance steps are followed prior to starting activities. Refer to Prior to Device Disassembly section on ([page 20](#)) for details.



- Device Serial Number Notation – The serial number for this device model is located on its original cover. To keep track of the device's serial number, please record it using waterproof ink ([page 6](#)) on a sticker or label and apply the sticker or label to an easily accessible area on the device exterior. The serial number cannot be added permanently to a replacement part. Microsoft may have provided a label for this use in the replacement part's packaging.

Battery Safety

- This device contains a built-in, lithium-ion rechargeable battery. Battery safety is a significant concern when repairing a device.
- For optimum compatibility, performance, and product safety, we recommend using genuine Microsoft replacement parts. Use of non-Microsoft (non-genuine), incompatible, reused, or modified batteries; improper battery installation; improper handling or storage of batteries; and/or failure to follow the instructions in this Guide could cause battery overheating, expansion, venting, leaking, or a thermal event which could result in fire, serious personal injury, death, data loss, or damage to the device or other property damage.
- Before beginning device repair, ensure your workspace is free of flammable debris or materials, has adequate ventilation, and that you have a fire suppressant device (example: fire blanket, container of sand, Class B fire extinguisher) within easy reach or you are within 20 feet of a fireproof enclosure. Fireproof enclosures should be kept free of combustible or flammable materials.
- Use personal protective equipment (PPE) when handling damaged, venting, or hot battery packs.
- Use the following best practices when handling batteries:
 - Always fully discharge batteries by running an application such as video playback with the device unplugged. If the device does not function while unplugged, you may leave out this step.
 - Do not puncture, impact, strike, bend, or crush the battery or a device containing a battery.
 - Keep your workspace clear of debris, extra tools, and sharp objects.
 - Exercise caution when using sharp tools near the battery to avoid impacting or poking the battery.
 - Don't leave loose screws or small parts inside the device.
 - Avoid using tools that conduct electricity.
 - Do not drop or throw a lithium-ion battery.
 - Do not expose the battery to excessive heat, sunlight, or temperatures outside the battery's normal operating range (0°C to 60°C)/(32°F to 140°F).
 - Ensure you handle, recycle, and/or dispose of used or damaged batteries in accordance with local laws and regulations. Follow Handling Used, Damaged or Defective Li-ion Batteries below.
- If device repair cannot be completed immediately and the device needs to be stored temporarily before restarting the repair:
 - Select a storage location and process that follows the battery safety precautions in this Guide.
 - Avoid exposing the device to environmental conditions and objects that could damage the battery pack.
 - Reinspect the battery pack as outlined in this Guide prior to restarting repair and installing the new battery pack.



Lithium-Ion Battery Inspection

Upon device opening, we recommend that you visually inspect the battery for signs of damage. Factors to consider when inspecting the battery include, but are not limited to:

- Evidence of leaking or venting
- Visible signs of physical or mechanical damage, such as:
 - Expansion or swelling. In expanded or swollen batteries, the soft pouch encasing the cell pulls away from the inner material and appears baggy, loose, or puffy
 - Discoloration of the battery casing
 - Odor, smell, or visible corrosion. Leaked battery electrolyte smells like nail polish remover (acetone)
 - Dents along the battery cell edges or on the top surface
 - Surface scratches that have exposed the aluminum beneath the black coating layer on the battery
 - Loose or damaged wires
 - Known misuse or abuse

Any battery exhibiting the signs listed above must be replaced. Consult the [Battery Replacement](#) section of this document for battery replacement instructions.

Handling Used, Damaged, or Defective Lithium-Ion Batteries:

- DO NOT dispose of used lithium-ion batteries, whether damaged or not, in household or commercial garbage or recycling bins.

⚠ WARNING: DO NOT SHIP DAMAGED OR DEFECTIVE BATTERIES ALONE OR INSIDE DEVICES. Damaged or defective batteries and devices containing damaged or defective batteries require special packaging and handling. Prior to transport:

- Follow all instructions provided by your local e-waste recycling or household hazardous waste collection provider.
 - Place the device or battery in an individual, non-metallic inner packaging, such as a zip-to-close plastic bag, that completely encloses the device or battery.
 - Surround the inner packaging with non-combustible, electrically non-conductive, absorbent cushioning material.
 - Each damaged battery or device containing a damaged battery should be packed individually in its own carton and that carton should be clearly marked as containing a damaged battery.
-

For more information on industry practices concerning damaged, defective, or recalled batteries, please see [PHMSA Lithium-Battery-Recycling-Safety-Advisory](#).

Undamaged, used lithium batteries can be sent to e-waste recycling or household hazardous waste collection points for processing. Please see <https://www.microsoft.com/en-us/legal/compliance/recycling> for more information.

Report Battery Thermal Events to Microsoft

A thermal event is a rapid chemical chain reaction that can occur inside a battery cell. During a thermal event, the energy stored inside the battery is released suddenly, resulting in heating and/or smoke and, in some instances, fire or flame. A battery thermal event can be triggered by physical damage to the battery (including during replacement/repair), improper storage, or exposure to temperatures outside of the battery's operating range.




Act immediately if you see any of the following symptoms of a battery thermal event:

- Smoke, soot, sparks, or flame emitted by the battery or from a device containing a battery.
- The battery pouch suddenly expands in size.
- A popping or hissing noise from the battery or a device containing a battery.

Actions to take:

- **DO NOT use water. Immediately smother** the battery or device with clean, dry sand, a fire blanket, or an appropriate (Class B) fire extinguisher. If using sand, dump the sand all at once until the device is completely covered.
- **Contact** local fire authorities if further assistance is needed.
- **Exit** the work area and ventilate it until it is clear of smoke.
- **Wait** at least 2 hours before attempting to touch the device.
- **Dispose** of the damaged battery or device in accordance with local environmental or e-waste laws and guidelines.

 **WARNING:** DO NOT SHIP DAMAGED OR DEFECTIVE BATTERIES ALONE OR INSIDE DEVICES. Damaged batteries and devices containing damaged batteries require special packaging and handling. See [Handling Used, Damaged, or Defective Lithium-Ion Batteries](#) in this Guide for additional information.

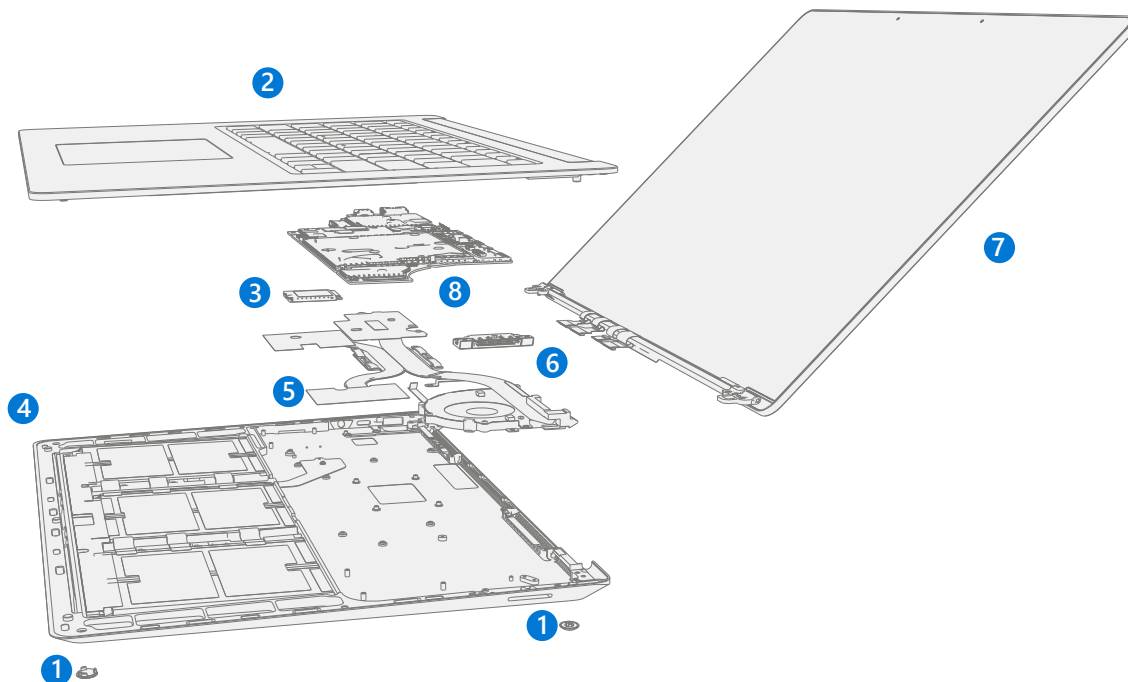
Stop Repair and Contact Microsoft

If any Microsoft device visually exhibits any of the following symptoms, cease all further repair efforts and contact Microsoft Surface Customer Support to report and obtain next steps:

- Any burned or melted components, traces, or plastic parts on the outside of the device, or which otherwise exhibits heat damage, including charring seen in charging and other ports.
 - Any burned or melted components, traces, or plastic parts on the inside of the device, or which otherwise exhibits heat damage.
 - Any accessories exhibiting melting or heat damage that are included with the Microsoft device, such as power supplies, keyboards, mice, cables, charging connectors, etc.
 - Any devices that exhibit a case that has separated apart or opened for reasons other than impact damage from dropping, evidence of tampering, or separation caused by a malfunctioning battery.
 - Any other finding that may constitute a safety hazard to the user, such as sharp edges on plastics.
- Microsoft Surface Customer Support will ask you to provide the following information:
- o The model and serial number of the affected Microsoft Surface device and/or accessory(ies).
 - o A brief description of the damage found.
 - o Clear photographs depicting the symptoms observed.



Illustrated Service Parts List



IMPORTANT: Device service part availability is segmented into two groups. FRUs are parts available for repair activity through an Authorized Service Provider under specific contract with Microsoft. CRUs/Spares are parts available for repair activity by a skilled technician.

Item	Component	ASP / FRU Part No.	CRU Part No.	13.5-inch	15-inch
(1)	Non-Skid Feet				
	Platinum Feet	RPW-00003	CIG-00002	X	X
	Black Feet	RPW-00001	CIG-00001	X	X
	Sage Feet	RPW-00006	CIG-00006	X	
	Sandstone Feet	RPW-00004	CIG-00004	X	
(2)	Keyboard (C-Cover) Assembly				
	Platinum, English (America / Asia)	U1T-00001	U3B-00001	X	
	Platinum, English/French (Canada)	U1T-00002	U3B-00002	X	
	Platinum, Spanish (Mexico)	U1T-00003	U3B-00003	X	
	Platinum, Japanese	U1T-00004	U3B-00004	X	
	Platinum, Korean	U1T-00005	U3B-00005	X	
	Platinum, Taiwan	U1T-00006	U3B-00006	X	
	Platinum, Chinese Traditional (Taiwan)	U1T-00007	U3B-00007	X	
	Platinum, Arabic	U1T-00008	U3B-00008	X	
	Platinum, English (British)	U1T-00009	U3B-00009	X	
	Platinum, English (International)	U1T-00010	U3B-00010	X	
	Platinum, German	U1T-00011	U3B-00011	X	
	Platinum, French (France)	U1T-00012	U3B-00012	X	
	Platinum, Switzerland/Luxemburg	U1T-00013	U3B-00013	X	
	Platinum, Belgium	U1T-00014	U3B-00014	X	
	Platinum, Italian (Italy)	U1T-00015	U3B-00015	X	



Item	Component	ASP / FRU Part No.	CRU Part No.	13.5-inch	15-inch
(2)	Keyboard (C-Cover) Assembly (Continued)				
	Platinum, Portuguese (Portugal)	U1T-00016	U3B-00016	X	
	Platinum, Spanish (Spain)	U1T-00017	U3B-00017	X	
	Platinum, Nordic (Denmark, Finland, Norway, Sweden)	U1T-00018	U3B-00018	X	
	Black, English (America / Asia)	U1T-00019	U3B-00019	X	
	Black, English/French (Canada)	U1T-00020	U3B-00020	X	
	Black, Spanish (Mexico)	U1T-00021	U3B-00021	X	
	Black, Japanese	U1T-00022	U3B-00022	X	
	Black, Korean	U1T-00023	U3B-00023	X	
	Black, Taiwan	U1T-00024	U3B-00024	X	
	Black, Chinese Traditional (Taiwan)	U1T-00025	U3B-00025	X	
	Black, Arabic	U1T-00026	U3B-00026	X	
	Black, English (British)	U1T-00027	U3B-00027	X	
	Black, English (International)	U1T-00028	U3B-00028	X	
	Black, German	U1T-00029	U3B-00029	X	
	Black, French (France)	U1T-00030	U3B-00030	X	
	Black, Switzerland/Luxemburg	U1T-00031	U3B-00031	X	
	Black, Belgium	U1T-00032	U3B-00032	X	
	Black, Italian (Italy)	U1T-00033	U3B-00033	X	
	Black, Portuguese (Portugal)	U1T-00034	U3B-00034	X	
	Black, Spanish (Spain)	U1T-00035	U3B-00035	X	
	Black, Nordic (Denmark, Finland, Norway, Sweden)	U1T-00036	U3B-00036	X	
	Sage, English (America / Asia)	U1T-00037	U3B-00037	X	
	Sage, English/French (Canada)	U1T-00038	U3B-00038	X	
	Sage, Japanese	U1T-00039	U3B-00039	X	
	Sage, Chinese Traditional (Taiwan)	U1T-00040	U3B-00040	X	
	Sage, English (British)	U1T-00041	U3B-00041	X	
	Sage, German	U1T-00042	U3B-00042	X	
	Sage, French (France)	U1T-00043	U3B-00043	X	
	Sage, Switzerland/Luxemburg	U1T-00044	U3B-00044	X	
	Sandstone, English (America / Asia)	U1T-00045	U3B-00045	X	
	Sandstone, English/French (Canada)	U1T-00046	U3B-00046	X	
	Sandstone, Japanese	U1T-00047	U3B-00047	X	
	Sandstone, Chinese Traditional (Taiwan)	U1T-00048	U3B-00048	X	
	Sandstone, English (British)	U1T-00049	U3B-00049	X	
	Sandstone, German	U1T-00050	U3B-00050	X	
	Sandstone, French (France)	U1T-00051	U3B-00051	X	
	Sandstone, Switzerland/Luxemburg	U1T-00052	U3B-00052	X	
	Platinum, English (America / Asia)	U5I-00001	U83-00001		X
	Platinum, English/French (Canada)	U5I-00002	U83-00002		X
	Platinum, Spanish (Mexico)	U5I-00003	U83-00003		X



Item	Component	ASP / FRU Part No.	CRU Part No.	13.5-inch	15-inch
(2)	Keyboard (C-Cover) Assembly (Continued)				
	Platinum, Japanese	U5I-00004	U83-00004		X
	Platinum, Korean	U5I-00005	U83-00005		X
	Platinum, Taiwan	U5I-00006	U83-00006		X
	Platinum, Chinese Traditional (Taiwan)	U5I-00007	U83-00007		X
	Platinum, Arabic	U5I-00008	U83-00008		X
	Platinum, English (British)	U5I-00009	U83-00009		X
	Platinum, English (International)	U5I-00010	U83-00010		X
	Platinum, German	U5I-00011	U83-00011		X
	Platinum, French (France)	U5I-00012	U83-00012		X
	Platinum, Switzerland/Luxemburg	U5I-00013	U83-00013		X
	Platinum, Belgium	U5I-00014	U83-00014		X
	Platinum, Italian (Italy)	U5I-00015	U83-00015		X
	Platinum, Portuguese (Portugal)	U5I-00016	U83-00016		X
	Platinum, Spanish (Spain)	U5I-00017	U83-00017		X
	Platinum, Nordic (Denmark, Finland, Norway, Sweden)	U5I-00018	U83-00018		X
	Black, English (America / Asia)	U5I-00019	U83-00019		X
	Black, English/French (Canada)	U5I-00020	U83-00020		X
	Black, Spanish (Mexico)	U5I-00021	U83-00021		X
	Black, Japanese	U5I-00022	U83-00022		X
	Black, Korean	U5I-00023	U83-00023		X
	Black, Taiwan	U5I-00024	U83-00024		X
	Black, Chinese Traditional (Taiwan)	U5I-00025	U83-00025		X
	Black, Arabic	U5I-00026	U83-00026		X
	Black, English (British)	U5I-00027	U83-00027		X
	Black, English (International)	U5I-00028	U83-00028		X
	Black, German	U5I-00029	U83-00029		X
	Black, French (France)	U5I-00030	U83-00030		X
	Black, Switzerland/Luxemburg	U5I-00031	U83-00031		X
	Black, Belgium	U5I-00032	U83-00032		X
	Black, Italian (Italy)	U5I-00033	U83-00033		X
	Black, Portuguese (Portugal)	U5I-00034	U83-00034		X
	Black, Spanish (Spain)	U5I-00035	U83-00035		X
	Black, Nordic (Denmark, Finland, Norway, Sweden)	U5I-00036	U83-00036		X
(3)	Removable Solid-State Drive (rSSD, NOTE: rSSD size must be same as original U1P-00001)				
	rSSD 256 GB	U1P-00001	U1Y-00001	X	X
	rSSD 512 GB	U1Q-00001	U1Z-00001	X	X
	rSSD 1 TB	U4I-00001	U7B-00001		X



Item	Component	ASP / FRU Part No.	CRU Part No.	13.5-inch	15-inch
(4)	Chassis + Battery				
	Platinum	U1L-00001	U1V-00001	X	
	Black	U1L-00002	U1V-00002	X	
	Sage	U1L-00003	U1V-00003	X	
	Sandstone	U1L-00004	U1V-00004	X	
	Platinum	U3I-00001	U6B-00001		X
	Black	U3I-00002	U6B-00002		X
(5)	Thermal Module (THM)				
	Thermal Module + Fan	U1N-00001	U1X-00001	X	
	Thermal Module + Fan	U1N-00002	U1X-00002		X
(6)	Surflink Port				
	Surflink	U1K-00001	U1U-00001	X	
	Surflink	U1K-00002	U1U-00002		X
(7)	Display (AB-Cover)				
	Platinum	U1S-00001	U2I-00001	X	
	Sage	U1S-00003	U2I-00003	X	
	Sandstone	U1S-00004	U2I-00004	X	
	Black	CIB-00001	CIB-00001	X	
	Platinum	U5B-00001	U7I-00001		X
	Black	U5B-00002	U7I-00002		X
(8)	Motherboard (PCBA)				
	i5, 8GB RAM (Consumer)	U1M-00001		X	
	i5, 8GB RAM (Commercial China Only)	U1M-00002	U1W-00001	X	
	i5, 8GB RAM (Commercial Rest of World)	U1M-00003	U1W-00002	X	
	i5, 16GB RAM (Commercial China Only)	U1M-00007	U1W-00005	X	
	i5, 16GB RAM (Commercial Rest of World)	U1M-00008	U1W-00006	X	
	i5, 16GB RAM (Consumer)	U1M-00009		X	
	i7, 16GB RAM (Commercial China Only)	U1M-00012	U1W-00009	X	
	i7, 16GB RAM (Commercial Rest of World)	U1M-00013	U1W-00010	X	
	i7, 16GB RAM (Consumer)	U1M-00014		X	
	i7, 8GB RAM, (Consumer)	U4B-00001			X
	i7, 8GB RAM (Commercial China Only)	U4B-00002	U6I-00001		X
	i7, 8GB RAM (Commercial Rest of World)	U4B-00003	U6I-00002		X
	i7, 16GB RAM (Commercial China Only)	U4B-00007	U6I-00005		X
	i7, 16GB RAM (Commercial Rest of World)	U4B-00008	U6I-00006		X
	i7, 16GB RAM (Consumer)	U4B-00009			X
	i7, 32GB RAM (Consumer)	U4B-00012			X
	i7, 32GB RAM (Commercial China Only)	U4B-00013	U6I-00009		X
	i7, 32GB RAM (Commercial Rest of World)	U4B-00014	U6I-00010		X



Service Diagnostics/Troubleshooting Overview

- For general Surface support, visit www.support.microsoft.com
- To troubleshoot device feature/function problems or learn more about Surface Laptop 5 visit www.aka.ms/SurfaceProHelp
- If you'd like to learn more about Windows, visit aka.ms/WindowsHelp
- To learn more about the accessibility features of the Surface Laptop 5, go to the online user guide at aka.ms/Windows-Accessibility

Software Tools:

- How To: [Update Surface device firmware and OS](#)
- How To: [Surface Tools Video](#)
- Download: [Surface drivers and firmware](#)
- Download: [Surface Diagnostic Toolkit \(SDT\)](#)
- Download: [Surface Data Eraser](#)
- Download: [Surface Imaging Tools](#)

Hardware Troubleshooting Approach

The following approach should be taken when troubleshooting Surface devices:

1. Update device to latest OS/FW versions using the SDT tool – Refer to Software Tools section above for details on SDT.

 **IMPORTANT:** Device updates are required as a prerequisite to all hardware repairs.

2. Verify any suspected hardware failures by setting the device in a known OS/FW version state and running SDT to verify fault:
 - a. Replace the device's internal rSSD with a BMR imaged rSSD containing latest OS and FW updates (not supplied – must be created as a fault verification jig/tool) – Refer to Software Tools section above for details on imaging.
 - b. Run SDT and verify if condition persists or if resolved with use of BMR imaged drive – Refer to Software Tools section above for details on SDT.
 - i. If problem is resolved, then re-image original rSSD or replace original rSSD and image.
 - ii. If problem persists, then replace suspected hardware FRU related to the problem by following the detailed replacement procedures covered within this service guide.
3. SDT must be run following all hardware repairs where a FRU was replaced to further verify that problem was resolved by the repair action taken.




Component Removal and Replacement Procedures

Prior to Device Disassembly

- Read this Guide in its entirety before starting any repairs. Pay special attention to the [Repair-Specific Precautions and Warnings](#) and the [Battery Safety](#) sections of the Guide.

Battery Warning

 **WARNING:** Please note that the battery bears the following warning label. Please heed the information provided on the label.




Battery cannot be easily replaced by user

- Risk of fire or burning – contact Microsoft for assistance
- Do not separate or remove battery from backplate cover
- Do not modify battery, its wiring, or connectors
- Do not replace, short circuit, bend, crush, or puncture battery
- Do not dispose of battery in fire or expose to high temperatures (+140°F/60°C)
- For more information: <http://aka.ms/surface-security>



Non-Skid Feet Replacement Process

Preliminary Requirements

 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components

- **Tools:**
 - Plastic tweezers
 - Spudger
 - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
 - Cleaning swabs
 - Soft ESD-safe mat
 - Microfiber cloth
- **Components:**
 - Feet (Refer to [Illustrated Service Parts List](#))

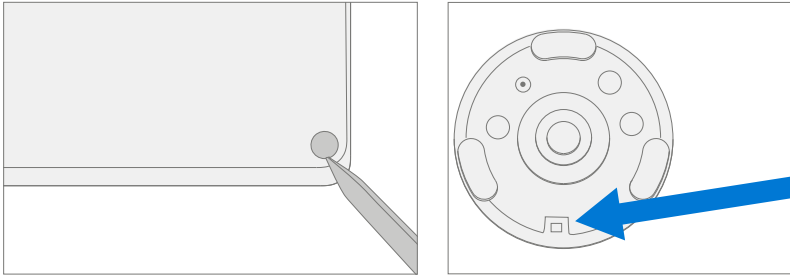
Prerequisite Steps:

- **Power off device** – Ensure device is powered off and disconnected from a power supply.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening the device. Refer to Prior to Device Disassembly section on ([page 20](#)) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.

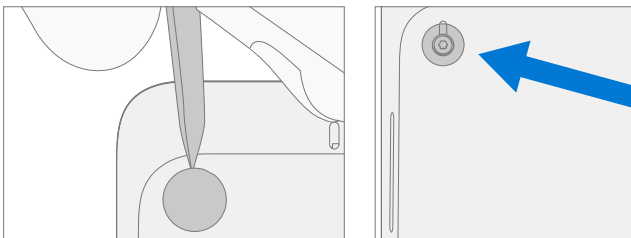


Procedure – Remove (Feet)

1. **Remove front feet** – Use a plastic tool to pry up the front foot from the front divot and then peel to remove. Repeat for the other foot.




2. **Remove back feet** – Use a plastic tool to pry up the back foot from back divot and then peel to remove. Repeat for the other foot.

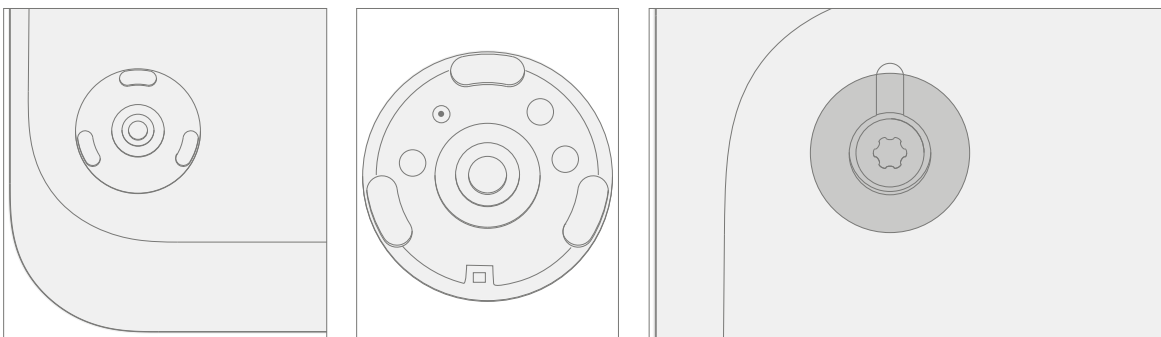


3. **Cleaning** – Remove any adhesive tape remnants from the chassis and clean off any glue residue with 70% or greater Isopropyl Alcohol.

Procedure – Install (Feet)

 **IMPORTANT:** Once removed, the feet must be replaced with new ones.


1. **Device Orientation** – Place device onto a clean surface free of debris with the bottom facing up.
2. **Applying New Feet** – Remove the liners to the adhesive and align the posts on the front feet with the holes in the chassis. Place the foot in the chassis and press down firmly for a few seconds. Repeat the same steps for the remaining front foot. Remove the liners to the adhesive of the back foot and align with the screw hole of the chassis. Place the foot on the chassis and press down firmly for a few seconds. Repeat the same steps for the remaining front foot.



3. **Securing New Feet** – Press down on the foot firmly for about 30 seconds to secure the foot. Repeat the same steps for the remaining feet.

Keyboard Assembly Replacement Process (Metal, Fabric)

Preliminary Requirements

 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components

- **Tools:**
 - Plastic tweezers / spudger
 - Plastic card tool example iFixit Plastic Card
 - Anti-static wrist strap (1 MOhm resistance)
 - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
 - Cleaning swabs
 - 5IP (Torx-plus) driver
 - USB Thumb drive with SDT
 - Surface Power Supply
 - Soft ESD-safe mat
 - Microfiber cloth
 - Heavy duty suction cups (2) – 57.15mm (2.25 in)
- **Components:**
 - Keyboard Assembly (Refer to [Illustrated Service Parts List](#))
 - Foot Screw (M1091264-001) Qty. 4

Prerequisite Steps:

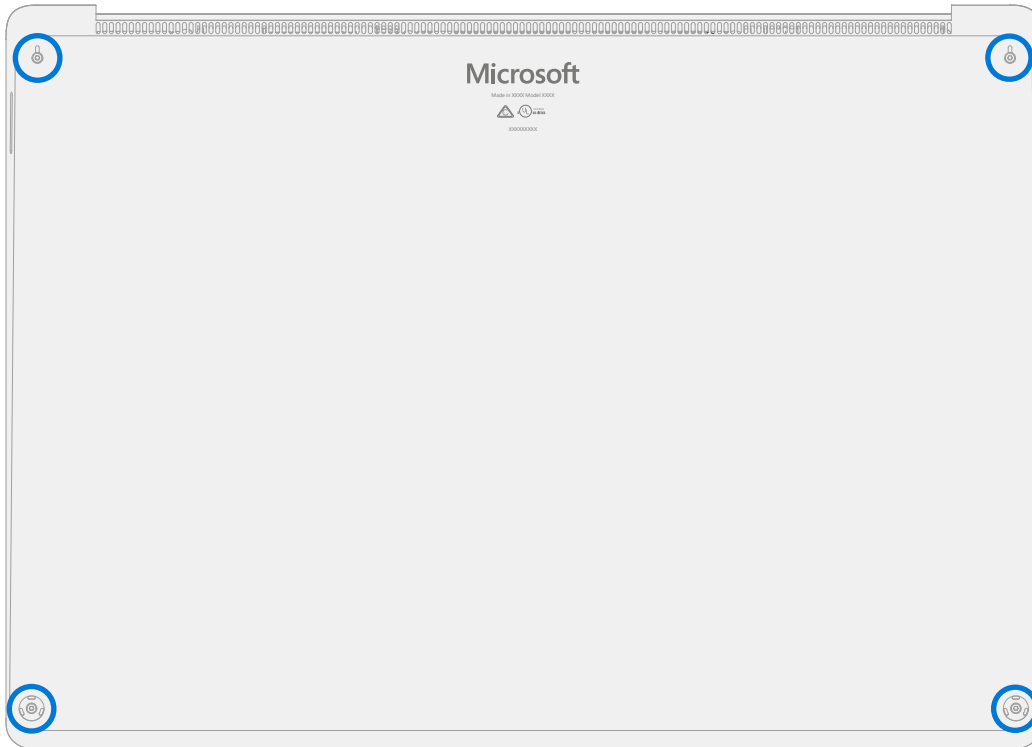
- **Power off device** – Ensure device is powered off and disconnected from a power supply. Remove all attached cables and drives.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening the device. Refer to Prior to Device Disassembly section on ([page 20](#)) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove Feet** – Refer to Procedure – Removal (Feet) on ([page 22](#)) for details.



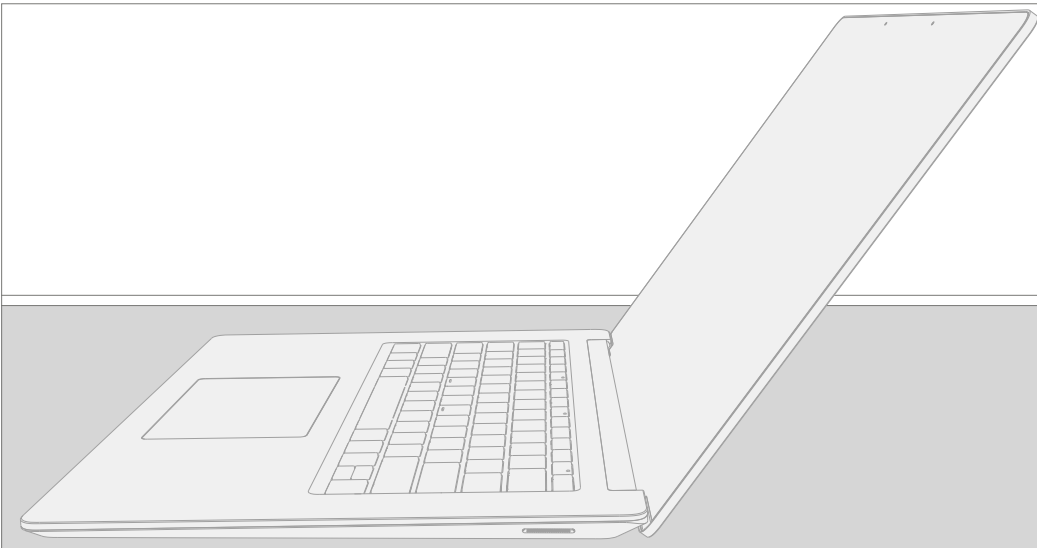
Procedure – Removal (Keyboard Assembly, Metal)

1. **Remove Screws** – Using a 5IP (Torx-plus) screwdriver remove the four screws from under the four feet on the device.

! **CAUTION:** Take care to prevent the keyboard power button depressing during this step. If power button is accidentally depressed and device turns on, shut down device as normal through OS Start menu.



2. **Open Device** – Turn device over and open screen to about 110-degrees.

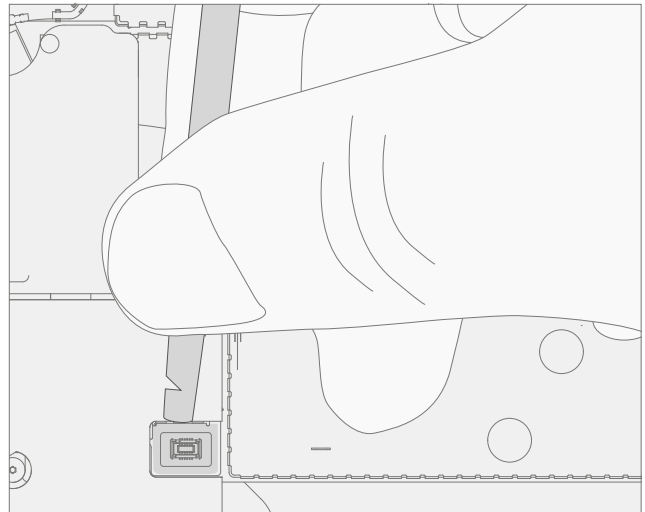
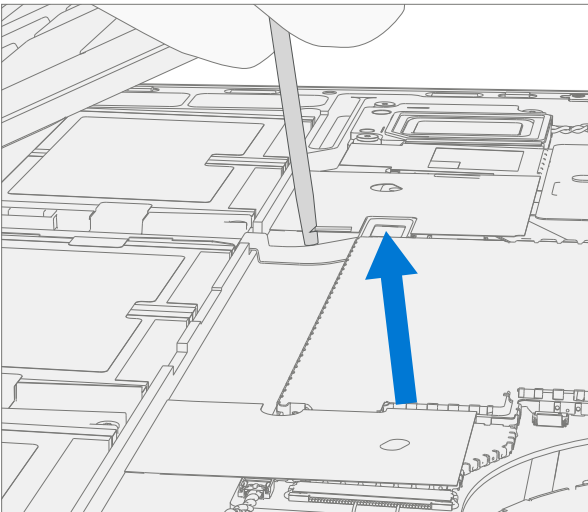


3. **Separate keyboard from device** – Grasp the back of the keyboard, by the display, and pull directly up. Keyboard should lift free from the device.



4. **Disconnect Keyboard** – While holding the keyboard at a ~45-degree angle, use a spudger to remove keyboard FPC from motherboard.

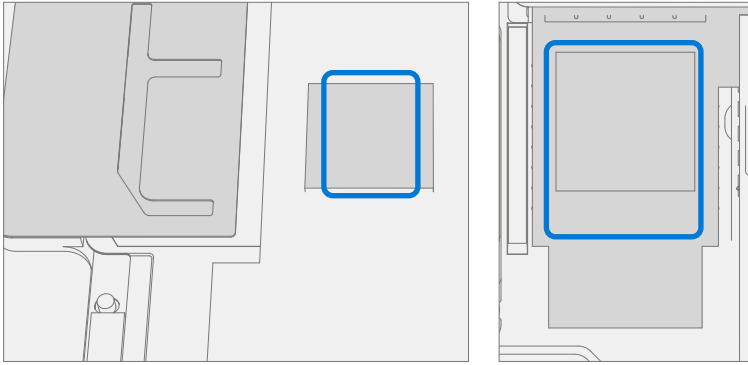
⚠ WARNING: It is recommended a Microsoft provided ESD-safe battery cover appropriate for size (either 13.5" or 15" device) is placed across the device to protect the battery from any accidental damage during repair. Ensure corners of cover are always aligned with the corners of the device during repair. If battery cover is misaligned during the repair operation in any way, re-align before continuing repair activities.



! CAUTION: When removed from the device, place the keyboard in a safe place with key and trackpad side down and FPC facing up to avoid bending/creasing the FPC. Be sure the key and trackpad side of the keyboard is protected from cosmetic damage during storage.



5. **Remove TIM from keyboard and rSSD** – Using IPA and a cotton swab, clean the thermal material from the rSSD and the back of the keyboard.

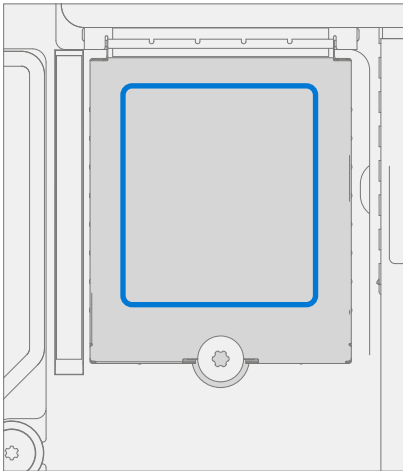


Procedure – Installation (Keyboard Assembly, Metal)

1. Pre-installation Device Inspection

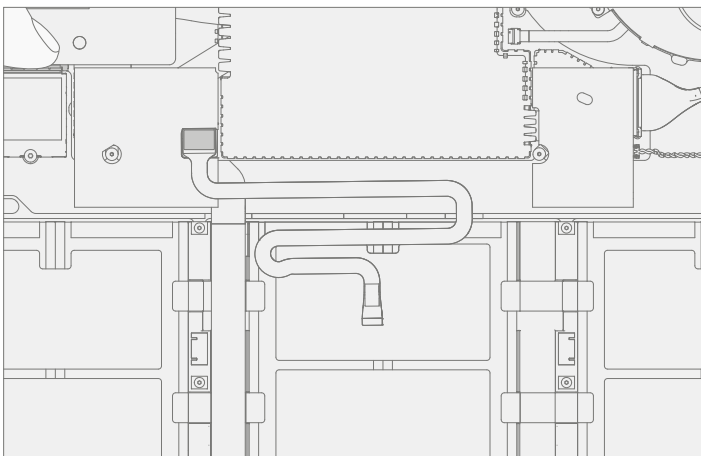
⚠ WARNING: Verify the condition of Liquid Damage Indicator (LDI) inside the audio jack. Use a bright light to illuminate the interior of the audio jack port. Any color other than white indicates liquids have entered the device. Devices exhibiting LDI require whole unit replacement.

2. **Check for unexpected items within device** – Check keyboard (both sides) and device enclosure for any loose articles that may be present inadvertently on the keyboard or within the device enclosure areas.
 - a. Check and remove any foreign objects that the magnets may have attracted or that may have been accidentally introduced into the device during replacement.
 - b. Carefully inspect the area around battery specifically for any foreign objects before removing battery cover.
3. **Apply TIM** – Apply a thermal pad to the rSSD approximately as shown in image below.



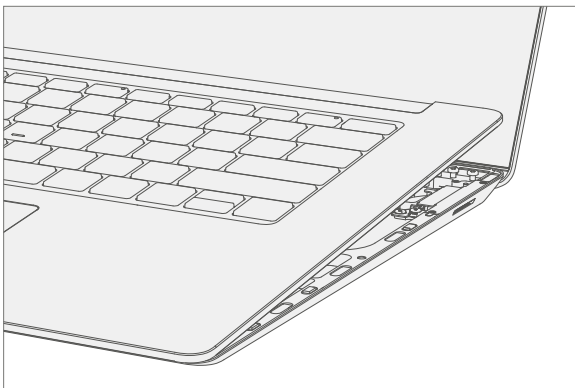
4. **Remove tape from new keyboard FPC** – Tape secures the keyboard FPC during shipping. Remove this tape before continuing with assembly.
5. **Connect Keyboard** – While holding the keyboard at a 45-degree angle, use your hand to align keyboard FPC with connector on motherboard. Gently push connector into place.

! CAUTION: Be sure that FPC bends fall in place properly as pre-bent, and no folds or creases are created during re-assembly of keyboard.

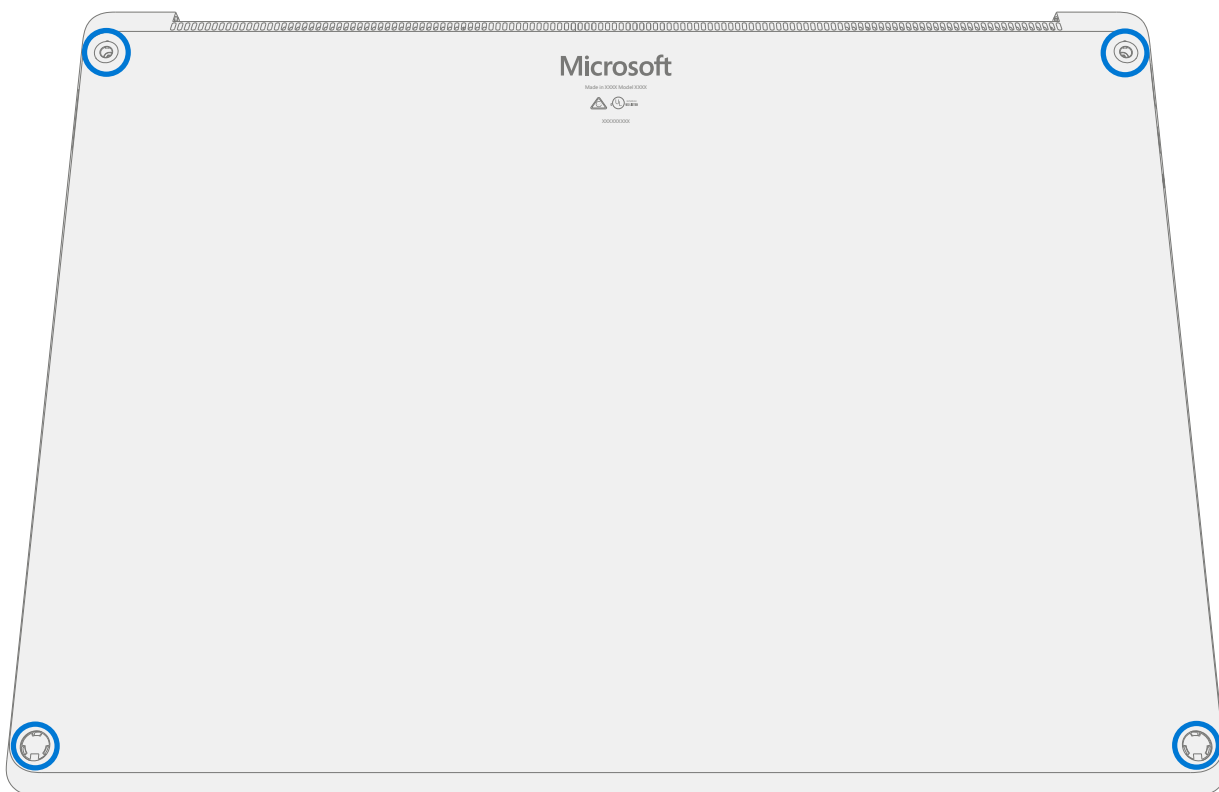


6. **Align keyboard with chassis** – Place keyboard on top of chassis, there should be no discernable gap between keyboard and chassis when viewed from the side.

! **CAUTION:** Before installing keyboard, inspect area for loose screws and debris, paying special attention to the magnetic areas around the chassis and the battery.



7. **Flip Device** – Close display and turn device over.
8. **Install New Chassis Screws** – Using a 5IP (Torx-plus) screwdriver install 1 new Chassis Screw in each corner (4 total). Turn all screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.

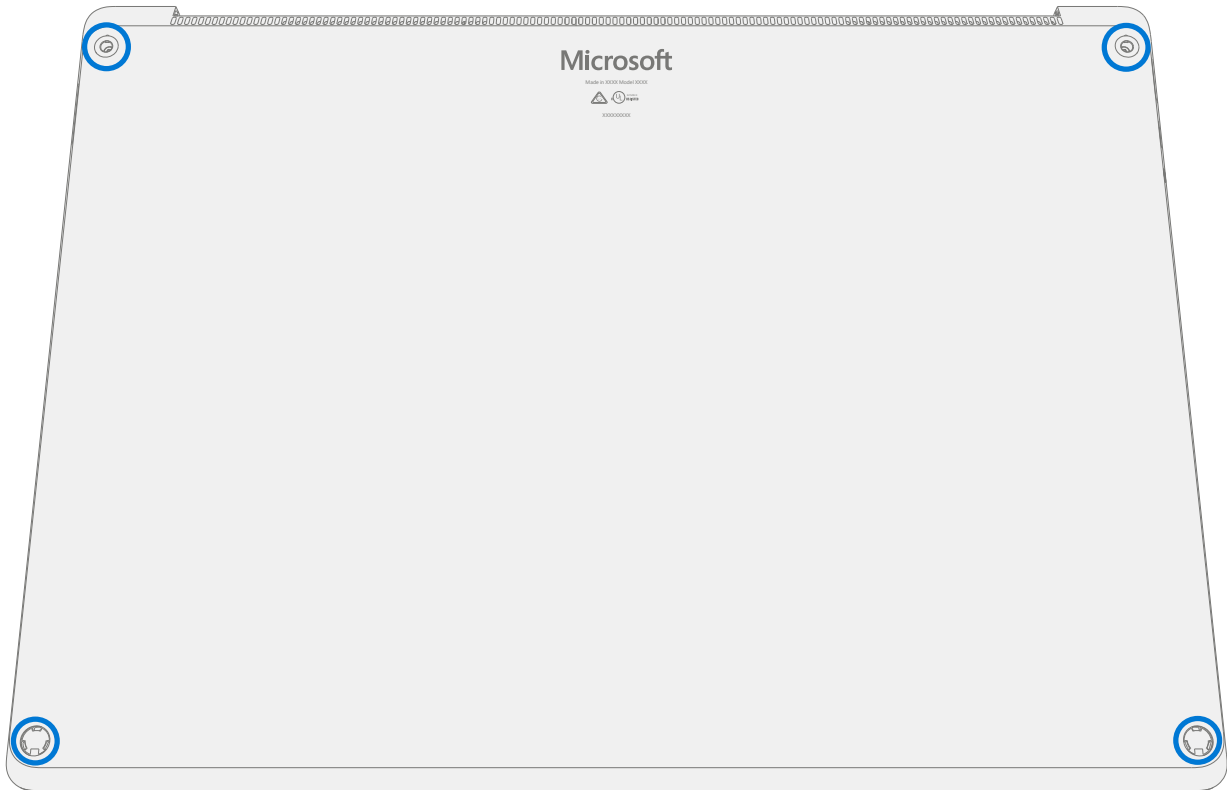


9. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
10. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.
11. **Install Feet** – Refer to Procedure – Installation (Feet) on [\(page 22\)](#) for details.

Procedure – Removal (Keyboard Assembly, Fabric)

1. **Remove Screws** – Using a 5IP (Torx-plus) screwdriver remove the four screws from under the four feet on the device.

! **CAUTION:** Take care to prevent the keyboard power button depressing during this step. If power button is accidentally depressed and device turns on, shut down device as normal through OS Start menu.



2. **Open Device** – Turn device over and open screen to about 110-degrees.



3. **Apply suction cups** – Place suction cup in the bottom palm rest area as shown, as close to the edge as possible.

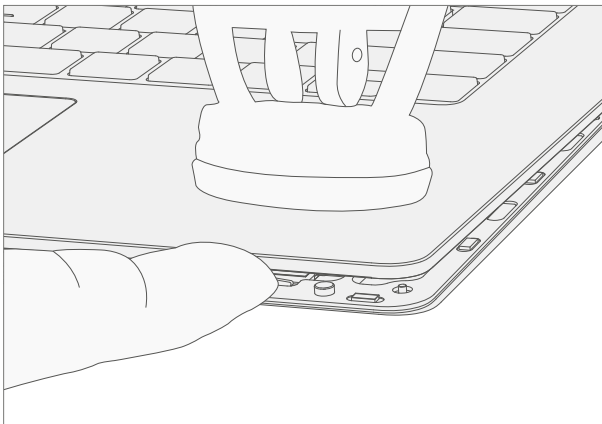
! **CAUTION:** Do not pull the keyboard apart beyond 45 degrees otherwise damage to keyboard FPC could occur.

! **CAUTION:** Do not place suction cup on Trackpad to avoid potential damage to the Trackpad.

! **CAUTION:** Do not wet the suction cup in any way as liquid could stain the keyboard fabric. Place thumb holding down the corner hinge side of the cover closest to the user as shown. Keep pressure on the hinge area to prevent back edge of cover from lifting while pulling up on the suction cup. Be careful to prevent back edge from lifting. If suction cup releases before keyboard is separated from chassis, then re-attach suction cup and try again.



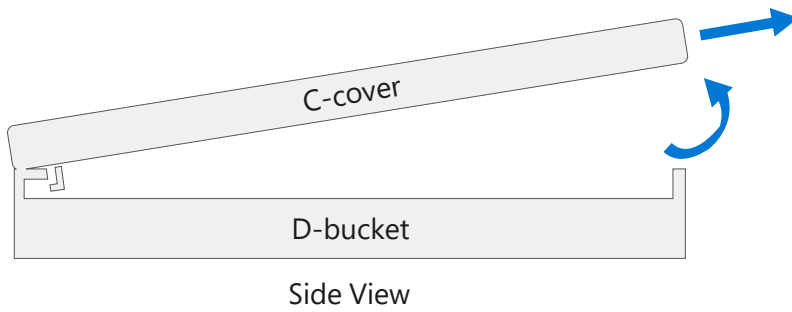
4. **Separate keyboard from device** – Once keyboard separation from the device bottom case is achieved, place a finger between the keyboard and device region. Pull upwards slightly to separate the keyboard from the magnets.



5. **Angle C-cover** – Angle the C-cover at approximately 45 degrees from horizontal – be sure to angle the keyboard **no more than 45 degrees** or else risk damaging the keyboard hook or FPC. If hook is damaged, it needs to be removed carefully to avoid damaging the FPCs, and then a new keyboard needs to be installed.

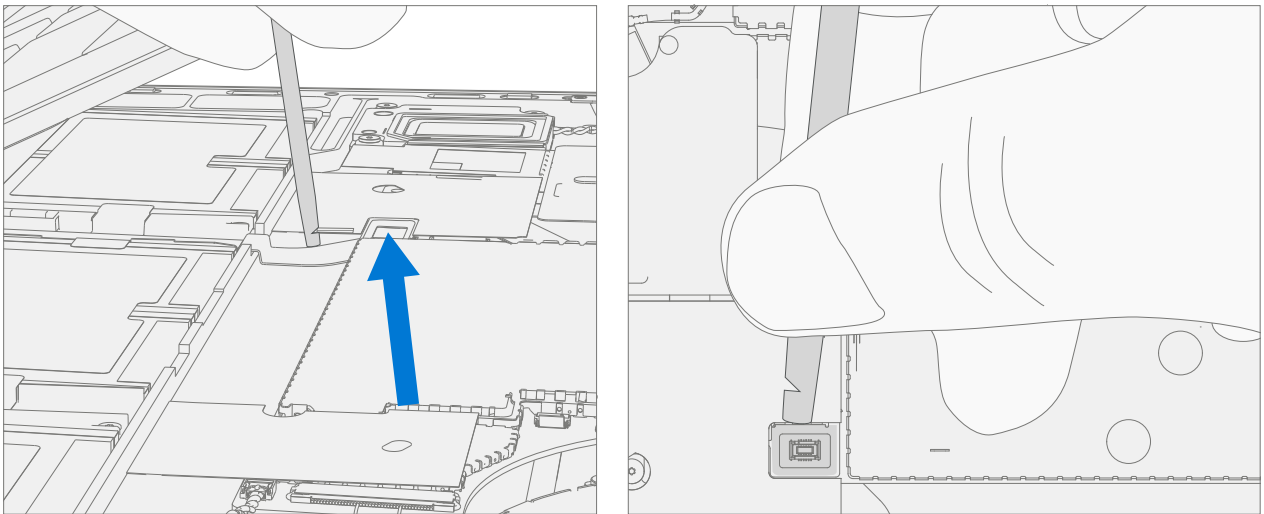


6. **Keyboard hook clearance** – Once angled, keep the angle of the keyboard while pulling the keyboard directly towards yourself. Be sure to avoid pressing on the power button during this procedure.



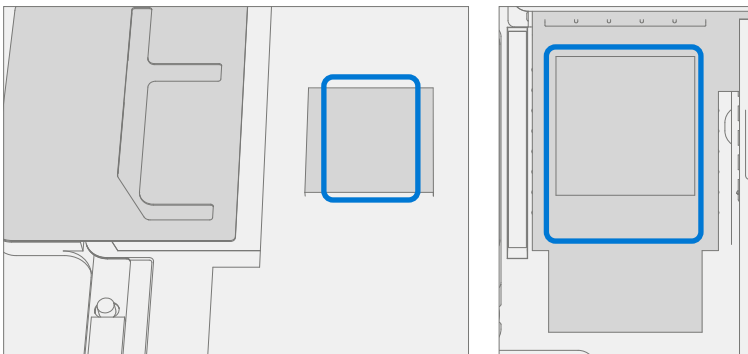
7. **Disconnect Keyboard** – While holding the keyboard at a ~45-degree angle, use a spudger to remove keyboard FPC from motherboard.

⚠ WARNING: It is recommended an ESD-safe battery cover appropriate for size (either 13.5" or 15" device) across the device to protect the battery from any accidental damage during repair. Ensure corners of cover are aligned with the corners of the device at all times during repair. If battery cover is misaligned during the repair operation in any way, re-align before continuing repair activities.



! CAUTION: When removed from the device, place the C-cover in a safe place with key and trackpad side down and FPC facing up to avoid bending/creasing the FPC. Be sure the key and trackpad side of the C-cover is protected from cosmetic damage during storage.

8. **Remove TIM from keyboard and rSSD** – Using IPA and a cotton swab, clean the thermal material from the rSSD and the back of the keyboard.

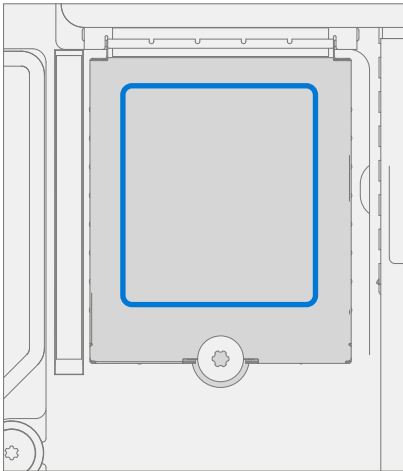


Procedure – Installation (Keyboard Assembly, Fabric)

1. Pre-installation Device Inspection

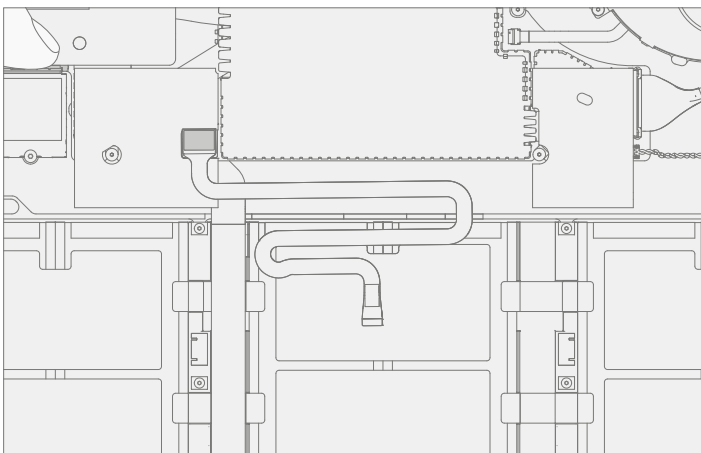
⚠ WARNING: Verify the condition of Liquid Damage Indicator (LDI) inside the audio jack. Use a bright light to illuminate the interior of the audio jack port. Any color other than white indicates liquids have entered the device. Devices exhibiting LDI require whole unit replacement.

2. **Check for unexpected items within device** – Check keyboard (both sides) and device enclosure for any loose articles that may be present inadvertently on the keyboard or within the device enclosure areas.
 - a. Check and remove any foreign objects that the magnets may have attracted or that may have been accidentally introduced into the device during replacement.
 - b. Carefully inspect the area around battery specifically for any foreign objects before removing battery cover.
3. **Apply TIM** – Apply a thermal pad to the rSSD approximately as shown in image below.



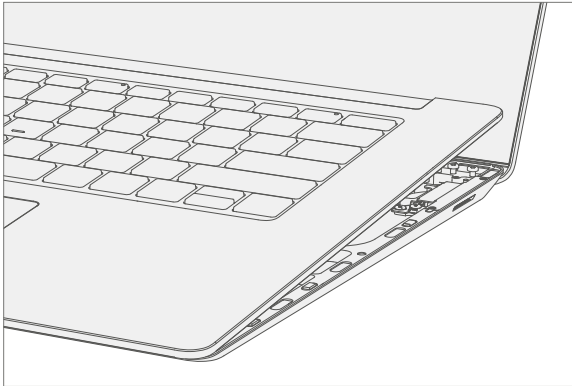
4. **Remove tape from new keyboard FPC** – Tape secures the keyboard FPC during shipping. Remove this tape before continuing with assembly.
5. **Connect Keyboard** – While holding the keyboard at a 45-degree angle, use your hand to align keyboard FPC with connector on motherboard. Gently push connector into place.

! CAUTION: Be sure that FPC bends fall in place properly as pre-bent, and no folds or creases are created during re-assembly of C-cover.

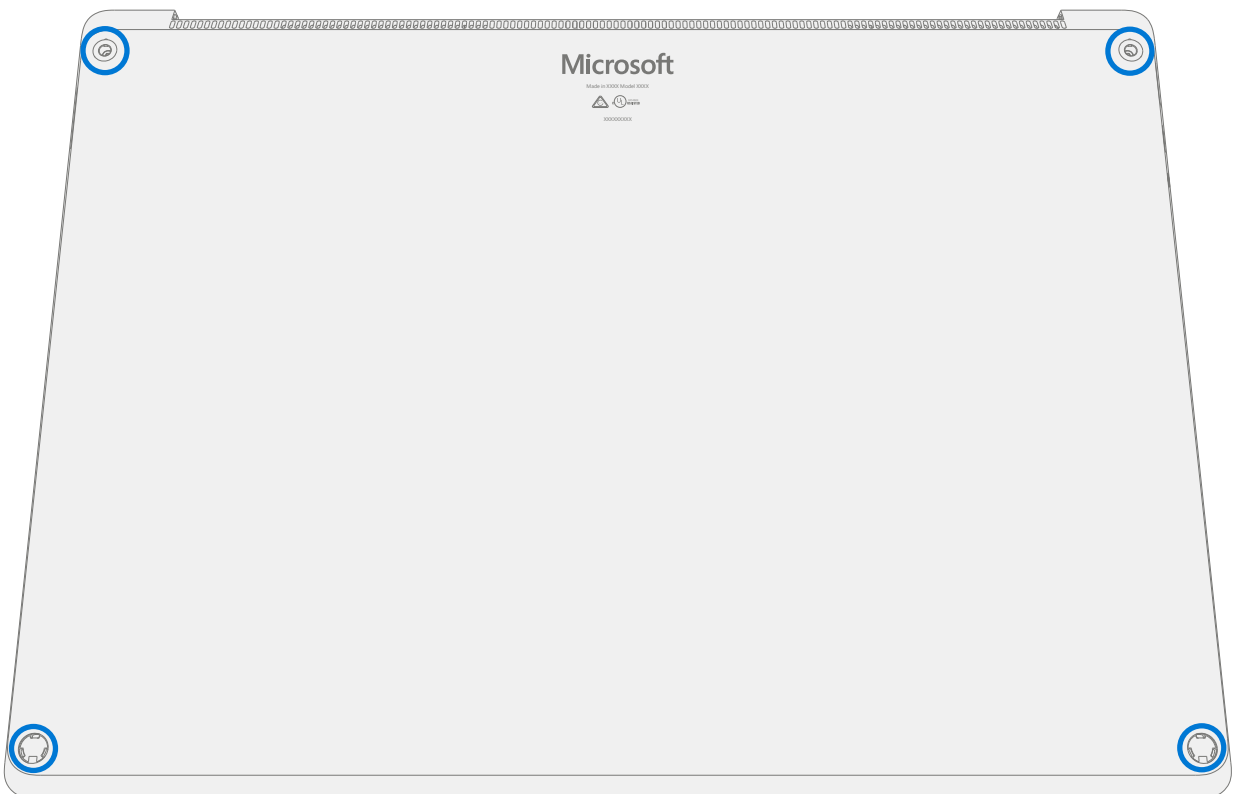


6. **Align keyboard with chassis** – Place keyboard on top of chassis, there should be no discernable gap between keyboard and chassis when viewed from the side.

! **CAUTION:** Before installing keyboard, inspect area for loose screws and debris, paying special attention to the magnetic areas around the chassis and the battery.



7. **Flip Device** – Close display and turn device over.
8. **Install New Chassis Screws** – Using a 5IP (Torx-plus) screwdriver install 1 new Chassis Screw in each corner (4 total). Turn all screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.




9. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
10. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.
11. **Install Feet** – Refer to Procedure – Installation (Feet) on [\(page 22\)](#) for details.



rSSD Replacement Process

Preliminary Requirements

 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components


- **Tools:**
 - Plastic tweezers / spudger
 - Anti-static wrist strap (1 MOhm resistance)
 - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
 - Cleaning swabs
 - 5IP (Torx-plus) driver
 - USB Thumb drive with SDT
 - Surface Power Supply
 - Soft ESD-safe mat
 - Microfiber cloth
- **Components:**
 - rSSD (Refer to [Illustrated Service Parts List](#)) if replacing
 - rSSD Screw (M1108751-001) Qty. 1

Prerequisite Steps:

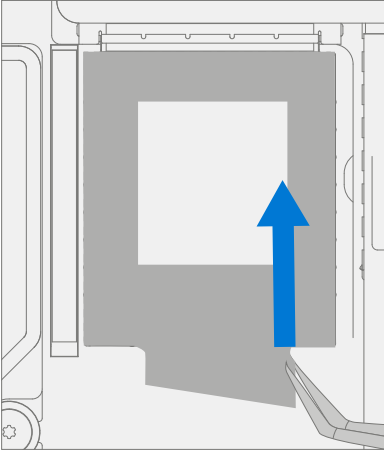
- **Power off device** – Ensure device is powered off and disconnected from a power supply.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening the device. Refer to Prior to Device Disassembly section on ([page 20](#)) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove Feet** – Refer to Procedure – Removal (Feet) on ([page 22](#)) for details.
- **Remove Keyboard** – Refer to Procedure – Removal (Keyboard) on ([page 24](#)) for details.



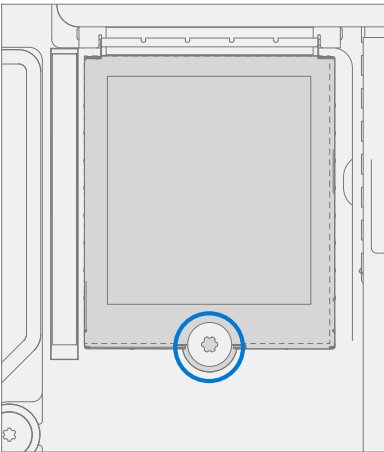
Procedure – Removal (rSSD)

 **IMPORTANT:** Removing the rSSD disconnects the battery from the rest of the electronic components in the unit. Remove the rSSD to **safely** power down the device prior to performing any repairs.

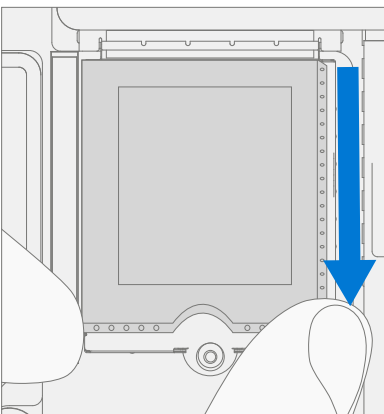
1. **Remove desense** – On the **15" model only**, there is a desense sticker covering the rSSD. Carefully peel the sticker off using a pair of tweezers.



2. **Remove rSSD screw** – Using a 5IP (Torx-plus) driver remove the screw securing the rSSD.

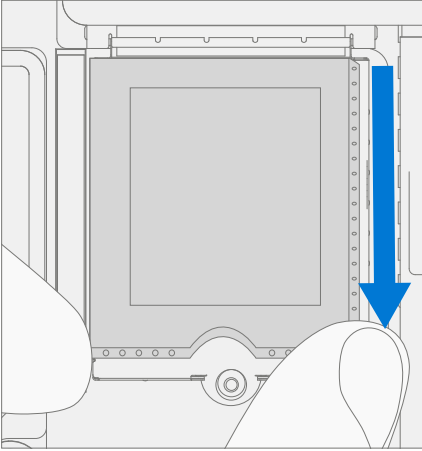


3. **Remove rSSD** – The rSSD should lift upwards to ~15-degrees after screw is removed. Carefully grab sides of rSSD case and pull out of main board socket at same ~15-degree angle.

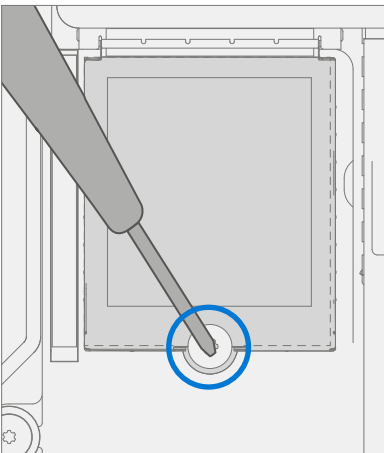


Procedure – Installation (rSSD)

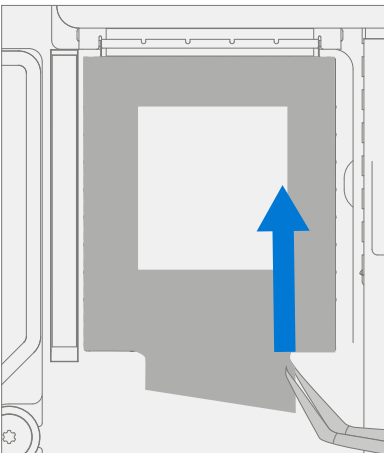
1. **Insert rSSD** – Insert the connector end of the rSSD into the receptacle on the motherboard at a ~15-degree angle.



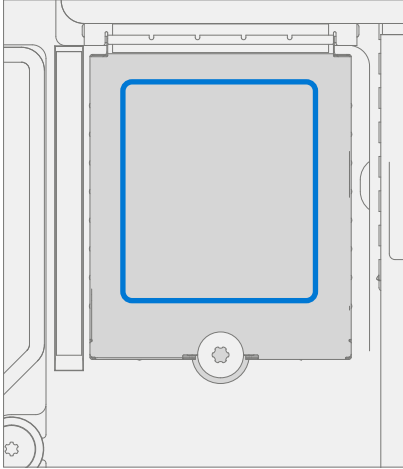
2. **Install new rSSD screw** – Using a 5IP (Torx-plus) driver install the rSSD screw. Turn the screw until just snug and seated, and then turn another 45 degrees (1/8 turn) or until fully fastened.




3. **Apply desense** – On the **15" model only**, there is a desense sticker covering the rSSD. Carefully align the desense sticker over the rSSD and apply.



4. **Apply TIM** – Apply a thermal pad to the rSSD approximately as shown in image below.



5. **Connect Keyboard** – Connect keyboard as detailed on Procedure – Installation (Keyboard Assembly) ([page 32](#)).
6. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
7. **Imaging** – Image the new rSSD by using a BMR Imaging USB drive specific to the device model.


 **IMPORTANT:** Refer to Surface imaging process - [Surface Imaging Tools](#)

8. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.
9. **Install Keyboard** – Refer to Procedure – Installation (Keyboard) on ([page 32](#)) for details.
10. **Install Feet** – Refer to Procedure – Installation (Feet) on ([page 22](#)) for details.



rSSD Swap to a New Device Process

Preliminary Requirements

 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components


- **Tools:**
 - Plastic tweezers / spudger
 - Anti-static wrist strap (1 MOhm resistance)
 - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
 - Cleaning swabs
 - 5IP (Torx-plus) driver
 - USB Thumb drive with SDT
 - Surface Power Supply
 - Soft ESD-safe mat
 - Microfiber cloth

Prerequisite Steps:

- Using an Internet connection install all available updates: Navigate to *Settings* -> *Update and Security* and check for Windows Update.
- Consumer using Windows Home:
 - The Bitlocker recovery key is automatically generated for users with an MSA and can be found by the user by searching the web for “bitlocker recovery key” and logging into their MSA. If the user does not have an MSA based account, the disk will not be encrypted.
- Commercial using Windows Pro:
 - This is managed via commercial policy, and each business may have their own bitlocker policy / recovery method.
 - Confirm that the customer knows the **Windows password to the device**.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening device. Refer to Prior to Device Disassembly section ([page 20](#)) for details.



Procedure – Swap (rSSD)

 **IMPORTANT:** Removing the rSSD disconnects the battery from the rest of the electronic components in the unit. Remove the rSSD to **safely** power down the device prior to performing any repairs.

1. Manage Bitlocker

a. If rSSD remains encrypted during swap

- i. Navigate to *Bitlocker* -> *Manage Bitlocker* -> *Generate Bitlocker Recovery Key*.
- ii. Plug in USB drive.
- iii. Save the recovery key to USB storage.
- iv. Remove the USB drive.

b. If rSSD can be unencrypted before swap

- i. Navigate to *Bitlocker* -> *Manage Bitlocker*.
- ii. Select *Turn Off Bitlocker*.

c. If Bitlocker key has been lost

- i. Follow the instructions for [recovering your Bitlocker key](#).

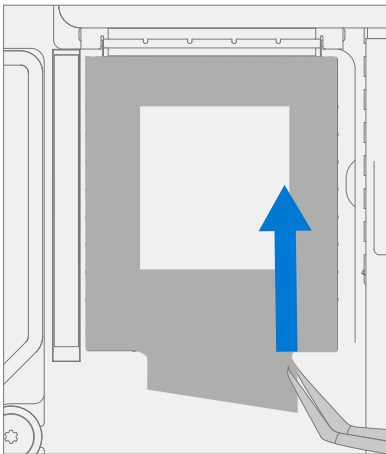
2. **Power off device** – Ensure device is powered off and disconnected from a power supply.

3. **Position device** – Place device onto a clean surface free of debris with the bottom facing up.

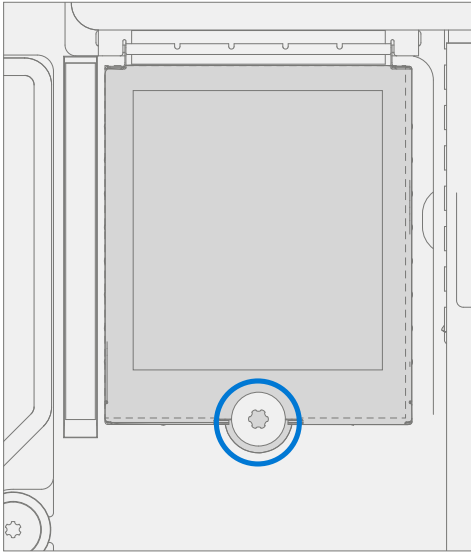
4. **Remove Feet** – Refer to Procedure – Removal (Feet) on [\(page 22\)](#) for details.

5. **Remove Keyboard** – Refer to Procedure – Removal (Keyboard) on [\(page 24\)](#) for details.

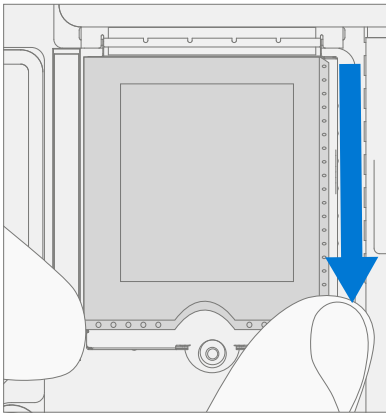
6. **Remove desense** – On the **15” model only**, there is a desense sticker covering the rSSD. Carefully peel the sticker off using a pair of tweezers.



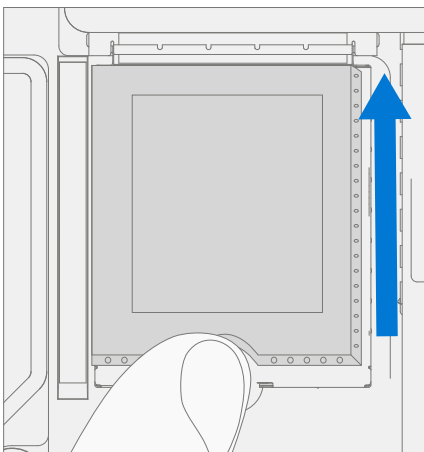
7. **Remove rSSD screw** – Using a 5IP (Torx-plus) driver remove the screw securing the rSSD. Take care not to damage the screw; it will be reused.



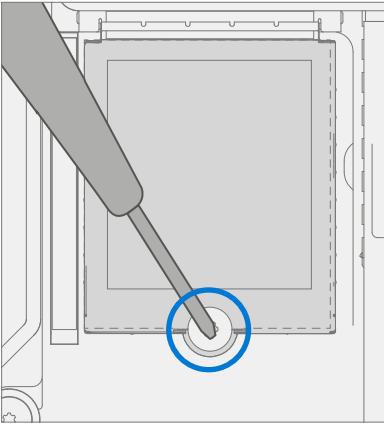
8. **Remove rSSD** – The rSSD should lift upwards to ~15-degrees after screw is removed. Carefully grab sides of rSSD case and pull out of main board socket at same ~15-degree angle.



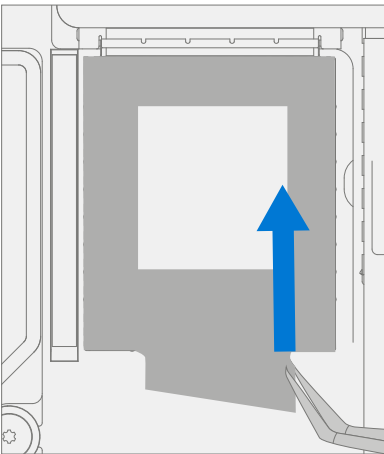
9. **Clean TIM** – Using IPA alcohol and a cotton swab, remove any residual TIM from both rSSD's.
10. **rSSD Swap** – Insert rSSD removed from the new device into customer's original device, then insert customer's original rSSD into new device. Insert the connector end of the rSSD into the rSSD connector on Main board at ~ 15-degree angle.



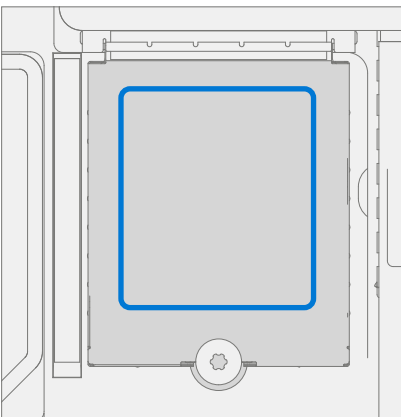
11. **Install rSSD screws in both devices** – Use a 5IP (Torx-plus) driver to install a new rSSD screw until the screw is just snug and seated, and then turn another 45-degrees (1/8 turn) or until screw is fully fastened.



12. **Apply desense** – On the **15" model only**, there is a desense sticker covering the rSSD. Carefully align the desense sticker over the rSSD and apply.




13. **Apply TIM** – Apply a thermal pad to the rSSD approximately as shown in image below.



14. **Install Keyboard** – Refer to Procedure – Installation (Keyboard) on [\(page 32\)](#) for details.
15. **Install Feet** – Refer to Procedure – Installation (Feet) on [\(page 22\)](#) for details.
16. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
17. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.

Surflink Replacement Process

Preliminary Requirements

 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components

- **Tools:**
 - Plastic tweezers / spudger
 - Anti-static wrist strap (1 MOhm resistance)
 - Non-Metallic ruler (Amazon Example)
 - 3IP (Torx-plus) driver
 - USB Thumb drive with SDT
 - Surface Power Supply
 - Soft ESD-safe mat
 - Microfiber cloth
- **Components:**
 - Surflink Port (Refer to [Illustrated Service Parts List](#))
 - Bracket Screw 1 (M1086672-001) Qty. 2
 - Bracket Screw 2 (M1109237-001) Qty. 2
 - Surflink Screw (M1093898-001) Qty. 2

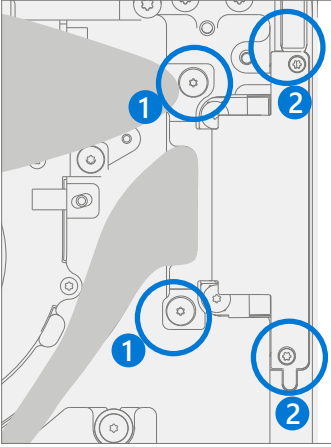
Prerequisite Steps:

- **Power off device** – Ensure device is powered off and disconnected from a power supply. Remove all attached cables and drives.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening the device. Refer to Prior to Device Disassembly section on ([page 20](#)) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove Feet** – Refer to Procedure – Removal (Feet) on ([page 22](#)) for details.
- **Remove Keyboard** – Refer to Procedure – Removal (Keyboard) on ([page 24](#)) for details.
- **Remove rSSD** – Refer to Procedure – Removal (rSSD) on ([page 35](#)) for details.

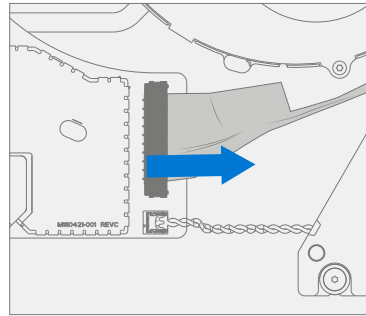
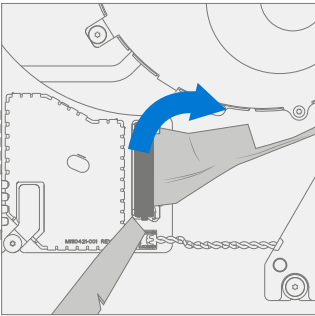


Procedure – Removal (Surflink)

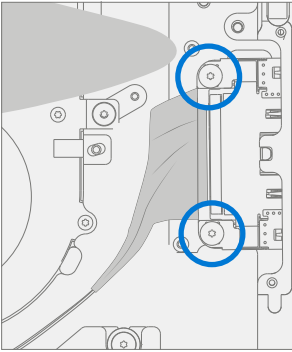
1. **Remove bracket** – Using a 3IP (Torx-plus) driver remove the 4 Bracket Screws securing the bracket to the chassis. Remove the bracket.



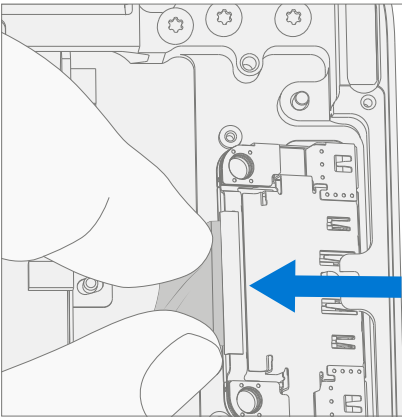
2. **Remove Surflink FPC** – Using a plastic spudger lift locking connector on FPC and use spudger to remove connector from motherboard.



3. **Remove Surflink Port Screws** – Using a 3IP (Torx-plus) driver remove the 2 Surflink Screws securing the Surflink Port to the chassis.

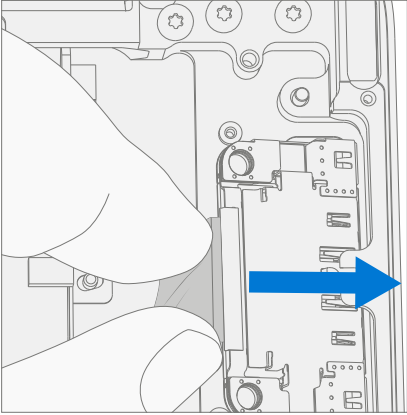


4. **Remove Surflink Port** – Remove the Surflink Port from the chassis.

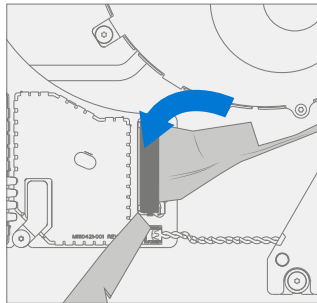
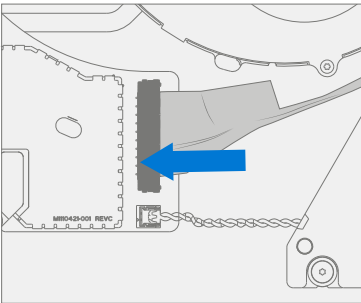


Procedure – Installation (Surflink)

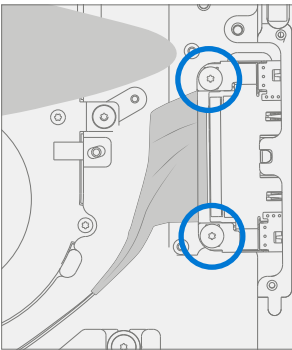
1. **Install Surflink Port** – Place the Surflink Port into the chassis. Ensure the chassis posts nest into the Surflink Port slot.



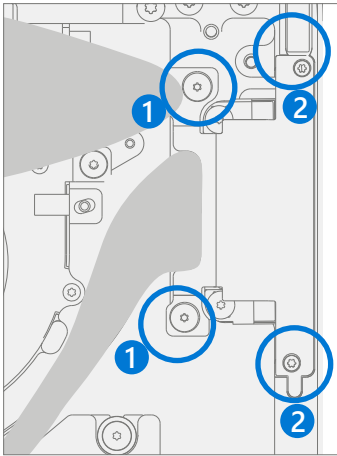
2. **Connect Surflink FPCs** – Align the FPC's connectors to the motherboard and slide into connector. Press down on locking cover.



3. **Install new Surflink Screws** – Using a 3IP (Torx-plus) driver install 2 new Surflink Screws. Turn all screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



4. **Install bracket** – Place the Surflink bracket over the Surflink. Using a 3IP (Torx-plus) driver install 4 new Bracket Screws. Turn all screws until they are just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.




5. **Install rSSD** – Refer to Procedure – Installation (rSSD) on [\(page 36\)](#) for details.
6. **Install Keyboard** – Refer to Procedure – Installation (Keyboard) on [\(page 32\)](#) for details.
7. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
8. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.
9. **Install Feet** – Refer to Procedure – Installation (Feet) on [\(page 22\)](#) for details.



Thermal Module Replacement Process

Preliminary Requirements

 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components

- **Tools:**
 - Plastic tweezers
 - Plastic spudger
 - Anti-static wrist strap (1 MOhm resistance)
 - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
 - Cleaning swabs
 - 3IP (Torx-plus) driver
 - USB Thumb drive with SDT
 - Surface Power Supply
 - Soft ESD-safe mat
 - Microfiber cloth
- **Components:**
 - Thermal Module + Fan (Refer to [Illustrated Service Parts List](#))
 - Thermal Module + Fan Screw 1 (M1101188-001) Qty. 1
 - Thermal Module + Fan Screw 2 (MM1086672-001) Qty. 2
 - Thermal Module + Fan Screw 3 (M1091265-001) Qty. 2 (Qty. 3 for 15")
 - Socket Screw 1 (M1108753-001) Qty. 2
 - Socket Screw 2 (M1108752-001) Qty. 2

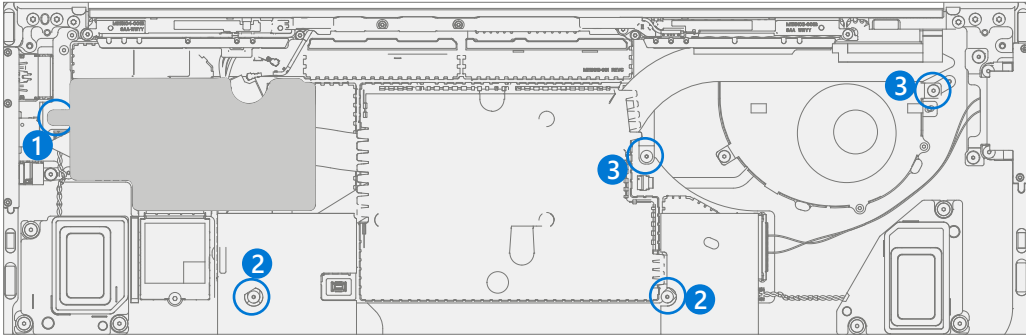
Prerequisite Steps:


- **Power off device** – Ensure device is powered off and disconnected from a power supply. Remove all attached cables and drives.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening the device. Refer to Prior to Device Disassembly section on ([page 20](#)) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove Feet** – Refer to Procedure – Removal (Feet) on ([page 22](#)) for details.
- **Remove Keyboard** – Refer to Procedure – Removal (Keyboard) on ([page 24](#)) for details.
- **Remove rSSD** – Refer to Procedure – Removal (rSSD) on ([page 35](#)) for details.

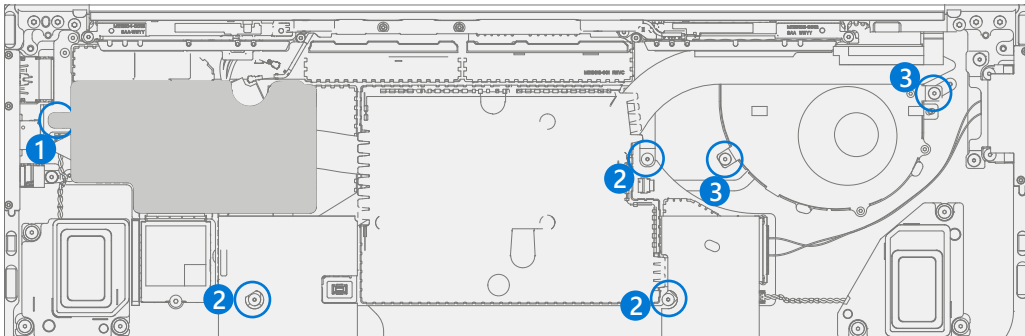


Procedure – Removal (Thermal Module)

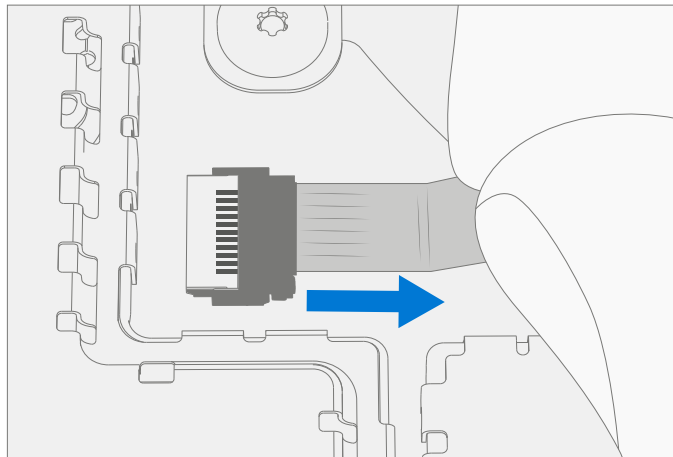
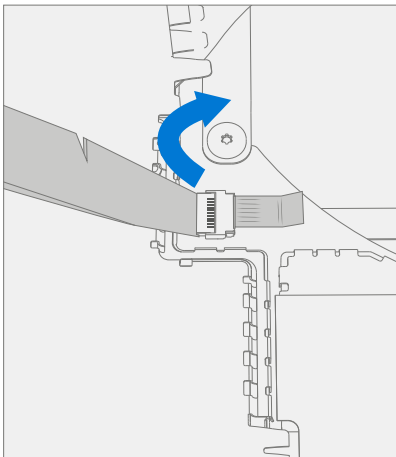
1. **Remove Screws** – Using a 3IP (Torx-plus) driver remove the 5 screws securing the Thermal Module + Fan to the chassis.



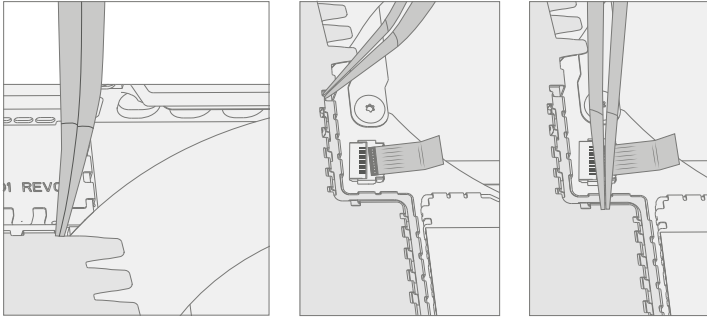
 **IMPORTANT:** The 15" model has six screws on the thermal module. Locations are listed below.



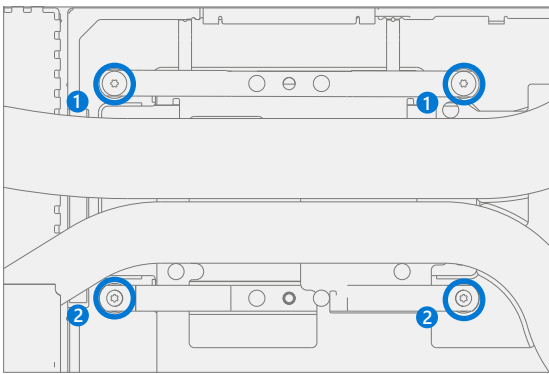
2. **Remove fan connector** – Using a plastic spudger lift the locking tab on the fan connector and pull fan FPC out of connector.



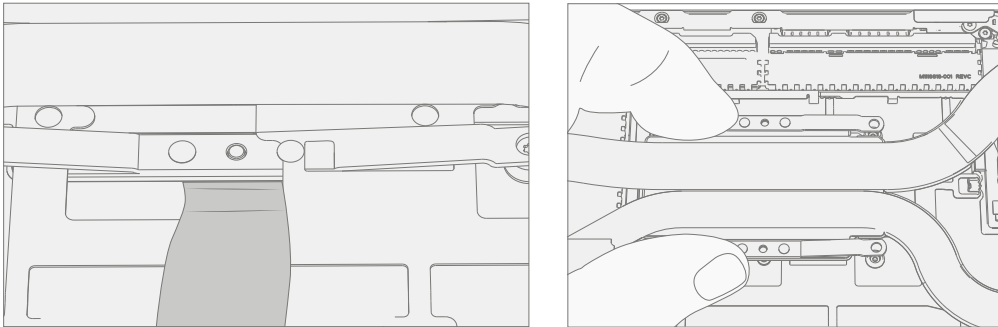
3. **Remove thermal module shield** – Using plastic tweezers work around the right-side of the thermal shield, gently prying it up. Once the right side is separated from the retention frame underneath the shield, gently pull up using fingers.



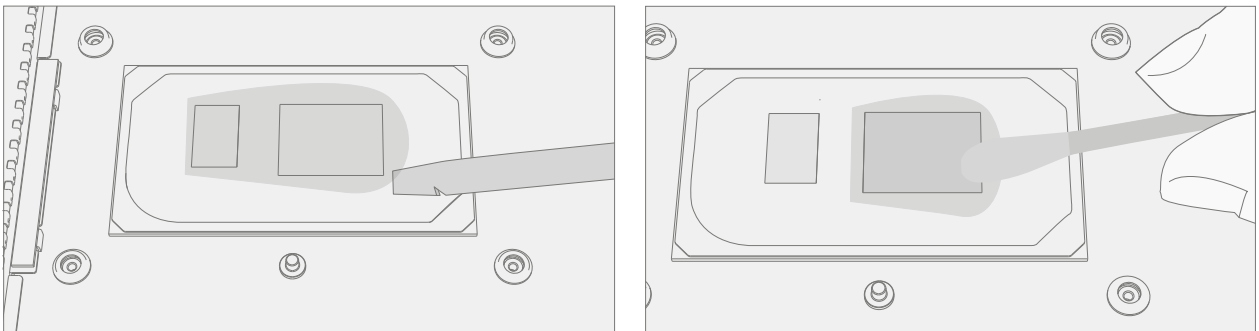
4. **Remove socket screws** – Using a 3IP (Torx-plus) driver remove the 4 socket screws securing the Thermal Module + Fan to the motherboard.



5. **Remove thermal module** – Using a plastic spudger gently work under the edge of the thermal module to break the seal with the TIM underneath. Lift out thermal module.




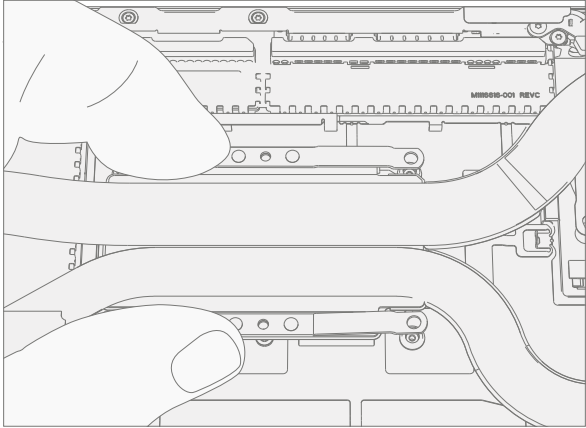
6. **Clean residual TIM** – Using a plastic spudger gently scrape off left over TIM. Use a cotton swab dipped in IPA to clean off residual TIM. Clean with microfiber cloth.



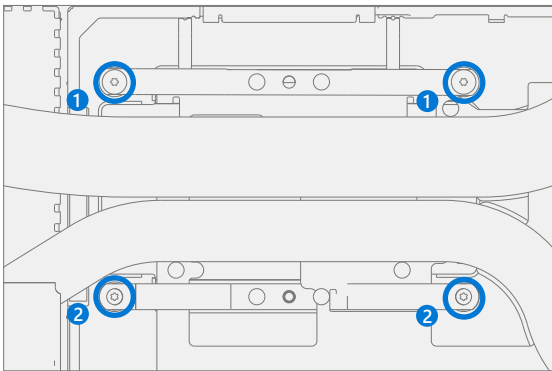
Procedure – Installation (Thermal Module)

1. **Install thermal module** – Place new thermal module + fan into device. Be sure to align screw holes with chassis posts.

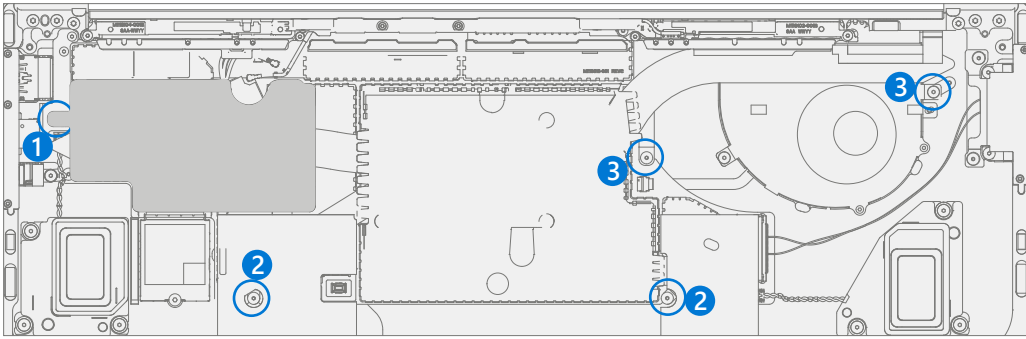
 **IMPORTANT:** Do not reposition device once placed. Thermal Interface Material on thermal module is not procurable separately.




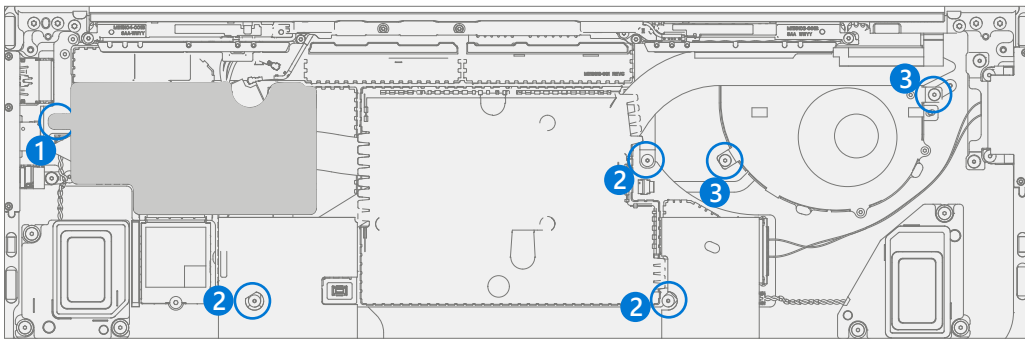
2. **Install socket screws** – Using a 3IP (Torx-plus) driver install the 4 new socket screws in each corner tensioner. Turn each screw until just snug and seated, and then turn another 45 degrees (1/8 turn) or until screws are fully fastened.



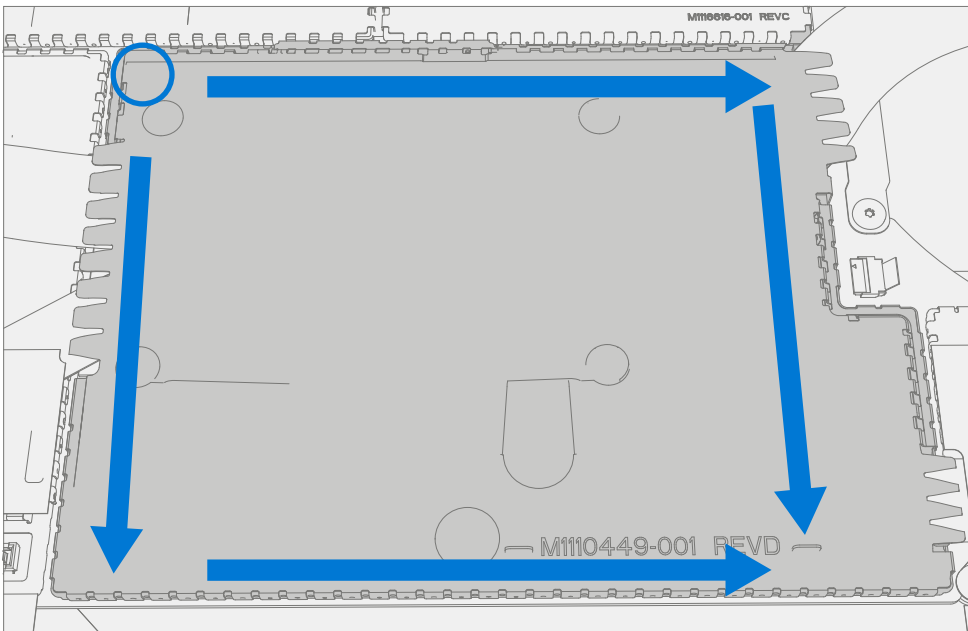
3. **Install thermal module screws** – Using a 3IP (Torx-plus) driver install the 5 new Thermal Module Screws that secure it to the chassis. Turn each screw until just snug and seated, and then turn another 45-degrees (1/8 turn) or until screws are fully fastened.



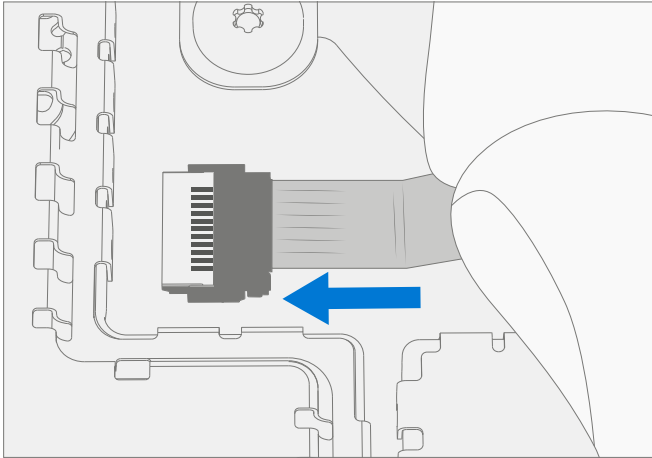
 **IMPORTANT:** The 15" model has 6 screws on the thermal module. Locations are listed below.



4. **Install thermal module shield** – Align shield around retention frame and press down the upper left corner. Then work around the outer edge of the shield, there should be clicking as the shield seats properly.



5. **Install fan connector** – Reconnect fan FPC and press down the locking tab on the connector.




6. **Install rSSD** – Refer to Procedure – Installation (rSSD) on [\(page 36\)](#) for details.
7. **Install Keyboard** – Refer to Procedure – Installation (Keyboard) on [\(page 32\)](#) for details.
8. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
9. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.
10. **Install Feet** – Refer to Procedure – Installation (Feet) on [\(page 22\)](#) for details.



Speaker Replacement Process

Preliminary Requirements

 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components

- **Tools:**
 - Plastic tweezers / spudger
 - Anti-static wrist strap (1 MOhm resistance)
 - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
 - Cleaning swabs
 - 3IP (Torx-plus) driver
 - USB Thumb drive with SDT
 - Surface Power Supply
 - Soft ESD-safe mat
 - Microfiber cloth
- **Components:**
 - Speakers (Refer to [Illustrated Service Parts List](#))
 - Speaker Screw (M1014142-001) Qty. 6

Prerequisite Steps:

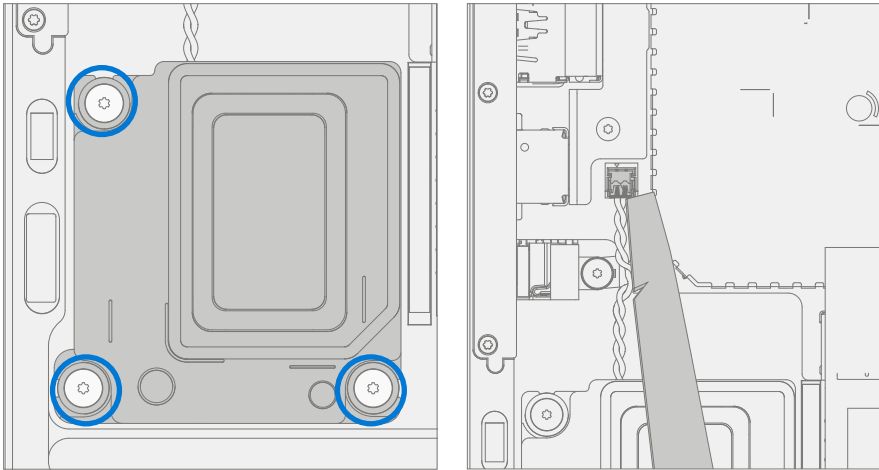
- **Power off device** – Ensure device is powered off and disconnected from a power supply. Remove all attached cables and drives.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening the device. Refer to Prior to Device Disassembly section on ([page 20](#)) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove Feet** – Refer to Procedure – Removal (Feet) on ([page 22](#)) for details.
- **Remove Keyboard** – Refer to Procedure – Removal (Keyboard) on ([page 24](#)) for details.
- **Remove rSSD** – Refer to Procedure – Removal (rSSD) on ([page 35](#)) for details.
- **Remove Thermal Module** – Refer to Procedure – Removal (Thermal Module) on ([page 48](#)) for details.



Procedure – Removal (Speakers)

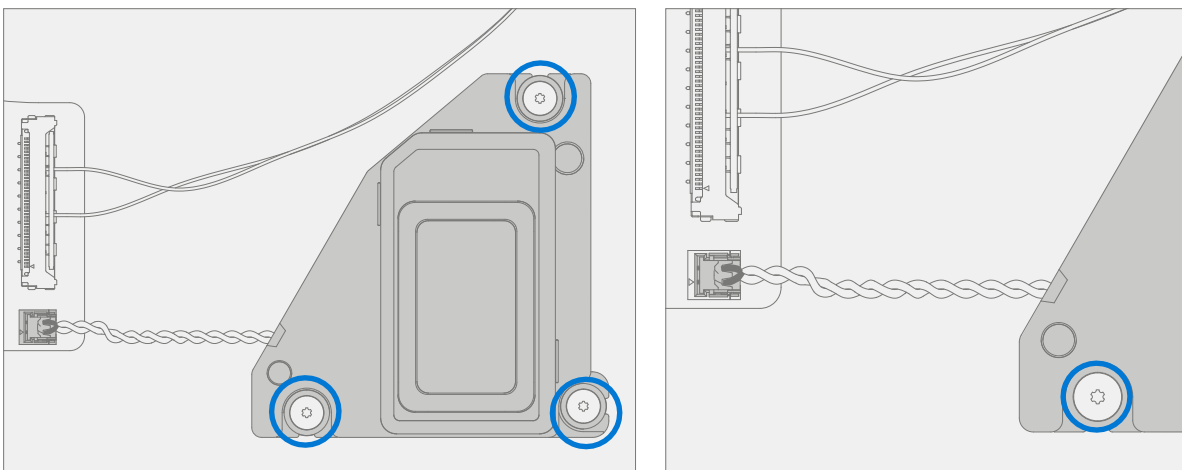
1. **Remove right speaker** – Using a 3IP (Torx-plus) driver remove the 3 screws securing the left speaker to the chassis. Disconnect speaker from motherboard using a plastic spudger, by lifting the cable up from the motherboard. Remove the left speaker.

! **CAUTION:** Do not attempt to pull cable out, cable slots into the connector from the top and should be lifted out of the chassis.



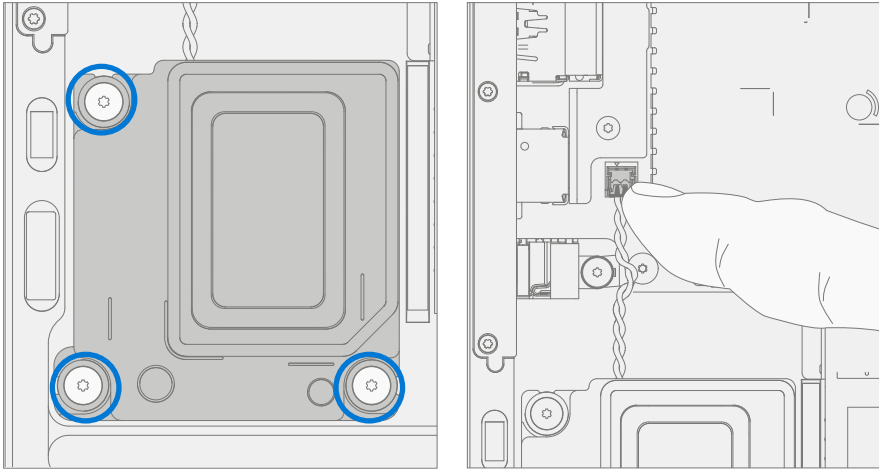
2. **Remove right speaker** – Using a 3IP (Torx-plus) driver remove the 3 screws securing the right speaker to the chassis. Disconnect speaker from motherboard using a plastic spudger, by lifting the cable up from the motherboard. Remove the right speaker.

! **CAUTION:** Do not attempt to pull cable out, cable slots into the connector from the top and should be lifted out of the chassis.

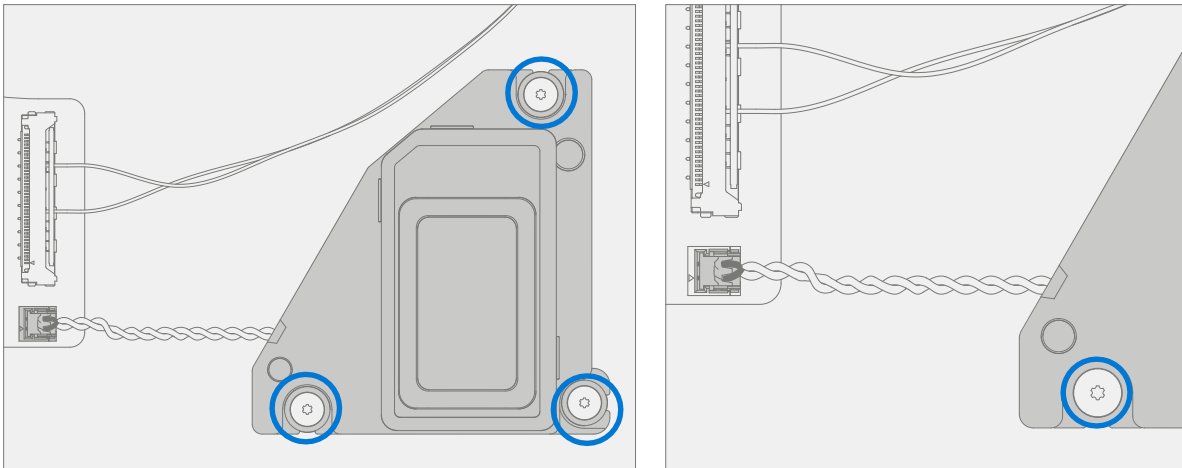


Procedure – Installation (Speakers)

1. **Install left speaker** – Place left speaker in chassis. Using a 3IP (Torx-plus) driver install the 3 Speaker Screws securing the left speaker to the chassis until finger tight. Then turn each screw an additional ~45-degrees (1/8 turn), or until fully fastened. Connect speaker to motherboard.



2. **Install right speaker** – Place right speaker in chassis. Using a 3IP (Torx-plus) driver install the 3 screws securing the right speaker to the chassis until finger tight. Then turn each screw an additional ~45-degrees (1/8 turn), or until fully fastened. Connect speaker to motherboard.




3. **Install rSSD** – Refer to Procedure – Installation (rSSD) on [\(page 36\)](#) for details.
4. **Install Keyboard** – Refer to Procedure – Installation (Keyboard) on [\(page 32\)](#) for details.
5. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
6. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.
7. **Install Feet** – Refer to Procedure – Installation (Feet) on [\(page 22\)](#) for details.



Display Replacement Process

Preliminary Requirements

 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components


- **Tools:**
 - Plastic tweezers / spudger
 - Anti-static wrist strap (1 MOhm resistance)
 - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
 - Cleaning swabs
 - 3IP (Torx-plus) driver
 - 6IP (Torx-plus) driver
 - USB Thumb drive with SDT
 - Surface Power Supply
 - Soft ESD-safe mat
 - Microfiber cloth
 - 0.1mm thickness gauge
 - 0.15mm thickness gauge

- **Components:**
 - Display (Refer to [Illustrated Service Parts List](#)) if replacing
 - Hinge Screw (M1005491-001) Qty. 6
 - Display Connector Shields 1 (M1116612-001) Qty. 1
 - Display Connector Shields 2 (M1116616-001) Qty. 1



Prerequisite Steps:

- **Prep Device** – Device must be set in **TDM Replacement Mode** prior to removing a **faulty** display. This is not required if the original display will be reinstalled.

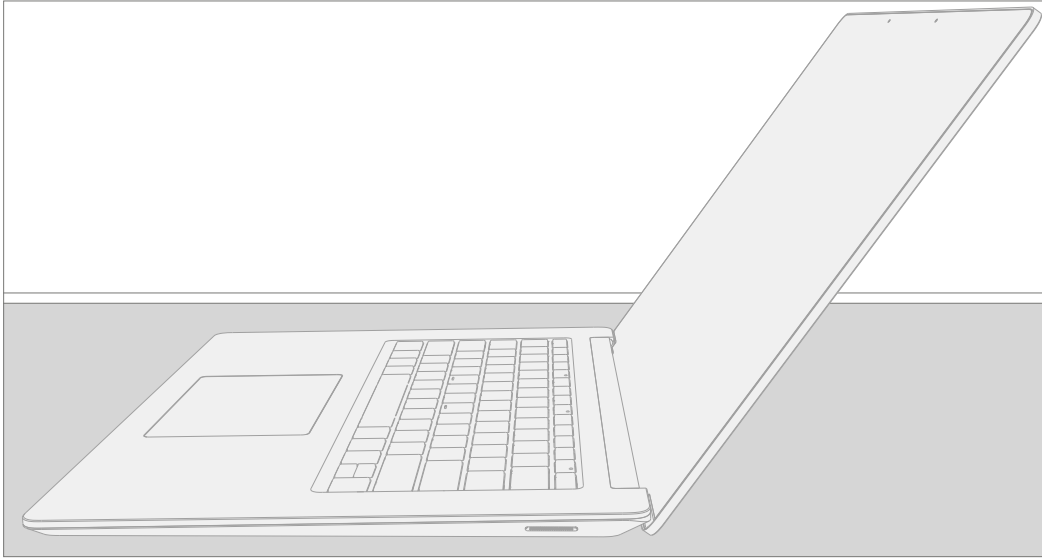
 **WARNING:** This step must be carried out on the device successfully before removal of a faulty display. If display is unusable, connect an external monitor to run these steps.

- **Connect USB** – Connect USB with SDT to USB connector on device under repair.
 - **Power on device** – Connect power supply to device. Press the power button on the device.
 - **Run SDT** – At the device OS, use Windows Explorer to navigate to USB drive: select Repair Setup and Validation. Run the Touch Display Setup. At the end of the tool process device will power down.
- **Power off device** – Ensure device is powered off and disconnected from a power supply. Remove all attached cables and drives.
 - **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening the device. Refer to Prior to Device Disassembly section on (page 20) for details.
 - **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
 - **Remove Feet** – Refer to Procedure – Removal (Feet) on (page 22) for details.
 - **Remove Keyboard** – Refer to Procedure – Removal (Keyboard) on (page 24) for details.
 - **Remove rSSD** – Refer to Procedure – Removal (rSSD) on (page 35) for details.
 - **Remove Thermal Module** – Refer to Procedure – Removal (Thermal Module) on (page 48) for details.



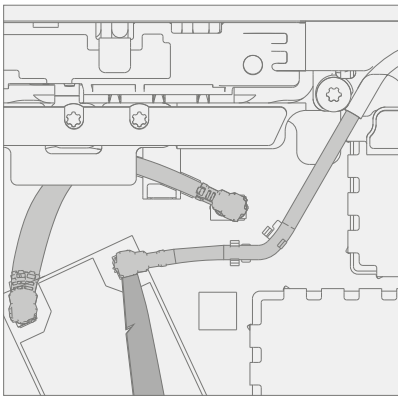
Procedure – Removal (Display)

1. **Open display** – Open display to approximately 110-degrees.



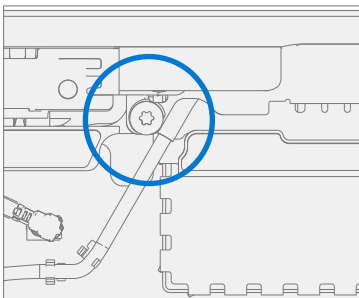
2. **Remove Antenna** – Using a spudger, remove the black WiFi antenna from the WiFi module.

! **CAUTION:** Connectors on WiFi module are very fragile. Do not attempt to remove with fingers. If connector is damaged, motherboard must be replaced.



3. **Loosen WiFi deck** – Remove the marked screw on the WiFi deck using a 3IP (Torx-plus) driver. Move WiFi antenna off to the side.

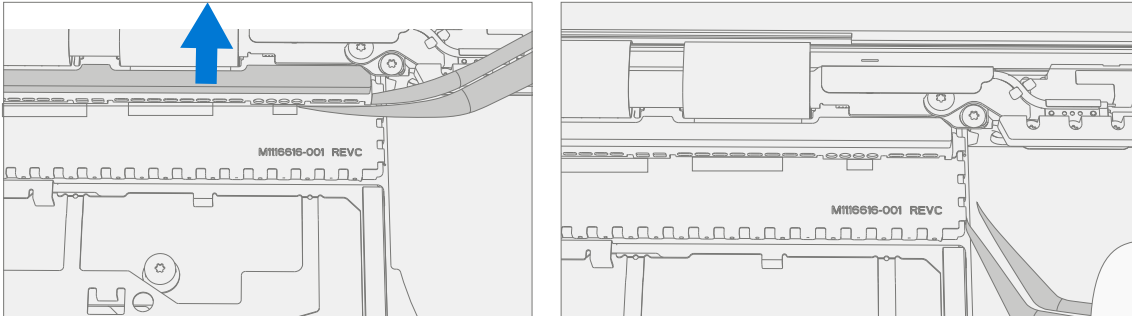
✍ **IMPORTANT:** Retain screw for future use during reassembly.



4. **Remove connector shielding** – Using a pair of tweezers, remove the display FPC covers.

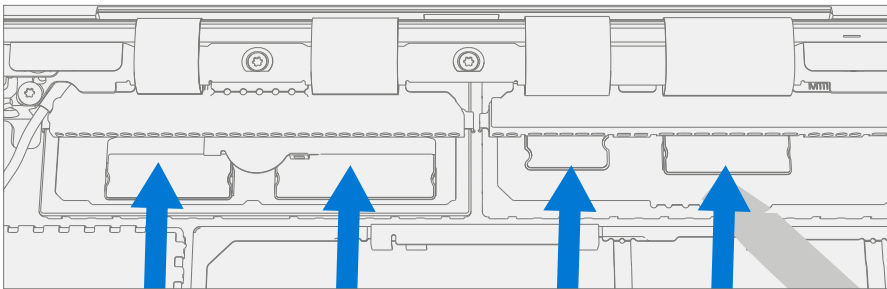
! **CAUTION:** When removing the connector shields ensure to only remove the black shields and not the silver shield retainers.

! **CAUTION:** The nearby foams are very delicate. Take care not to damage or remove them.

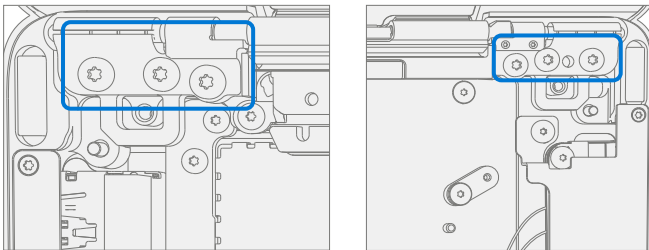


5. **Remove display connectors** – Using a plastic spudger remove the 4 display connectors from the motherboard by slowly working the spudger back and forth on each connector until it comes off.

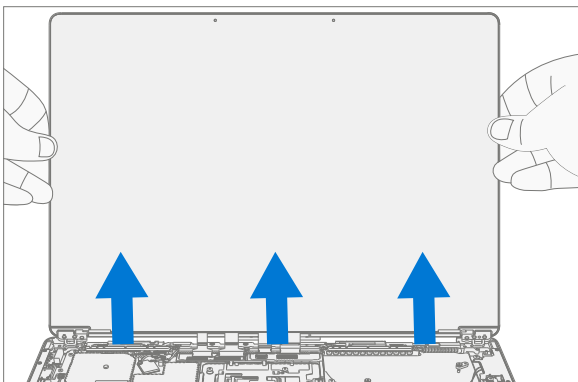
! **CAUTION:** The connectors on the motherboard side are very fragile. Take care not to damage them.



6. **Remove hinge screws** – While supporting the display with one hand, use a 6IP (Torx-plus) driver to remove the 6 screws securing the display to the chassis.

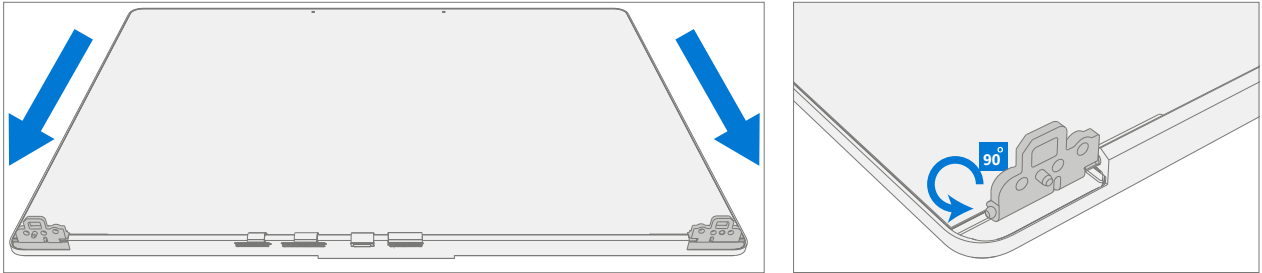


7. **Remove display** – Using two hands lift display away from chassis and set aside.

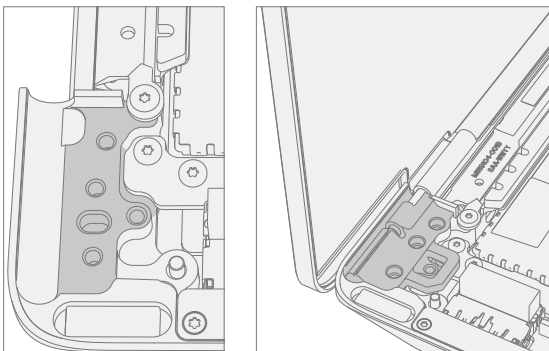


Procedure – Installation (Display)

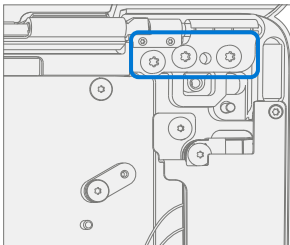
1. **Position hinges** – Place the backside of the display module on the ESD safe workbench. Adjust hinges until they are approximately set at 90 degrees.



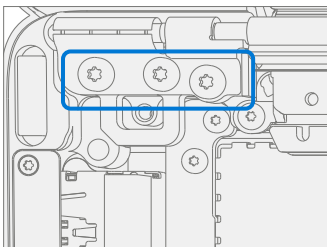
2. **Install display module onto chassis** – While holding the display with one hand. Carefully align the hinges into the pockets on the chassis.



3. **Pre-fasten right hinge screws** – Using a 6IP (Torx-plus) driver assemble 3 new Hinge Screws in the right-side hinge and tighten until just snug.

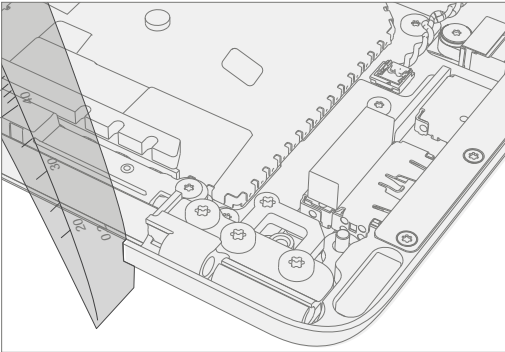


4. **Pre-fasten left hinge screws** – Using a 6IP (Torx-plus) driver assemble 3 new Hinge Screws in the left-side hinge and tighten until just snug.




5. Hinge alignment

- a. Loosen all 6 hinge screws 90 degrees (1/4 turn).
- b. Close the lid and adjust the alignment until the back edge is flush across the hinge and chassis surfaces.
- c. Verify a 0.1 mm plastic thickness gauge can slide easily in the hinge gap.

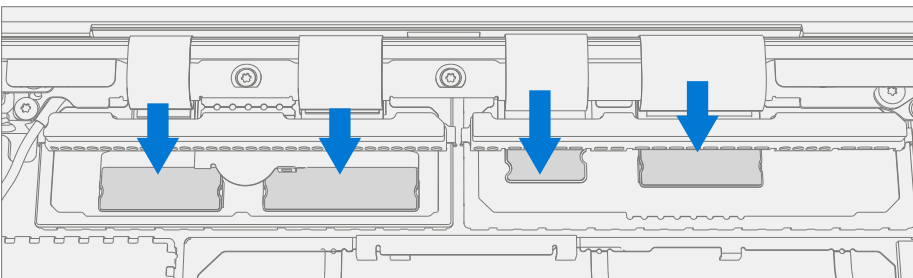


- d. Open the lid and tighten 1 screw on each hinge until snug then turn an additional 90 degrees (1/4 turn), recheck alignment, and 0.1mm gaps.
- e. Repeat steps b through d on each of the 5 remaining hinge screws.

 **IMPORTANT:** Placing a 0.15 mm plastic thickness gauge in the smaller of the 2 hinge gaps during step "d." will aid in achieving a 0.1 mm gap after tightening.

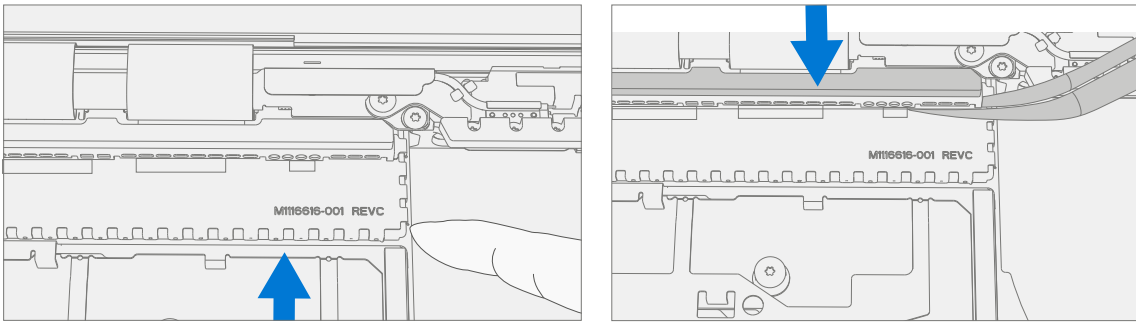
6. **Connect 4 Display Cables** – Carefully connect the 4 display cables into the motherboard connectors. Ensure the connections are fully seated.

! **CAUTION:** Connectors are fragile. Ensure that they are properly aligned before pressing down to snap into motherboard. If motherboard side connectors are damaged the motherboard must be replaced.



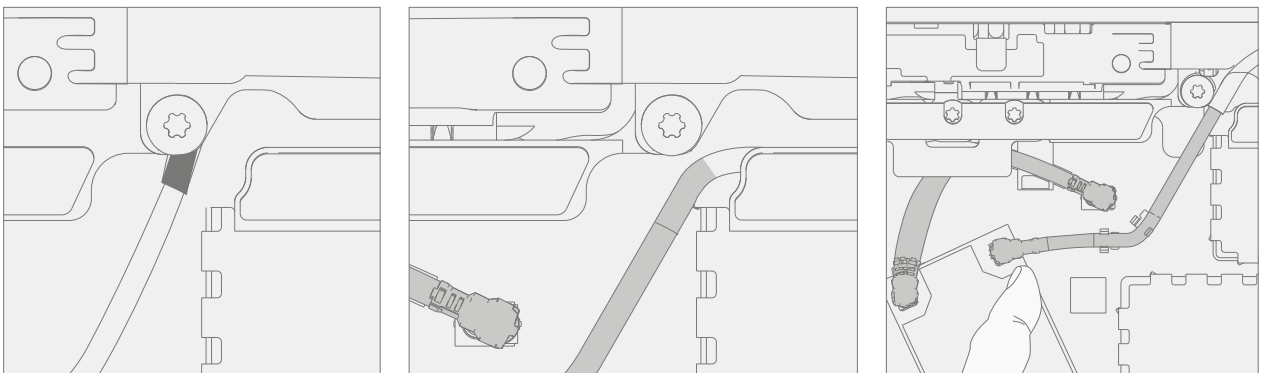
7. **Install connector shielding** – Using a pair of tweezers, slide the display FPC shields into place. Once shields are properly positioned press into place.

! **CAUTION:** The nearby foams are very delicate. Take care not to damage or remove them.

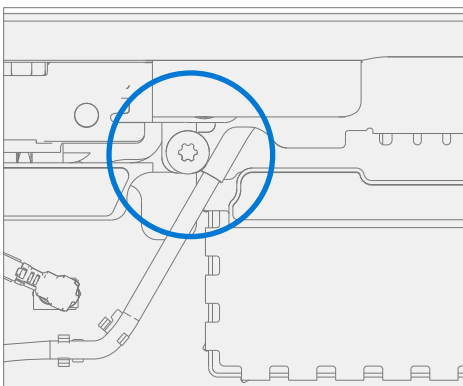



8. **Install Antenna** – Using your fingers, gently move the black WiFi antenna into place under the WiFi deck as shown below. Then connect the black antenna to the WiFi module.

! **CAUTION:** Connectors on WiFi module are very fragile. If connector is damaged, Motherboard must be replaced.



9. **Secure WiFi deck** – Using the screw retained in Procedure – Removal (Display) step 3 and a 3IP (Torx-plus) driver, tighten the WiFi deck back down onto the chassis until finger tight. Then turn the screw an additional ~45-degrees (1/8 turn), or until fully fastened.




10. **Install Thermal Module** – Refer to Procedure – Installation (Thermal Module) on (page 50) for details.
 11. **Install rSSD** – Refer to Procedure – Installation (rSSD) on (page 36) for details.
 12. **Install Keyboard** – Refer to Procedure – Installation (Keyboard) on (page 32) for details.
 13. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
 14. **New display calibration** – On installation of a new display, final calibration relies on the successful completion of the TDM Replacement Mode. Display calibration is not required when installing the originally removed display.
 - a. **Connect software tools USB** drive with SDT to USB connector on device under repair.
 - b. **Run software tool** – At the device OS, use Windows Explorer, navigate to USB drive, and run: **SDT** – Select Repair setup and validation. Run the Touch Display Calibration. Accept the restart prompt at the end of the tool process.
-
-  **IMPORTANT:** This step must be conducted on the device successfully on installation of a new display or when installing any display onto a new motherboard.
-
15. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.
 16. **Install Feet** – Refer to Procedure – Installation (Feet) on (page 22) for details.



Motherboard Replacement Process


Preliminary Requirements

 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components

- **Tools:**
 - Plastic tweezers / spudger
 - Anti-static wrist strap (1 MOhm resistance)
 - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
 - Goo Gone
 - Cleaning swabs
 - Metric plastic thickness gauges
 - Non-Metallic ruler ([Amazon Example](#))
 - 3IP (Torx-plus) driver
 - USB Thumb drive with SDT
 - Surface Power Supply
 - Soft ESD-safe mat
 - Microfiber cloth
- **Components:**
 - Motherboard (Refer to [Illustrated Service Parts List](#)) if replacing
 - Motherboard Screw (M1086672-001) Qty. 6
 - Grounding Bar Screw (M1101188-001) Qty. 2
 - Retention Bracket Screw (M1109237-001) Qty. 3

Prerequisite Steps:

 **IMPORTANT:** If replacing both the Motherboard and Display, complete the Motherboard repair first and ensure functionality before beginning the Display replacement procedure. Failure to do so may result in TDM functionality being impacted.

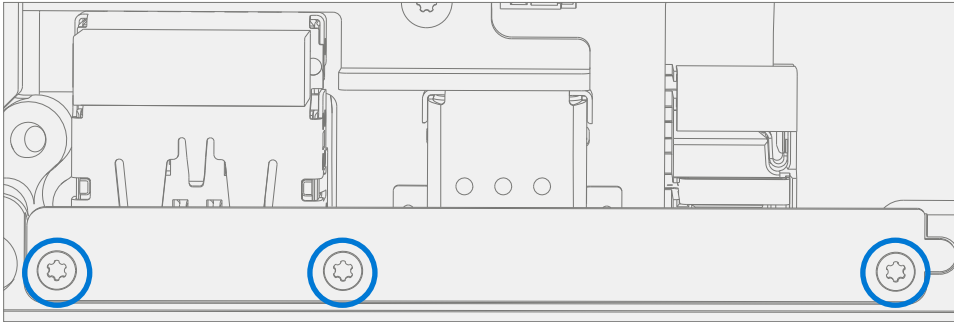
- **Power off device** – Ensure device is powered off and disconnected from a power supply. Remove all attached cables and drives.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening the device. Refer to Prior to Device Disassembly section on ([page 20](#)) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove Feet** – Refer to Procedure – Removal (Feet) on ([page 22](#)) for details.
- **Remove Keyboard** – Refer to Procedure – Removal (Keyboard) on ([page 24](#)) for details.
- **Remove rSSD** – Refer to Procedure – Removal (rSSD) on ([page 35](#)) for details.
- **Remove Thermal Module** – Refer to Procedure – Removal (Thermal Module) on ([page 48](#)) for details.
- **Remove Speakers** – Refer to Procedure – Removal (Speakers) on ([page 54](#)) for details.
- **Remove Display** – Refer to Procedure – Removal (Display) on ([page 58](#)) for details.



Procedure – Removal (Motherboard)

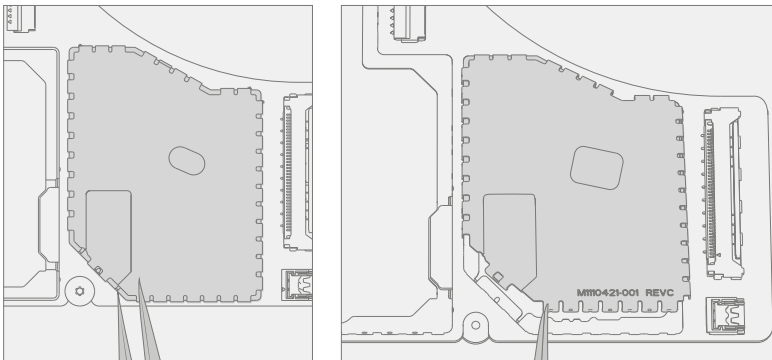
! **CAUTION:** The Motherboard and Chassis + Battery are very sensitive to ESD and can be easily damaged. Ensure proper grounding before performing any work on these parts.

1. **Remove retention clip** – Using a 3IP (Torx-plus) driver remove the 3 screws securing the retention bracket to chassis. This bracket is located on the right side of the chassis, above USB port.



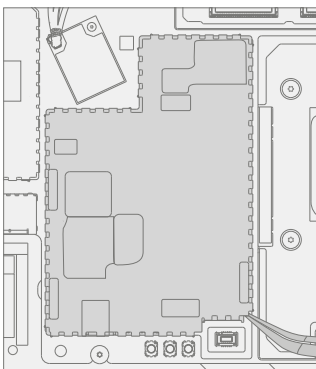
2. **Remove right shield** – Using a pair of tweezers remove the right-hand shield from the motherboard.

! **CAUTION:** When removing the connector shield be careful not to remove the shield retainers under shield lids.

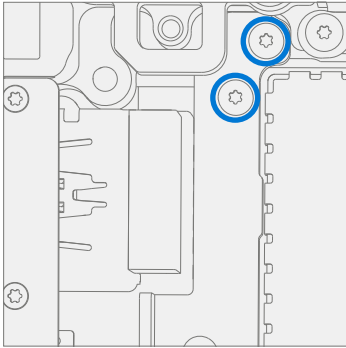


3. **Remove left shield** – Using a pair of tweezers remove the left-hand shield from the motherboard.


! **CAUTION:** When removing the connector shield be careful not to remove the shield retainers under shield lids.

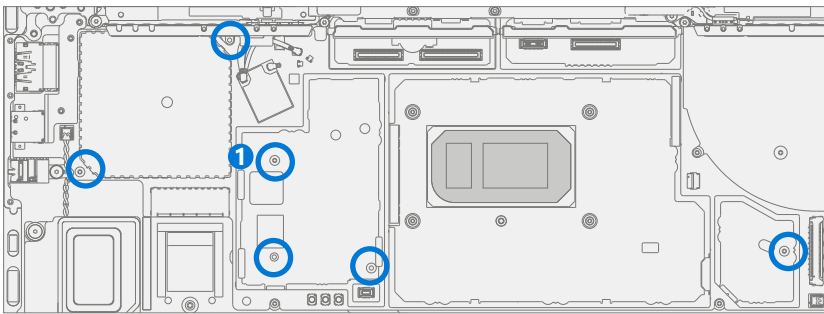


4. **Remove stiffener bar** – On right side of motherboard, using a 3IP (Torx-plus) driver remove the 2 screws securing the stiffening bar to the motherboard and chassis.

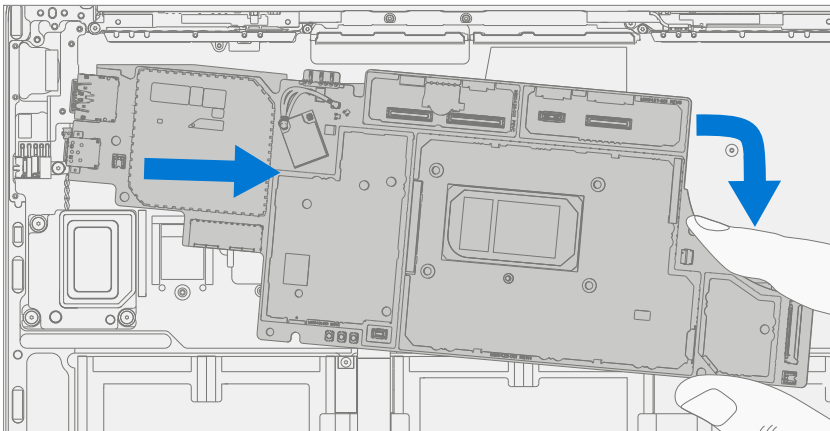


5. **Remove motherboard screws** – Using a 3IP (Torx-plus) driver remove the 6 screws securing the motherboard to the chassis.

 **IMPORTANT:** Screw marked #1 is hidden by a plastic cover. Remove cover with plastic tweezers.

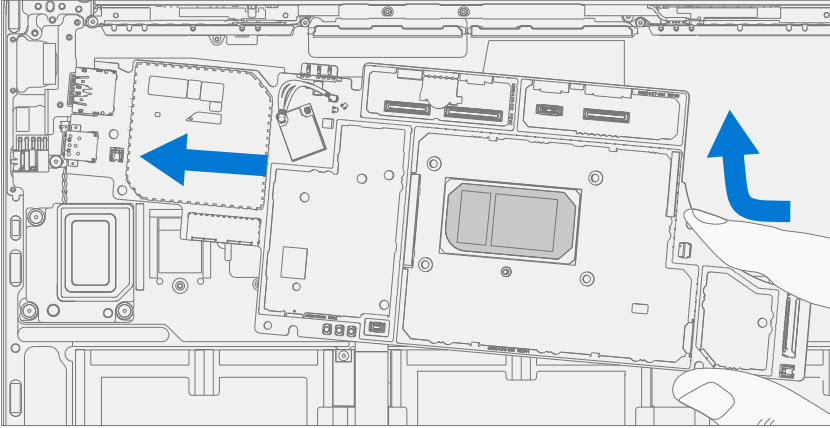


6. **Remove motherboard** – Grab the right-hand side of the motherboard and lift until just of the chassis standoffs while gently rotating it toward you and pulling gently to the right. A wiggling motion will be required to loosen the top of the board from the chassis. Lift the motherboard out of the Chassis.




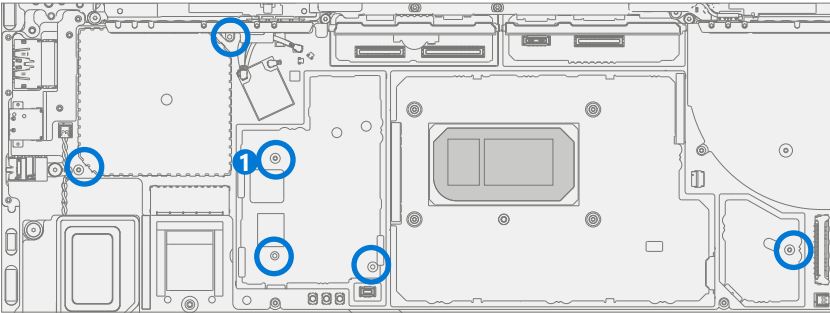
Procedure – Installation (Motherboard)

1. **Insert motherboard** – While holding the right-hand side of the motherboard, insert the USB ports into the left-hand side of the chassis. Once inserted, rotate the board down and into the chassis under the WiFi deck.

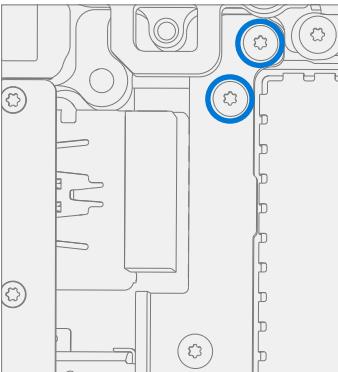


2. **Install motherboard screws** – Using a 3IP (Torx-plus) driver install 6 screws new motherboard screws in the location below until finger tight. Then turn each screw an additional ~45-degrees (1/8 turn), or until fully fastened.

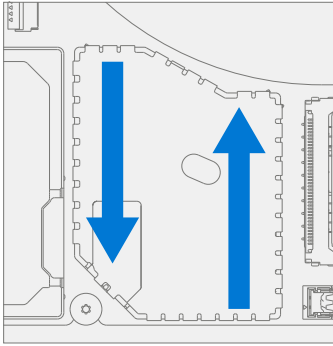
 **IMPORTANT:** Do not forget to add the rubber cap to screw marked #1



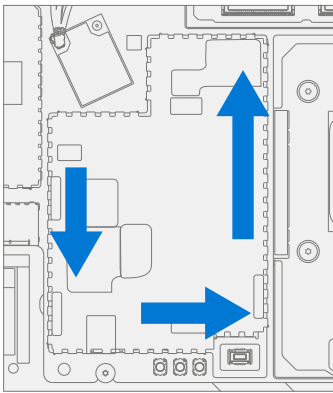
3. **Install stiffening bar** – Using a 3IP (Torx-plus) driver install the 2 stiffening bar screws securing the stiffening bar to the motherboard and chassis.




4. **Install right shield** – Align shield with shield retainer. Press along the edge of the shield until the shield is fully seated.




5. **Install left shield** – Align shield with shield retainer. Press along the edge of the shield until the shield is fully seated.



6. **Install Speakers** – Refer to Procedure – Installation (Speakers) on (page 55) for details.
 7. **Install Display** – Refer to Procedure – Installation (Display) on (page 60) for details.
 8. **Install Thermal Module** – Refer to Procedure – Installation (Thermal Module) on (page 50) for details.
 9. **Install rSSD** – Refer to Procedure – Installation (rSSD) on (page 36) for details.
 10. **Install Keyboard** – Refer to Procedure – Installation (Keyboard) on (page 32) for details.
 11. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
 12. **Complete Display Calibration**
 - a. **Connect software tools USB** drive with SDT to USB connector on device under repair.
 - b. **Run software tool** – At the device OS, use Windows Explorer, navigate to USB drive, and run:
SDT – Select Repair setup and validation. Run the Touch Display Calibration. Accept the restart prompt at the end of the tool process.
-
-  **IMPORTANT:** This step must be conducted on the device successfully on installation of a new motherboard to ensure proper display functionality.
-



13. **New Battery Authentication** – Ensure the battery reads as authenticated in the Battery Repair (Validation) workflow in SDT. If the battery shows as inauthentic run the SDT Battery Repair (Validation) workflow in its entirety.
 - Connect the SDT Configuration USB drive.
 - Run the SDT Battery Repair (Validation) to ensure the battery is properly authenticated and all features and functions operate as expected.

 **IMPORTANT:** Battery authentication requires a stable internet connection. If any battery steps fail retry with a new internet connection. If failures continue reach out to Microsoft Support.

14. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.
15. **Install Feet** – Refer to Procedure – Installation (Feet) on [\(page 22\)](#) for details.

Chassis + Battery Replacement Process

Preliminary Requirements


 **IMPORTANT:** Be sure to follow all special (bolded) notes of caution within each process section.

Required Tools and Components

- **Tools:**
 - Plastic tweezers / spudger
 - Anti-static wrist strap (1 MOhm resistance)
 - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
 - Goo Gone
 - Cleaning swabs
 - Metric plastic thickness gauges
 - Non-Metallic ruler ([Amazon Example](#))
 - 3IP (Torx-plus) driver
 - USB Thumb drive with SDT
 - Surface Power Supply
 - Soft ESD-safe mat
 - Microfiber cloth
 - Bucket (1 gallon)
 - Clean, dry, untreated sand (0.5 gallon)
- **Components:**
 - Chassis + Battery (Refer to [Illustrated Service Parts List](#))
 - Audio Jack Screw (M1014142-001)
 - WiFi Deck Screw 1 (M1108756-001) Qty. 2
 - WiFi Deck Screw 2 (M1118001-001) Qty. 6
 - WiFi Deck Screw 3 (M1109237-001) Qty. 2
 - WiFi Deck Screw 4 (M1108754-001) Qty. 1
 - WiFi Deck Screw 5 (X930709-XXX) Qty. 2



Prerequisite Steps:

 **IMPORTANT:** The serial number for this device model is located on its original cover. To keep track of the device's serial number, please record it using waterproof ink ([page 6](#)) on a sticker or label and apply the sticker or label to an easily accessible area on the device exterior. The serial number cannot be added permanently to a replacement part. Microsoft may have provided a label for this use in the replacement part's packaging.

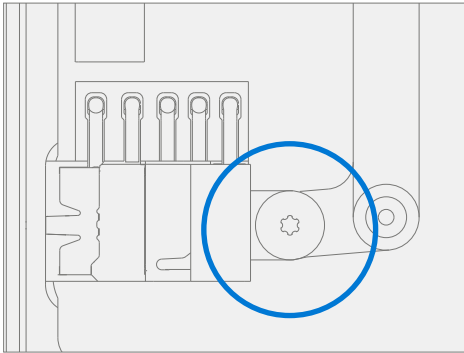
- **Run SDT** – Insert the SDT USB drive and execute the Battery Repair (Setup) workflow to have the device enter repair mode.
- **Power off device** – Ensure device is powered off and disconnected from a power supply.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening the device. Refer to Prior to Device Disassembly section on ([page 20](#)) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove Feet** – Refer to Procedure – Removal (Feet) on ([page 22](#)) for details.
- **Remove Keyboard** – Refer to Procedure – Removal (Keyboard) on ([page 24](#)) for details.
- **Remove rSSD** – Refer to Procedure – Removal (rSSD) on ([page 35](#)) for details.
- **Remove Thermal Module** – Refer to Procedure – Removal (Thermal Module) on ([page 48](#)) for details.
- **Remove Speakers** – Refer to Procedure – Removal (Speakers) on ([page 54](#)) for details.
- **Remove Display** – Refer to Procedure – Removal (Display) on ([page 58](#)) for details.
- **Remove Motherboard** – Refer to Procedure – Removal (Motherboard) on ([page 65](#)) for details.



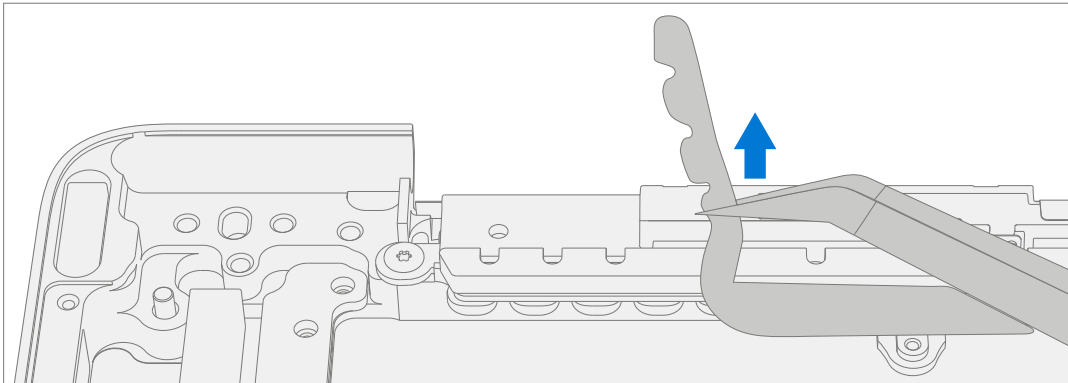
Procedure – Removal (Chassis + Battery)

- ✎ **IMPORTANT:** Place the chassis somewhere where the battery cannot accidentally be contacted or damaged. The chassis is preferably stored vertically to prevent anything from being placed on top of the battery.
- ✎ **IMPORTANT:** When disposing of the chassis, recycle the old battery according to local laws.
- ! **CAUTION:** The Motherboard and Chassis + Battery are very sensitive to ESD and can be easily damaged. Ensure proper grounding before performing any work on these parts.
- ⚠ **WARNING:** In case of battery event submerge entire device sand in. **Do not attempt to pick up device.**

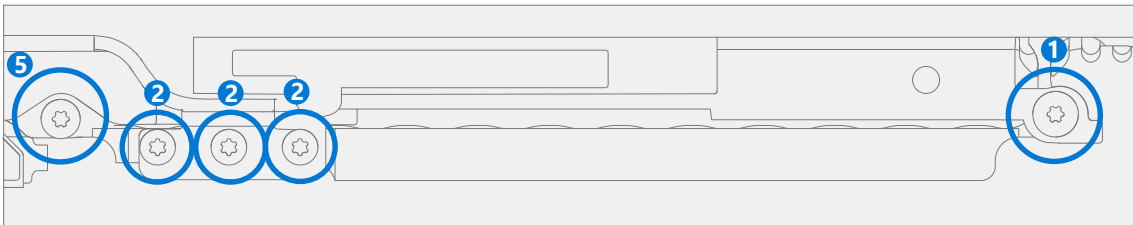
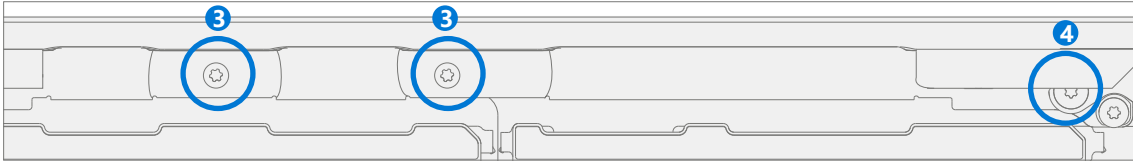
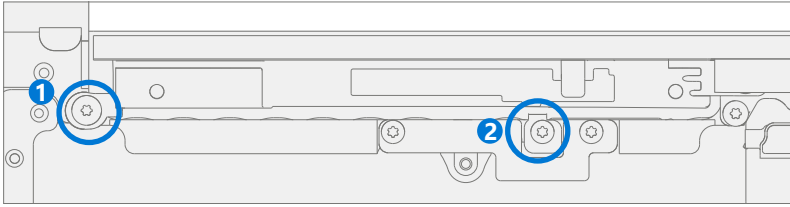
1. **Remove audio jack** – Using a 3IP (Torx-plus) driver remove the screw that holds in the audio jack. Remove audio jack and set aside.



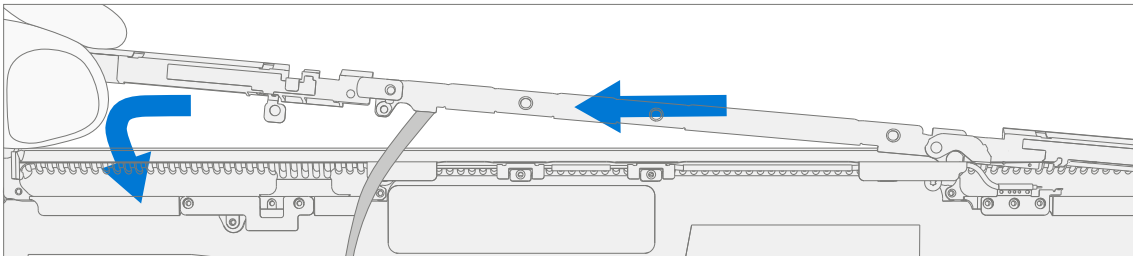
2. **Remove padding** – Using a pair of plastic tweezers remove the padding next to the WiFi deck on the left and right side of the chassis.



3. **Remove WiFi deck screws** – Using a 3IP (Torx-plus) driver remove the 12 screws that hold in the WiFi deck.



4. **Lift WiFi deck out of chassis.**



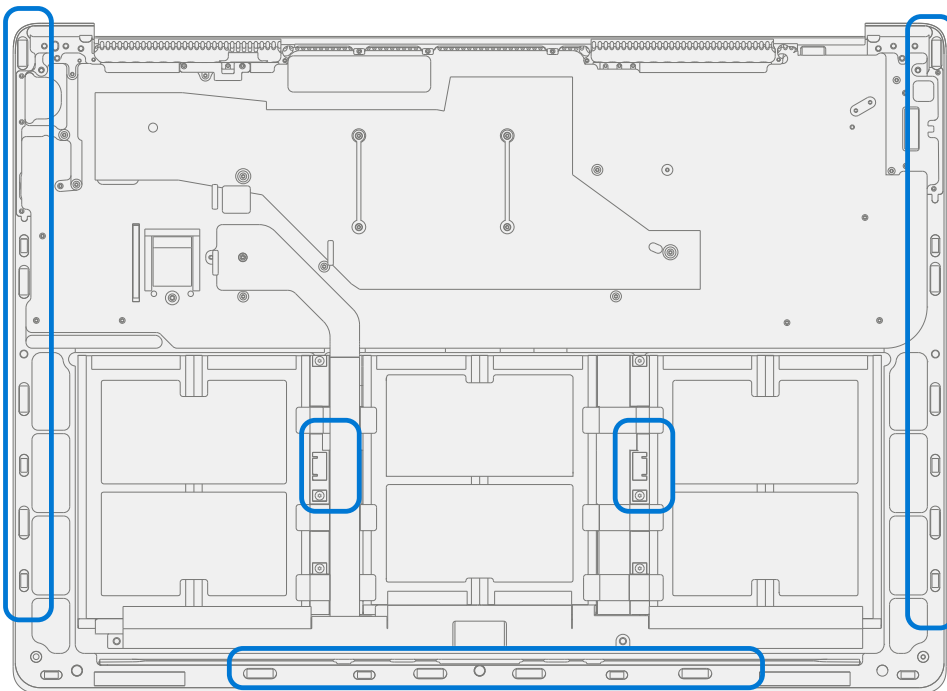
Procedure – Installation (Chassis + Battery)

1. **Pre-installation Device Inspection** – Check chassis (both sides) and device enclosure for any loose articles that may be present.
 - a. Check and remove any foreign objects that the magnets may have attracted. Refer to the circled Magnetized areas pictured below.
 - b. Pay special attention to the magnetized area around the bottom of the trackpad.
 - c. Verify all removed screws are accounted for and have not been misplaced in the device.
 - d. Loose screws should never be stored on the magnetic areas of the chassis.
 - e. Inspect battery for any signs of damage or deformation.

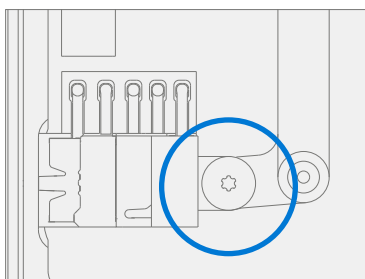
⚠ WARNING: In case of battery event submerge entire device sand in. Do not attempt to pick up device.

2. **Position the chassis** – Place the chassis above the device as pictured below. The bottom of the chassis should be on the table with the battery facing up.

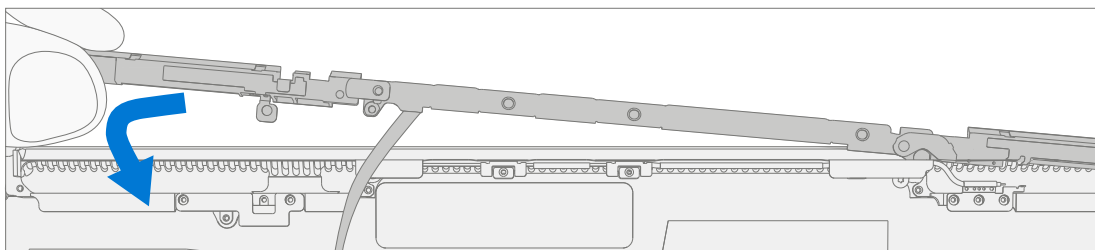
! CAUTION: Highlighted areas of chassis are magnetized. Ensure no loose screws or debris is stuck to the chassis.



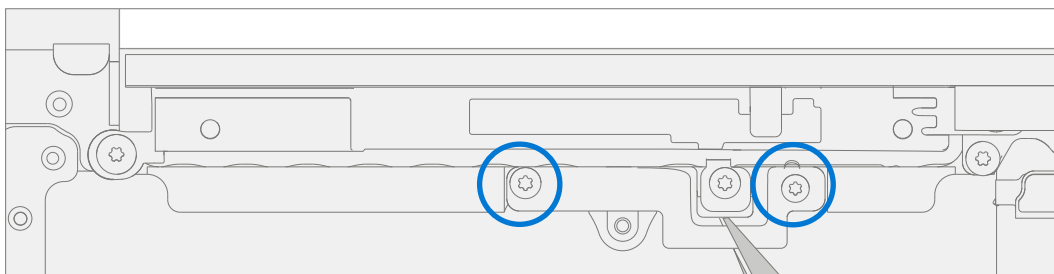
3. **Install audio jack** – Using a 3IP (Torx-plus) driver install the audio jack then secure with the audio jack screw in the location below until finger tight. Then turn screw an additional ~45-degrees (1/8 turn), or until fully fastened.



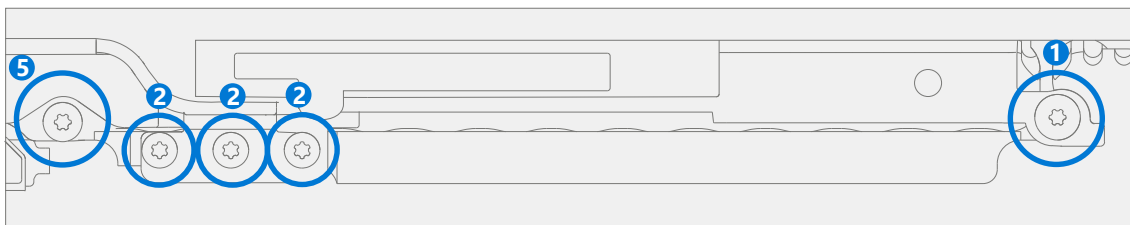
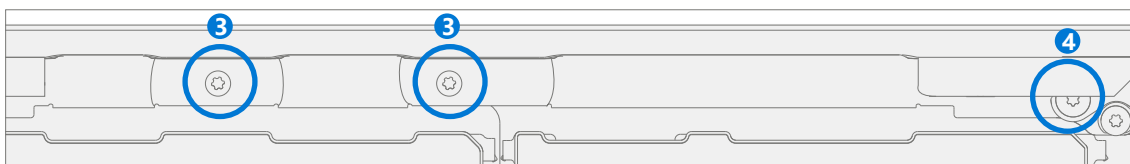
4. **Position WiFi deck** – Align the WiFi deck to the posts on the Chassis. Be sure to make sure the black WiFi antenna is not pinched between the chassis and the deck.



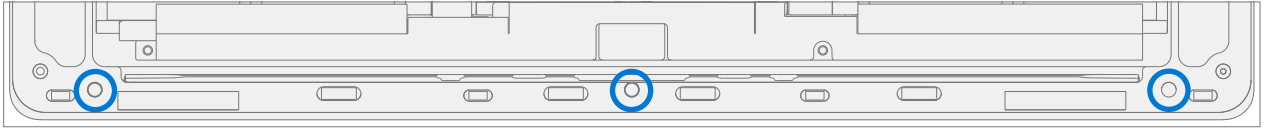
5. **Install WiFi clip** – Using a pair of tweezers, align WiFi clip with screw holes. Then use a 3IP (Torx-plus) driver install 2 WiFi clip 2 screws until finger tight. Then turn screw an additional ~45-degrees (1/8 turn), or until fully fastened.




6. **Install WiFi deck screws** – Using a 3IP (Torx-plus) driver install the 10 marked WiFi deck screws until finger tight. Numbers correspond to the relevant WiFi deck screw. Then turn screw an additional ~45-degrees (1/8 turn), or until fully fastened.



7. **Install rubber caps** – Install rubber caps on chassis standoff where shown below.



8. **Install Motherboard** – Refer to Procedure – Installation (Motherboard) on (page 67) for details.
9. **Install Speakers** – Refer to Procedure – Installation (Speakers) on (page 55) for details.
10. **Install Display** – Refer to Procedure – Installation (Display) on (page 60) for details.
11. **Install Thermal Module** – Refer to Procedure – Installation (Thermal Module) on (page 50) for details.
12. **Install rSSD** – Refer to Procedure – Installation (rSSD) on (page 36) for details.
13. **Install Keyboard** – Refer to Procedure – Installation (Keyboard) on (page 32) for details.
14. **New Battery Charging** – New batteries are shipped and stored at low states of charge in compliance with shipping regulations. The battery should be charged to at least 50%. This step will take between 20 and 60 minutes and is needed to validate full functionality of the new battery. Carefully place device right-side up. Open device, connect the power supply, and power it on.
15. **New Battery Authentication** – After charging the new battery to at least 50%, ensure new battery reads as authenticated in the Battery Repair (Validation) workflow in SDT. If the battery shows inauthentic run the SDT Battery Repair (Validation) workflow in its entirety.
- Connect the SDT Configuration USB drive.
 - Run the SDT Battery Repair (Validation) to ensure battery is properly authenticated and all features and functions operate as expected.
-
-  **IMPORTANT:** Battery authentication requires a stable internet connection. If any battery steps fail retry with a new internet connection. If failures continue reach out to Microsoft Support.
- Power off at completion of tests. Remove SDT Configuration Files USB drive and power supply.
 - If no further repairs are required proceed to final steps.
16. **Original Battery Verify Device Functions** – Carefully place device right-side up. Open device and connect the SDT USB drive, and power supply. Power on device then Run SDT to ensure all features and functions operate as expected. Power off at completion of tests. Remove SDT USB drive and power supply. If no further repairs are required proceed to final steps.
17. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
18. **Run SDT** – Run SDT to ensure all device features and functions operate as expected.
19. **Install Feet** – Refer to Procedure – Installation (Feet) on (page 22) for details.



Environmental Compliance Requirements

All waste electrical and electronic equipment (WEEE), waste electronic components, waste batteries, and electronic waste residuals must be managed according to applicable laws and regulations. and H09117, "Conformance Standards for Environmentally Sound Management of Waste Electrical and Electronic Equipment (WEEE)," which is available at this link: <https://www.microsoft.com/en-us/download/details.aspx?id=11691> In case of questions, please contact AskECT@microsoft.com

