



Microsoft Surface Laptop Go 3 Service Guide



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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 service or repair.

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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

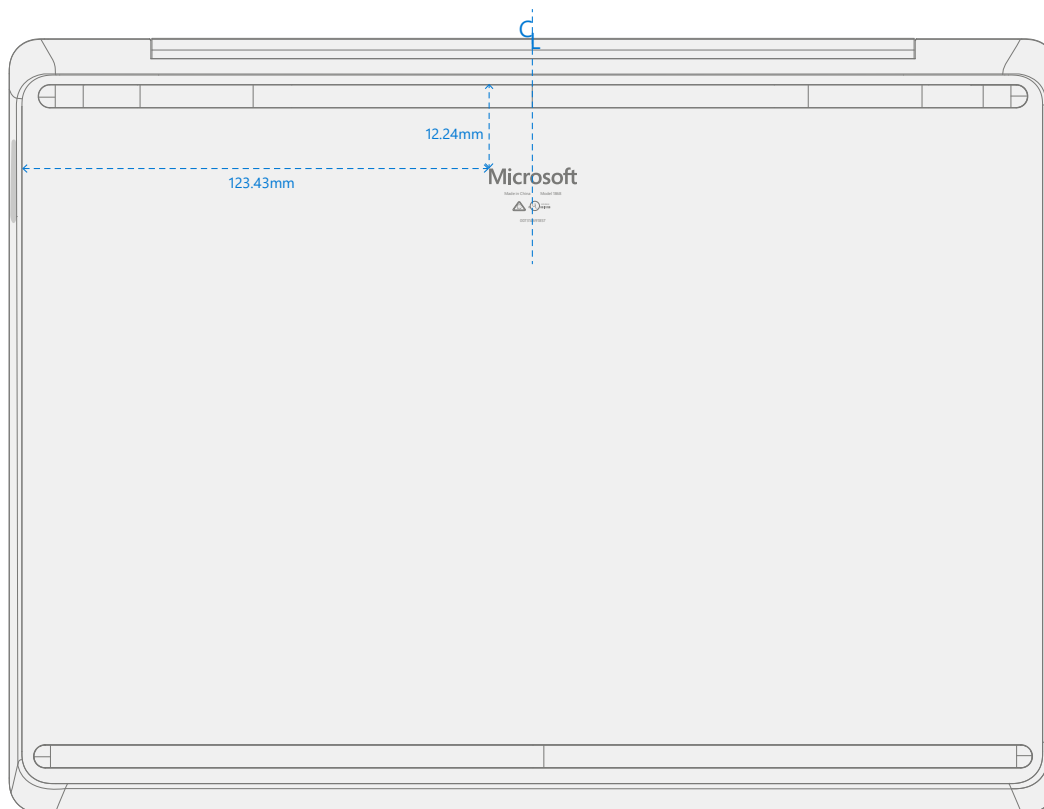
Surface Laptop Models

2013 – Microsoft Surface Laptop Go 3

Surface Support - Laptop: [Link](#)

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

The model and serial number for Surface Laptops are on the bottom center closest to the display hinge point.



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.
- **Back cover** or **chassis** – Device bottom case
- **BMR** – Bare Metal Recovery, refers to the process of installing a clean image.
- **Keyboard** – Keyboard Trackpad Assembly.
- **ESD** – Electro-Static Discharge
- **Feet** or **foot** – Non-Skid Foot Pads
- **FPC** – Flexible Printed Circuit Connections
- **CRU** – Customer Replaceable Units are sub-system components such as the PCBA, rSSD, and TDM
- **FW** – Firmware
- **IPA** – Isopropyl Alcohol, should be used to clean adhesive from the device as detailed within process steps. Use 70% IPA in all cases.
- **LDI** – Liquid Damage Indicators, indicates if moisture has made its way into the device.
- **OS** – Operating System
- **PCBA** – Primary Circuit Board Assembly, usually refers to the motherboard.
- **PSA** – Pressure Sensitive Adhesive
- **PSU** – Power Supply Unit
- **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.
- **TDM** – Touch Display Module is the complete screen with all layers.
- **THM** – Thermal Module is an assembly which manages thermal regulation for the system.
- **TIM** – Thermal interface material used between the THM and PCBA



General Information, Precautions, Warnings

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

 This symbol identifies important information in this manual.

Service Tools and Jigs

Microsoft Recommended Service Jigs

- ESD-safe Surface Battery Cover (M1214771-001)

Microsoft Provided Software Tools / References

- 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
- Spudger tool
- Plastic Opening Pick [iFixit Opening Picks](#)
- Plastic Opening tool [iFixit Plastic Opening Tool](#)
- Phillips drivers PH0, PH00
- Isopropyl alcohol dispenser bottle (use 70% IPA)
- Cleaning swabs
- ESD-safe tweezers
- Lint free cleaning cloths

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. Refer to the ASP Guidebook for Microsoft tools.



General Safety Precautions

⚠ 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.
- Clean your work surface regularly to remove debris and abrasive particles.
- While working on devices, avoid the use of clothing accessories such as bracelets or watches that can cause electrical shorts and/or damage the battery.
- 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.
- 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 [Actions To Take In Thermal Event](#) under Handling Used, Damaged or Defective Lithium-Ion Batteries in this Guidebook or contact Microsoft directly for proper device disposition.

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.

Electro-Static Discharge (ESD) Prevention

- Review and follow the general guidelines and ESD prevention steps in this Guide prior to beginning work.
- Ensure your work surface is level/flat and covered with ESD-safe, soft, non-marring material.
- 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.



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.

⚠ WARNING: 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 Keyboard 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 Keyboard are installed. Refer to Procedure - Installation (rSSD) section for details. Repair- Cross-reference Documents

-
- Review the General Safety Precautions and Battery Safety Sections of this Guide before beginning work.

✍ 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 on a sticker or label and apply the sticker or label to an easily accessible area on the device exterior. For serial number location please see Surface Laptop Models ([page 5](#)). 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.

⚠ WARNING: It is recommended that an ESD-safe battery cover be placed across the device to protect the battery from any physical contact or accidental damage whenever display is removed for internal repairs. Ensure corners of cover are always aligned with the corners of the device while battery is exposed. If battery cover is misaligned during activities in any way, re-align before continuing work.

- 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.



Battery Warning Label

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



Battery is replaceable by trained personnel; replacement must follow Microsoft procedure
See <http://aka.ms/surface-safety> for important information.

- Risk of fire or burning – contact Microsoft for assistance
- Do not modify battery, its wiring, or connectors
- Do not short circuit, bend, dent, crush, or puncture battery
- Do not dispose of battery in fire or expose to high temperatures (+140°F/60°C)



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 Process](#) 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 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.

Actions To Take In Thermal Event

- **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 ([page 12](#)) for additional 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.

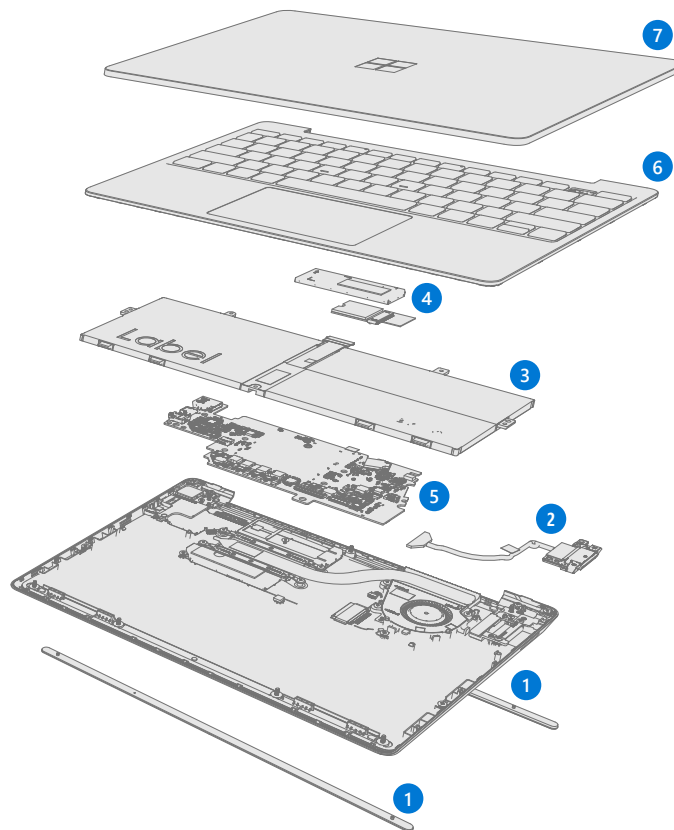
Stop Repair and Contact Microsoft

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:
 - The model and serial number of the affected Microsoft Surface device and/or accessory(ies).
 - A brief description of the damage found.
 - Clear photographs depicting the symptoms observed.



Illustrated Service Parts List



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

Item	Component	SKU Part No.
1	Non-Skid Feet	
	Sage	N1R-00001
	Ice Blue	N1R-00002
	Platinum	N1R-00003
	Sandstone	N1R-00004
2	Surflink Assembly	
	Sage	ZNH-00001
	Ice Blue	ZNH-00002
	Platinum	ZNH-00003
	Sandstone	ZNH-00004
3	Battery	
	Battery	ZNI-00001
4	Removable Solid-State Drive (NOTE: rSSD size must be same as original)	
	rSSD 128GB	XTD-00001
	rSSD 256GB	XTC-00001
	rSSD 512GB	XTB-00001




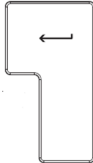
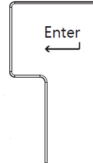
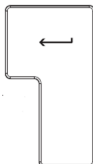
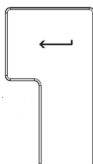
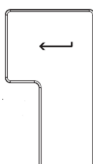
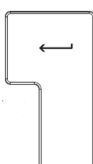
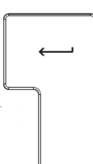
Item	Component	SKU Part No.
5	Motherboard	
	i5, 8GB RAM, NUV NVMe (Commercial ROW Only)	XT5-00001
	i5, 8GB RAM, NUV UFS (Commercial ROW Only)	XT5-00002
	i5, 8GB RAM, fTPM NVMe (Consumer)	XT5-00003
	i5, 8GB RAM, fTPM UFS (Consumer)	XT5-00004
	i5, 16GB RAM, NUV NVMe (Commercial ROW Only)	XT7-00001
	i5, 16GB RAM, fTPM NVMe (Consumer)	XT7-00002
6	Keyboard Assembly	
	Sage 105 French with Fingerprint Reader	ZNG-00001
	Sage 104 Traditional Chinese with Fingerprint Reader	ZNG-00002
	Sage 105 Austria/Germany with Fingerprint Reader	ZNG-00003
	Sage 105 Canadian, Bilingual with Fingerprint Reader	ZNG-00004
	Sage 109 Japan with Fingerprint Reader	ZNG-00005
	Sage 104 English, US with Fingerprint Reader	ZNG-00006
	Sage 105 Switzerland, Luxembourg with Fingerprint Reader	ZNG-00007
	Sage 105 English, UK Ireland with Fingerprint Reader	ZNG-00008
	Ice Blue 105 French with Fingerprint Reader	ZNG-00009
	Ice Blue 104 Traditional Chinese with Fingerprint Reader	ZNG-00010
	Ice Blue 105 Austria/Germany with Fingerprint Reader	ZNG-00011
	Ice Blue 105 Canadian, Bilingual with Fingerprint Reader	ZNG-00012
	Ice Blue 109 Japan with Fingerprint Reader	ZNG-00013
	Ice Blue 104 English, US with Fingerprint Reader	ZNG-00014
	Ice Blue 105 Switzerland, Luxembourg with Fingerprint Reader	ZNG-00015
	Ice Blue 105 English, UK Ireland with Fingerprint Reader	ZNG-00016
	Platinum 105 Spanish, European with Fingerprint Reader	ZNG-00017
	Platinum 104 English, US with Fingerprint Reader	ZNG-00018
	Platinum 105 Nordic Denmark, Finland, Norway, Sweden with Fingerprint Reader	ZNG-00019
	Platinum 104 English, International Netherlands with Fingerprint Reader	ZNG-00042
	Platinum 105 Italy with Fingerprint Reader	ZNG-00020
	Platinum 105 Austria/Germany with Fingerprint Reader	ZNG-00021
	Platinum 104 Traditional Chinese with Fingerprint Reader	ZNG-00022
	Platinum 106 Korea with Fingerprint Reader	ZNG-00023
	Platinum 105 Switzerland, Luxembourg with Fingerprint Reader	ZNG-00024
	Platinum 105 French with Fingerprint Reader	ZNG-00025
	Platinum 105 English, UK Ireland with Fingerprint Reader	ZNG-00026
	Platinum 104 Arabic with Fingerprint Reader	ZNG-00027
	Platinum 109 Japan with Fingerprint Reader	ZNG-00028
	Platinum 105 Spanish, Latin American with Fingerprint Reader	ZNG-00029
	Platinum 105 Canadian, Bilingual with Fingerprint Reader	ZNG-00030
	Platinum 105 Portuguese with Fingerprint Reader	ZNG-00031
	Platinum 105 Belgium AZERTY with Fingerprint Reader	ZNG-00032
	Platinum 104 Thai with Fingerprint Reader	ZNG-00033
	Platinum 104 English, US	ZTV-00018



Item	Component	SKU Part No.
6	Keyboard Assembly (Continued)	
	Platinum 105 Canadian, Bilingual	ZTV-00030
	Platinum 105 Austria/Germany	ZTV-00021
	Platinum 104 Arabic	ZTV-00027
	Platinum 105 Spanish, Latin American	ZTV-00017
	Platinum 105 Switzerland, Luxembourg	ZTV-00024
	Platinum 104 Traditional Chinese	ZTV-00022
	Platinum 104 English, International Netherlands	ZTV-00042
	Platinum 105 Spanish, European	ZTV-00029
	Platinum 105 English, UK Ireland	ZTV-00026
	Platinum 105 Belgium AZERTY	ZTV-00032
	Platinum 105 Nordic Denmark, Finland, Norway, Sweden	ZTV-00019
	Platinum 105 Portuguese	ZTV-00031
	Platinum 109 Japan	ZTV-00028
	Platinum 105 French	ZTV-00025
	Platinum 106 Korea	ZTV-00023
	Platinum 105 Italy	ZTV-00020
	Platinum 104 Thai	ZTV-00033
	Sandstone 105 French with Fingerprint Reader	ZNG-00034
	Sandstone 104 Traditional Chinese with Fingerprint Reader	ZNG-00035
	Sandstone 105 Austria/Germany with Fingerprint Reader	ZNG-00036
	Sandstone 105 Canadian, Bilingual with Fingerprint Reader	ZNG-00037
	Sandstone 109 Japan with Fingerprint Reader	ZNG-00038
	Sandstone 104 English, US with Fingerprint Reader	ZNG-00039
	Sandstone 105 Switzerland, Luxembourg with Fingerprint Reader	ZNG-00040
	Sandstone 105 English, UK Ireland with Fingerprint Reader	ZNG-00041
7	Display Assembly	
	Platinum	XT9-00001
	Sage	XT9-00002
	Sandstone	XT9-00003
	Ice Blue	XT9-00004

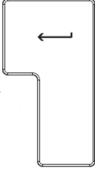
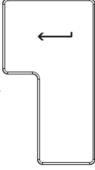
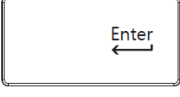
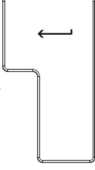
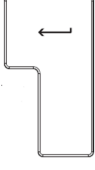


Keyboard Assembly Localization

Description	Enter Key	"4,5,6" Keys			
104 English, US		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>\$ 4</td> <td>% 5</td> <td>^ 6</td> </tr> </table>	\$ 4	% 5	^ 6
\$ 4	% 5	^ 6			
105 Canadian, Bilingual		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>\$ 4 ¢</td> <td>% 5 ¢</td> <td>? ^ 6 ~</td> </tr> </table>	\$ 4 ¢	% 5 ¢	? ^ 6 ~
\$ 4 ¢	% 5 ¢	? ^ 6 ~			
109 Japan		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>\$ う 4 う</td> <td>% え 5 え</td> <td>& お 6 お</td> </tr> </table>	\$ う 4 う	% え 5 え	& お 6 お
\$ う 4 う	% え 5 え	& お 6 お			
105 Austria/Germany		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>\$ 4</td> <td>% 5</td> <td>& 6</td> </tr> </table>	\$ 4	% 5	& 6
\$ 4	% 5	& 6			
105 Belgium AZERTY		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>4 ' {</td> <td>5 ([</td> <td>6 § ^</td> </tr> </table>	4 ' {	5 ([6 § ^
4 ' {	5 ([6 § ^			
105 Nordic Denmark, Finland, Norway, Sweden		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>¤ 4 \$</td> <td>% 5</td> <td>& 6</td> </tr> </table>	¤ 4 \$	% 5	& 6
¤ 4 \$	% 5	& 6			
105 French		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>4 ' {</td> <td>5 ([</td> <td>6 - </td> </tr> </table>	4 ' {	5 ([6 -
4 ' {	5 ([6 -			
105 English, UK Ireland		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>\$ 4 €</td> <td>% 5</td> <td>^ 6</td> </tr> </table>	\$ 4 €	% 5	^ 6
\$ 4 €	% 5	^ 6			



Keyboard Assembly Localization

Description	Enter Key	"4,5,6" Keys			
105 Italy		<table border="1" style="width: 100%; text-align: center;"> <tr> <td data-bbox="1019 289 1130 394">\$ 4</td> <td data-bbox="1149 289 1260 394">% 5 €</td> <td data-bbox="1279 289 1390 394">& 6</td> </tr> </table>	\$ 4	% 5 €	& 6
\$ 4	% 5 €	& 6			
105 Switzerland, Luxembourg		<table border="1" style="width: 100%; text-align: center;"> <tr> <td data-bbox="1019 489 1130 594">ç 4 °</td> <td data-bbox="1149 489 1260 594">% 5 §</td> <td data-bbox="1279 489 1390 594">& 6 ¬</td> </tr> </table>	ç 4 °	% 5 §	& 6 ¬
ç 4 °	% 5 §	& 6 ¬			
104 English, International Netherlands		<table border="1" style="width: 100%; text-align: center;"> <tr> <td data-bbox="1019 688 1130 793">\$ 4</td> <td data-bbox="1149 688 1260 793">% 5 €</td> <td data-bbox="1279 688 1390 793">^ 6</td> </tr> </table>	\$ 4	% 5 €	^ 6
\$ 4	% 5 €	^ 6			
105 Portuguese		<table border="1" style="width: 100%; text-align: center;"> <tr> <td data-bbox="1019 825 1130 930">\$ 4 §</td> <td data-bbox="1149 825 1260 930">% 5 €</td> <td data-bbox="1279 825 1390 930">& 6</td> </tr> </table>	\$ 4 §	% 5 €	& 6
\$ 4 §	% 5 €	& 6			
105 Spanish, European		<table border="1" style="width: 100%; text-align: center;"> <tr> <td data-bbox="1019 1024 1130 1129">\$ 4 ~</td> <td data-bbox="1149 1024 1260 1129">% 5 €</td> <td data-bbox="1279 1024 1390 1129">& 6 ¬</td> </tr> </table>	\$ 4 ~	% 5 €	& 6 ¬
\$ 4 ~	% 5 €	& 6 ¬			




Service Diagnostics/Troubleshooting Overview

- For general Surface support, visit www.support.microsoft.com
- To troubleshoot device feature/function problems or learn more about Surface Laptops visit aka.ms/SurfaceLaptopHelp
- If you'd like to learn more about Windows, visit aka.ms/WindowsHelp
- To learn more about the accessibility features of the Surface Laptop, 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

 **IMPORTANT:** Be sure that devices meet all pre-repair qualifications related to safety and policy prior to repair. See ASP Guidebook for details.

The following approach should be taken when troubleshooting Surface devices:

1. Update device to the latest OS/FW versions using Windows Update.

 **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 CRU related to the problem by following the detailed replacement procedures covered within this service manual.
3. SDT must be run following all hardware repairs where a CRU was replaced to further verify that problem was resolved by the repair action taken.



Component Removal and Replacement Procedures

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

- All tools required for repair are listed under Service Tools and Jigs ([page 7](#))
- All parts required for this repair will be provided in the CRU kit being purchased. CRU kits are listed on the Illustrated Parts List ([page 14](#)).

Prerequisite Steps

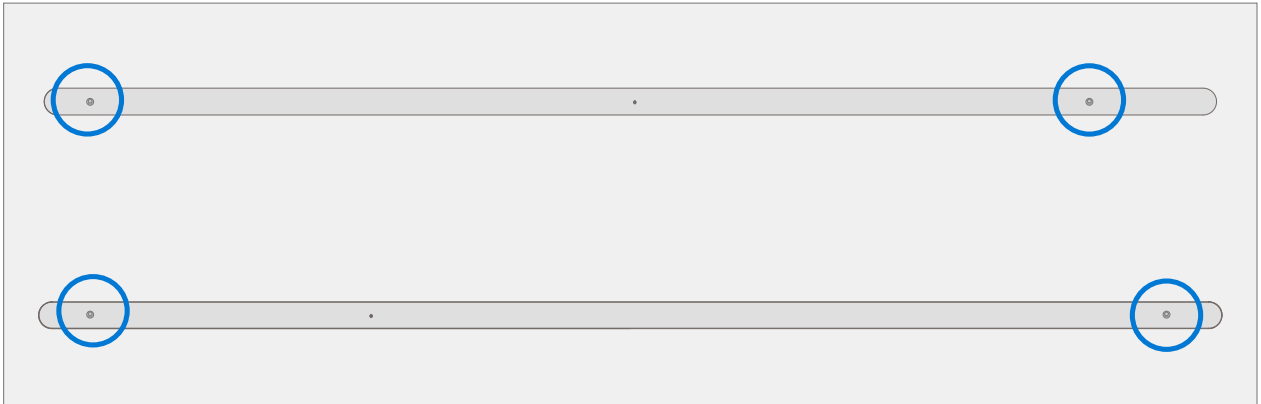
- **Power off device** – Ensure device is powered off by fully discharging the battery. Refer to Repair-Specific Precautions and Warnings section ([page 9](#)) for details. Ensure device is disconnected from a power supply and all cables and drives are removed.
- **ESD Prevention** – Check to make sure that general guidelines and ESD Prevention steps are followed prior to opening device. Refer to ESD Prevention section ([page 8](#)) for details.
- **Position device** – To prevent scratches, flip device over onto a clean surface free of debris with the device bottom facing up for access to the feet for removal.



Procedure – Removal (Non-Skid Feet)

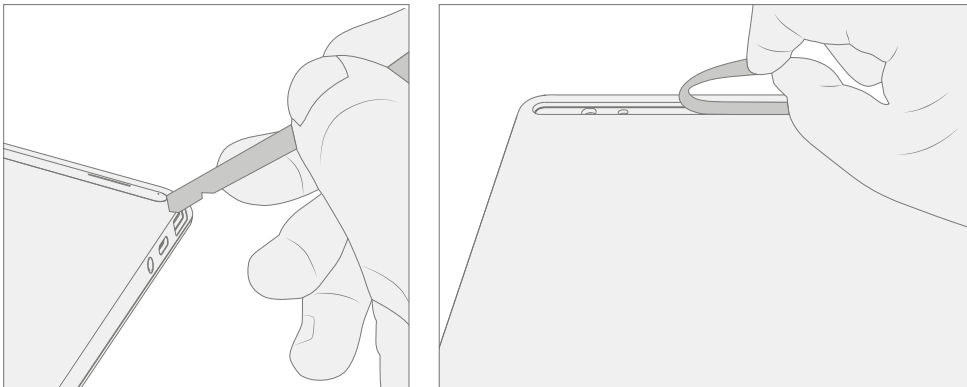
1. **Remove Feet** – Use a plastic tool to pry up the foot from one end and then peel to remove. Repeat for the other foot.

✎ **IMPORTANT:** The front and back feet are not the same. There is one locating post on the rear foot near the left hinge and two locating posts for the front foot below the trackpad. – refer to illustration for details.




2. **Feet removal technique** – Use plastic tweezers / spudger to lift one edge of each foot. Grasp the loose end and pull the foot from the chassis. Ensure all adhesive tape remnants and glue residue are removed. Clean the chassis foot recesses with 70% Isopropyl Alcohol.

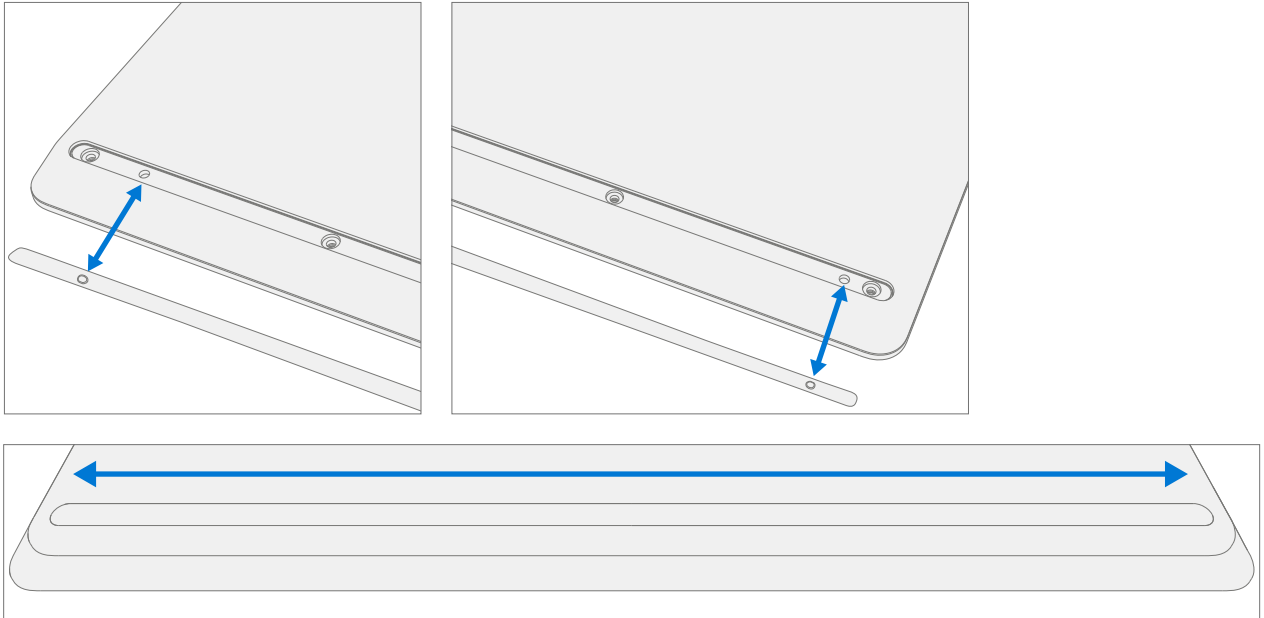
✎ **IMPORTANT:** Once removed, the Feet will be stretched out of shape and must be replaced with new ones.



Procedure – Installation (Non-Skid Feet)

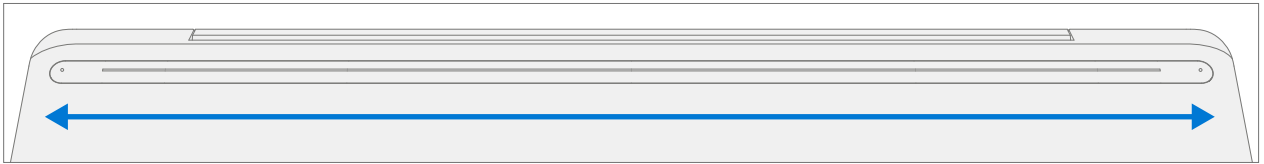
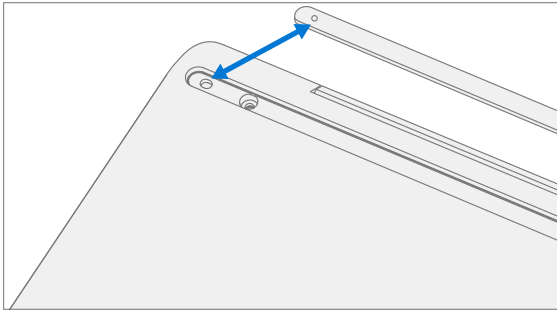
 **IMPORTANT:** Any further repairs that are required on the device should be carried out prior to feet installation. Do not reuse feet previously removed from a device.

1. **Prepare new front foot and press into place** – To install the front foot, remove protective sheet to expose adhesive on foot. Align the two locating posts for the front foot. Press the foot in firmly. Then slide your hand up and down the length of the foot to ensure that it is secured in place.




2. **Inspect for anomalies** – Inspect foot to ensure no cosmetic damage or gaps between the foot and the chassis foot recesses exist.

3. **Prepare new back foot and press into place** – To install the back foot, remove protective sheet to expose adhesive on foot. Align the one locating post for the back foot. Press the foot in firmly. Then slide your hand up and down the length of the foot to ensure that it is secured in place.




4. **Inspect for anomalies** – Inspect foot to ensure no cosmetic damage or gaps between the foot and the chassis foot recesses exist.

 **IMPORTANT:** Before transporting the device, we recommend letting it sit feet-down on a tabletop for at least 12 hours. If this isn't possible, it's recommended to avoid placing the device in a backpack, purse, other types of carriers, until at least 12 hours after installing new feet.




Keyboard Assembly Replacement Processes

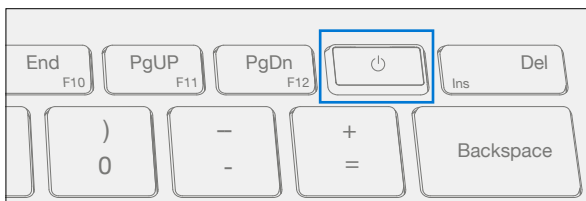
Preliminary Requirements

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

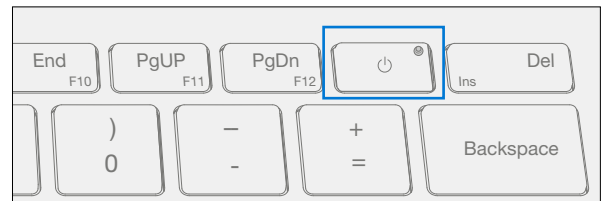
Required Tools and Components

- All tools required for repair are listed under Service Tools and Jigs ([page 7](#))
- All parts required for this repair will be provided in the CRU kit being purchased. CRU kits are listed on the Illustrated Parts List ([page 14](#)).

 **IMPORTANT:** There are Keyboards with and without a fingerprint reader. Ensure the new Keyboard used matches the original. The fingerprint reader is integrated into the power button. Without the fingerprint reader a physical bump is present on the upper right-hand corner.



Keyboard with fingerprint reader



Keyboard without fingerprint reader

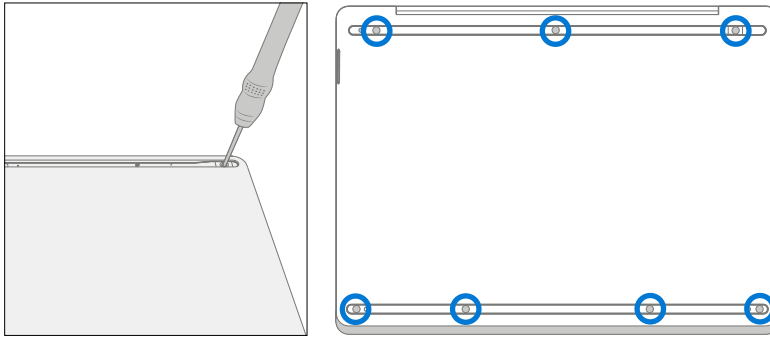
Prerequisite Steps

- **Power off device** – Ensure device is powered off by fully discharging the battery. Refer to Repair-Specific Precautions and Warnings section ([page 9](#)) for details. Ensure device is disconnected from a power supply and all cables and drives are removed.
- **ESD Prevention** – Check to make sure that general guidelines and ESD Prevention steps are followed prior to opening device. Refer to ESD Prevention section ([page 8](#)) for details.
- **Remove Feet** – Follow steps for Procedure – Removal (Non-Skid Feet) section ([page 21](#)).



Procedure – Removal (Keyboard)

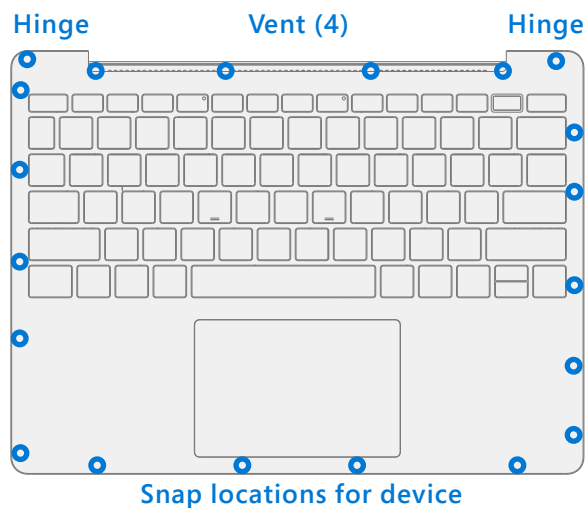
1. **Remove Keyboard screws** – Using a PH0 screwdriver uninstall the three screws from the rear, and four screws from the front chassis foot recesses.



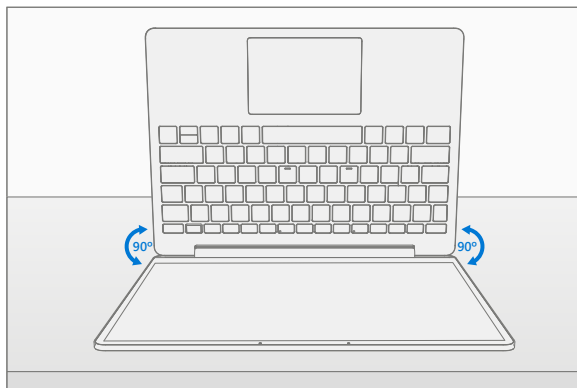
- ✎ **IMPORTANT:** Ensure the plastic pick depth into the keyboard is kept shallow to avoid damaging snaps and impacting the battery.
- ✎ **IMPORTANT:** Remove keyboard exactly as described in this step to avoid damaging the Flexible Printed Circuit (FPC) connected between the keyboard and the Main Board. Do not pull the keyboard apart beyond **45 degrees** otherwise damage to keyboard FPC could occur.

2. Separate keyboard from device

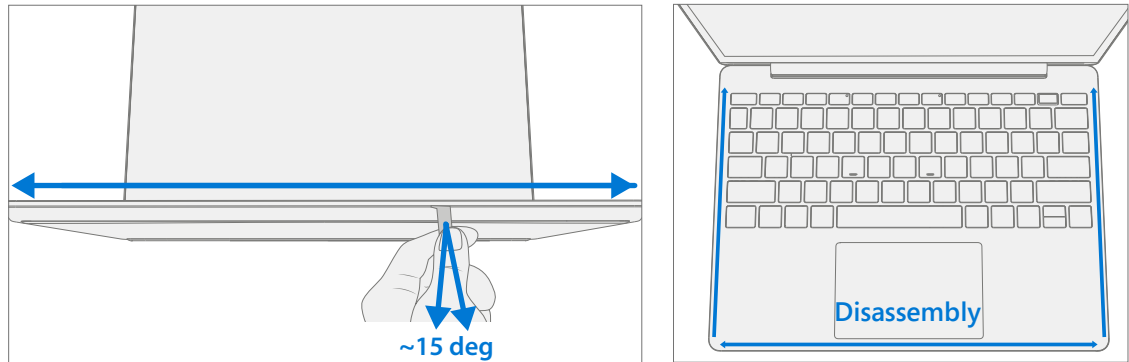
- a. Note the locations of the snaps that secure the keyboard to the chassis.



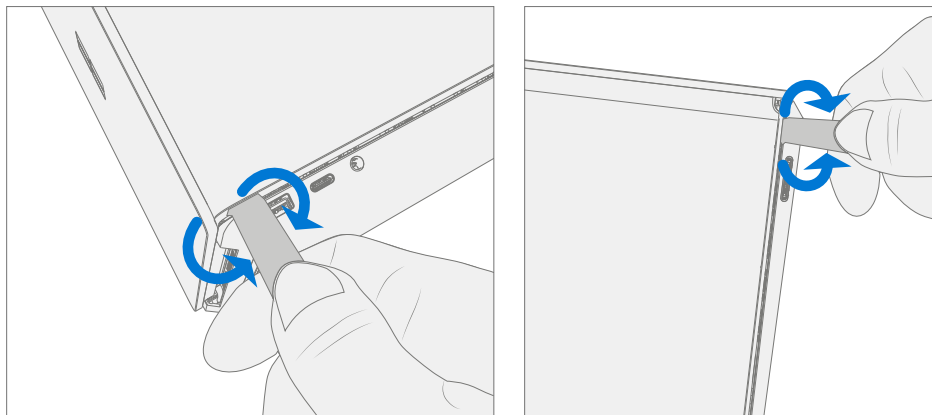
- b. Open the device to 90 degrees and place the display side down with the keyboard facing up.



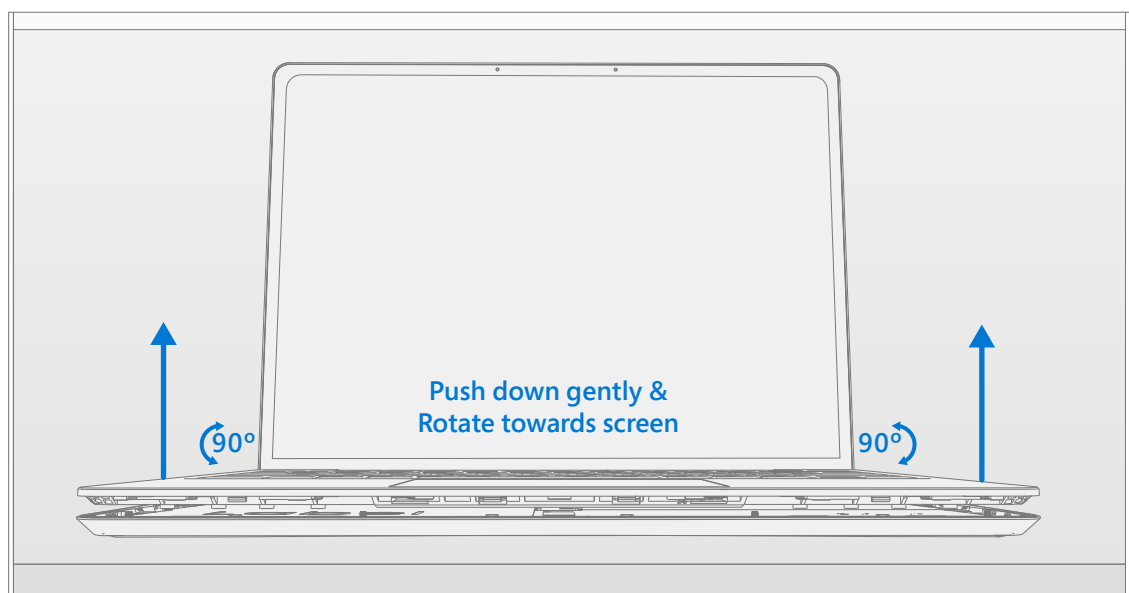
- c. Using a plastic opening tool to pry between the keyboard and chassis along the front between the snap locations. Rotate the opening tool by about 15 degrees and slowly run the tool along the seam between the keyboard and chassis. Start along the front seam and then the 2 sides until all snaps of keyboard are disengaged.



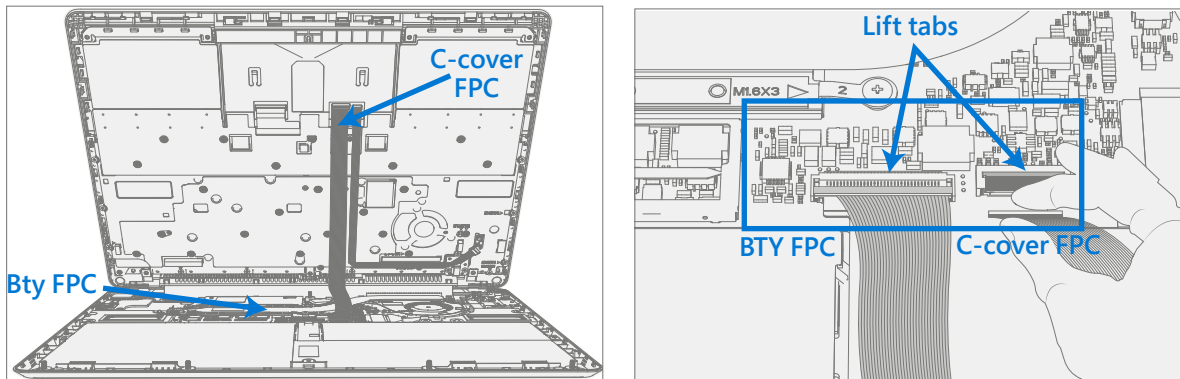
- d. Gently rotate the opening tool at the hinge corner until you hear a soft pop from the snap. Repeat this for both hinges.



- e. To disengage the 4 vent snaps, ensure the device is open to 90 degrees and the display is lying flat on the work surface. Gently push the Keyboard downward towards the work surface and rotate it for towards the screen.



3. **Disconnect FPCs** – With the Keyboard rotated towards the screen, lift the connector lock on the battery FPC and then pull the FPC out. Next lift the connector lock on the keyboard FPC and then pull the FPC out.



⚠ WARNING: It is recommended that an ESD-safe battery cover be placed across the device to protect the battery from any physical contact or accidental damage whenever Keyboard is removed. Ensure corners of cover are always aligned with the corners of the device while battery is exposed. If battery cover is misaligned during activities in any way, re-align before continuing activities.

- ✍ **IMPORTANT:** 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.
 - ✍ **IMPORTANT:** Ensure battery FPC remains disconnected from the PCBA whenever Keyboard is removed from device for safety purposes.
-

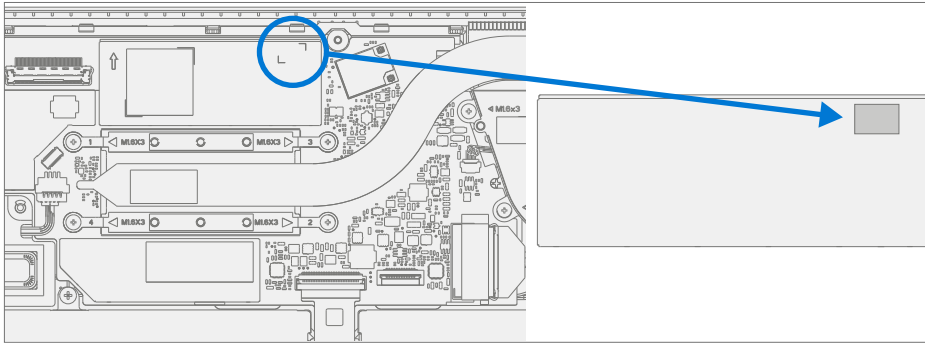


Procedure – Installation (Keyboard)

1. Pre-installation Device Inspection

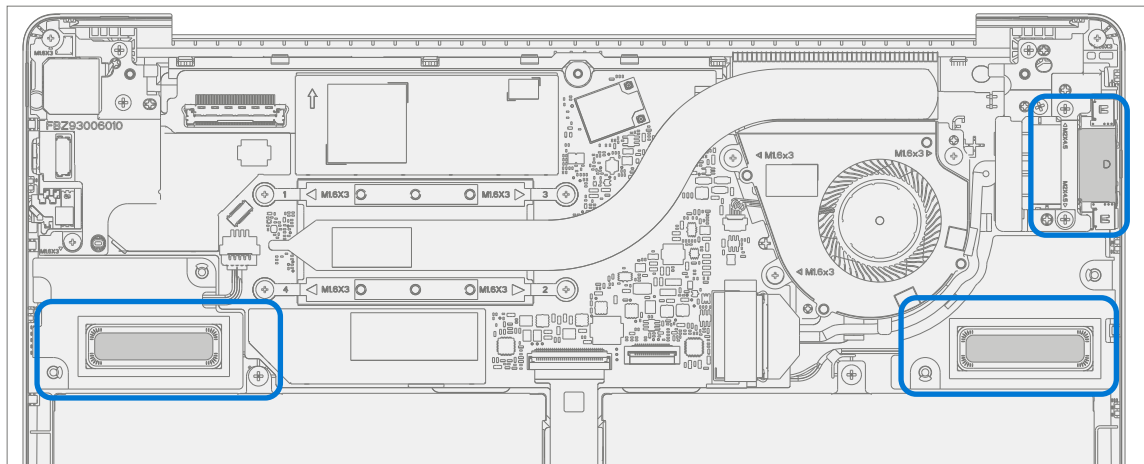
⚠ WARNING: Verify the battery's condition refer to, Lithium-Ion Battery Inspection on (page 11).

⚠ WARNING: Verify the condition of LDI (Liquid Damage Indicators). Any color other than white indicates liquids have entered the device. Devices exhibiting LDI require whole unit replacement.

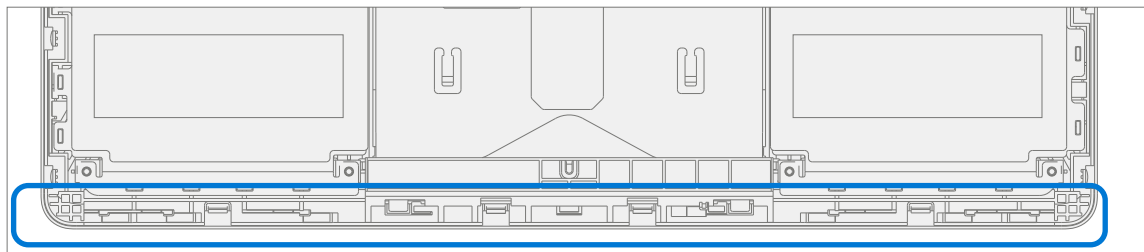


2. Check Device for Debris – Check the keyboard (both sides) and device enclosure for any loose articles that may be present inadvertently on the Keyboard or within the device enclosure areas.

- 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.



Chassis

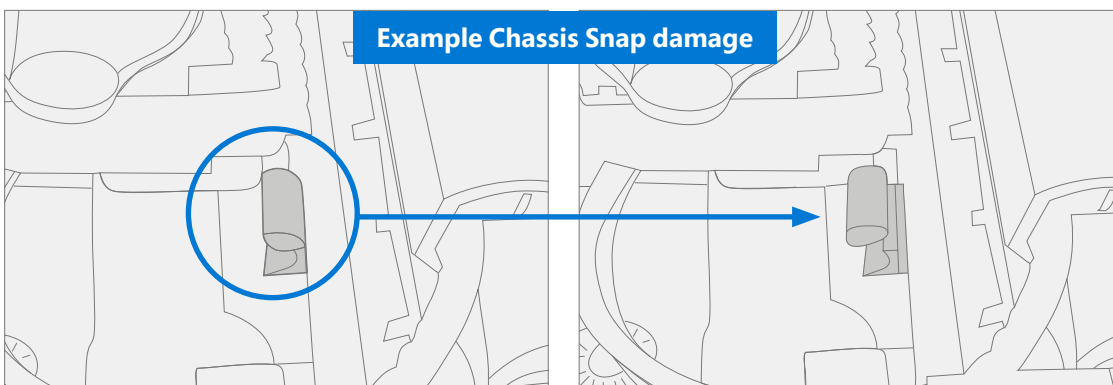
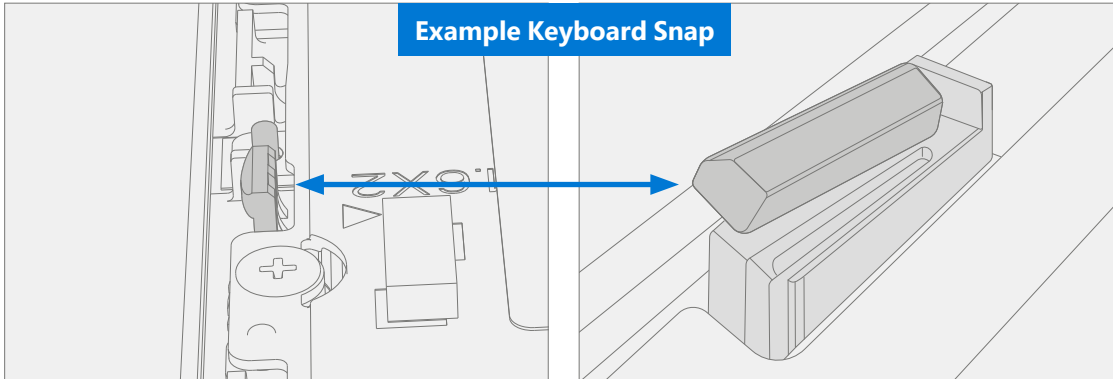


Keyboard

- b. Carefully inspect the area around battery specifically for any foreign objects before removing battery cover.




3. **Check Keyboard Snaps** – Verify the 16 Keyboard snaps and the 4 Chassis snaps were not damaged during device disassembly. Damaged Keyboard snaps require installing a new Keyboard. Damaged Chassis snaps can only be addressed by whole device replacement. Refer to illustrations for further details.

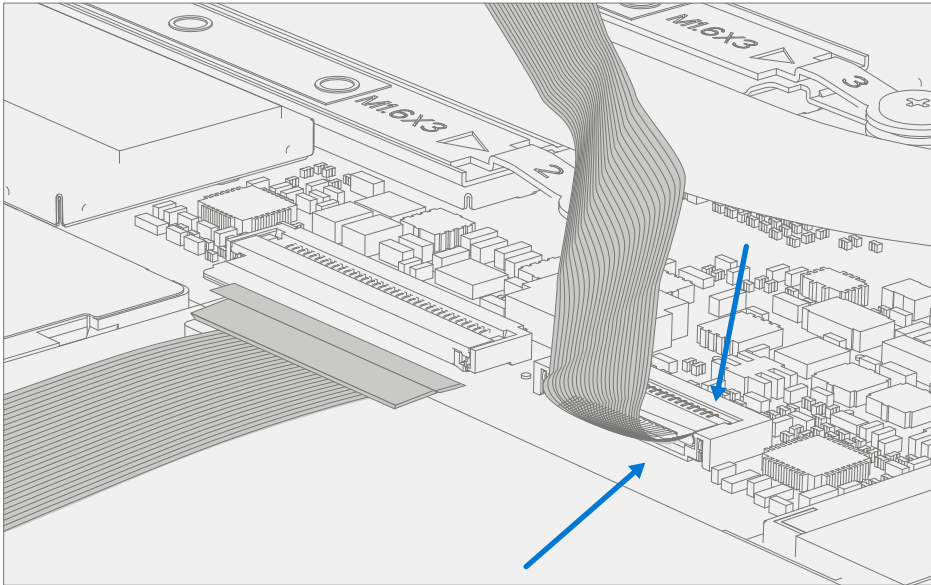


4. **Remove Tape from New Keyboard FPC** – Tape secures the Keyboard FPC during shipping. Remove this tape before continuing with assembly.

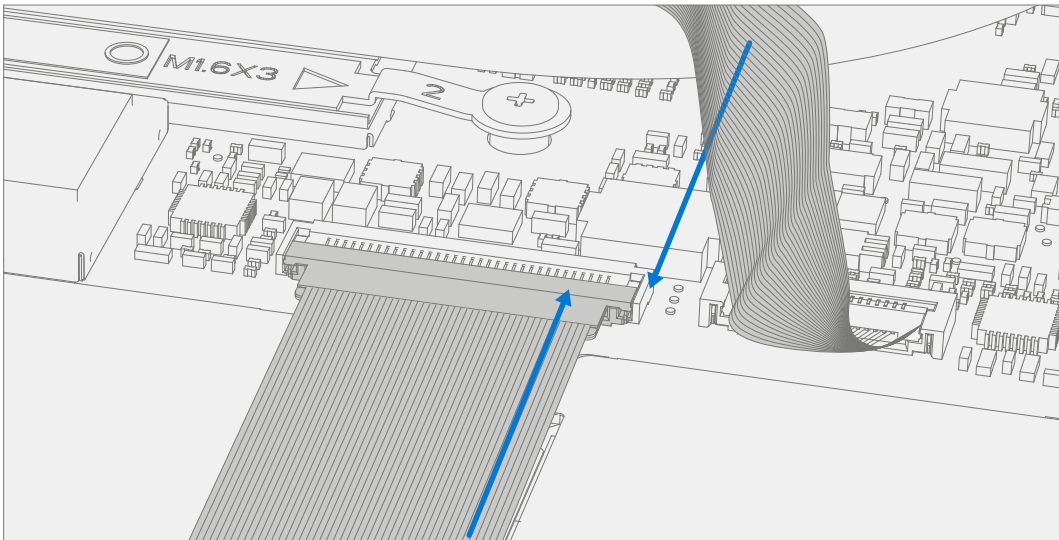


5. **Connect Keyboard FPC** – Remove the battery cover. Hover the Keyboard over the device while assembling the Keyboard FPC to the main board. Slide the FPC into the connector and then press down on the locking tab.

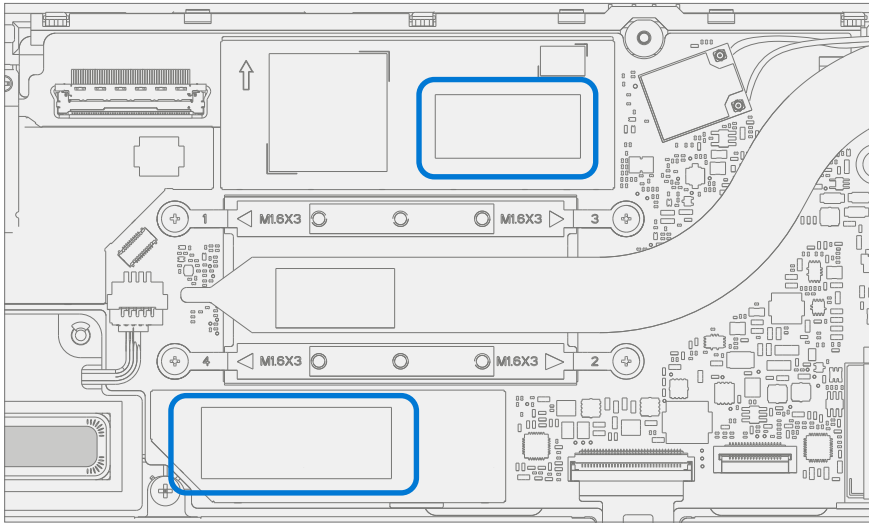
 **IMPORTANT:** Be sure that FPC bends fall in place properly as pre-bent, and no folds or creases are created during re-assembly of Keyboard.



6. **Connect Battery FPC** – Connect the Battery FPC to the Motherboard. Slide the FPC into the connector and then press down on the locking tab.

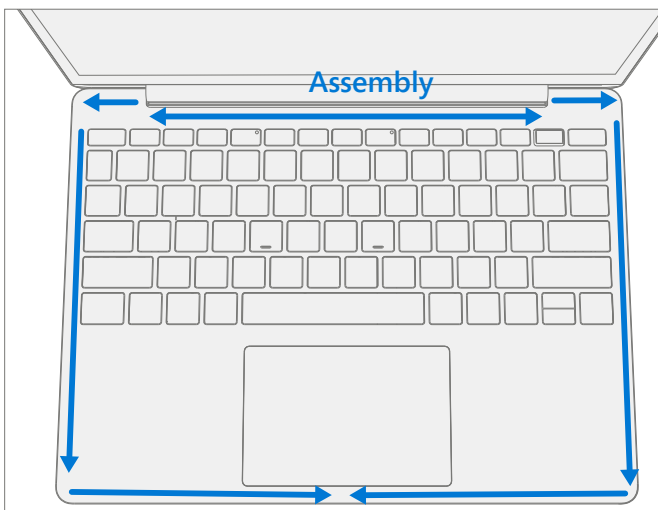


7. **Apply New Thermal Pads** – Remove the original thermal pads from top of the shield marked below. Clean thermal pad residue with IPA and cotton swabs. Apply new thermal pads on the shield in the same approximate location.




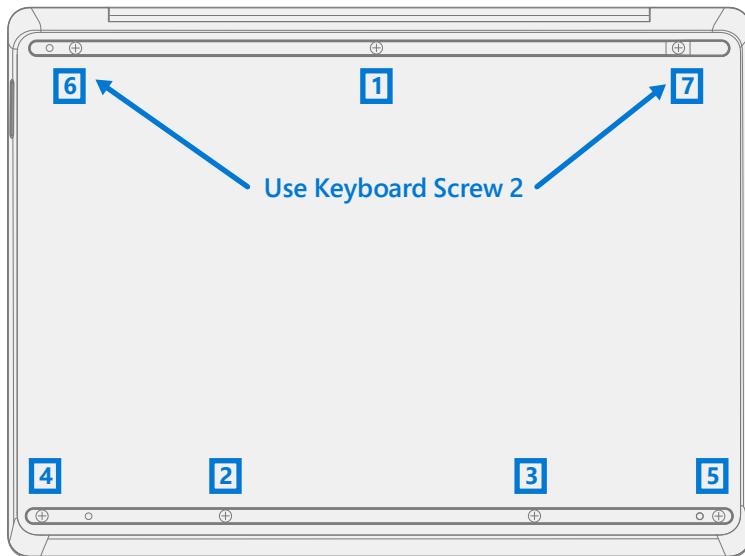
8. **Align the Keyboard** – Properly align the cover to the device using the front edge alignment posts. Carefully place the Keyboard back onto the Chassis and shift the Keyboard snaps into place. Press gently on the Keyboard to engage the snaps correctly. Follow the direction of progress as shown in the picture below. Verify there are no visible gaps between the Keyboard and Chassis.

IMPORTANT: Ensure that the Keyboard is correctly aligned and seated before closing the device. There is the risk of breaking the display if the device lid is closed before Keyboard is aligned.



9. **Run SDT** – Run SDT to ensure all device features and functions operate as expected. Refer to ([page 19](#)) for details on SDT.
10. **Install New Keyboard Screws** – Close the Display and turn the unit over. Use a PH0 screwdriver to install 5 Keyboard Screws (MM20048I000) to secure the Keyboard in the order pictured below. Then install 2 longer screws (MS20055I430) installed as marked below. All screws should be installed until just snug and seated, and then turned another 90 degrees (1/4 turn).

 **IMPORTANT:** Ensure the longer screws (MS20055I430) are installed in the two corner locations under the rear foot pad.




11. **Install Feet** – If SDT tests pass and no further repairs are to be performed on the device, follow the steps for Procedure – Installation (Non-Skid Feet) on ([page 22](#)).



rSSD Replacement Process

Preliminary Requirements

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

Required Tools and Components

- All tools required for repair are listed under Service Tools and Jigs ([page 7](#))
- All parts required for this repair will be provided in the CRU kit being purchased. CRU kits are listed on the Illustrated Parts List ([page 14](#)).

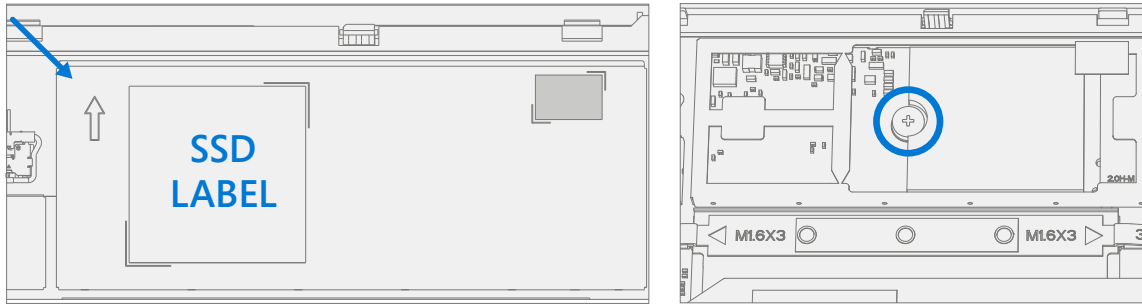
Prerequisite Steps

- **Power off device** – Ensure device is powered off by fully discharging the battery. Refer to Repair-Specific Precautions and Warnings section ([page 9](#)) for details. Ensure device is disconnected from a power supply and all cables and drives are removed.
- **ESD Prevention** – Check to make sure that general guidelines and ESD Prevention steps are followed prior to opening device. Refer to ESD Prevention section ([page 8](#)) for details.
- **Remove Feet** – Follow steps for Procedure – Removal (Non-Skid Feet) section ([page 21](#)).
- **Remove Keyboard** – Follow steps for Procedure – Removal (Keyboard) on ([page 25](#)).

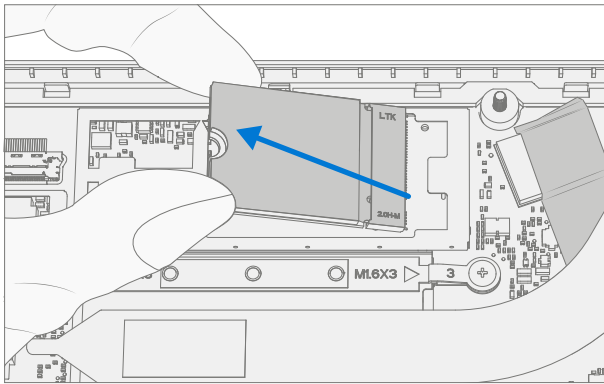


Procedure – Removal (rSSD)

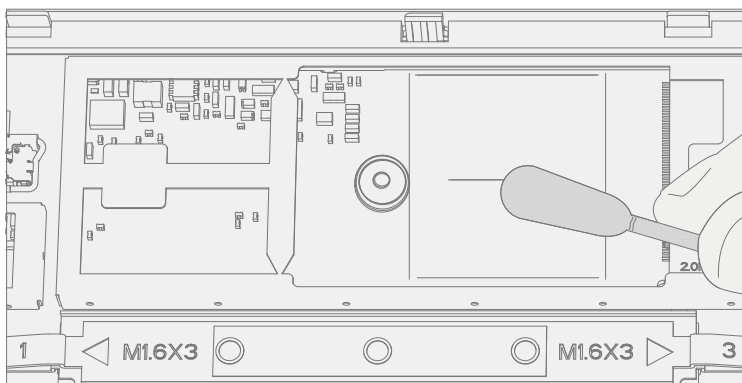
1. **Remove SSD Shielding cover and Screw** – Use a plastic opening tool to pry up Shielding cover. Slide the tool under the lip on the top side of the shield. Use a PH00 screwdriver to remove the screw securing the rSSD.



2. **Clean TIM Residue** – Inspect rSSD for TIM residue. Carefully wipe away any residue with IPA.
3. **Remove SSD** – Carefully grab sides of rSSD case and pull out of the mainboard socket at ~15-degree angle.



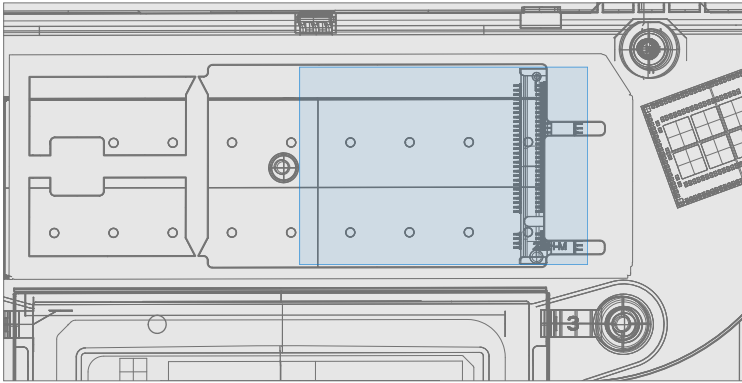
4. **Remove rSSD Thermal Pad** – After removing the SSD, peel the original Thermal Pad from the motherboard and clean off any residual with IPA and cotton swabs.



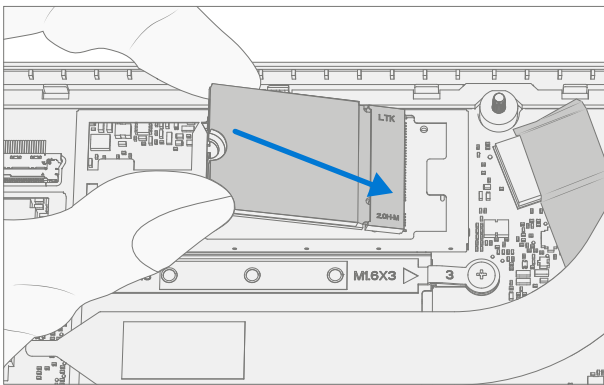
Procedure – Installation (rSSD)

IMPORTANT: Only a Microsoft rSSD with part number as specified in the parts list, per device model, and of like capacity should be replaced in the device.

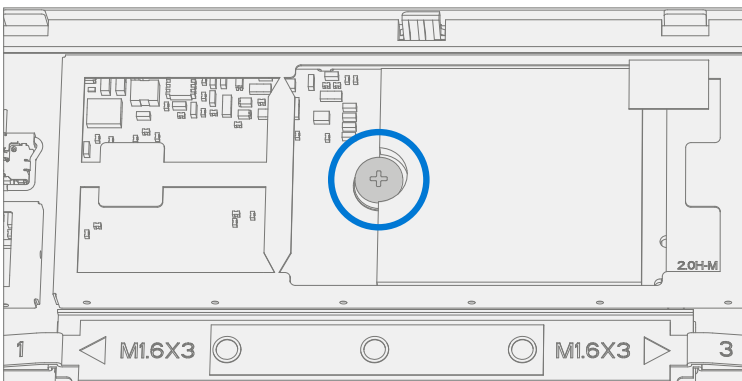
1. **Apply New Thermal Pad** – Align thermal pad on the Motherboard in approximate area shown below, use screw boss as alignment. Once positioned remove the release liner.



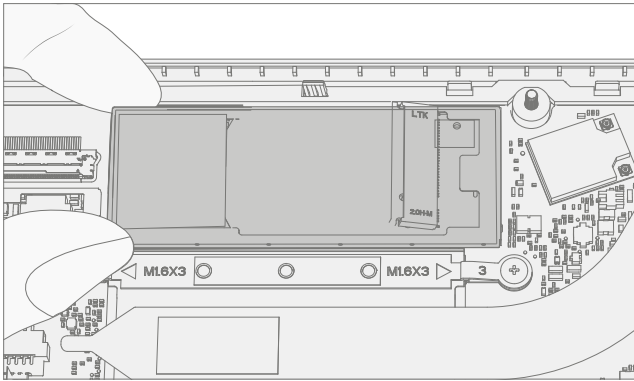
2. **Install New rSSD** – Insert the connector end of the rSSD into the SSD connector on Mainboard at ~15-degree angle.




3. **Install rSSD Screw** – Using a PH00 screwdriver install new MM160301130S screw until the screw is just snug and seated, and then turned another 45 degrees (1/8 turn).



4. **Install rSSD Shield** – Install a new shielding cover over the rSSD, a new thermal pad should be included with the shield lid. New shield should snap into place when pushed down along all edges.



5. **Install Keyboard** – Follow steps for Procedure – Installation (Keyboard) on [\(page 28\)](#).


 **IMPORTANT:** Only snap the Keyboard in place. Do not secure Keyboard with screws.

6. **Imaging new rSSD** – Power on device. Apply a new image to the rSSD using a BMR Imaging key specific to the device model. Refer to Surface Imaging Process - [Surface Imaging Tools](#).
7. **Run SDT** – Run SDT to ensure all device features and functions operate as expected. Refer to [\(page 19\)](#) for details on SDT. If SDT tests pass and no further repairs are to be performed on the device continue with the final assembly steps.
8. **Install New Keyboard Screws** – Power off device. Close the Display and turn the unit over. Use a PH0 screwdriver to install 7 new screws to secure the Keyboard as detailed on [\(page 32\)](#).
9. **Install Feet** – Follow the steps for Procedure – Installation (Non-Skid Feet) on [\(page 22\)](#).



Display Assembly Replacement Process

Preliminary Requirements


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

Required Tools and Components

- All tools required for repair are listed under Service Tools and Jigs ([page 7](#))
- All parts required for this repair will be provided in the CRU kit being purchased. CRU kits are listed on the Illustrated Parts List ([page 14](#)).

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.
 - **Connect software tools USB drive** with SDT to USB connector on device under repair.
 - **Connect power supply** to device.
 - **Power on device** – Depress the power button on the side of the device.
 - **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 Setup. At the end of the tool process device will power down.

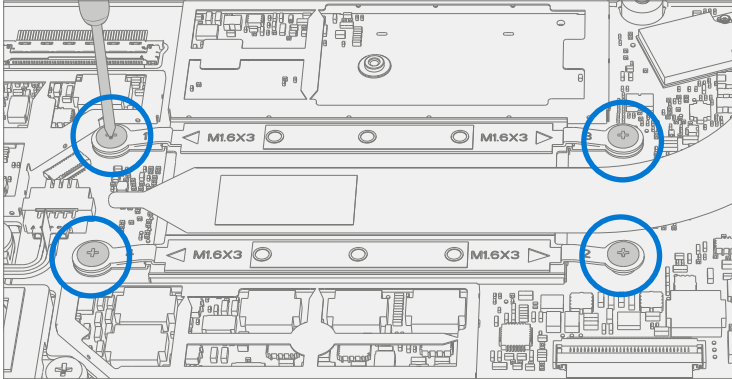
 **WARNING:** This step must be conducted on the device successfully before removal of a faulty display. If display is unusable, connect an external monitor to run these steps.

- **Power off device** – Ensure device is powered off by fully discharging the battery. Refer to Repair-Specific Precautions and Warnings section ([page 9](#)) for details. Ensure device is disconnected from a power supply and all cables and drives are removed.
- **ESD Prevention** – Check to make sure that general guidelines and ESD Prevention steps are followed prior to opening device. Refer to ESD Prevention section ([page 8](#)) for details.
- **Remove Feet** – Follow steps for Procedure – Removal (Non-Skid Feet) section ([page 21](#)).
- **Remove Keyboard** – Follow steps for Procedure – Removal (Keyboard) on ([page 25](#)).

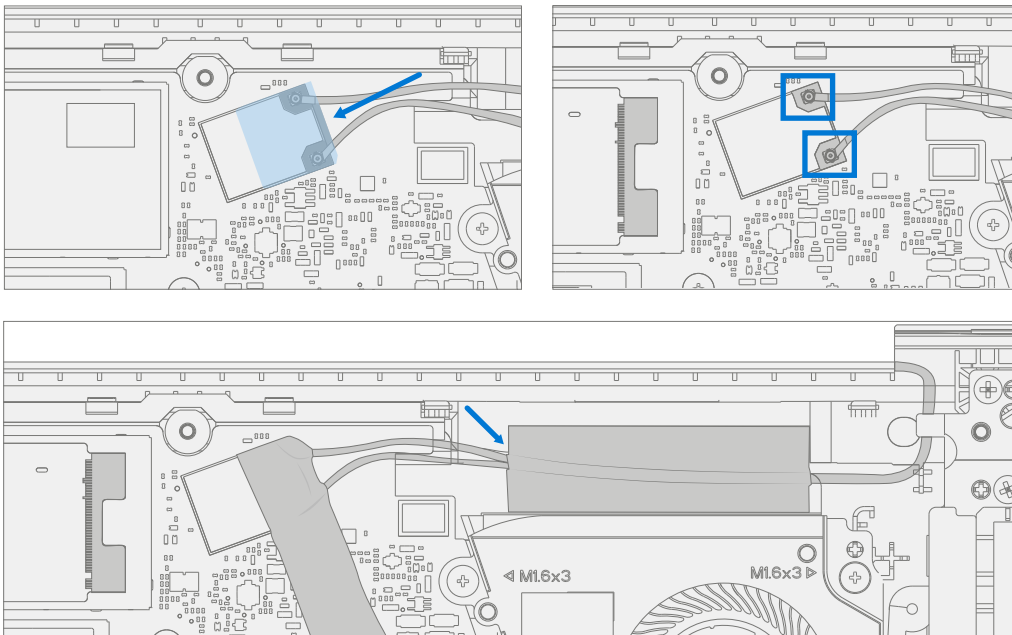


Procedure – Removal (Display Assembly)

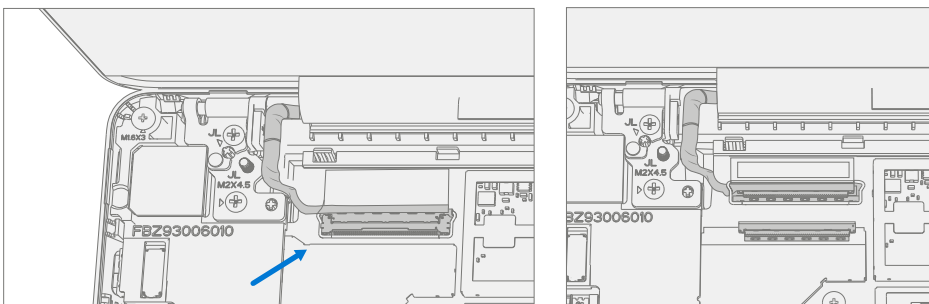
1. **Remove Thermal Module** – Use a PH00 screwdriver to remove the four screws securing the thermal module and remove it from the PCBA.



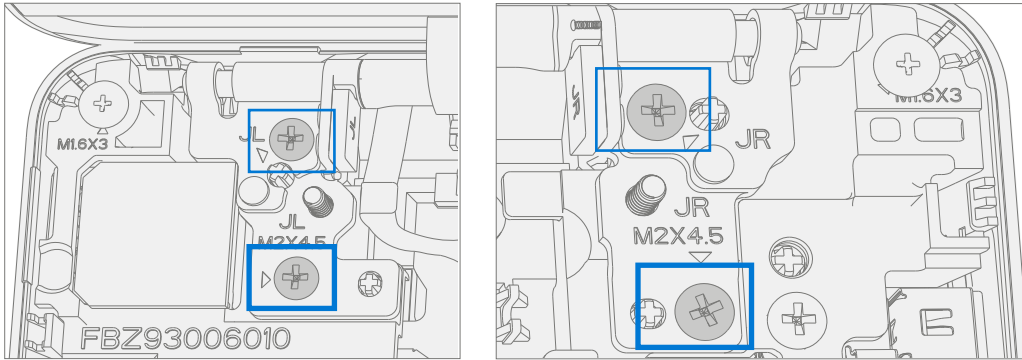
2. **Disconnect Antenna cable** – Using plastic tweezers remove the clear Mylar shield covering the antenna connectors. Disconnect the two Antenna cables located on Mainboard. Remove the black tape securing the antenna cables to the Chassis.



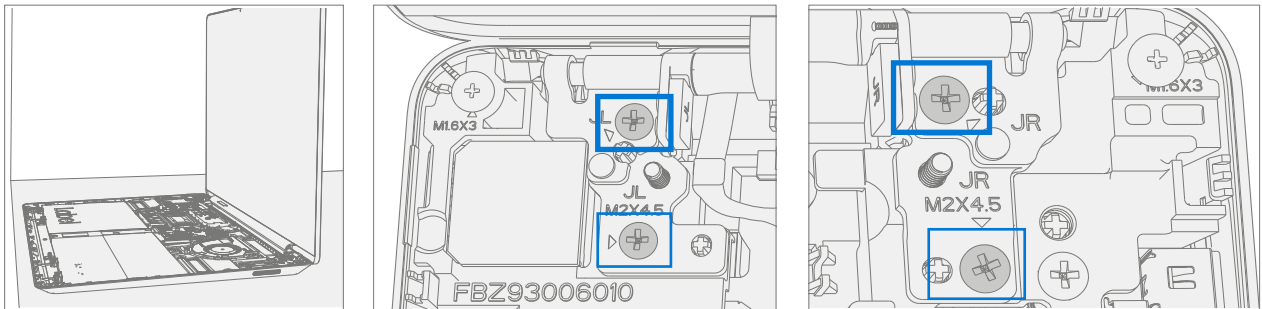
3. **Disconnect Display connector** – Lift up on the metal buckle. Then slide out the display connector from the Mainboard connector.



4. **Remove Two Inner Hinge Screws** – Use a PH0 screwdriver to remove the 2 inner screws on the left and right hinges.



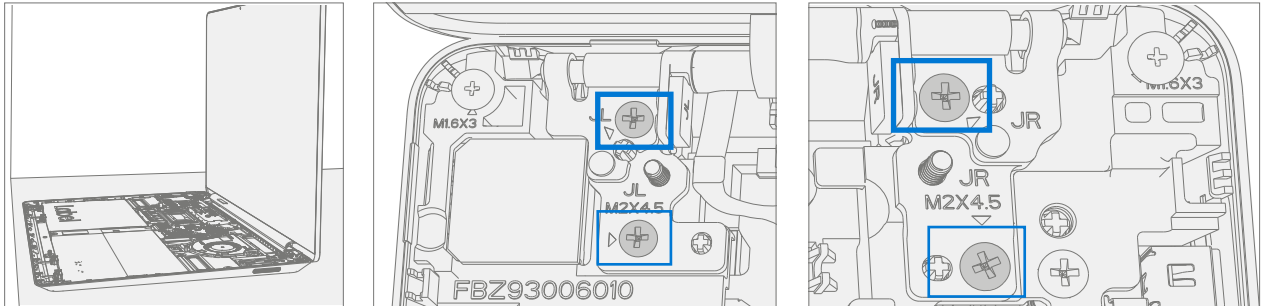
5. **Set Display Angle to 90 Degrees** – Place the display module at an angle of about 90 degrees. Use a PH0 screwdriver to remove the 2 outer screws at the left and right hinges while holding the display with your free hand.



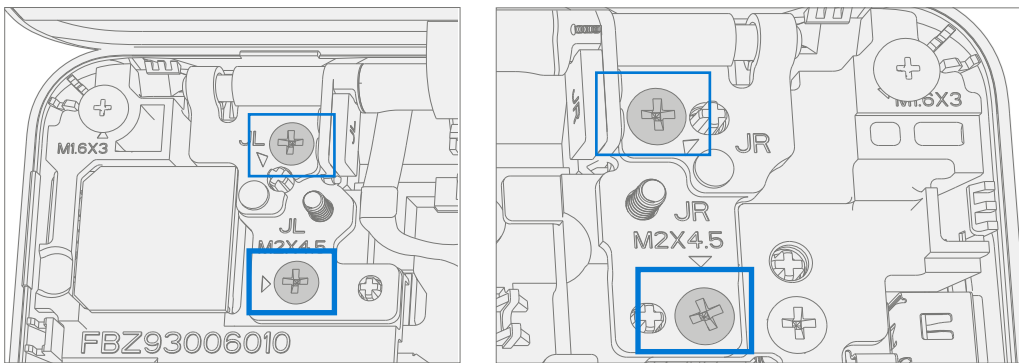
6. **Remove Display from Device** – Lift the display module straight up vertically until detached from the Chassis.

Procedure – Installation (Display Assembly)

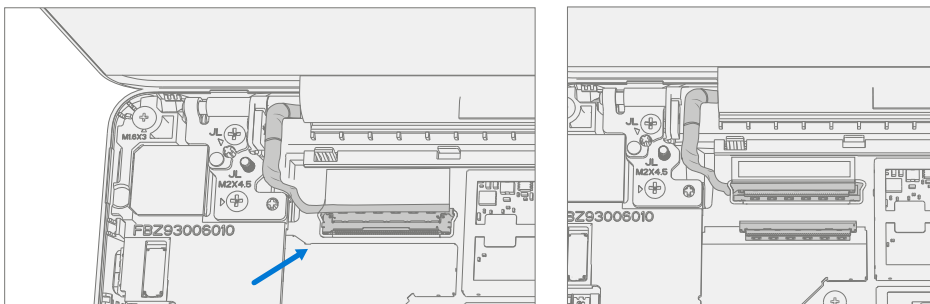
1. **Install Display** – Set the new Display in place in the device chassis hinge wells and hold in place. Use a PH0 screwdriver to install 2 new MS20055I430 outer screws on each hinge. Screws should be installed until just snug and seated, and then turned another 90 degrees (1/4 turn).



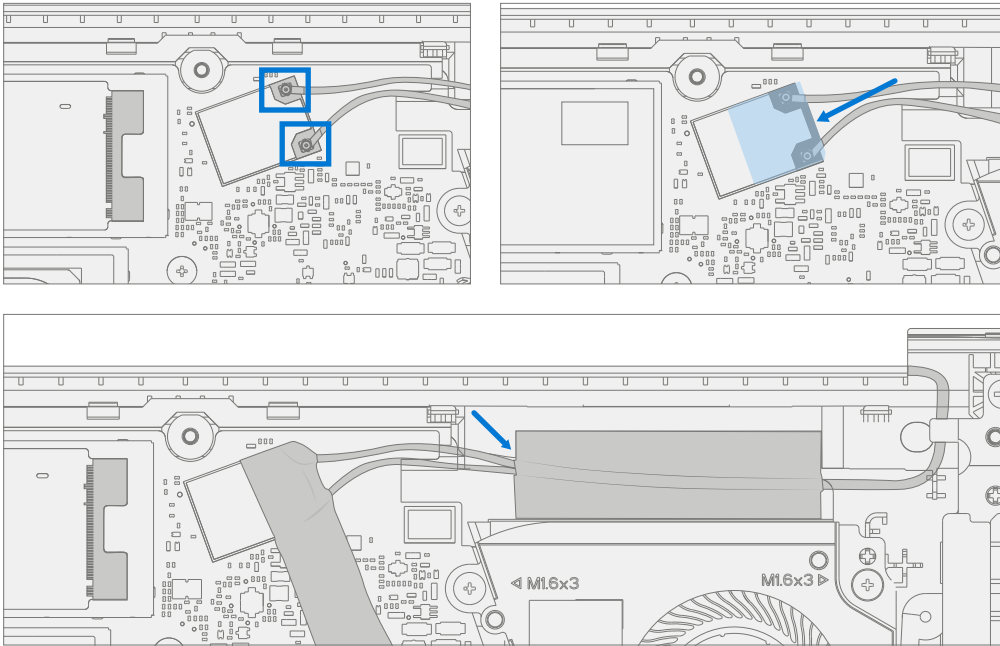
2. **Install Two Inner Hinge Screws** – Using a PH0 screwdriver, install 2 new inner MM20048I000 screws on the left and right hinges. Screws should be installed until just snug and seated, and then turned another 90 degrees (1/4 turn).




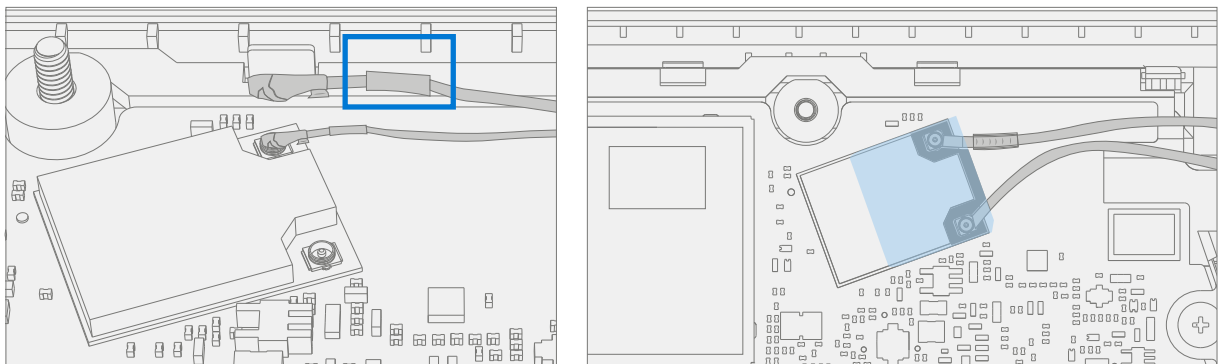
3. **Install Display connector** – Slide display connector into the Mainboard connector. Secure the cable with the metal buckle. Ensure the cable is routed below the metal tab near the hinge.




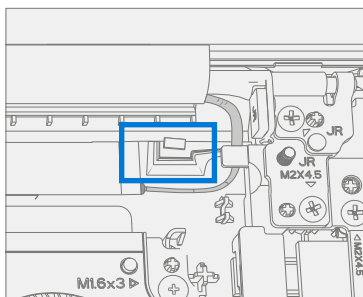
4. **Connect Antenna cable** – Carefully install two antenna connectors on the mainboard. Install a new clear Mylar shield over the antenna connectors. Secure the antenna cables to the Chassis with the supplied black tape.



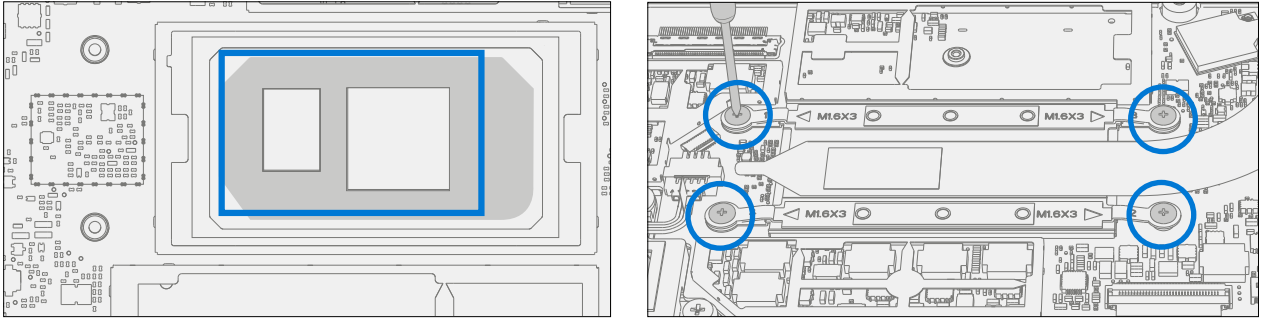
-  **IMPORTANT:** Ensure the antenna with the shrink wrap ring is connected to the top interface.




-  **IMPORTANT:** Ensure the antenna cables are routed under the tab on the bracket near the hinge.




5. **Install Thermal Module (Heatsink)** – Gently clean off the residual thermal grease from the two IC chips with a lint free cloth. Make sure there are no contaminants or residual grease. Check that the thermal grease on the underside of the new thermal module is intact and not smeared. Place the thermal module over the two IC chips. Using a PH00 screwdriver Install 4 new MM160301130 screws until just snug and seated, and then turn another 45 degrees (1/8 turn).




6. **Install Keyboard** – Follow steps for Procedure – Installation (Keyboard) on [\(page 28\)](#).

 **IMPORTANT:** Only snap the Keyboard in place. Do not secure Keyboard with screws.

7. **Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
8. **New Display TDM Calibration** – On installation of a **new Display TDM** device final calibration relies on the successful completion of the TDM Replacement Mode. TDM calibration is not required when installing the originally removed Display.
- Connect software tools USB drive** with SDT to USB connector on device under repair.
 - 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.

9. **Install Keyboard Screws** – Power off device. Close the Display and turn the unit over. Use a PH0 screwdriver to install 7 new screws to secure the Keyboard as detailed on [\(page 32\)](#).


 **IMPORTANT:** Ensure the longer MS200551430 screws are installed in the two corner locations under the rear foot pad as detailed in the Installation (Keyboard).

10. **Install Feet** – Follow the steps for Procedure – Installation (Non-Skid Feet) on [\(page 22\)](#).



Surflink Replacement Process

Preliminary Requirements

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

Required Tools and Components

- All tools required for repair are listed under Service Tools and Jigs ([page 7](#))
- All parts required for this repair will be provided in the CRU kit being purchased. CRU kits are listed on the Illustrated Parts List ([page 14](#)).

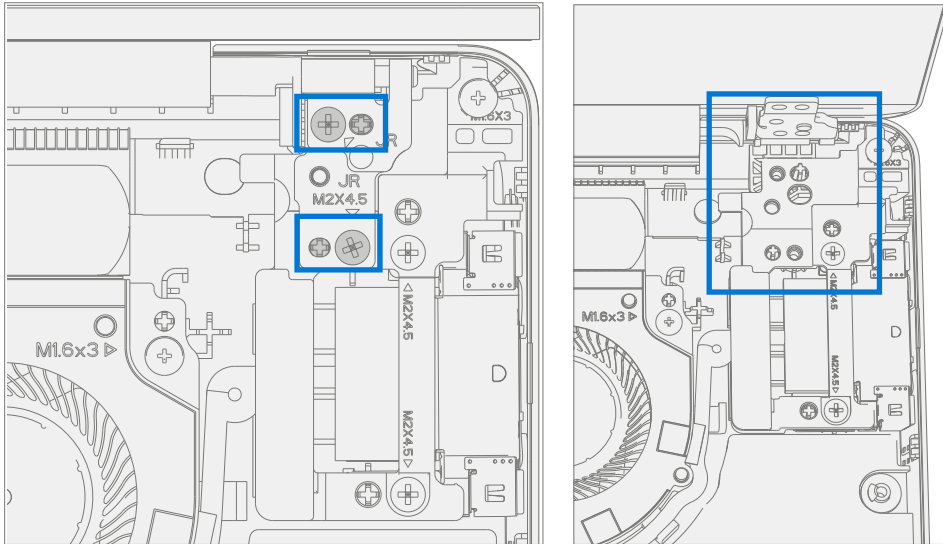
Prerequisite Steps

- **Power off device** – Ensure device is powered off by fully discharging the battery. Refer to Repair-Specific Precautions and Warnings section ([page 9](#)) for details. Ensure device is disconnected from a power supply and all cables and drives are removed.
- **ESD Prevention** – Check to make sure that general guidelines and ESD Prevention steps are followed prior to opening device. Refer to ESD Prevention section ([page 8](#)) for details.
- **Remove Feet** – Follow steps for Procedure – Removal (Non-Skid Feet) section ([page 21](#)).
- **Remove Keyboard** – Follow steps for Procedure – Removal (Keyboard) on ([page 25](#)).

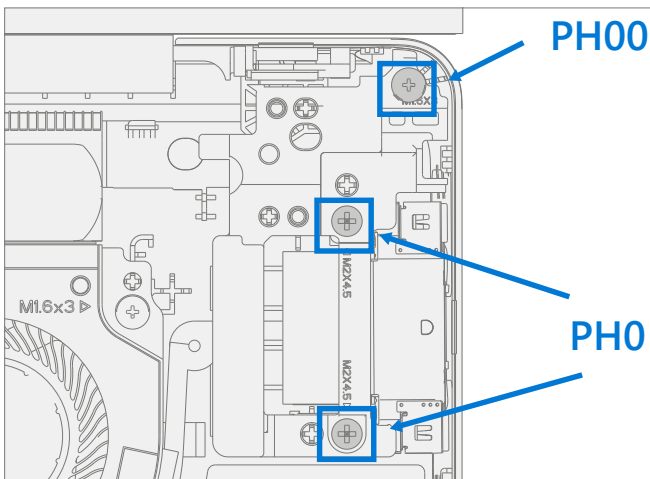


Procedure – Removal (Surflink)

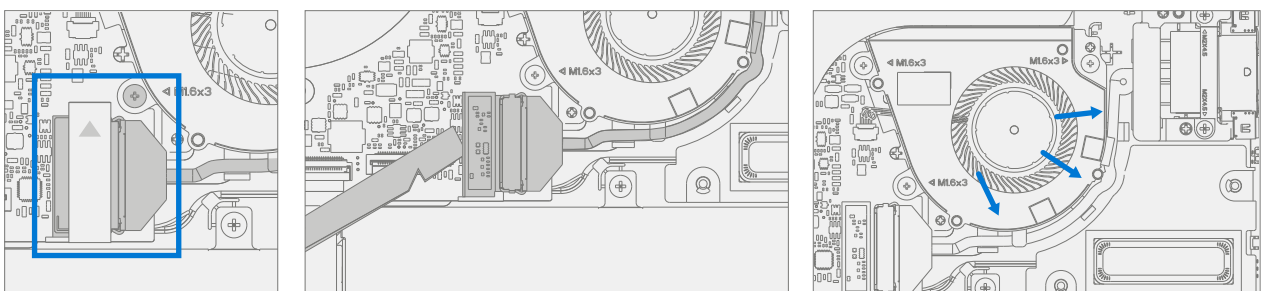
1. **Remove Right Display Hinge Screws** – Use a PH0 screwdriver to remove 2 screws securing the right Display hinge. Move the hinge up to make space for removal of the right bracket.




2. **Remove Bracket** – Use a PH0 screwdriver to remove 2 screws and a PH00 screwdriver to remove a 3rd screw securing the right bracket. Remove the bracket from the Chassis.



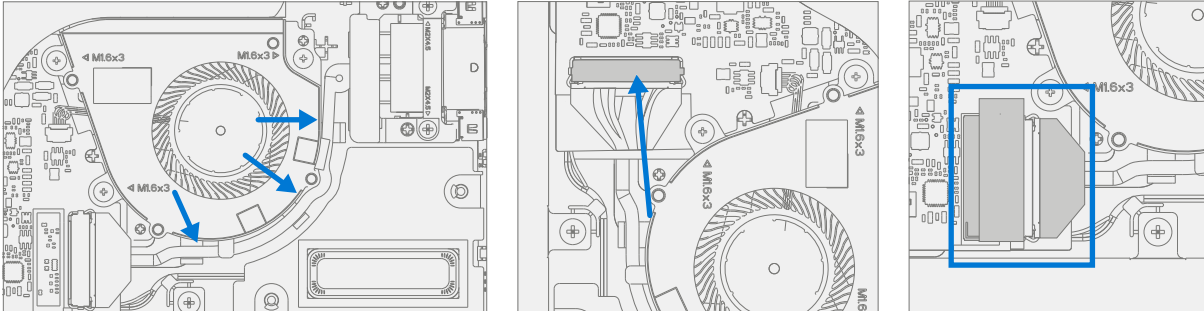
3. **Remove Surflink** – Remove foil tape. Use a spudger to unlock the Surflink cable connector and remove it from the mainboard. Remove the Surflink cable from the cooling fan shroud and then the Surflink assembly from the Chassis.



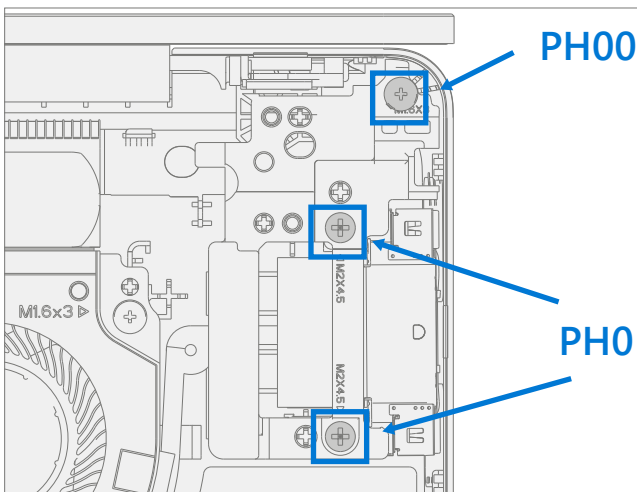
Procedure – Installation (Surflink)

 **IMPORTANT:** The Display hinge screws are of two lengths. Ensure the correct length screw is installed. Refer to the hinge screw installation step for further details.

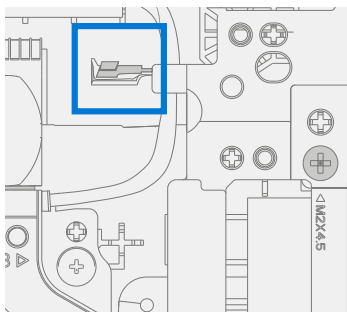
1. **Install Surflink** – Place the Surflink into the Chassis. Route the Surflink cable around the cooling fan shroud. Slide Surflink connector into the mainboard and press down on the locking tab. Apply new foil tape as pictured below.



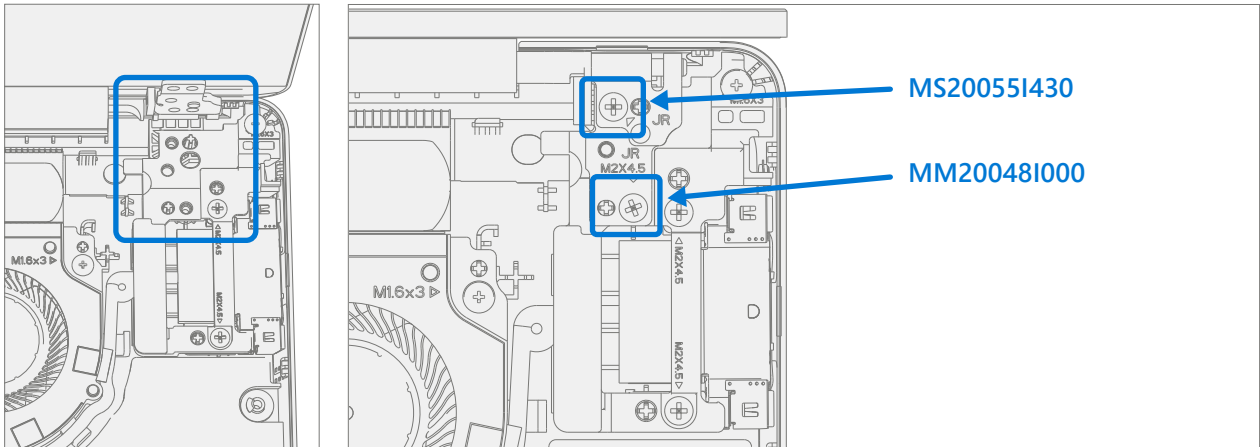
2. **Install Bracket** – Place right bracket in the Chassis over the Surflink. Use a PH0 screwdriver to install 2 new MM20045I080 screws and a PH00 screwdriver to a new MM160301130 screw into the right bracket. Screws should be installed until just snug and seated, and then turned another 45 degrees (1/8 turn).




 **IMPORTANT:** Ensure the antenna cables are routed under the tab on the bracket.




- 3. Install Right Display hinge Screws** – Tilt the hinge down over the right bracket. Use a PH0 screwdriver to install one MS200551430 screw, and one MM200481000 screw into the Display hinge. Screws should be installed until just snug and seated, and then turned another 45 degrees (1/8 turn).




- 4. Install Keyboard** – Follow steps for Procedure – Installation (Keyboard) on [\(page 28\)](#).

 **IMPORTANT:** Only snap the Keyboard in place. Do not secure Keyboard with screws.

- 5. Power On Device** – Carefully place device top side up. Connect device to power supply, open display, and power on.
- 6. 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.
 - Connect software tools USB drive with SDT to USB connector on device under repair.
 - 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.

- 7. Run SDT** – Run SDT to ensure all device features and functions operate as expected. Refer to [\(page 19\)](#) for details on SDT. If SDT tests pass and no further repairs are to be performed on the device continue with the final assembly steps.
- 8. Install Keyboard Screws** – Power off device. Close the Display and turn the unit over. Use a PH0 screwdriver to install 7 new screws to secure the Keyboard as detailed on [\(page 32\)](#).


 **IMPORTANT:** Ensure the longer MS200551430 screws are installed in the two corner locations under the rear foot pad as detailed in the Installation (Keyboard).

- 9. Install Feet** – Follow the steps for Procedure – Installation (Non-Skid Feet) on [\(page 22\)](#).



Battery Replacement Process

Preliminary Requirements

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

Required Tools and Components

- All tools required for repair are listed under Service Tools and Jigs ([page 7](#))
- All parts required for this repair will be provided in the CRU kit being purchased. CRU kits are listed on the Illustrated Parts List ([page 14](#)).

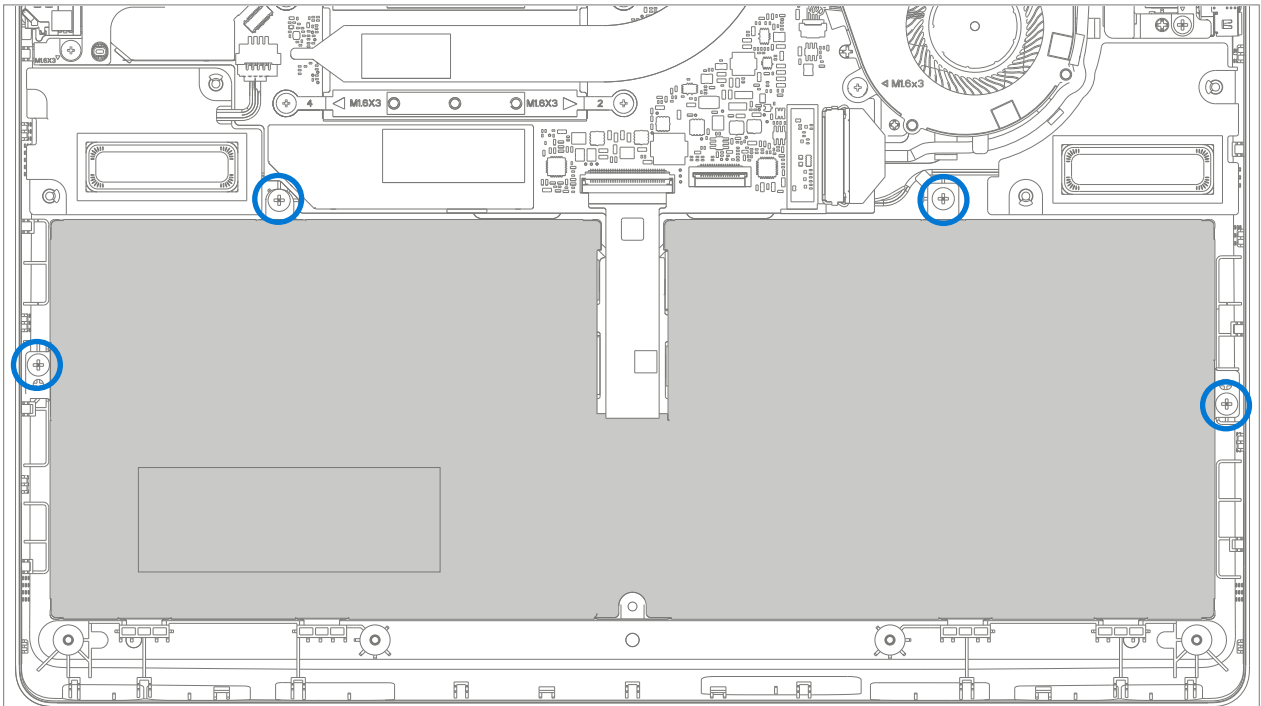
Prerequisite Steps

- **Power off device** – Ensure device is powered off by fully discharging the battery. Refer to Repair-Specific Precautions and Warnings section ([page 9](#)) for details. Ensure device is disconnected from a power supply and all cables and drives are removed.
- **ESD Prevention** – Check to make sure that general guidelines and ESD Prevention steps are followed prior to opening device. Refer to ESD Prevention section ([page 8](#)) for details.
- **Remove Feet** – Follow steps for Procedure – Removal (Non-Skid Feet) section ([page 21](#)).
- **Remove Keyboard** – Follow steps for Procedure – Removal (Keyboard) on ([page 25](#)).

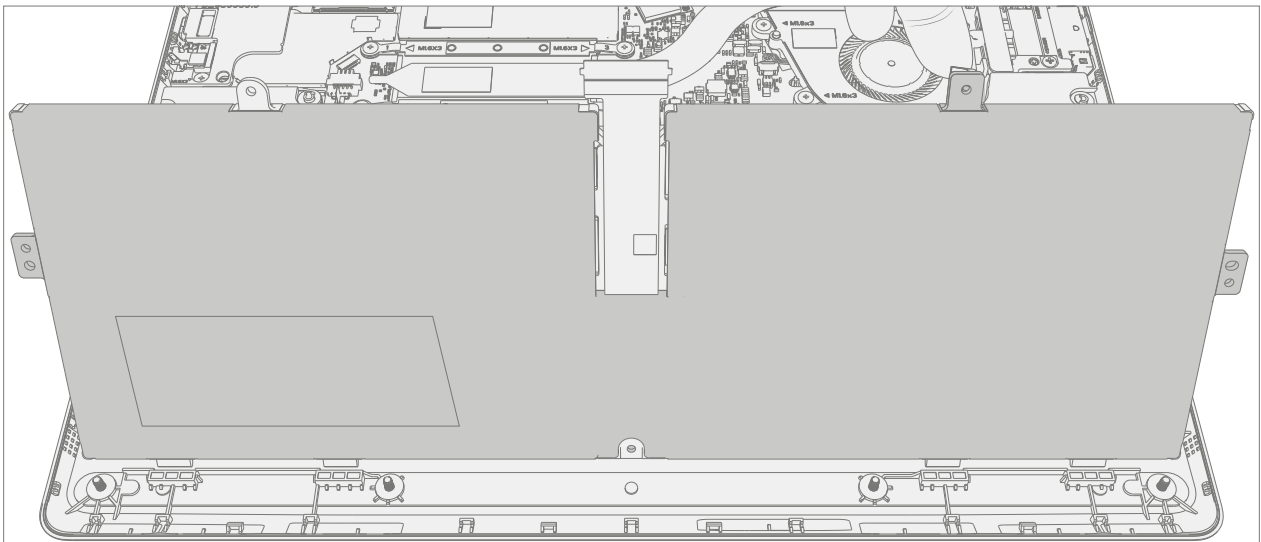


Procedure – Removal (Battery)

1. **Remove Battery Screws** – Use a PH00 screwdriver to remove the 4 screws securing the battery.

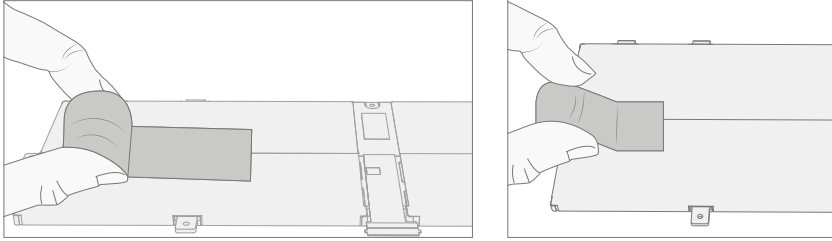


2. **Remove Battery** – Carefully lift battery up and out of the Chassis.

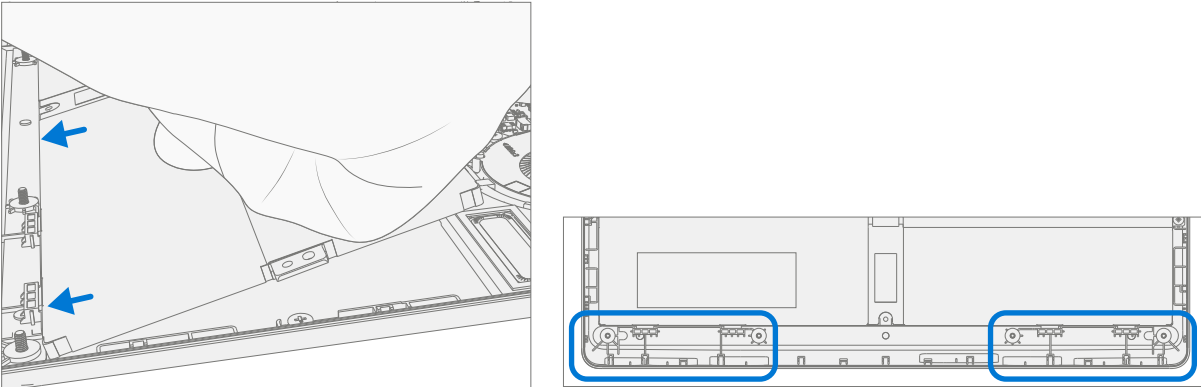


Procedure – Installation (New Battery)

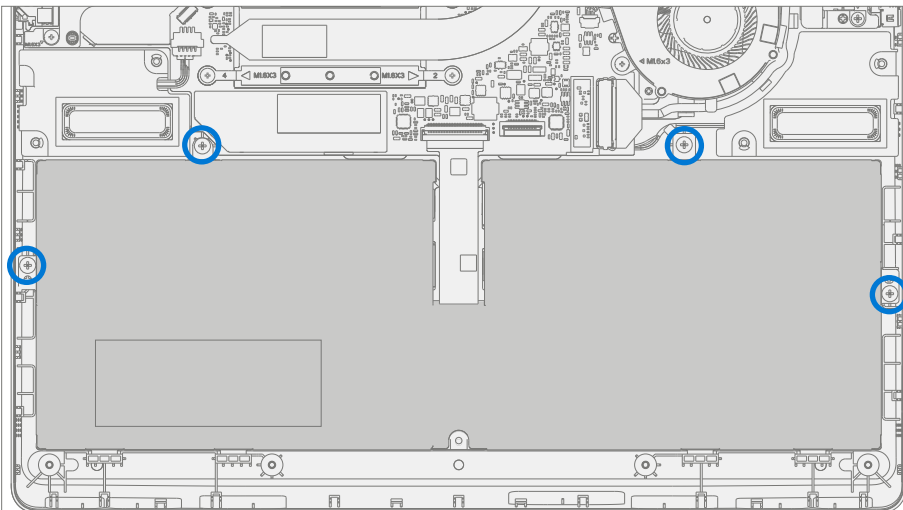
⚠ WARNING: Only handle new battery using the finger loops.




1. **Pre-Installation Device Inspection** – Check Chassis on both sides as well as device enclosure for any loose articles for foreign debris that may be present. Verify all removed screws are accounted for and have not been misplaced in the device.
2. **Insert New Battery** – Using the finger loops carefully place the new battery into the Chassis. Ensure the tabs along the front edge are fully seated into the Chassis.




3. **Install New Battery Screws** – Using a PH00 screwdriver install 4 new MM16035I040 screws. Screws should be installed until just snug and seated, and then turned another 45 degrees (1/8 turn). Carefully remove the liner.



4. **Install Keyboard** – Follow steps for Procedure – Installation (Keyboard) on [\(page 28\)](#).

 **IMPORTANT:** Only snap the Keyboard in place. Do not secure Keyboard with screws.

5. **New Battery Charging** – New batteries are shipped and stored at low states of charge in compliance with shipping regulations. They should be charged to at least 50%. This step will take between 20 minutes and 1 hour 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.
6. **New Battery Authentication** – After charging the new battery to at least 50%, ensure new battery reads as authenticated in the Battery Authentication Workflow in SDT. If the battery shows as inauthentic run the SDT battery repair validation 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 with the final steps.
7. **Install New Keyboard Screws** – Power off device. Close the Display and turn the unit over. Use a PH0 screwdriver to install 7 new screws to secure the Keyboard as detailed on [\(page 32\)](#).


 **IMPORTANT:** Ensure the longer MS200551430 screws are installed in the two corner locations under the rear foot pad as detailed in the Installation (Keyboard).

8. **Install Feet** – Follow the steps for Procedure – Installation (Non-Skid Feet) on [\(page 22\)](#).



Motherboard Replacement Process


Preliminary Requirements

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

Required Tools and Components

- All tools required for repair are listed under Service Tools and Jigs ([page 7](#))
- All parts required for this repair will be provided in the CRU kit being purchased. CRU kits are listed on the Illustrated Parts List ([page 14](#)).

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 by fully discharging the battery. Refer to Repair-Specific Precautions and Warnings section ([page 9](#)) for details. Ensure device is disconnected from a power supply and all cables and drives are removed.
- **ESD Prevention** – Check to make sure that general guidelines and ESD Prevention steps are followed prior to opening device. Refer to ESD Prevention section ([page 8](#)) for details.
- **Remove Feet** – Follow steps for Procedure – Removal (Non-Skid Feet) section ([page 21](#)).
- **Remove Keyboard** – Follow steps for Procedure – Removal (Keyboard) on ([page 25](#)).
- **Remove Display** - Follow steps for Procedure – Removal (Display) on ([page 38](#)).
- **Remove rSSD** – Follow steps for Procedure – Removal (rSSD) on ([page 34](#))
- **Remove Surfink** – Follow steps for Procedure – Removal (Surfink) on ([page 44](#))

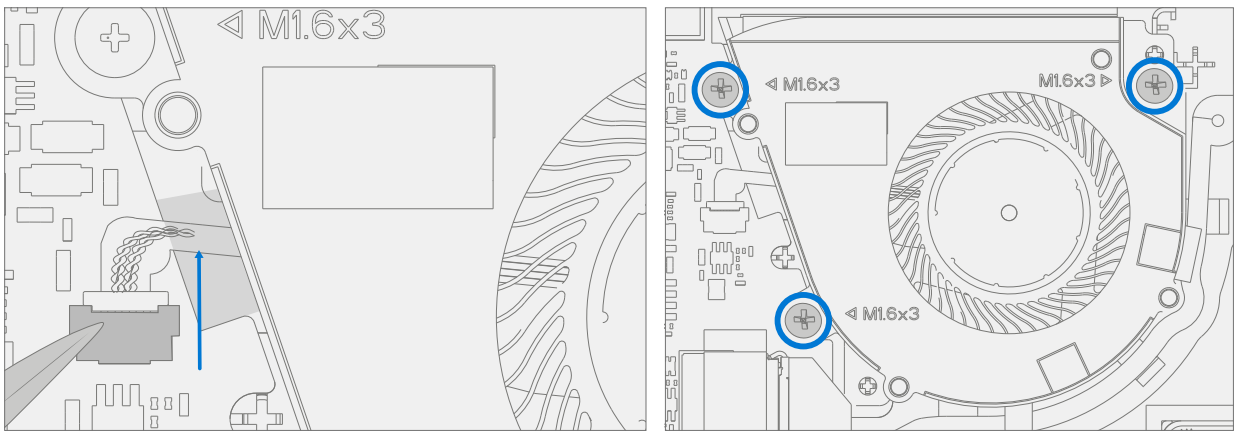


Procedure – Removal (Motherboard)

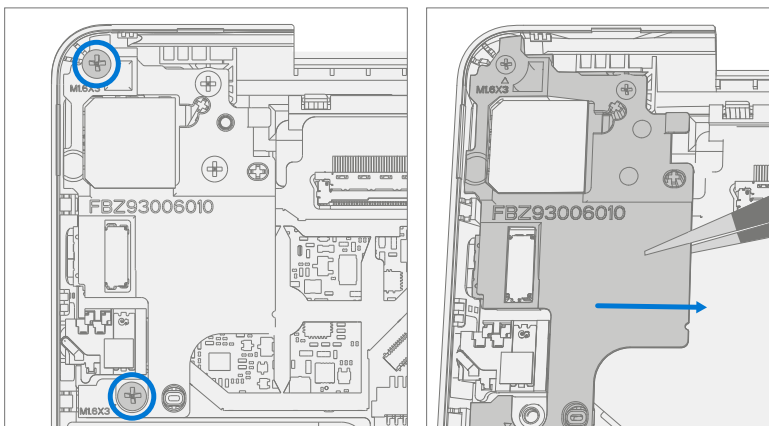
⚠ WARNING: Place a Microsoft recommended ESD-safe battery cover across the device to protect the battery from any accidental damage during repair. Ensure corners of cover are always aligned with the corners of the device during repair. If battery cover is misaligned during the repair operation in any way, re-align before continuing repair activities.

1. **Remove Fan assembly** – Use a plastic spudger to disengage the fan cable from the connector on the motherboard. Using a PH00 screwdriver remove the 3 screws securing the fan assembly to the chassis. Lift out the fan assembly.

🔗 IMPORTANT: Do not pull on the cable as the thin cables may be damaged

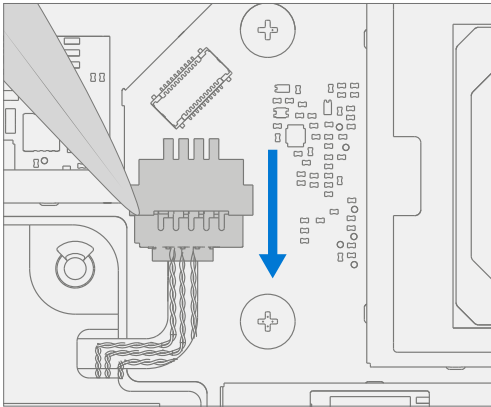


2. **Remove Left Bracket** – Using a PH00 screwdriver, remove the 2 screws on the left metal bracket. Remove bracket from chassis.

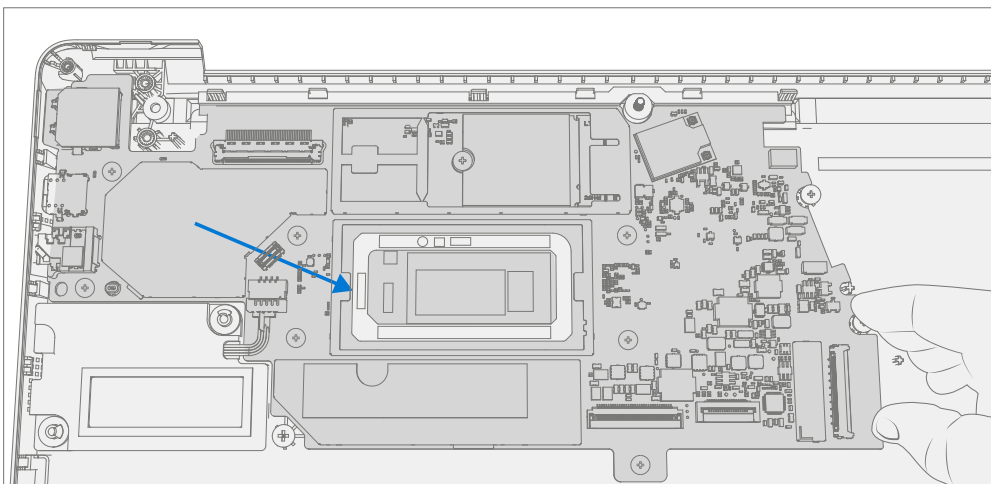
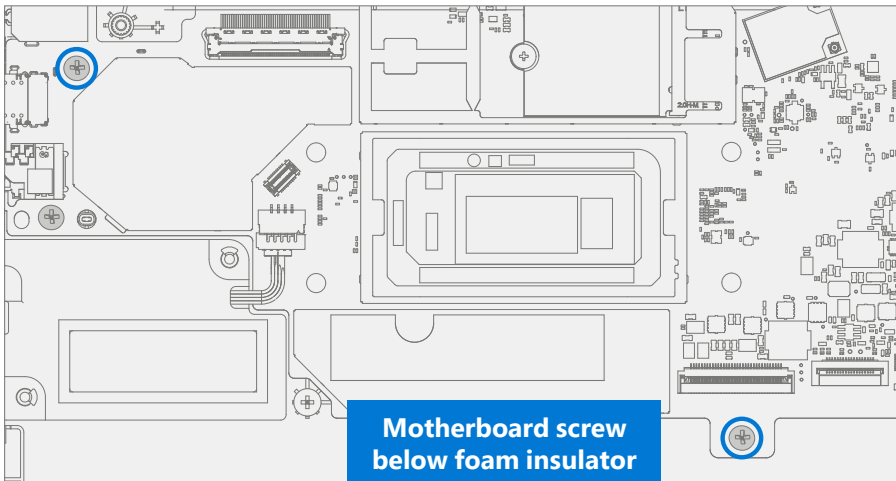


3. **Disconnect Speakers** – Use a plastic spudger to wiggle the speaker cable from the connector on the left side of the motherboard.

 **IMPORTANT:** Do not pull the cable wires as this may damage the cable assembly.

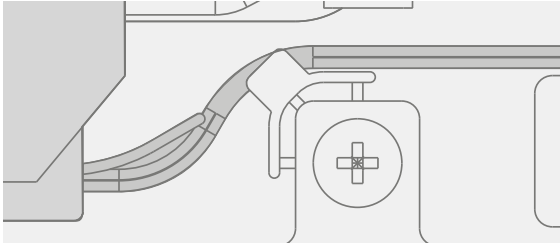


4. **Remove Motherboard** – Remove the small square foam piece from the screw located under the battery connector. Using a PH00 screw remove the 2 motherboard screws highlighted below. Remove the motherboard from the chassis by lifting the board at an angle and pulling it to the right.

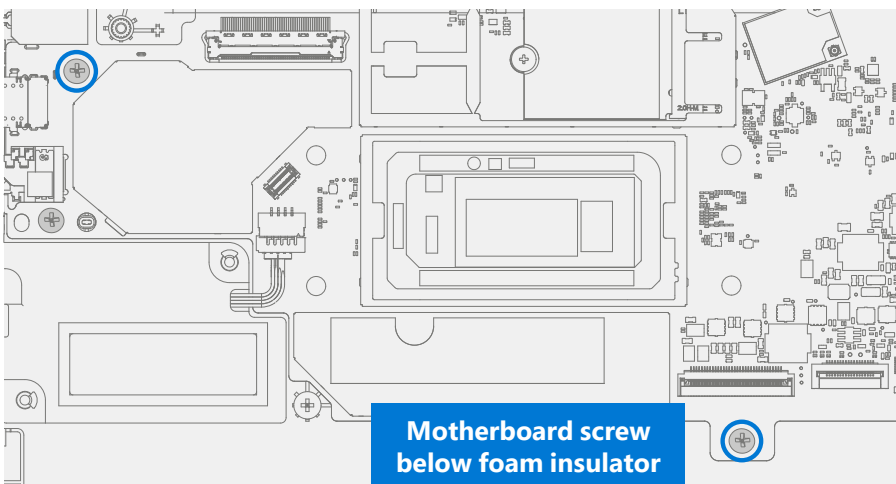
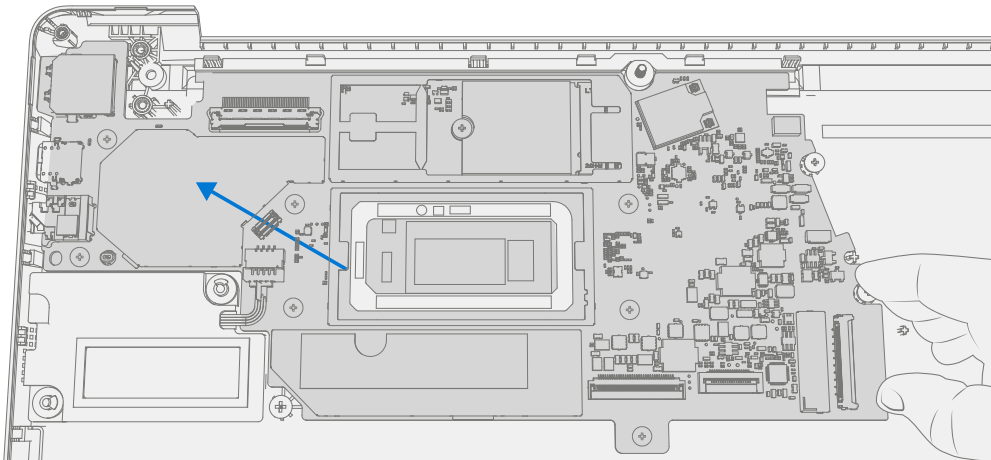


Procedure – Installation (Motherboard)

1. **Verify Fan Cable Routing** – Verify the fan cable has not shifted in the chassis and that the wire runs through the alignment channel in the chassis.

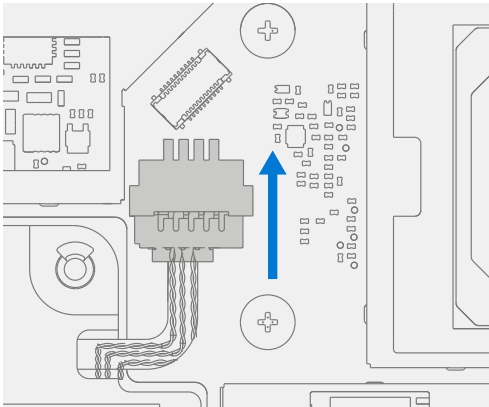


2. **Install Motherboard** – Align the motherboard with the locating bosses in the chassis. Ensure that the ports on the left are aligned with the chassis and lower into place. Using a PH00 screwdriver, install 2 new MS16020I480 screws. Screws should be installed until just snug and seated, and then turned another 45 degrees (1/8 turn). Install the square insulator on the marked screw.

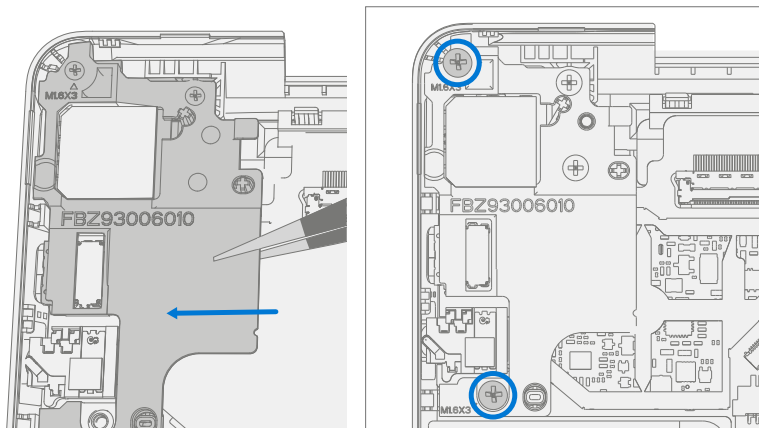


3. **Connect Speakers** – Use a plastic spudger to wiggle the speaker cable into the connector on the left side of the motherboard.


 **IMPORTANT:** Do not pull the cable wires as this may damage the cable assembly.

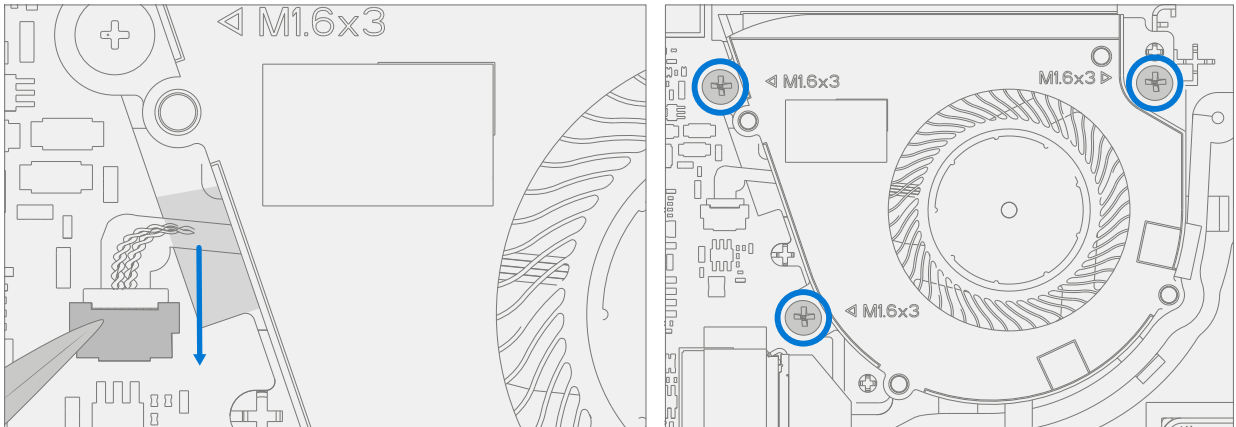


4. **Install Left Bracket** – Place the left bracket into the chassis, aligning screw holes. Using a PH00 screwdriver install 2 new MM16030I130 screws. Screws should be installed until just snug and seated, and then turned another 45 degrees (1/8 turn).




5. **Install Fan assembly** – Use a plastic spudger to install the fan cable in the connector on the motherboard. Using a PH00 screwdriver install 3 new MM160301130 screws securing the fan assembly to the chassis. Screws should be installed until just snug and seated, and then turned another 45 degrees (1/8 turn).


 **IMPORTANT:** Do not pull on the cable as the thin cables may be damaged



6. **Install Surfink** – Follow steps for Procedure – Installation (Surfink) on (page 45)
7. **Install Display** - Follow steps for Procedure – Installation (Display) on (page 40).
8. **Install rSSD** – Follow steps for Procedure – Installation (rSSD) on (page 35)
9. **Install Keyboard** – Follow steps for Procedure – Installation (Keyboard) on (page 28).


 **IMPORTANT:** Only snap the Keyboard in place. Do not secure Keyboard with screws.

10. **Install New Keyboard Screws** – Power off device. Close the Display and turn the unit over. Use a PH0 screwdriver to install 7 new screws to secure the Keyboard as detailed on (page 32).
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. Refer to (page 19) for details on SDT.
15. **Install Feet** – Follow steps for Procedure - Installation (Non-Skid Feet) section (page 22).

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-pk/download/details.aspx?id=11691> In case of questions, please contact AskECT@microsoft.com

