Microsoft Surface

Surface Laptop SE 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 servicing or repair.

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Device Identity Information

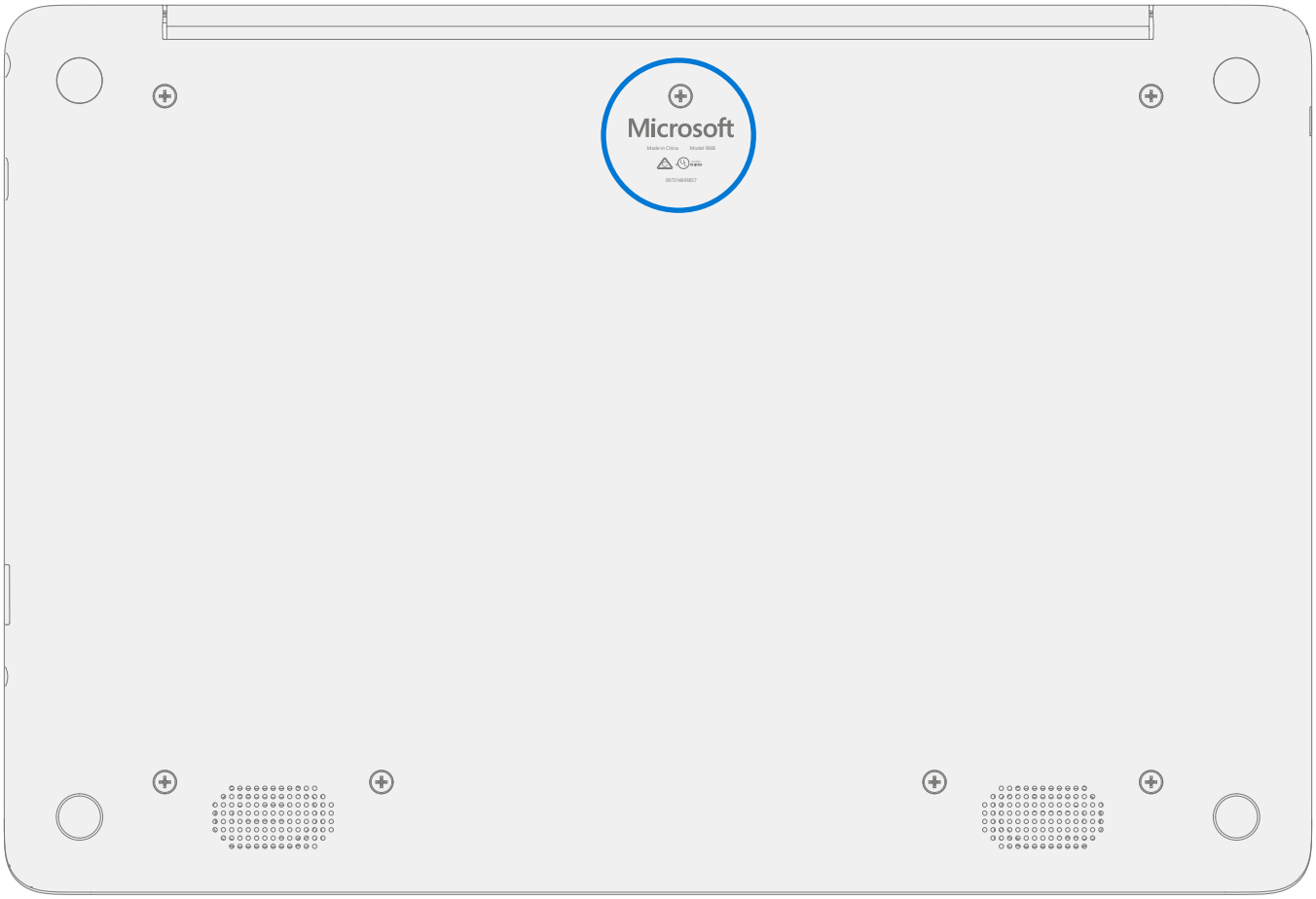
Surface Laptop Models

2016 – Surface Laptop SE

Surface Support – Laptop: Link

Surface Laptop Technical Specifications: Surface Laptop SE

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.

- **feet** or **foot** – Non-Skid Foot Pads
- **C-cover** – Keyboard Trackpad Assembly
- **Motherboard (PCBA)** – Printed circuit board with the primary processor, memory, and other integrated components.
- **AB-cover** – Display Assembly or AB-Cover Display Assembly
- **BMR** – Bare Metal Recovery refers to the clean imaging process.
- **Back cover** or **chassis** or **D-chassis** or **D-bucket** – Device bottom case
- **SDT** – Surface Diagnostic Toolkit
- **ESD** – Electro-Static Discharge
- **FPC** – Flexible Printed Circuits connections.
- **FRU** – Field Replaceable Units are sub-system components such as the C-cover, AB-cover, and rSSD sold or made available by Microsoft, available to ASP Partners.
- **Commercial Spares/CRU** – Customer Replaceable Units are sub-system components such as the C-cover, AB-cover, and rSSD sold or made available by Microsoft, available to commercial customers for repair by a skilled technician.
- **IPA** – Isopropyl alcohol which should be used to clean adhesive from device as detailed within process steps. Use 70% IPA in all cases.

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 Diagnostic Toolkit Configuration Files
- How To: Update Surface device firmware and OS
- How To: Surface Tools Video
- Download: Surface drivers and firmware
- Download: Surface Data Eraser
- Download: Surface Imaging Tools

Standard Service Tools:

- Anti-static wrist strap (1 MOhm resistance)
- ESD-safe benchtop
- USB Thumb drive
- Spudger tool
- Plastic opening tool
- Phillips driver PH0
- Torx T6 driver
- 2 Small suction cups
- 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 device can present electric shock, device damage, fire, and/or personal injury risks and other hazards. Exercise caution when undertaking these activities as described in this guide. Only skilled IT technicians to whom Microsoft has provided this guide should attempt CRU repair activities. Only Microsoft-authorized service providers should undertake FRU repair activities.
- Always select and use the appropriate AC power supply for a device. We recommend you use genuine Microsoft power supply units and AC power cords. A genuine Microsoft power supply unit is provided with every device.
- Use only AC power provided by a standard (mains) wall outlet. Do not use non-standard power sources, such as generators or inverters, even if the voltage and frequency appear acceptable.
- Improper use of device 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 exposed to other extreme sources of heat for an extended period of time. Doing so may cause damage or melt the batteries.
- Depending on the device type, the available suite of FRUs/CRUs may include replacement lithium-ion batteries. There are several ways to find battery recycling services and advice in your community. Visit Microsoft End-of-life management and recycling for more information about battery recycling and to find available resources near you.

For additional product safety information, including information about

- Hearing conservation
- Heat related concerns
- Choking hazard/small parts
- Interference with medical devices
- Broken glass
- Photosensitive seizures
- Musculoskeletal disorders

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.
- Prior to opening device, ensure device is powered off and disconnected from a power supply.
- We recommend wearing protective eyewear as a safety precaution when disassembling/re-assembling a device.
- Before opening device, always check that an anti-static wrist strap is worn, and work area is properly grounded to ensure electrostatic discharge (ESD) safe environment.
- 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 12 for details.
- If battery damage (e.g., leaking, expansion, folds or other) is discovered during the C-cover removal process or if the battery is impacted or damaged during the removal process, activities should cease. Refer to 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 and to the subassembly.
- During all activities (excluding feet-only replacement) check to ensure that no loose articles are on the back cover or within the internals of the device when reassembling the unit.

> ! **IMPORTANT:** Ensure battery FPC remains disconnected from the PCBA during all internal repairs.

Repair- Cross-reference Documents

- M1153910 In Device Battery Inspection process. Devices exhibiting battery issues as outlined in the Battery Inspection Process require whole unit replacement.

⚠ Safety Policies/Procedures

Microsoft's field product safety program team is referred to as the Rapid Response Team (RRT). All device issues that may be safety related should be managed per the following instructions.

As a quick guide, any Microsoft Surface device that visually exhibits any of the following symptoms shall be immediately removed from the repair process and delivered to your Variance Manager or IT Support Professional for notification to Microsoft RRT:

- 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 customer abuse (e.g., impact damage from dropping, evidence of tampering, separation caused by a malfunctioning battery).
- Any other finding that may constitute a safety hazard to the user, such as sharp edges on plastics.

The Variance Manager or IT Support Professional must send an email to Microsoft RRT with pictures showing the damage within 24 hours of device receipt. Refer to the ASP Guidebook for the Microsoft RRT email address.

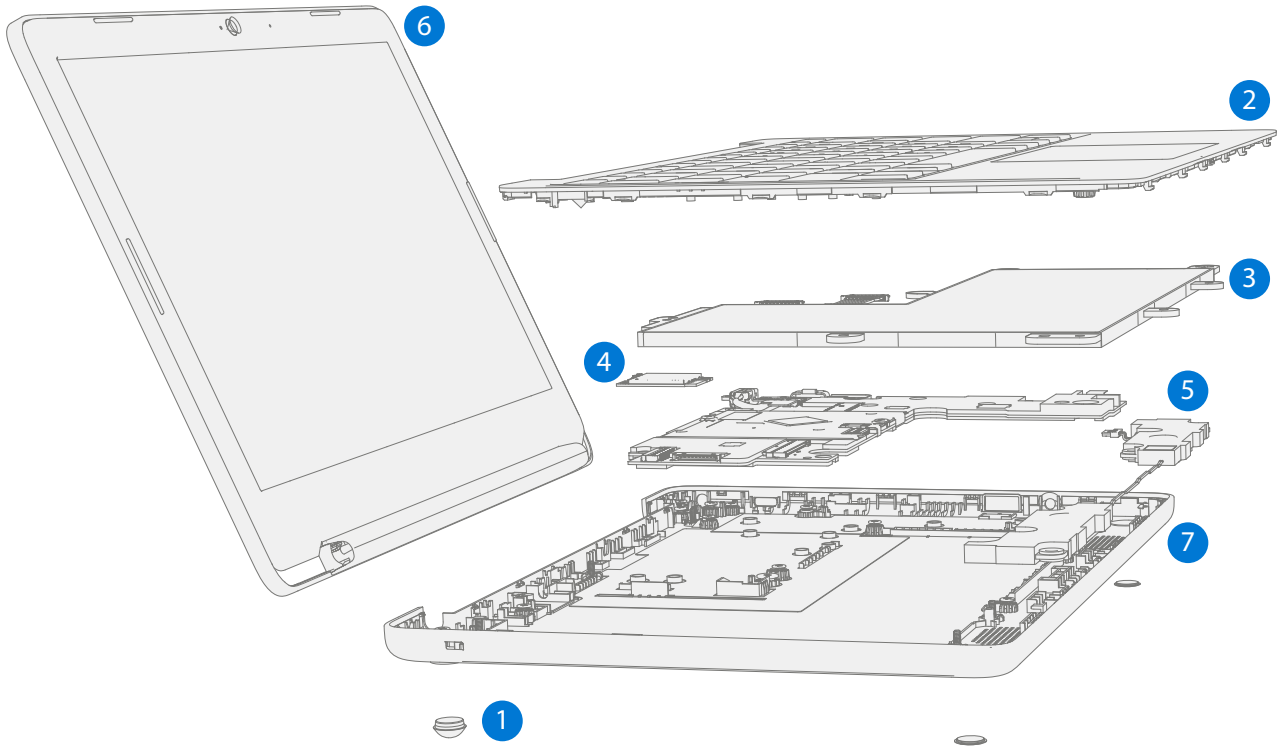
The Variance Manager or IT Support Specialist must await instructions from Microsoft Product Safety RRT for the affected unit before continuing with repair activities or returning the device to the end user.

Non-ASP's are to contact Microsoft Surface Support Services.

Your email should include:

- The model and serial number of the affected Microsoft Surface device and/or accessory(ies).
- The Service Request (SR) Number or alternative service tracking work order that the device was received under (Note as N/A if no SR exists).
- A brief description of the damage found.
- Clear photographs depicting the symptoms observed.

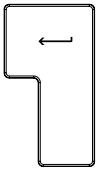
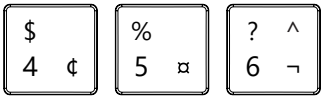
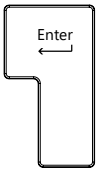
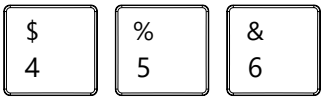
Illustrated Service Parts List

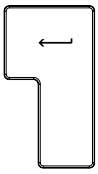
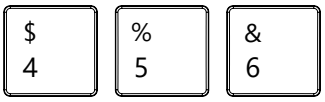
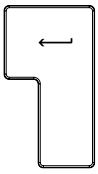
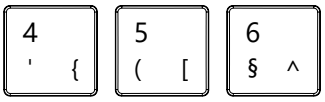
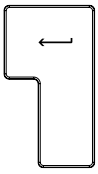
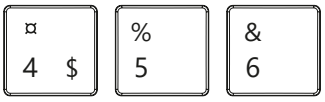
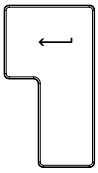
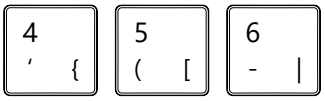
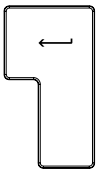
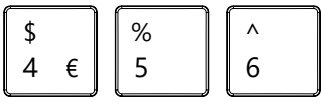
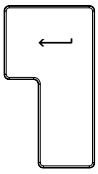
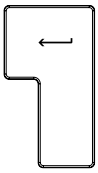
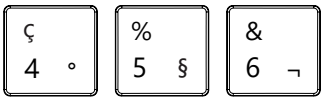
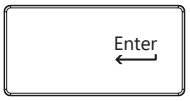
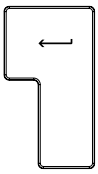
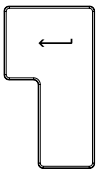


IMPORTANT: Note service part availability is segmented into two groups. FRUs are parts available for repair activity through an Authorized Service Provider under specific contract with Microsoft. CRUs/ Spares are parts available for repair activity by a skilled technician.

Item	Component	ASP / FRU Part No.	CRU Part No.	Models 2016
(1)	**Non-Skid Feet**	ILH-00001	IL8-00001	X
(2)	**C-Cover Keyboard Assembly (includes touch pad)**			
C-Cover US/Canada 104 – English, US		ILA-00001	IL2-00001	X
C-Cover Canada 105 – Canadian, Bilingual		ILA-00002	IL2-00002	X
C-Cover Japan 109		ILA-00003	IL2-00003	X
C-Cover UK/Ireland 105 – English, UK		ILA-00004	IL2-00004	X
C-Cover Austria/Germany 105 – German		ILA-00005	IL2-00005	X
C-Cover Belgium 105 – Belgium AZERTY		ILA-00006	IL2-00006	X
C-Cover France 105 – French, European		ILA-00007	IL2-00007	X
C-Cover Switzerland, Luxembourg 105 – Switzerland / Luxembourg		ILA-00008	IL2-00008	X
C-Cover Netherlands 104 – International English, European		ILA-00009	IL2-00009	X
C-Cover Italy 105		ILA-00010	IL2-00010	X

Item	Component	Models ASP / FRU Part No.	CRU Part No.	2016
(2)	**C-Cover Keyboard Assembly (includes touch pad)**			
C-Cover Portugal 105 – Portuguese, European		ILA-00011	IL2-00011	X
C-Cover Spain 105 – Spanish, European		ILA-00012	IL2-00012	X
C-Cover Denmark, Finland, Norway, Sweden 105 – All Nordic		ILA-00013	IL2-00013	X
(3)	**Battery**	ILB-00001	IL3-00001	X
(4)	**WiFi Module**	ILF-00001	IL6-00001	X
(5)	**Speakers**	ILD-00001	IL5-00001	X
(6)	**AB-Cover Display Assembly**	IL9-00001	IL1-00001	X
(7)	**D-Bucket (Base Bucket)**	ILG-00001	IL7-00001	X
(8)	**Motherboard (PCBA) (NOTE: PCBA replacement must be same as original)**			
2 core CPU / 4GB RAM / 64GB Storage, US / Canada		ILC-00001	IL4-00001	X
4 core CPU / 8GB RAM / 128GB Storage, US / Canada		ILC-00002	IL4-00002	X
2 core CPU / 4GB RAM / 64GB Storage, UK		ILC-00003	IL4-00003	X
4 core CPU / 8GB RAM / 128GB Storage, UK		ILC-00004	IL4-00004	X
2 core CPU / 4GB RAM / 64GB Storage, Japan		ILC-00005	IL4-00005	X
4 core CPU / 8GB RAM / 128GB Storage, Japan		ILC-00006	IL4-00006	X
2 core/ 4GB RAM / 64GB Storage, Australia / New Zealand		ILC-00007	IL4-00007	X
4 core/ 8GB RAM / 128GB Storage, Australia / New Zealand		ILC-00008	IL4-00008	X
(9)	**Power Port**	TBL-00001	TBM-00001	X
	External Power Supply (not pictured)			
PSU US/Canada		CBU-00017		X
PSU United Kingdom		CBU-00018		X
PSU Japan		CBU-00019		X
PSU Australia / New Zealand		CBU-00020		X

C-Cover Keyboard Assembly Localization		
Description	**Enter Key**	**"4,5,6" Keys**
104 English, US		
105 Canadian, Bilingual		
109 Japan		

105 Austria/Germany		
105 Belgium AZERTY		
105 Nordic Denmark, Finland, Norway, Sweden		
105 French		
105 English, UK Ireland		
105 Italy		
105 Switzerland, Luxembourg		
104 English, International Netherlands		
105 Portuguese		
105 Spanish, European		

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:

- Surface Diagnostic Toolkit Configuration Files
- How To: Update Surface device firmware and OS
- How To: Surface Tools Video
- Download: Surface drivers and firmware
- 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 after the device is running the latest OS/FW version by running SDT.
   a. Run SDT and verify if condition persists or if resolved with the updating to the latest software – Refer to Software Tools section above for details on SDT.
      i. 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:

- Before opening the device, always ensure device is powered off and disconnected from a power supply.
- Always ensure that the work surface is covered with an ESD-safe, soft, non-marring material.
- Work surfaces should be cleaned regularly to ensure debris/abrasive particles are not present.
- Check to make sure that general guidelines and ESD compliance steps are followed prior to opening device.

⚠ **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 C-Cover 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.

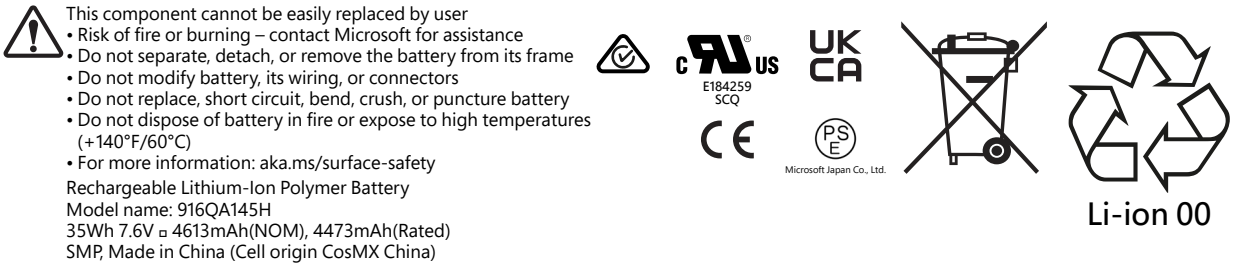
! **CAUTION:** Check C-Cover and device enclosure for any loose articles that may be present inadvertently on the C-Cover or within the device enclosure.

IMPORTANT: Ensure battery FPC remains disconnected from the PCBA whenever C-Cover is removed from device for safety purposes. Refer to Procedure-Removal (C-Cover) for further details.

- FRUs removed from a device under repair during the repair process should be stored in ESD-safe bags and packaged for return in the same packaging and order that the new replacement part came in.

Battery Warning

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



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

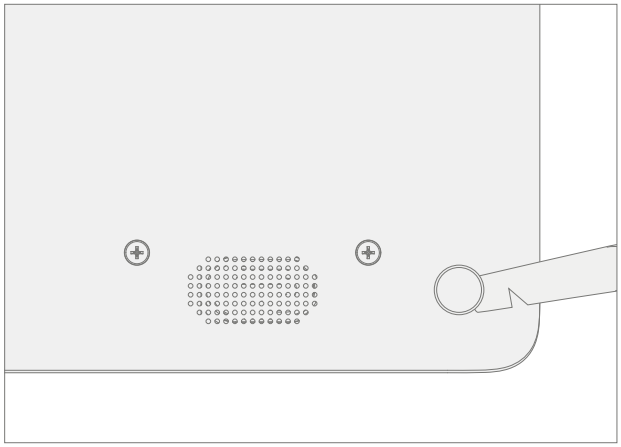
- **Tools:**
  - Plastic tool / spudger
  - Isopropyl Alcohol Dispenser Bottle (use only 70% IPA)
  - Cleaning swabs
- **Components:**
  - Feet FRU

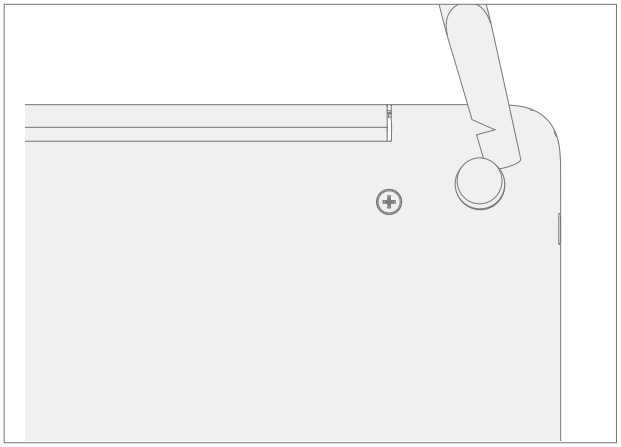
Prerequisite Steps:

- **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 (page 15) 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)

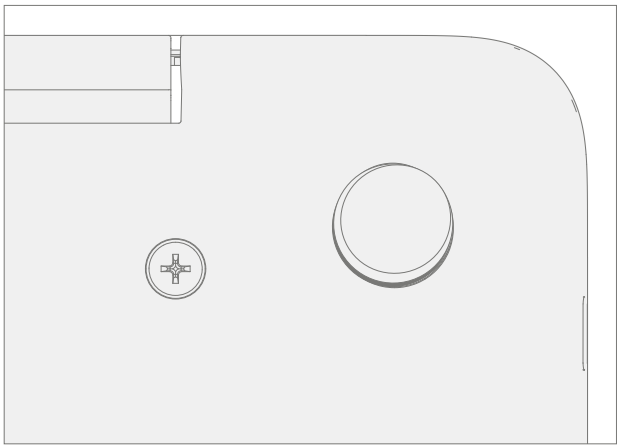
1. **Feet removal** – Use plastic tool / spudger to lift one edge of each foot. Ensure all adhesive tape remnants and glue residue are removed. Clean the D-Bucket foot recesses with 70% Isopropyl Alcohol.





Procedure – Installation (Non-Skid Feet)

1. **Prepare new foot and press into place** – To install each foot, remove protective sheet to expose adhesive on foot. Press foot into D-Bucket recess. Repeat for each foot. Note the back feet are larger.



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

C-Cover 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

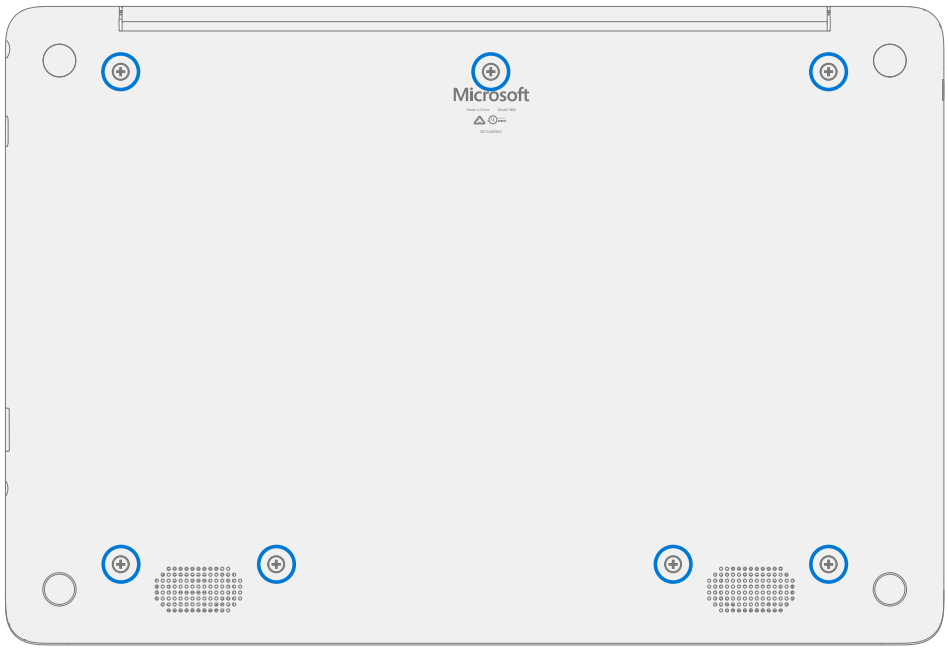
- **Tools:**
  - USB Thumb drive with Surface Diagnostic Toolkit Configuration Files
  - Plastic Opening tool / Spudger
  - Torx T6 driver
  - Anti-static wrist strap (1M Ohm resistance)
- **Components:**
  - C-Cover Keyboard Assembly (Refer to Illustrated Service Parts List)
  - C-Cover Screws (MM20065I030) Qty. 7

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 device. Refer to Prior to Device Disassembly section (page 15) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.

Procedure – Removal (C-Cover)

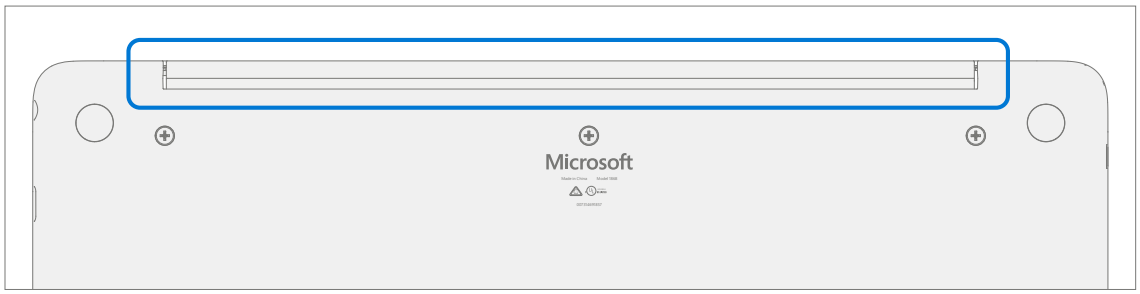
1. **Remove C-Cover screws** – Using a Torx T6 driver remove the 7 screws from the D-Bucket.



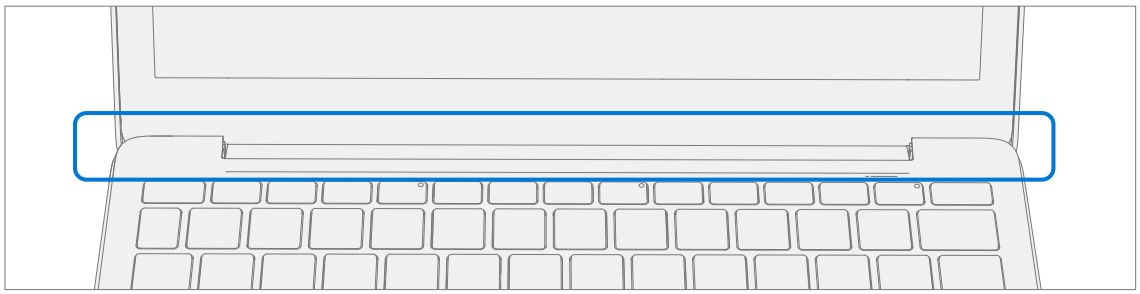
CAUTION: All 7 screws must be removed before starting C-Cover removal.

2. **Separate C-Cover from device** – Separation is a multistep process.

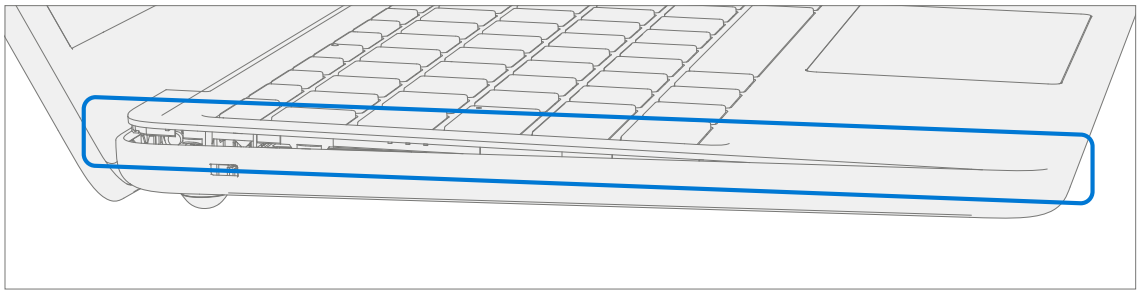
   a. Using your fingers or a plastic tool / spudger release the D-Bucket snaps along the back edge between the display hinges.

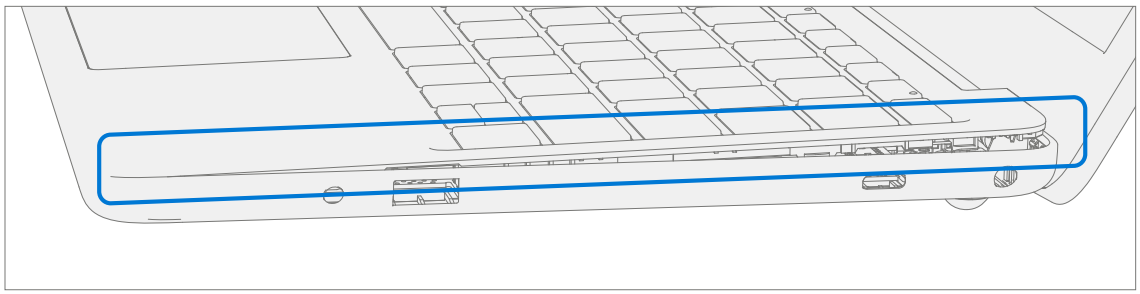


   b. Place the device topside up and open the display. Using your fingers or a plastic tool / spudger release the C-Cover snaps along the edge below the display.



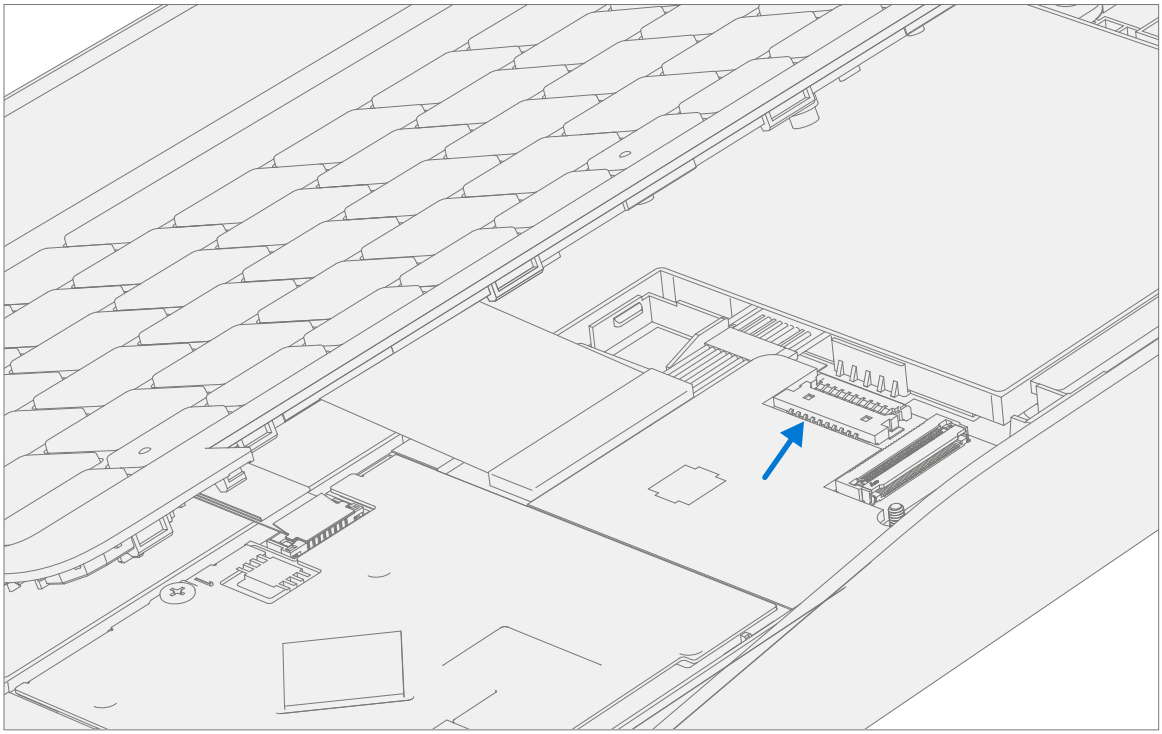
   c. Using your fingers or a plastic tool / spudger release the C-Cover snaps along the left and right sides.



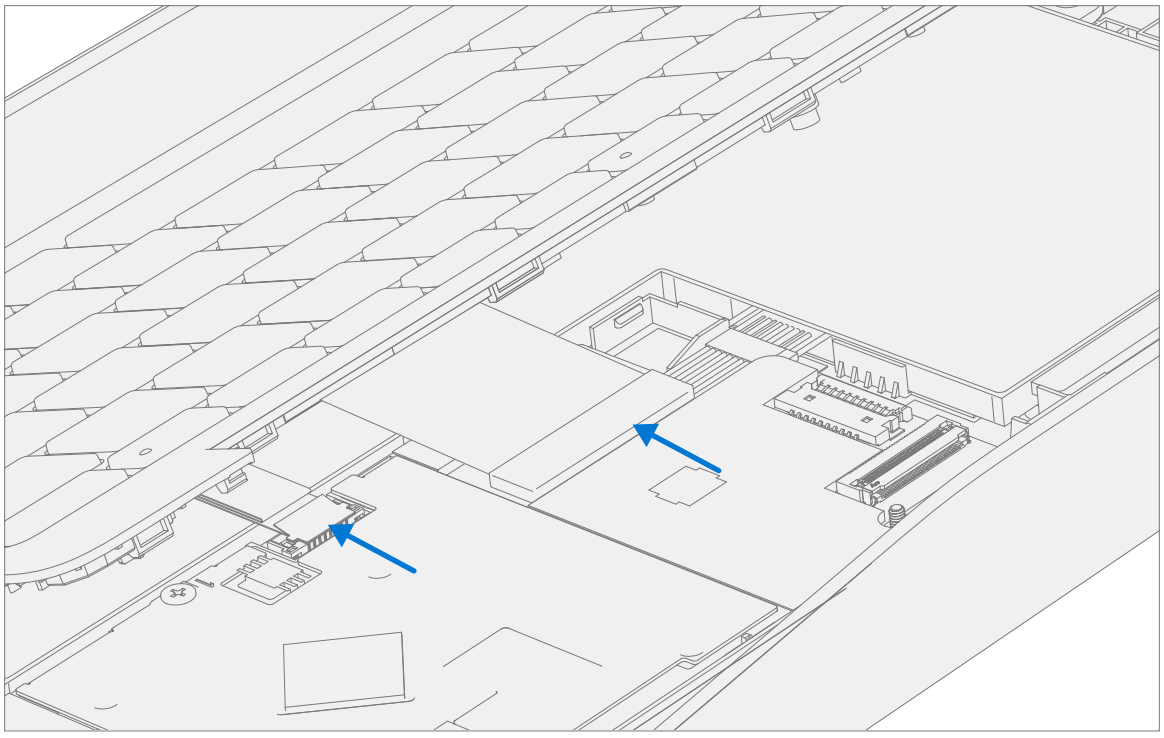


3. **Disconnect Battery Cable** – Holding the C-Cover at an angle use a plastic tool / spudger to disconnect the battery cable from the PCBA.

> ! **CAUTION:** Do not pull the C-cover apart beyond **45-degrees** otherwise damage to C-cover FPC could occur.



4. **Disconnect C-Cover FPCs** – Holding the C-Cover at an angle use a plastic tool / spudger to disconnect the FPC's from the PCBA.



Procedure – Installation (C-Cover)

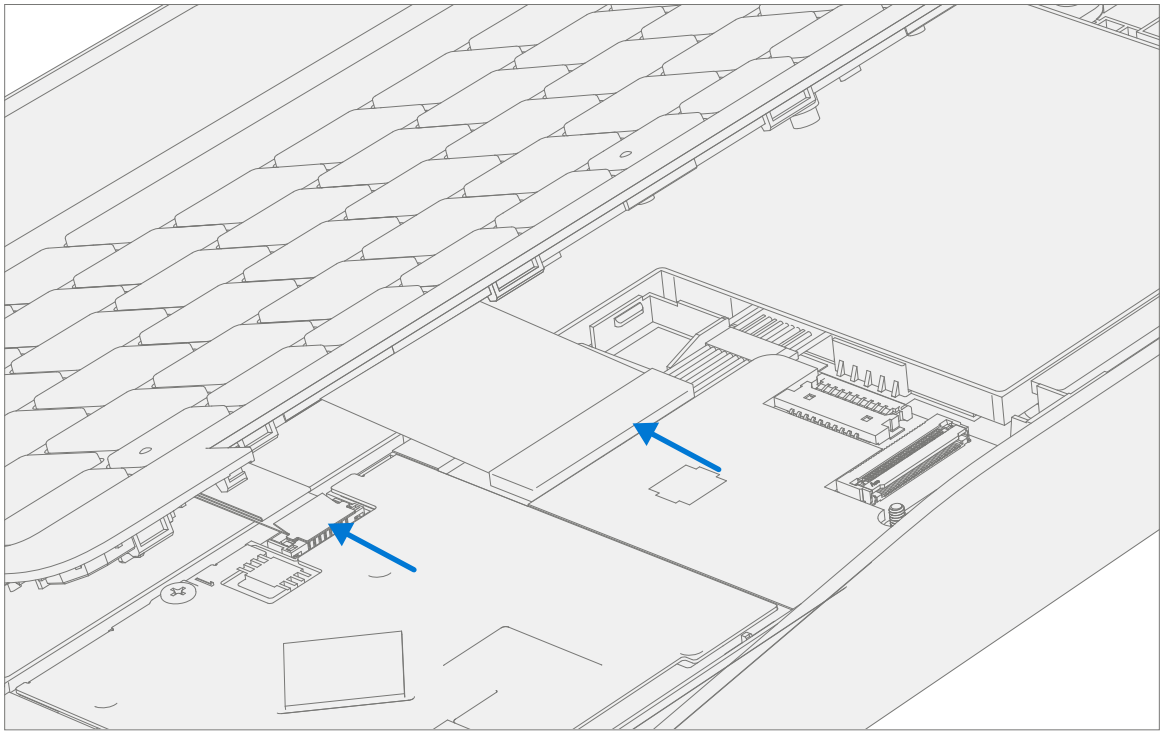
1. **Pre-installation Device Inspection**

   ⚠ **WARNING:** Verify the battery's condition, refer to the M1153910 in Device Battery Inspection process for details. Devices exhibiting battery issues as outlined in the Battery Inspection Process require battery replacement.

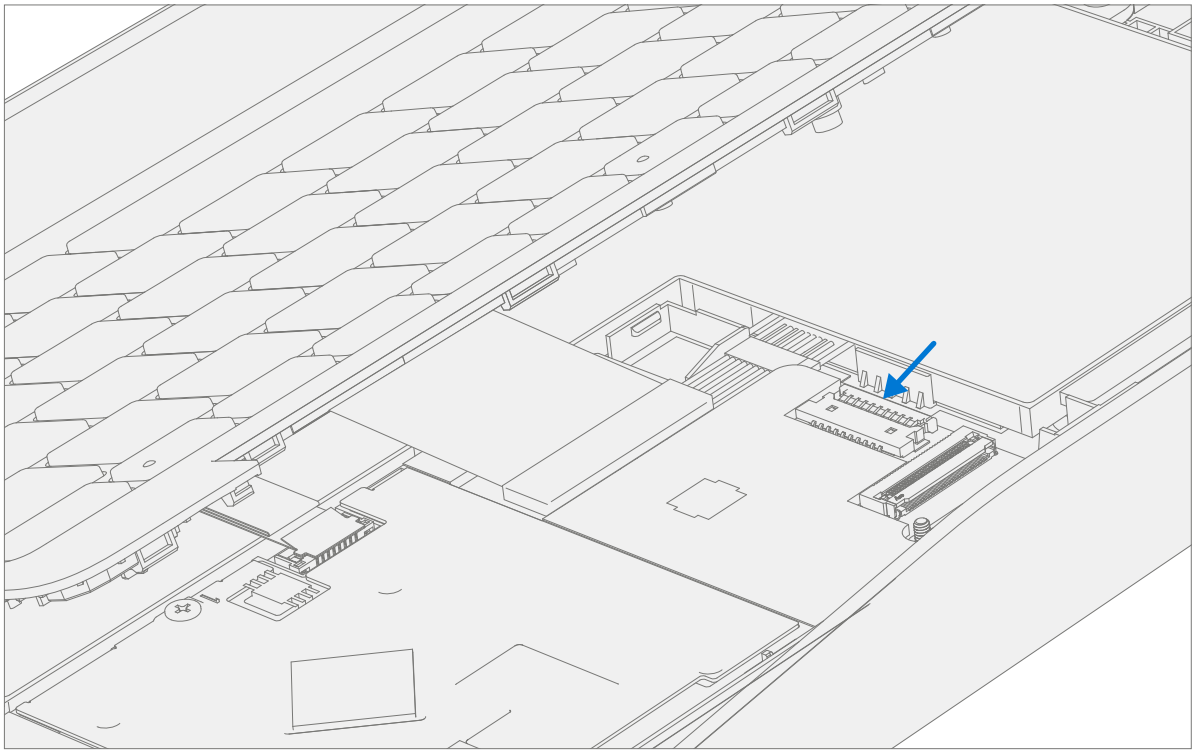
   ⚠ **WARNING:** Verify the condition of LDI (Liquid Damage Indicators) on the Audio Jack and PCBA. Any color other than white indicates liquids have entered the device. The LDI on the Audio Jack is viewable from the outside of the device. The LDI on the PCBA is along the top edge of the heatsink. Devices exhibiting LDI require whole unit replacement.

2. **Check for unexpected items within device** – Check C-Cover (both sides) and device enclosure for any loose articles that may be present inadvertently on the C-Cover or within the device enclosure areas.
   a. Carefully inspect the area around battery specifically for any foreign objects.
3. **Connect C-Cover FPC's** – Hover the C-Cover over the device while assembling the C-Cover FPC's to the PCBA.

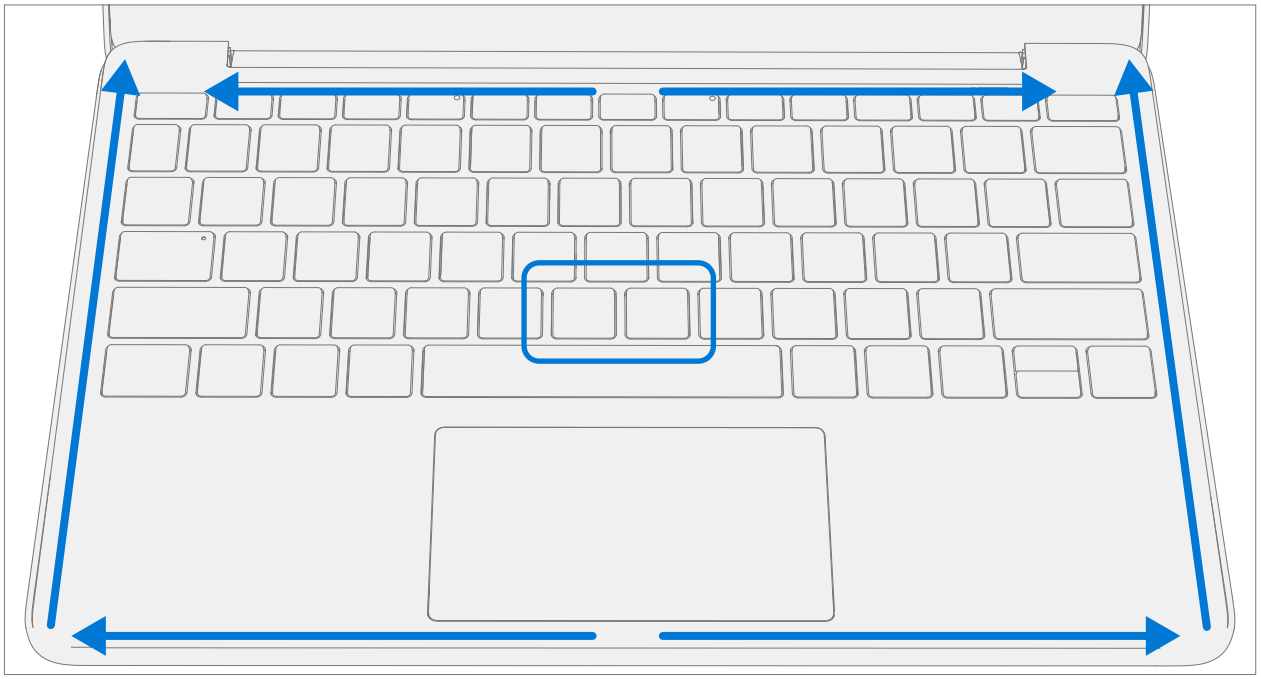
   ! **CAUTION:** Be sure that FPC bends fall in place properly as pre-bent and no folds or creases are created during re-assembly of C-Cover.



4. **Connect Battery Cable** – Holding the C-Cover at an angle connect the battery cable to the PCBA.

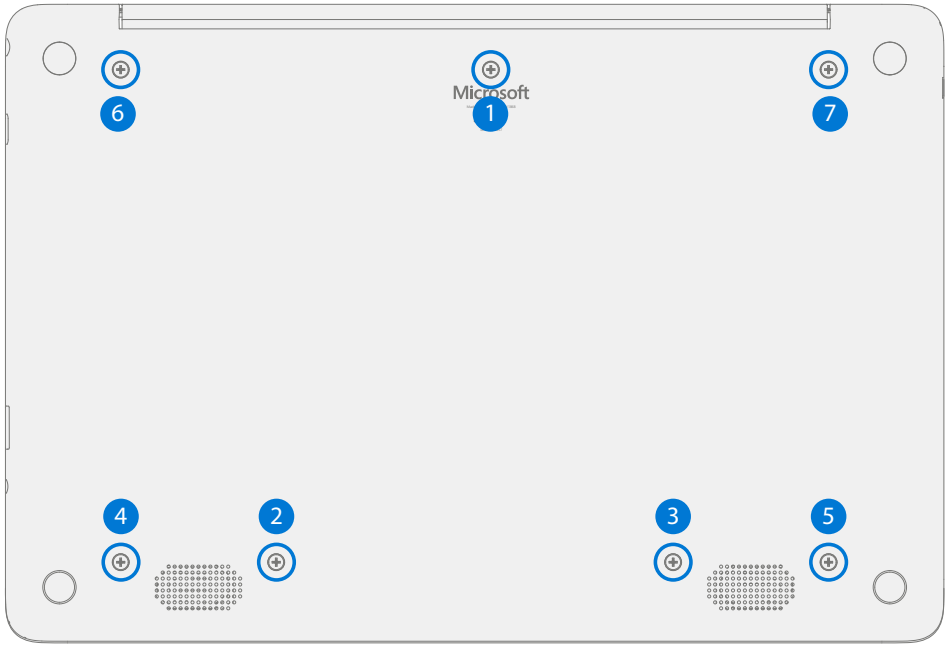


5. **Align the C-Cover** – Properly align the C-Cover to the device using the front edge. Place the C-cover back onto the device. Press down along the outside edges to engage snaps. Press down on the center of the keyboard to engage the keyboard hook.



6. **Run SDT** – Power on device and connect USB drive with SDT Configuration Files. Run SDT to ensure all device features and functions operate as expected. If no further repairs are required procced to final steps.

7. **Install new C-Cover screws** – Power off device, close display, and place it upside down. Using a Torx T6 driver install 7 new MM20065I030 screws into the D-Bucket. Follow the installation order pictured below. Turn all screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



Power Port Replacement Processes

Preliminary Requirements

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

Required Tools and Components

- **Tools:**
  - USB Thumb drive with Surface Diagnostic Toolkit Configuration Files
  - Plastic Opening tool / Spudger
  - PH0 driver
  - Torx T6 driver
  - Small suction cups
  - Anti-static wrist strap (1M Ohm resistance)

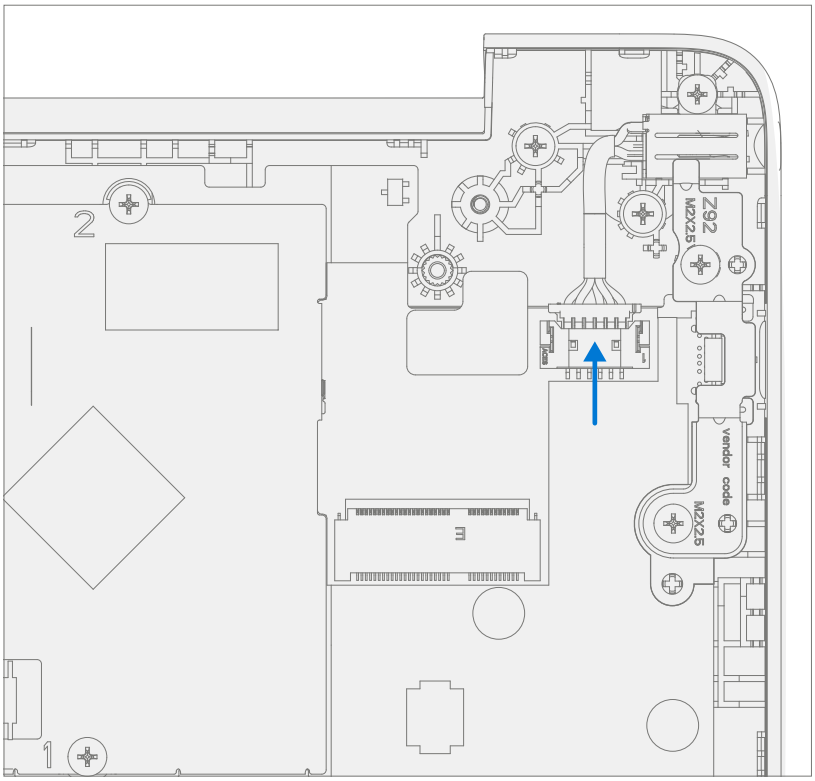
- **Components:**
  - Battery (Refer to Illustrated Service Parts List)
  - C-Cover Screws (MM20065I030) Qty. 7
  - Power Port Screws (MS20025I070) Qty. 3

Prerequisite Steps:

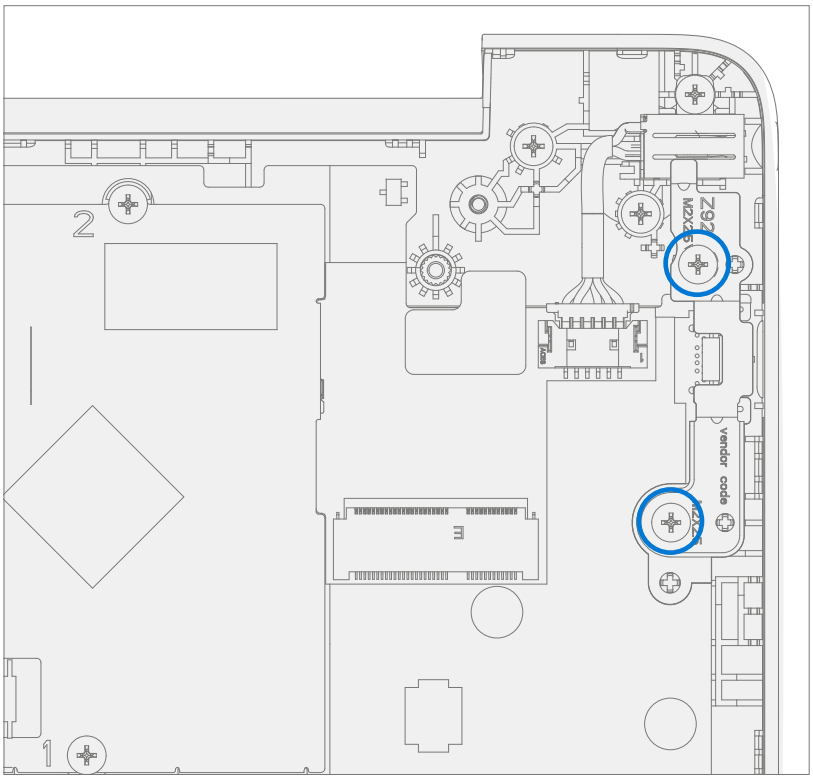
- **Power off device** – Ensure device is powered off and disconnected from a power supply.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening device. Refer to Prior to Device Disassembly section (page 15) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove C-cover** – Follow steps for Procedure – Removal (C-cover Keyboard) on (page 18).

Procedure – Removal (Power Port)

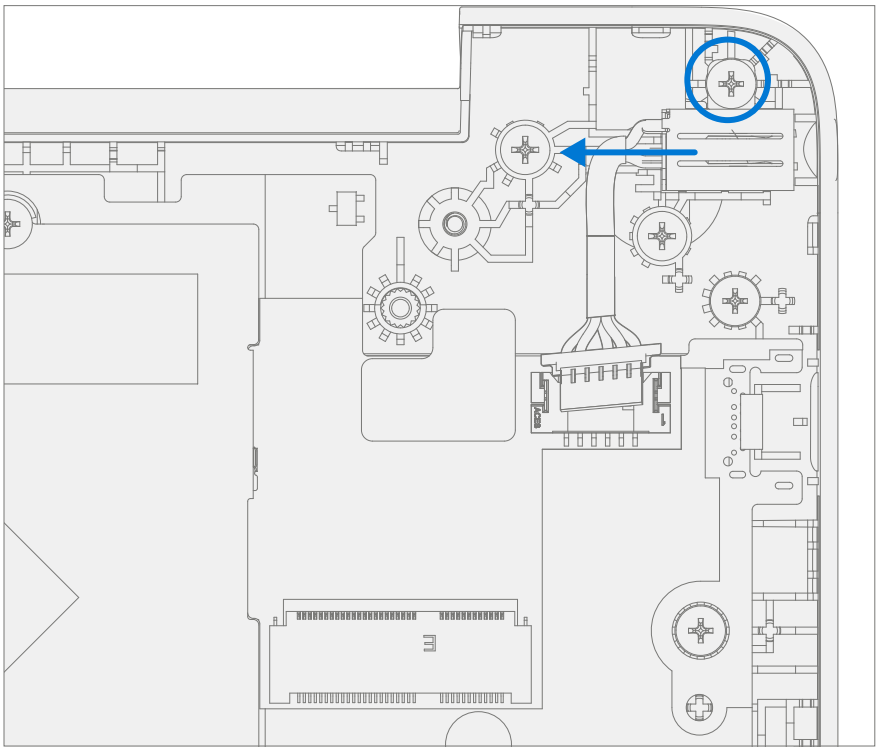
1. **Disconnect DC Power Cable** – Using a plastic tool / spudger to disconnect the DC power cable from the PCBA.



2. **Remove USB Bracket** – Using a PH0 driver remove the two screws from the USB bracket. Remove the bracket from the D-Bucket.

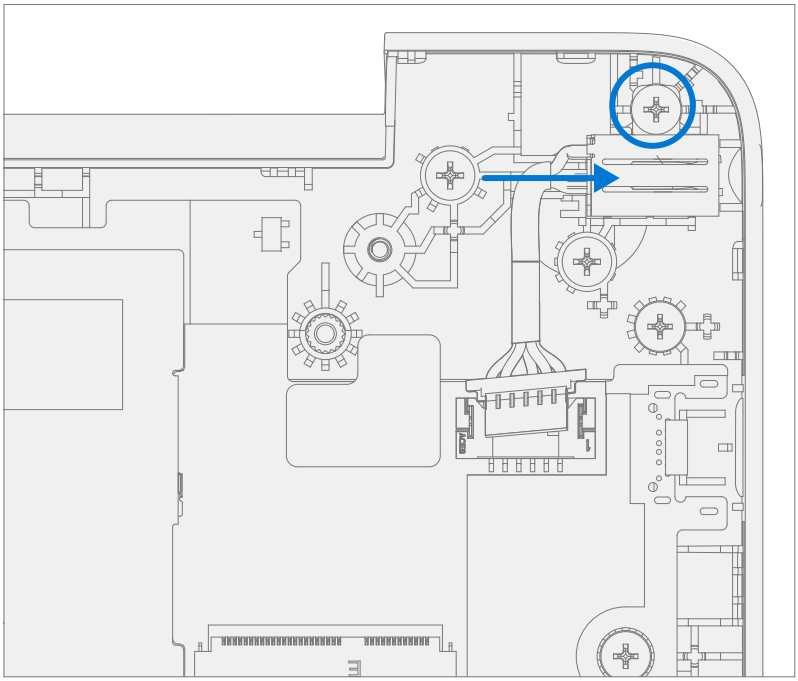


3. **Remove DC Power Port** – Using a PH0 driver remove the screw from the DC power port. Remove the DC power port from the D-Bucket.

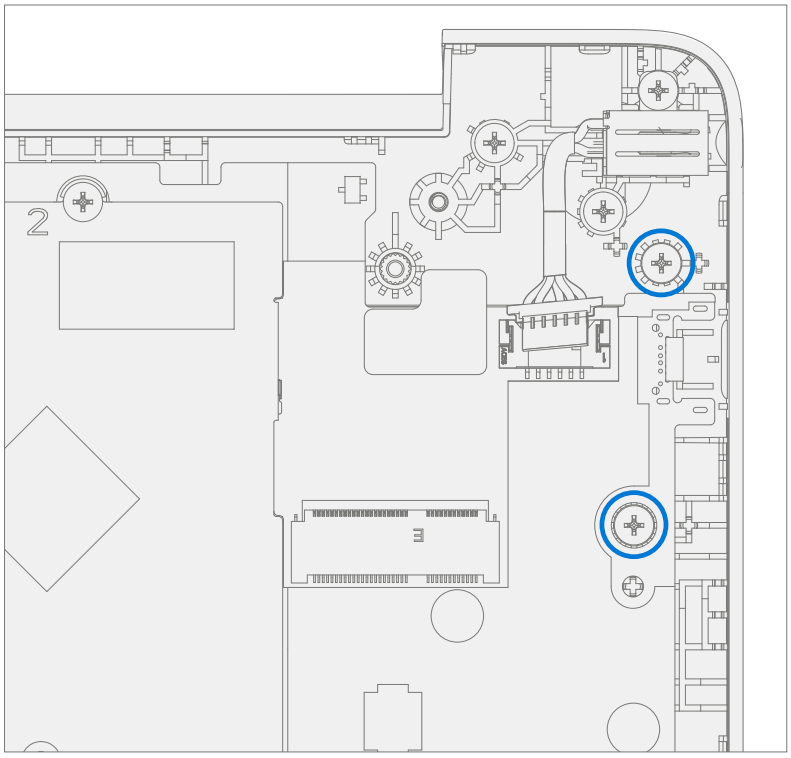


Procedure – Installation (Power Port)

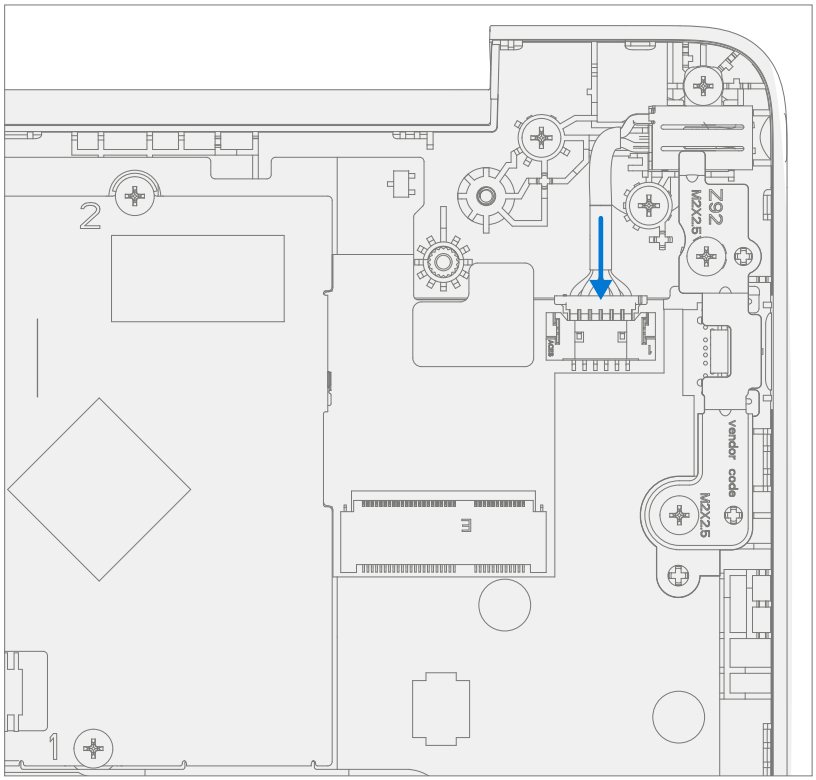
1. **Install DC Power Port** – Place the new DC power port into the D-Bucket. Ensure the port is aligned with the hole in the D-Bucket. Using a PH0 driver install a new MS20025I070 screw into the DC power port. Turn the screw until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



2. **Install USB Bracket** – Place the USB bracket into the D-Bucket. Using a PH0 driver install two new MS20025I070 screws into the USB bracket. Turn all the screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



3. **Connect DC Power Cable** – Connect the DC power cable to the PCBA



4. **Install C-cover** – Follow steps for Procedure – Installation (C-Cover Keyboard) on (page 21). Leaving C-Cover screws uninstalled.
5. **Run SDT** – Power on device and connect USB drive with SDT Configuration Files. Run SDT to ensure all device features and functions operate as expected. If no further repairs are required procced to final steps.
6. **Install new C-Cover screws –** Install new MM20065I030 Screws as detailed on page 23.

Battery Replacement Processes

Preliminary Requirements

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

Required Tools and Components

- **Tools:**
  - USB Thumb drive with Surface Diagnostic Toolkit Configuration Files
  - Plastic Opening tool / Spudger
  - PH0 driver
  - Torx T6 driver
  - Small suction cups
  - Anti-static wrist strap (1M Ohm resistance)

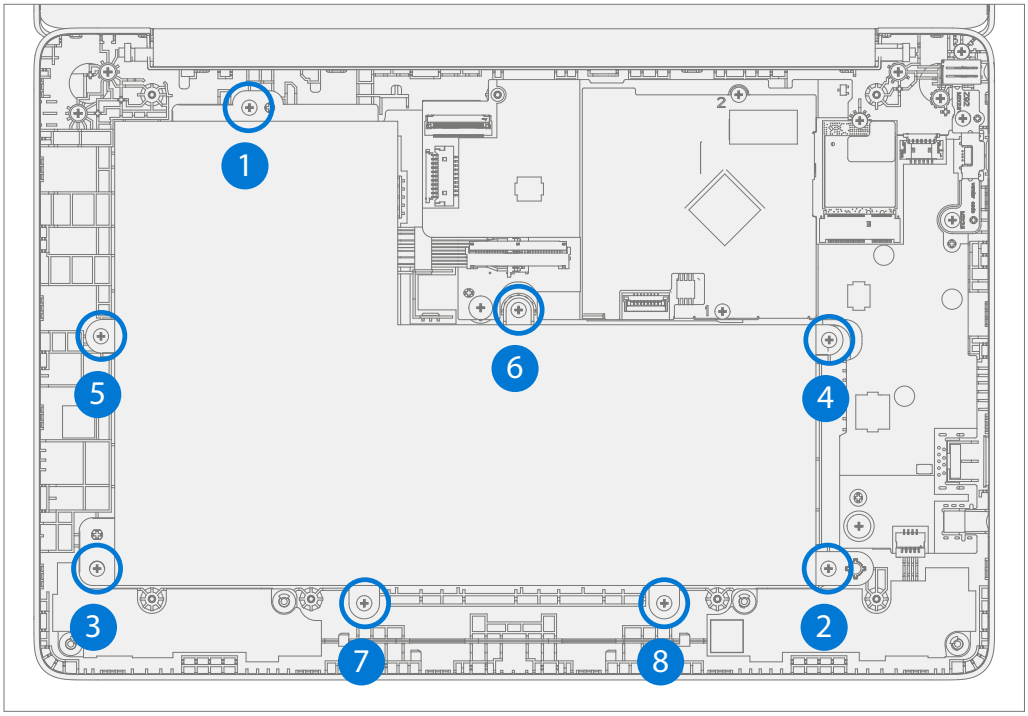
- **Components:**
  - Battery (Refer to Illustrated Service Parts List)
  - C-Cover Screws (MM20065I030) Qty. 7
  - Battery Screws (MS20025I070) Qty. 8

Prerequisite Steps:

- **Battery Status Check** – Connect power supply, boot device, connect the USB Thumb drive with SDT, and run SDT Battery tests. It is recommended batteries showing any of the following should be replaced:
  - PF Status of Non Functional
  - Wear value of 70% or less
  - Cycle Count equal to or greater than a 1000
  - Delta Voltage at or above 100 mV with state of charge 50% or greater
- **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 device. Refer to Prior to Device Disassembly section (page 15) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove C-cover** – Follow steps for Procedure – Removal (C-cover Keyboard) on (page 18).

Procedure – Removal (Battery)

1. **Remove Battery screws** – Using a PH0 driver remove the 8 screws from the Battery frame.

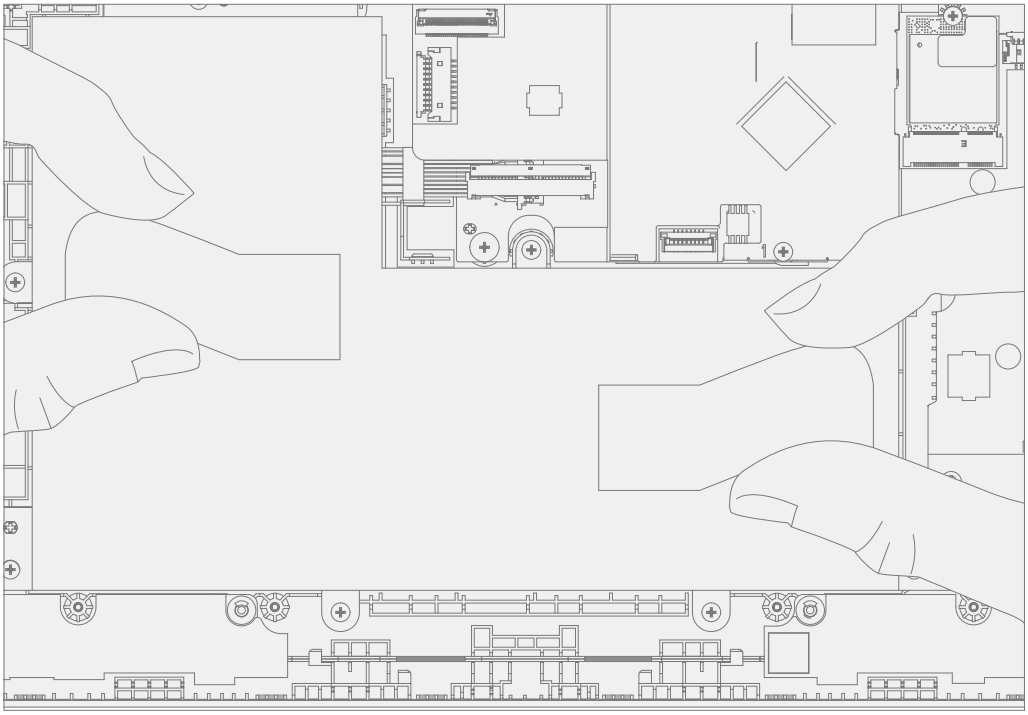


2. **Remove Battery from device** – Carefully remove the battery from the device using two small suction cups.

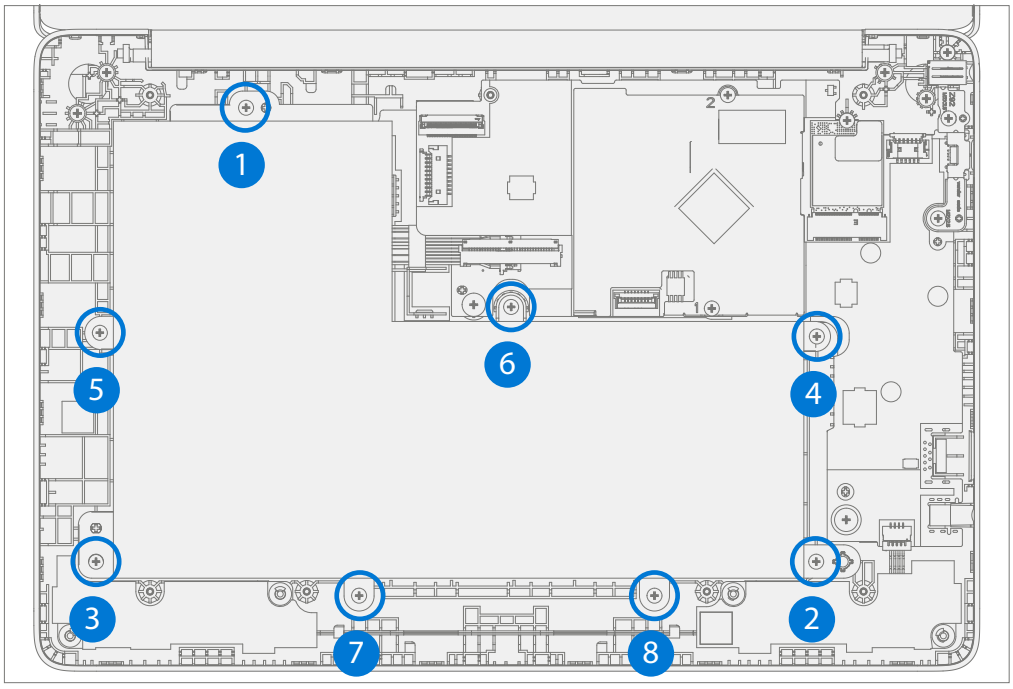
Procedure – Installation (Battery)

1. **Pre-installation Device Inspection** – Check D-bucket (both sides) and device enclosure for any loose articles that may be present.
    a. Check for and remove any foreign objects that the magnets may have attracted.
    b. Verify all removed screws are accounted for and have not been misplaced in the device.
    c. Loose screws should never be stored on the C-Cover or in the D-Bucket.

2. **Install New Battery into device** – Using the loops carefully install the new battery into the device.



3. **Install New Battery Screws** – Using a PH0 driver install 8 new MS20025I070 screws into the battery frame. Follow the installation order pictured below. Turn all screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened. Carefully remove the liner with handling loops.



4. **Install C-cover** – Follow steps for Procedure – Installation (C-Cover Keyboard) on (page 21). Leaving C-Cover screws uninstalled.

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** – New batteries require authentication. After charging the new battery to at least 50%, connect the SDT Configuration Files USB drive. Run the SDT battery repair validation to ensure all features and functions operate as expected. 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.
7. **Install new C-Cover screws** – Install new MM20065I030 Screws as detailed on page 23.

WiFi Module Replacement Processes

Preliminary Requirements

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

Required Tools and Components

- **Tools:**
  - USB Thumb drive with Surface Diagnostic Toolkit Configuration Files
  - Plastic Opening tool / Spudger
  - PH0 driver
  - Torx T6 driver
  - Anti-static wrist strap (1M Ohm resistance)

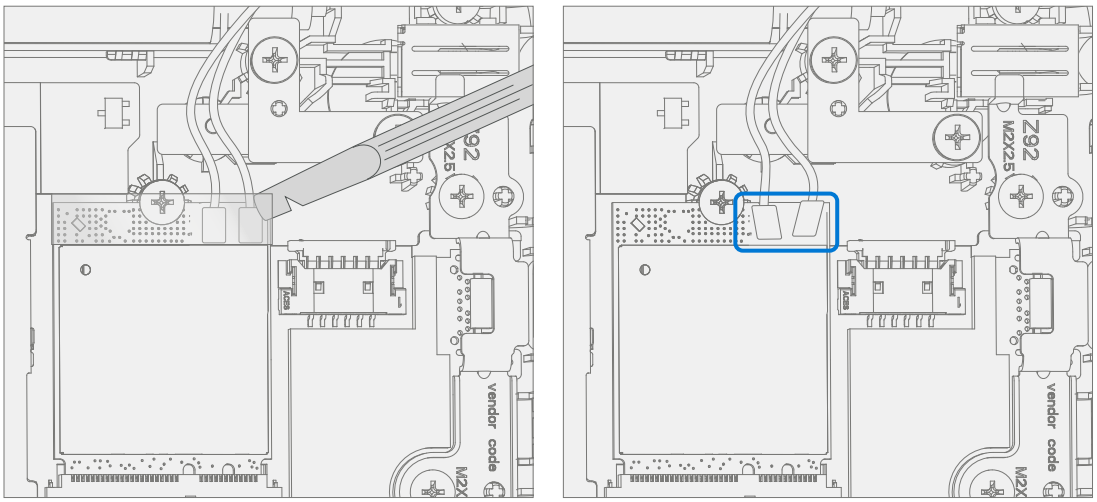
- **Components:**
  - WiFi Module (Refer to Illustrated Service Parts List)
  - C-Cover Screws (MM20065I030) Qty. 7
  - WiFi Module Screw (MS20025I070) Qty. 1

Prerequisite Steps:

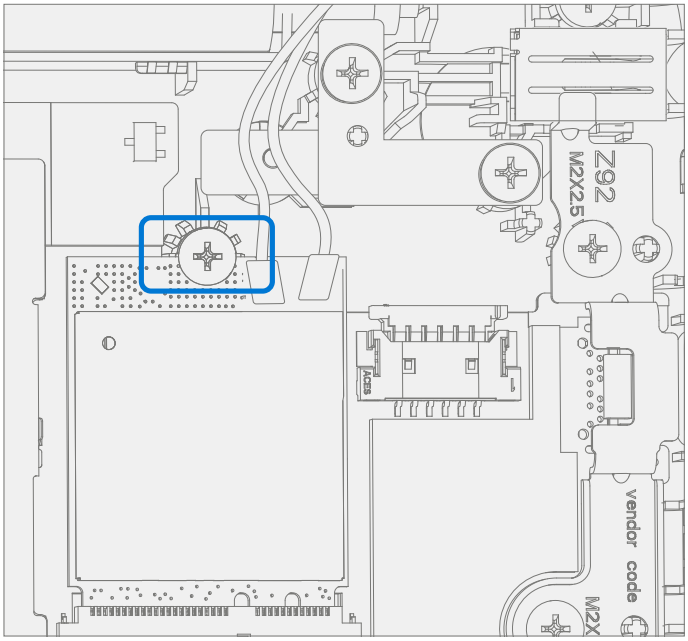
- **Power off device** – Ensure device is powered off and disconnected from a power supply.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening device. Refer to Prior to Device Disassembly section (page 15) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove C-cover** – Follow steps for Procedure – Removal (C-cover Keyboard) on (page 18).

Procedure – Removal (WiFi Module)

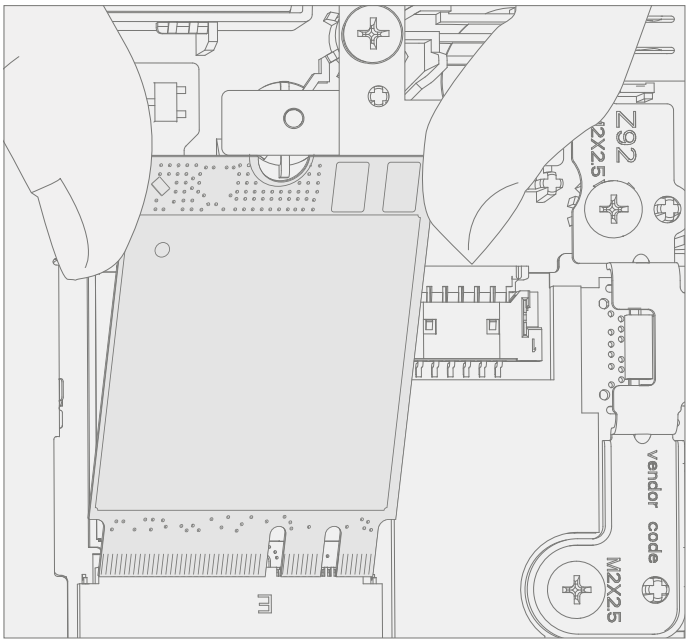
1. **Disconnect Antenna Cables** – Using a plastic tool / spudger remove the mylar cover from the WiFi Module. Disconnect the two antenna cables from the WiFi Module.



2. **Remove WiFi Module screw** – Using a PH0 driver remove the screw from the WiFi Module.

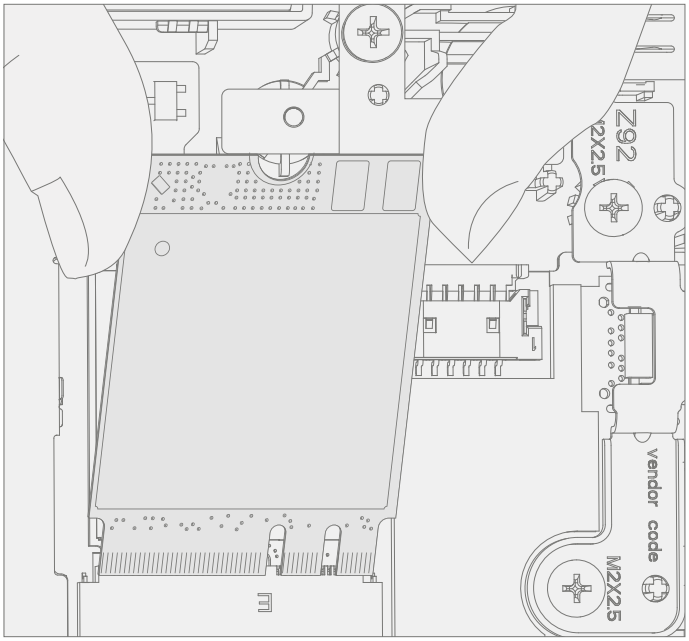


3. **Remove WiFi Module** – Pull the WiFi Module out of the PCBA connector.

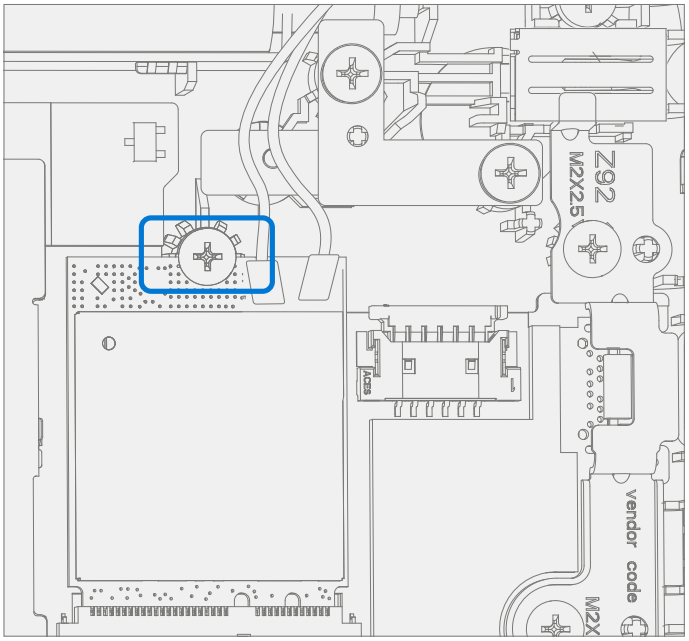


Procedure – Installation (WiFi Module)

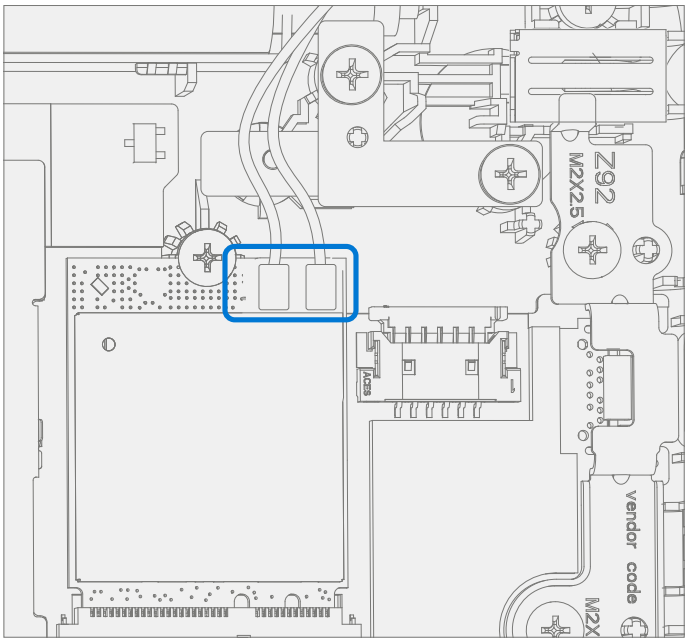
1. **Install New WiFi Module** – Install the WiFi Module into the PCBA connector.



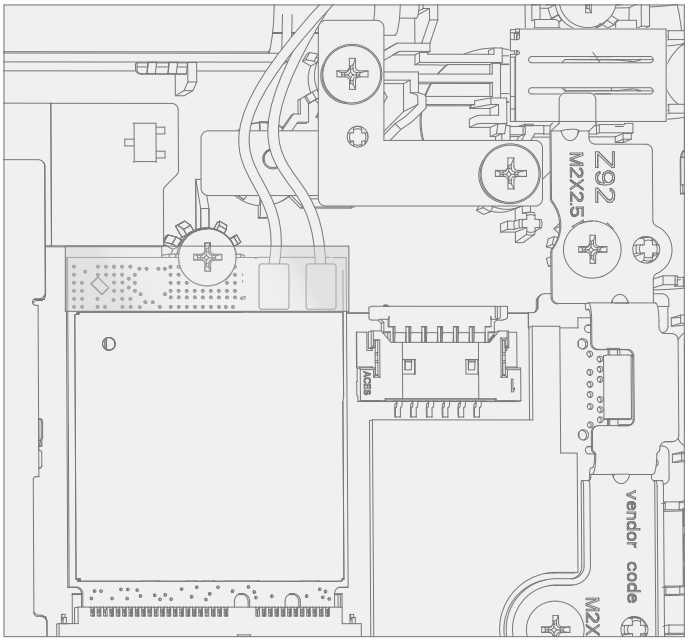
2. **Install New WiFi Module screw** – Using a PH0 driver install a new MS20025I070 screw onto the WiFi Module. Turn the screw until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



3. **Connect Antenna Cables** – Connect the antenna cables onto the WiFi Module as pictured below. Ensure the white cable is installed on the right side connector and the black cable is installed on the left side connector.



4. **Install Antenna Cable Mylar** – Install a new mylar cover onto the WiFi Module as pictured below.



5. **Install C-cover** – **Follow steps for Procedure** – Installation (C-Cover Keyboard) on (page 21). Leaving C-Cover screws uninstalled.
6. **Run SDT** – Power on device and connect USB drive with SDT Configuration Files. Run SDT to ensure all device features and functions operate as expected. If no further repairs are required procced to final steps.
7. **Install new C-Cover screws** – Install new MM20065I030 Screws as detailed on page 23.

Motherboard (PCBA) Replacement Process

Preliminary Requirements

IMPORTANT: Be sure to follow all special (bolded) notes, cautions, and warnings in each process section.

Required Tools and Components

- **Tools:**
  - USB Thumb drive with Surface Diagnostic Toolkit Configuration Files
  - Plastic Opening tool / Spudger
  - PH0 driver
  - Torx T6 driver
  - Anti-static wrist strap (1M Ohm resistance)

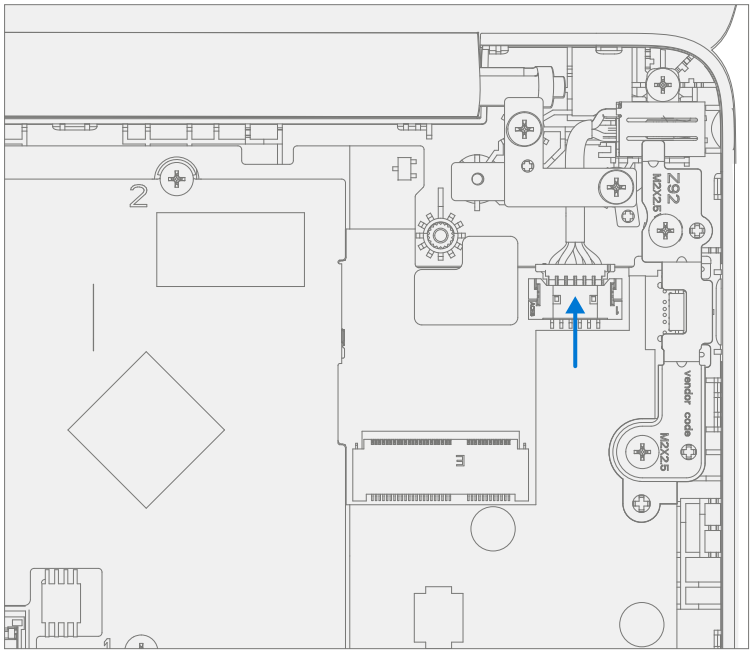
- **Components:**
  - Motherboard (PCBA) (Refer to Illustrated Service Parts List)
  - C-Cover Screws (MM20065I030) Qty. 7
  - USB Bracket / WiFi Module Screws (MS20025I070) Qty. 3
  - PCBA Screws (MS20015I220) Qty. 2

Prerequisite Steps:

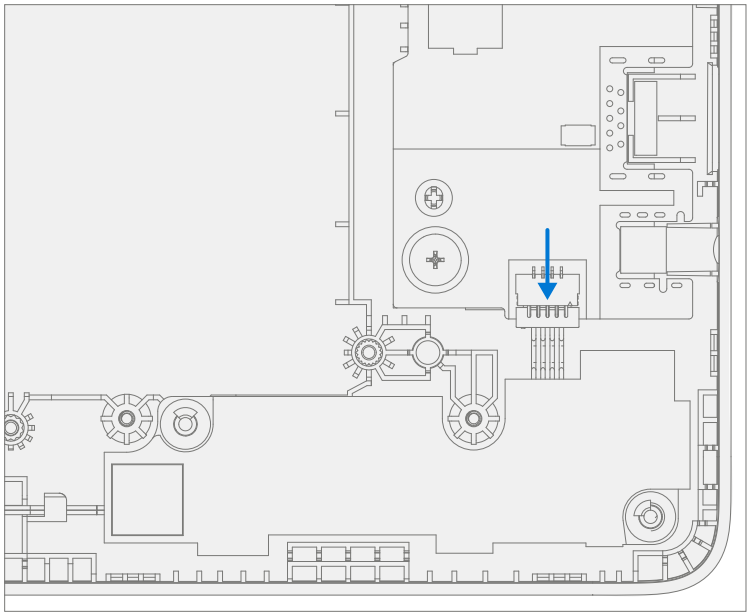
- **Power off device** – Ensure device is powered off and disconnected from a power supply.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening device. Refer to Prior to Device Disassembly section (page 15) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove C-cover** – Follow steps for Procedure – Removal (C-cover Keyboard) on (page 18).
- **Remove WiFi Module** – Follow steps for Procedure – Removal (WiFi Module) on (page 32).

Procedure – Removal (Motherboard PCBA)

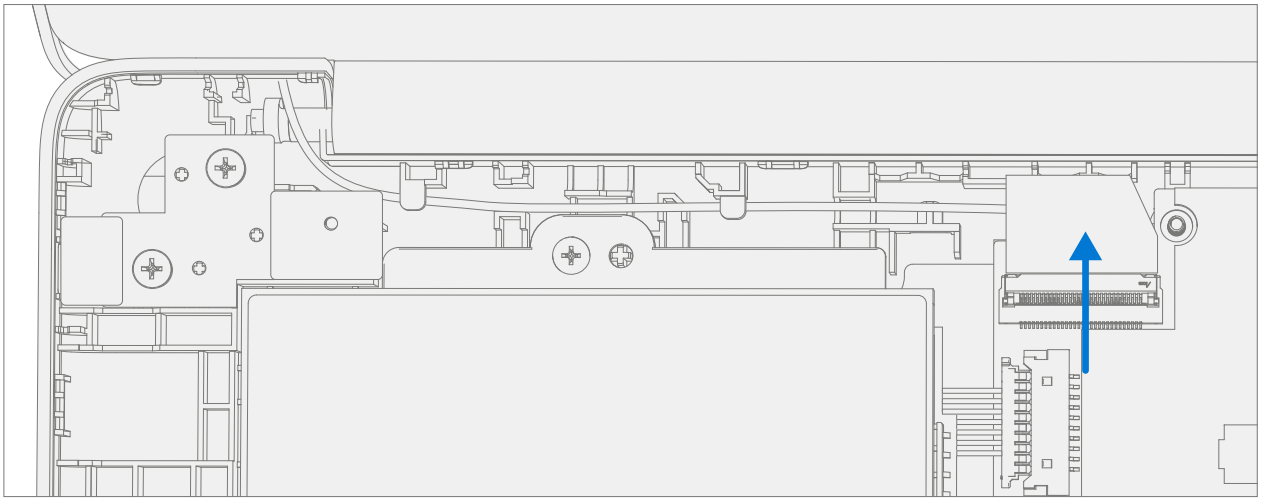
1. **Disconnect DC Power Cable** – Using a plastic tool / spudger to disconnect the DC power cable from the PCBA.



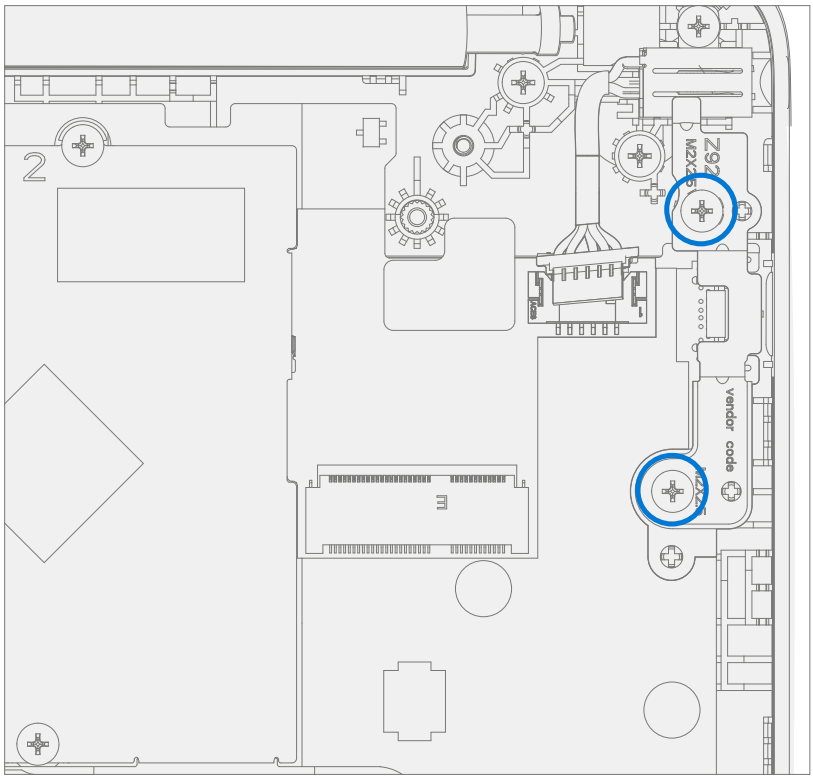
2. **Disconnect Speaker Cable** – Using a plastic tool / spudger disconnect the speaker cable from the PCBA.



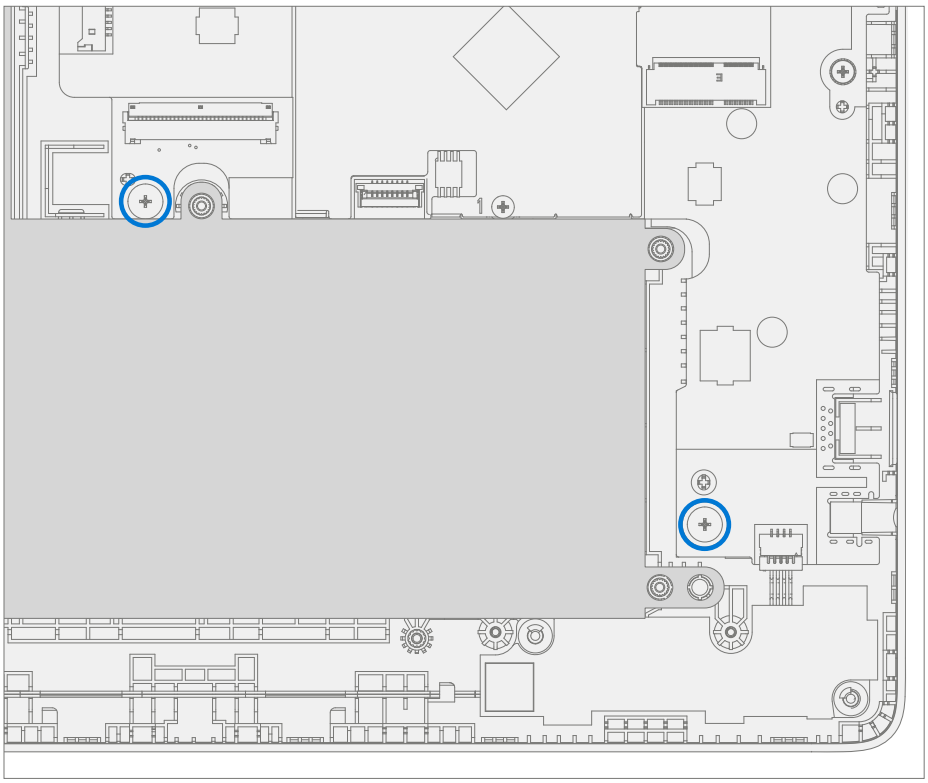
3. **Disconnect AB-Cover Cable** – Using a plastic tool / spudger unlock the AB-Cover cable connector. Remove AB-Cover cable from the PCBA.



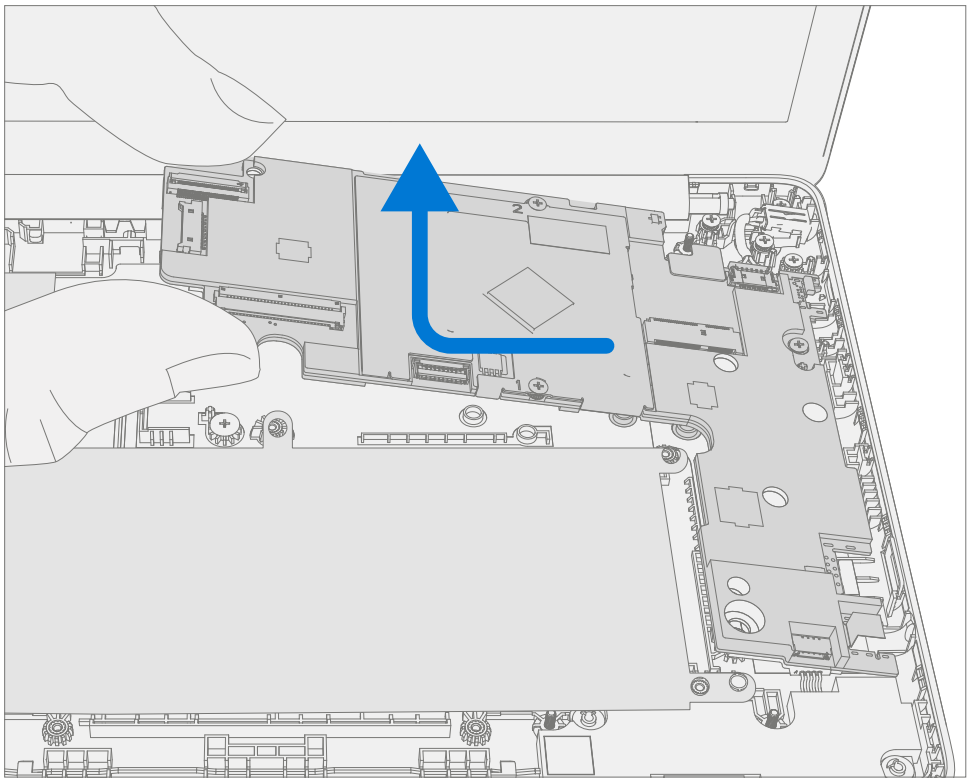
4. **Remove USB Bracket** – Using a PH0 driver remove the two screws from the USB bracket. Remove the bracket from the D-Bucket.



5. **Remove PCBA screws** – Using a PH0 driver remove the two screws from the PCBA.



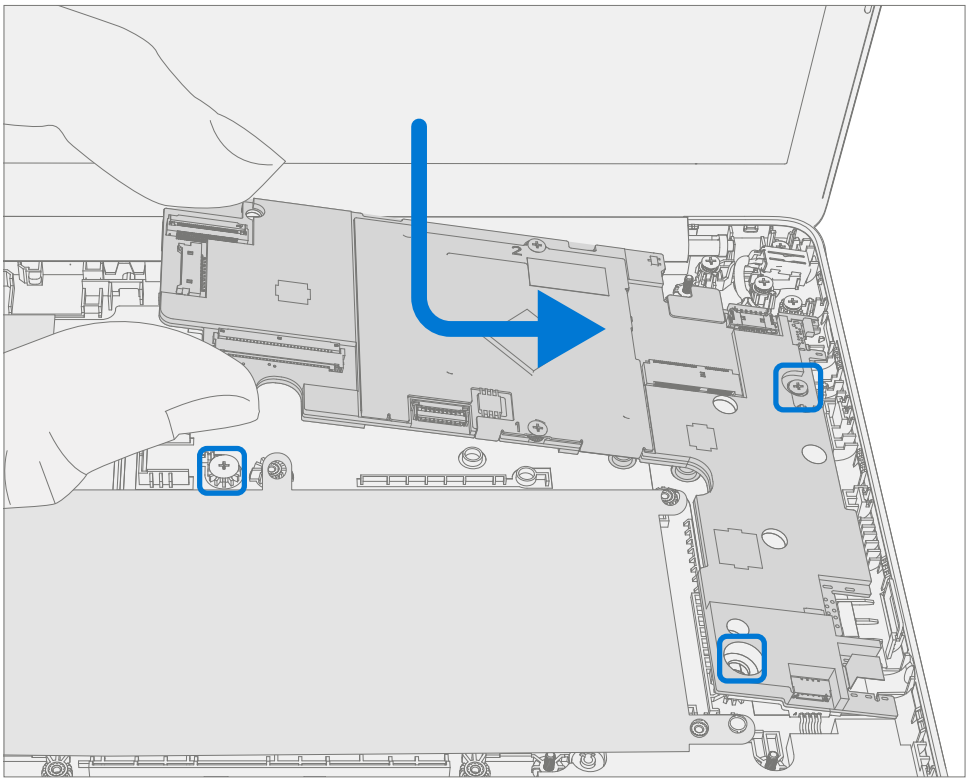
6. **Remove PCBA** – Remove PCBA from the D-Bucket.



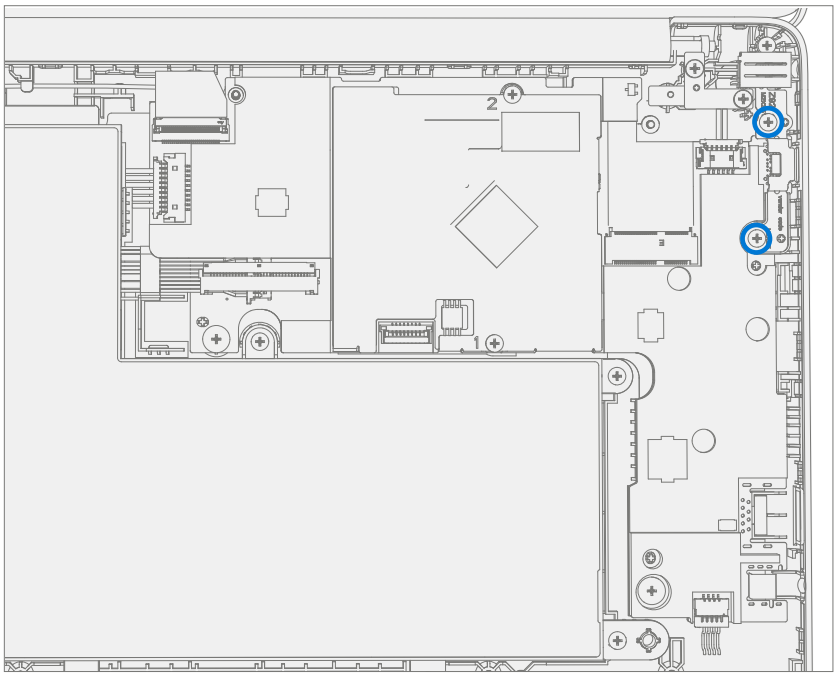
Procedure – Installation (Motherboard PCBA)

IMPORTANT: Only a Microsoft PCBA of like configuration should be replaced in the device.

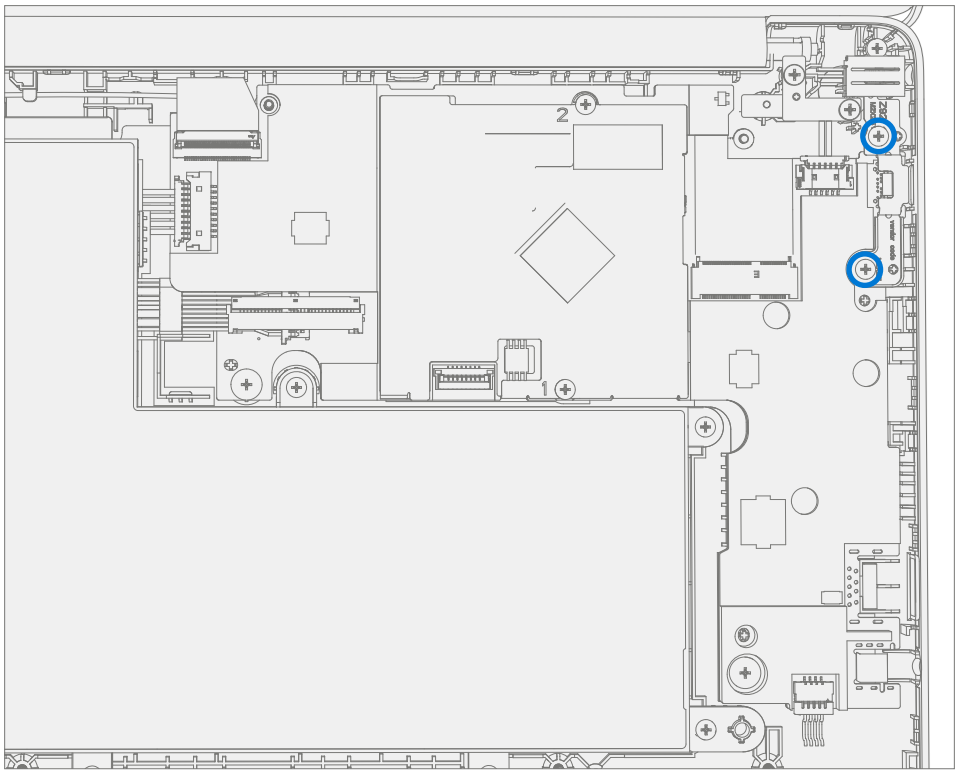
1. **Install PCBA** – Align PCBA into the D-Bucket. Ensure USB and audio ports are aligned to the holes in the D-Bucket. The PCBA should be centered on the locating posts as pictured below.



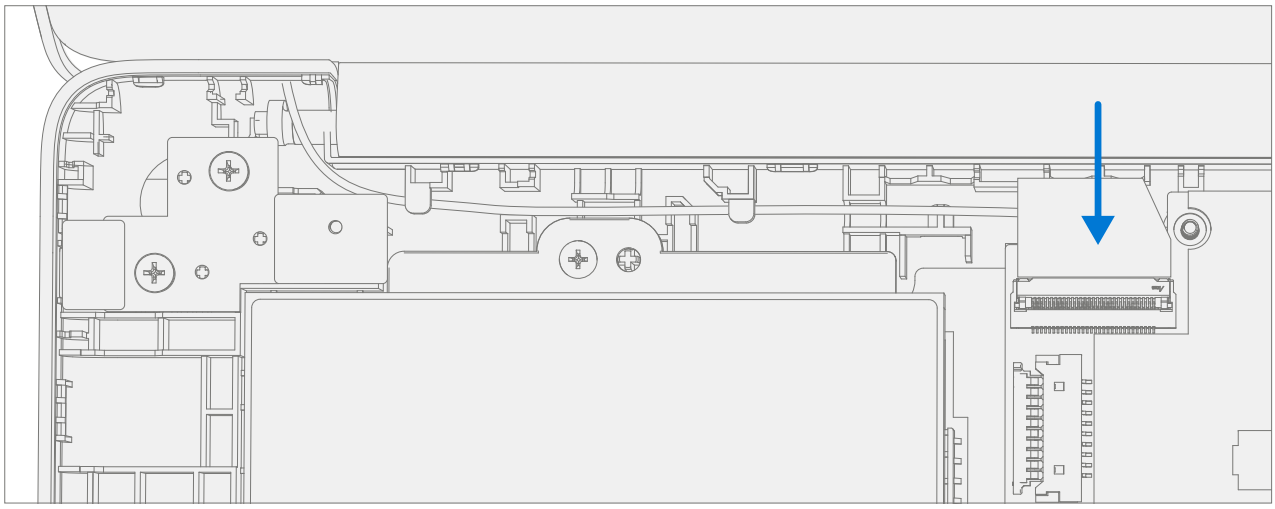
2. **Install New PCBA screws** – Verify the battery, display, antenna, power, and speaker cables are not captured under the PCBA. Using a PH0 driver install two new MS20015I220 screws into the PCBA. Turn all the screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



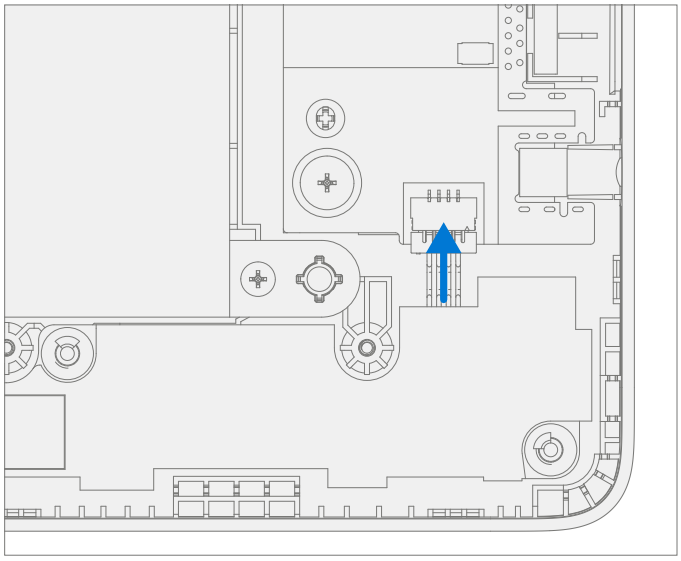
3. **Install USB Bracket** – Place the previously removed USB bracket into D-Bucket. Using a PH0 driver install two new MS20025I070 screws into the USB bracket. Turn all the screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



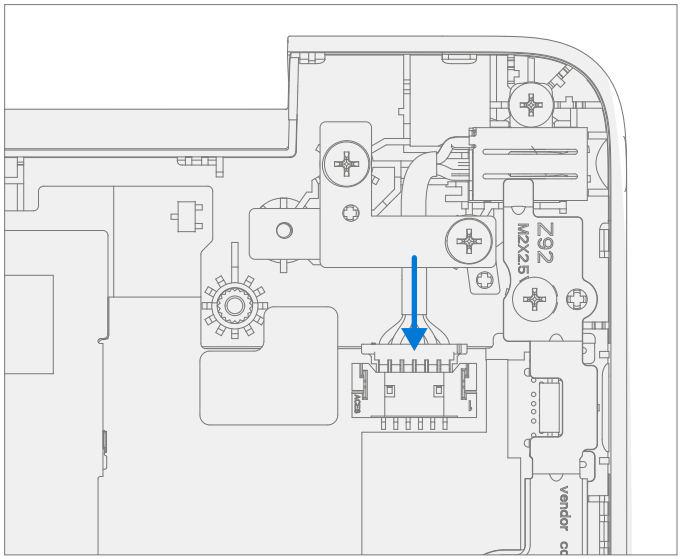
4. **Connect AB-Cover Cable** – Connect the AB-Cover cable into the PCBA. Ensure the cable is fully seated and locked in the connector.



5. **Connect Speaker Cable** – Connect the speaker cable onto the PCBA.



6. **Connect DC Power Cable** – Connect the DC power cable into the PCBA.



7. **Install WiFi Module** – Install WiFi Module as detailed Procedure – Installation (WiFi Module) on (page 29).
8. **Install C-cover** – Install C-Cover as detailed in Procedure – Installation (C-Cover) on (page 21). Leave C-Cover screws uninstalled.
9. **Run SDT** – Power on device and connect USB drive with SDT Configuration Files. Run SDT to ensure all device features and functions operate as expected. If no further repairs are required proceed to final steps.
10. **Battery Authentication** – Authenticate new battery as detailed in Procedure – Installation (Battery), step 5 on (page 26).
11. **Install new C-Cover screws** – Install new MM20065I030 Screws as detailed on (page 23).

IMPORTANT: To get hardware hash for enrolment into Intune follow instructions outlined here

Speaker Replacement Processes

Preliminary Requirements

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

Required Tools and Components

- **Tools:**
  - USB Thumb drive with Surface Diagnostic Toolkit Configuration Files
  - Plastic Opening tool / Spudger
  - PH0 driver
  - Torx T6 driver
  - Anti-static wrist strap (1M Ohm resistance)

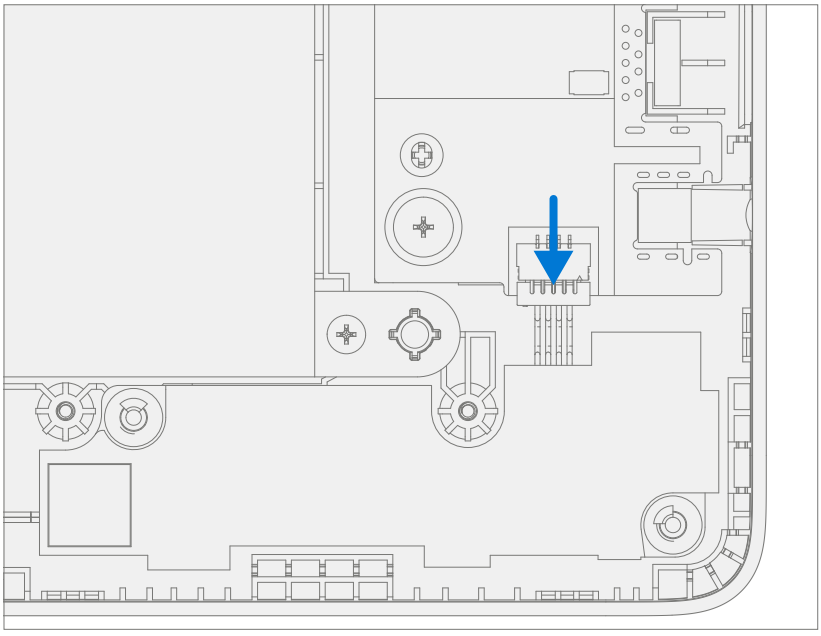
- **Components:**
  - Speaker Assembly (Refer to Illustrated Service Parts List)
  - C-Cover Screws (MM20065I030) Qty. 7

Prerequisite Steps:

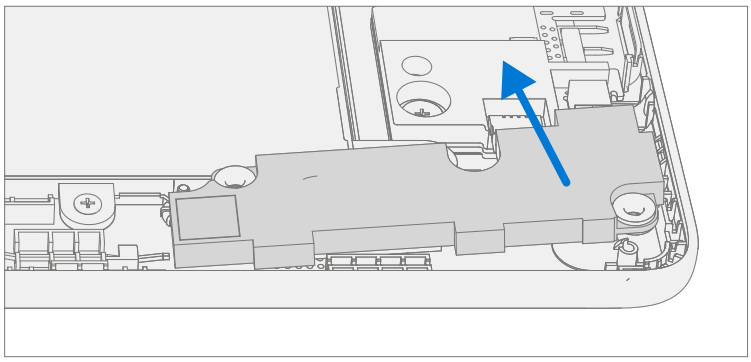
- **Power off device** – Ensure device is powered off and disconnected from a power supply.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening device. Refer to Prior to Device Disassembly section (page 15) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove C-cover** – Follow steps for Procedure – Removal (C-cover Keyboard) on (page 18).

Procedure – Removal (Speakers)

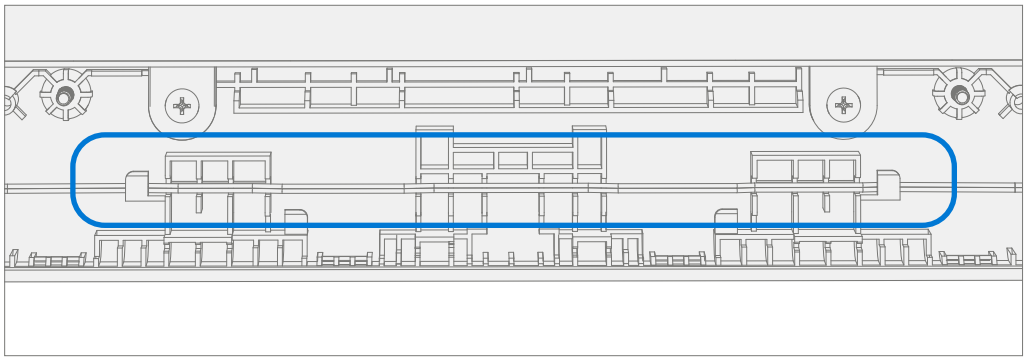
1. **Disconnect Speaker Cable** – Using a plastic tool / spudger disconnect the speaker cable from the PCBA.



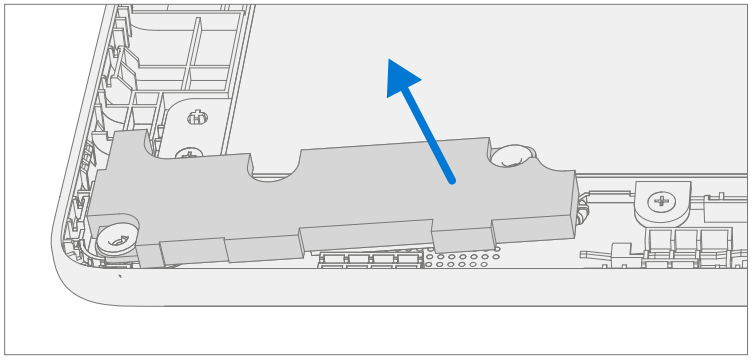
2. **Remove Speakers from device** – Separation is a multistep process.
    a. Lift the right speaker form the two D-Bucket posts.



    b. Unhook and release speaker cable from the D-Bucket.

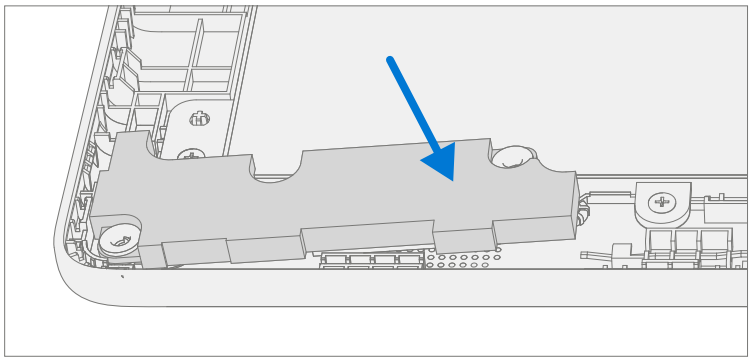


    c. Lift the left speaker from the two D-Bucket posts.

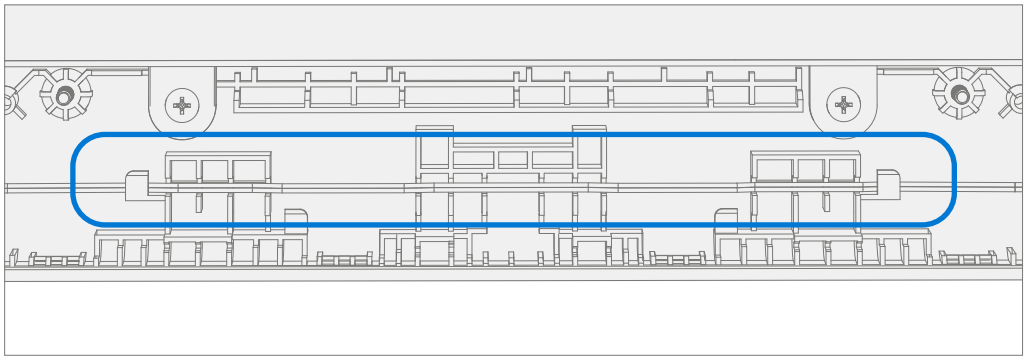


Procedure – Installation (Speakers)

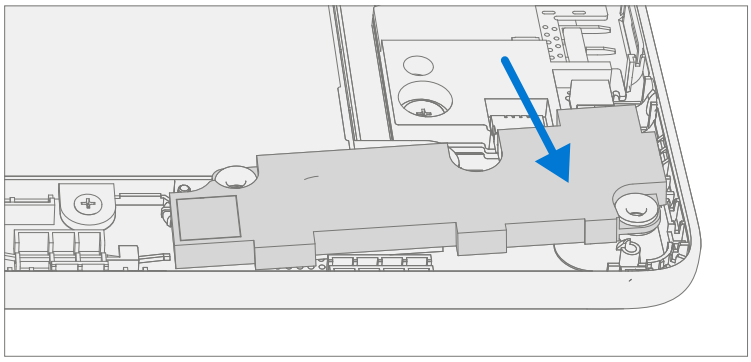
1. **Install Speakers into device** – Installation is a multistep process.
    a. Install the left speaker onto the two D-Bucket posts.



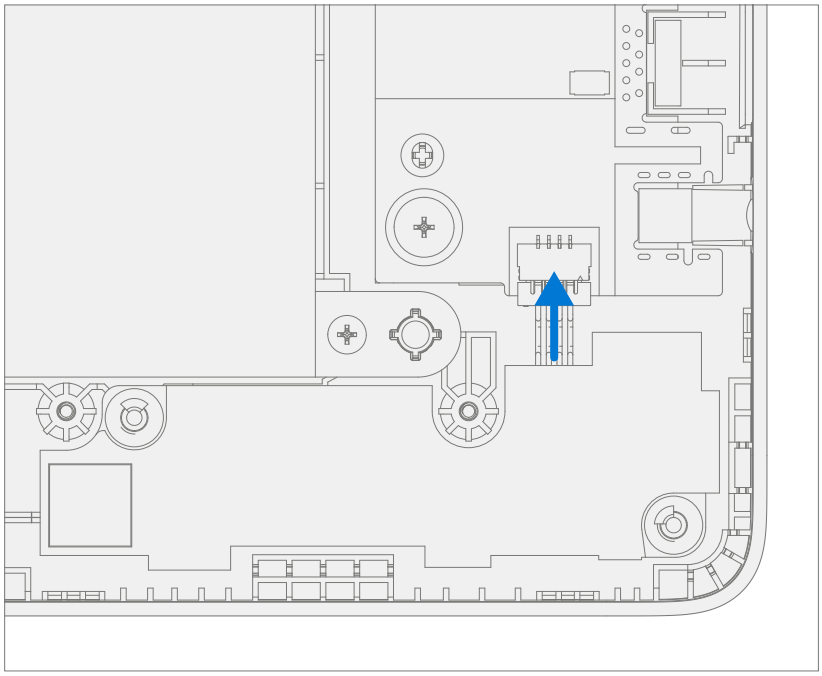
    b. Route and hook the speaker cable onto the D-Bucket.



    c. Install the right speaker onto the two D-Bucket posts.



2. **Connect Speaker Cable** – Connect the speaker cable onto the PCBA.



3. **Install C-cover** – Follow steps for Procedure – Installation (C-Cover Keyboard) on (page 21). Leaving C-Cover screws uninstalled.
4. **Run SDT** – Power on device and connect USB drive with SDT Configuration Files. Run SDT to ensure all device features and functions operate as expected. If no further repairs are required procced to final steps.
5. **Install new C-Cover screws** – Install new MM20065I030 Screws as detailed on page 23.

AB-Cover Display Assembly Replacement Processes

Preliminary Requirements

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

Required Tools and Components

- **Tools:**
  - USB Thumb drive with Surface Diagnostic Toolkit Configuration Files
  - Plastic Opening tool / Spudger
  - PH0 driver
  - Torx T6 driver
  - Anti-static wrist strap (1M Ohm resistance)

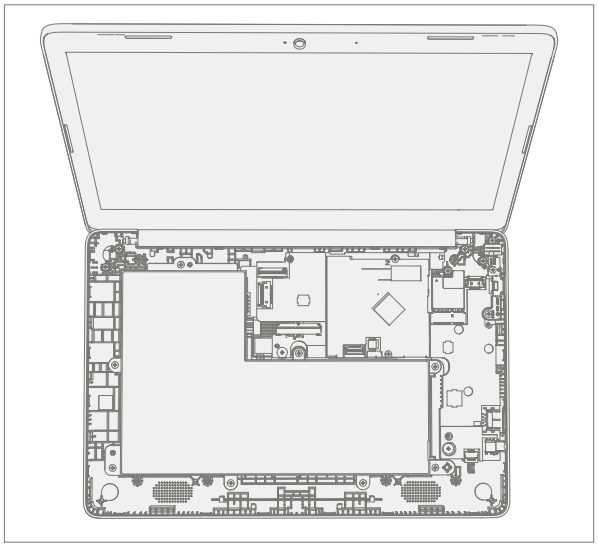
- **Components:**
  - AB-Cover Display Assembly (Refer to Illustrated Service Parts List)
  - C-Cover Screws (MM20065I030) Qty. 7
  - AB-Cover Hinges (MS25040I060) Qty. 4

Prerequisite Steps:

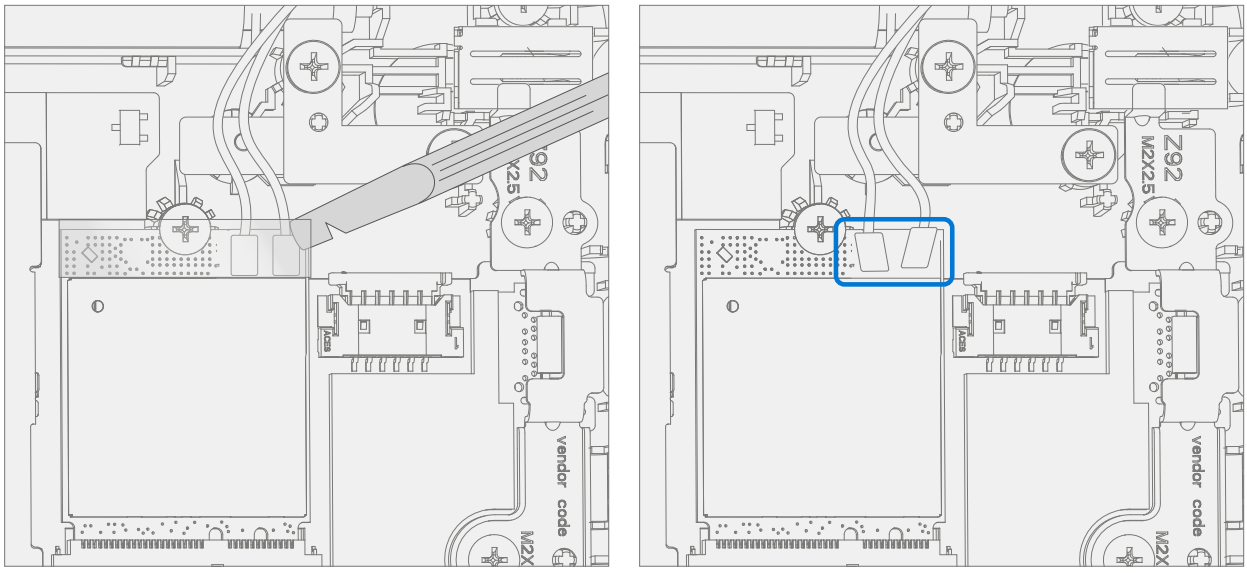
- **Power off device** – Ensure device is powered off and disconnected from a power supply.
- **General Safety** – Check to make sure that general guidelines and ESD compliance steps are followed prior to opening device. Refer to Prior to Device Disassembly section (page 15) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove C-cover** – Follow steps for Procedure – Removal (C-cover Keyboard) on (page 18).

Procedure – Removal (AB-Cover Display Assemby)

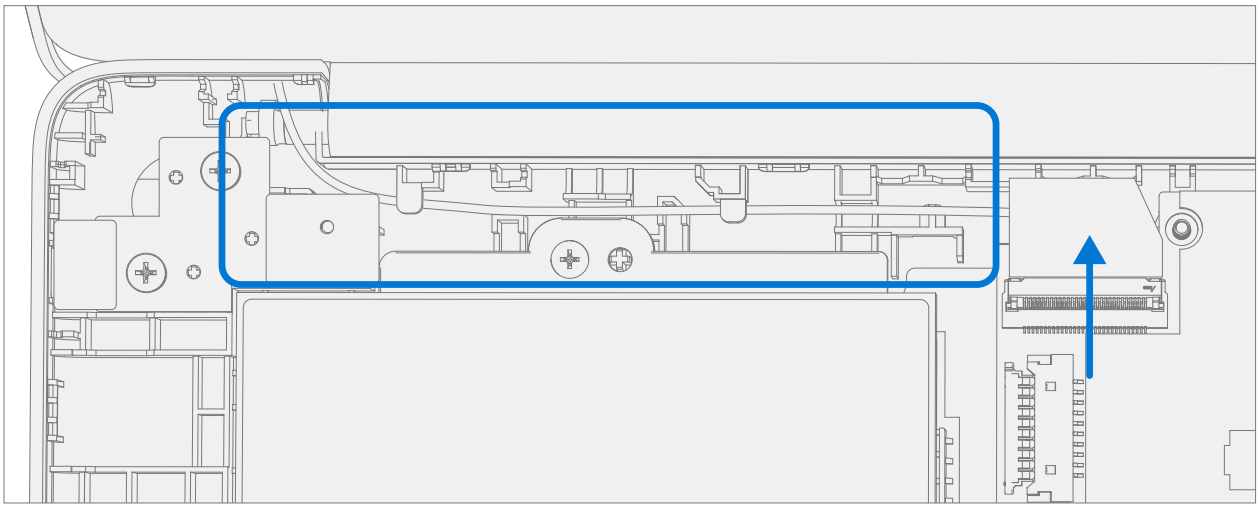
1. **Position AB-Cover** – Set AB-Cover to 90-degrees.



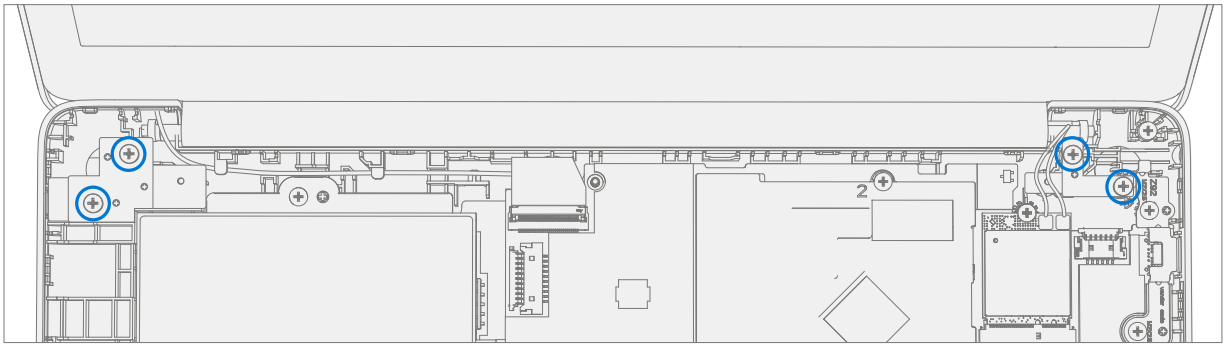
2. **Disconnect Antenna Cables** – Using a plastic tool / spudger remove the mylar cover from the WiFi Module. Disconnect the two antenna cables from the WiFi Module.



3. **Disconnect AB-Cover Cable** – Using a plastic tool / spudger unlock the AB-Cover cable connector. Remove AB-Cover cable from the PCBA. Carefully remove cable from the D-Bucket channels and hooks.

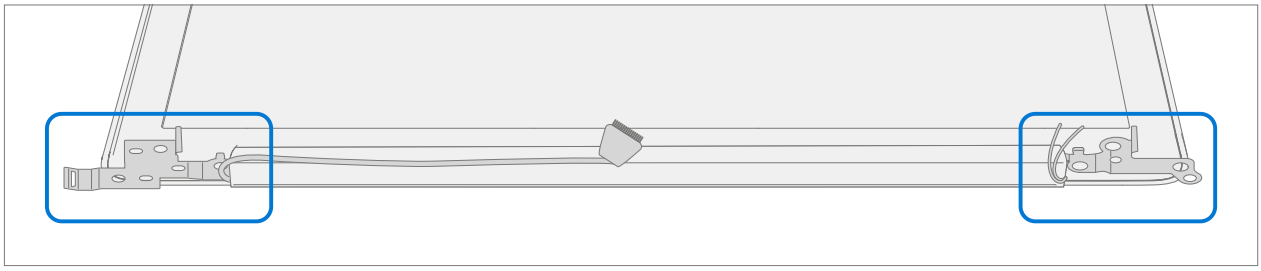


4. **Remove AB-Cover hinge screws** – Using a PH0 driver remove the two screws from the right AB-Cover hinge. While holding the AB-Cover with one hand remove the two screws from the left AB-Cover hinge. Remove the AB-Cover Display Assembly from the D-Bucket.

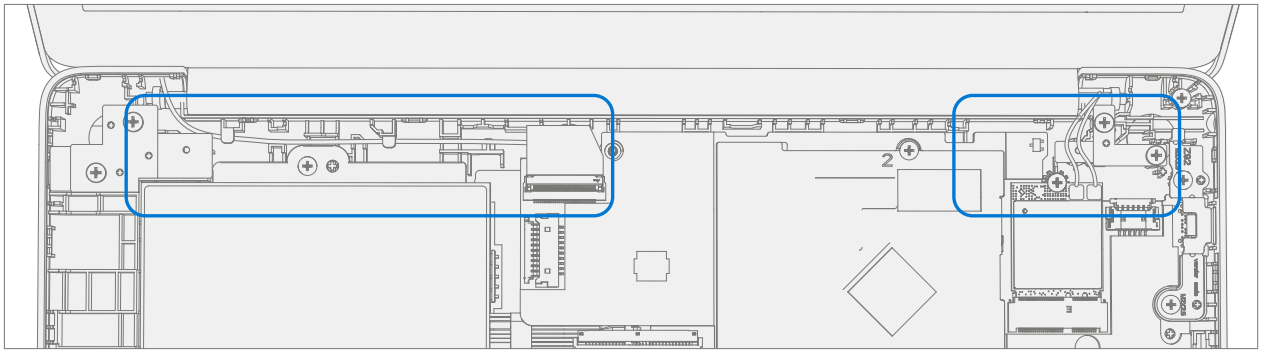


Procedure – Installation (AB-Cover Display Assembly)

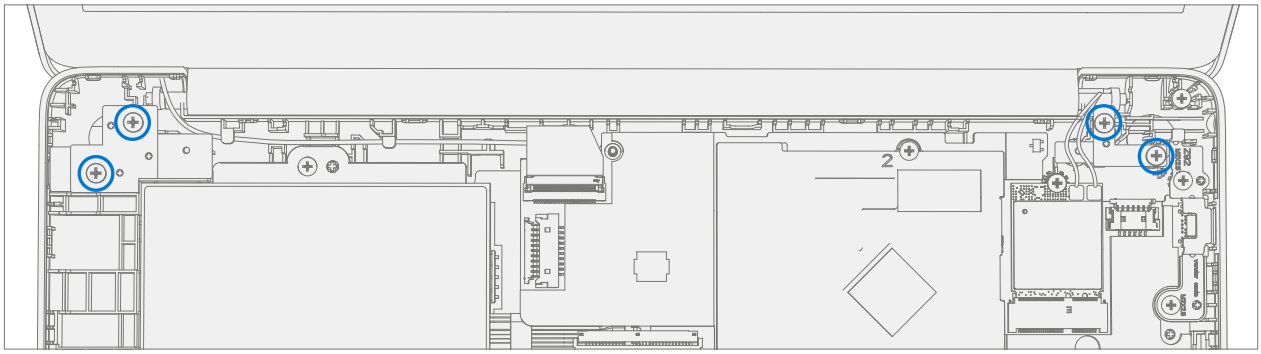
1. **Position New AB-Cover hinges** – Set AB-Cover hinges to 90-degrees.



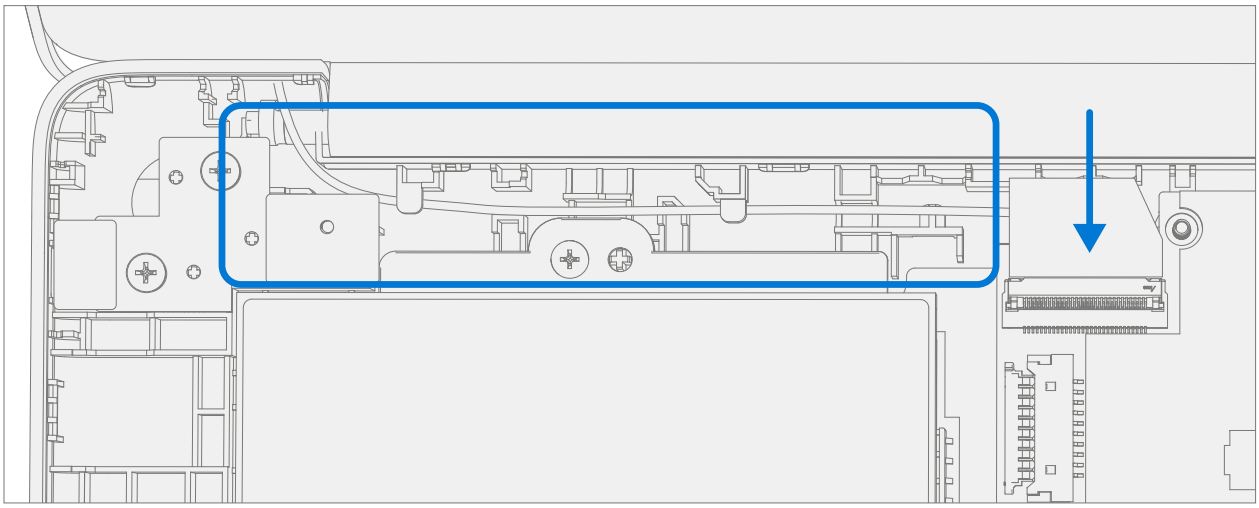
2. **Install New AB-Cover Display Assembly** – Align AB-Cover hinges into the D-Bucket. Ensure display and antenna cables are routed as pictured below.



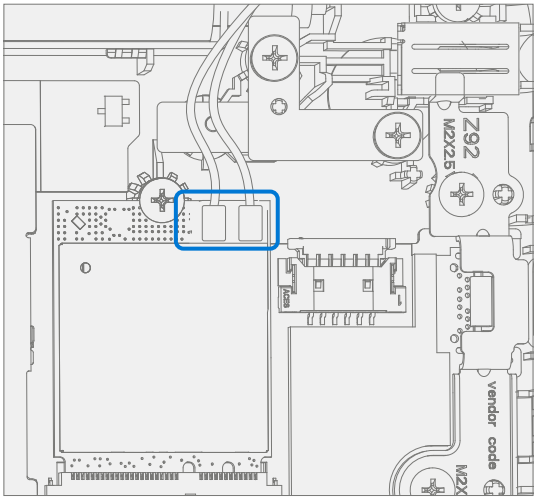
3. **Install New AB-Cover hinge screws** – Using a PH0 driver install two new MS25040I060 screws into the left hinge. Install two new MS25040I060 screws into the right hinge. Turn all the screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



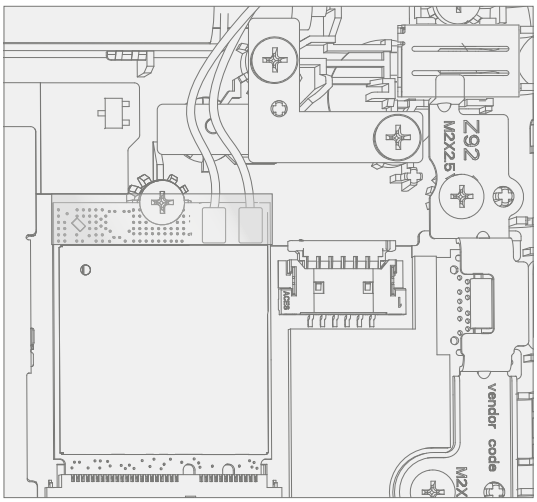
4. **Connect AB-Cover Cable** – Carefully route the cable into the D-Bucket channels and hooks. Connect the AB-Cover cable into the PCBA. Ensure the cable is fully seated and locked in the connector.



5. **Connect Antenna Cables** – Connect the antenna cables onto the WiFi Module as pictured below. Ensure the white cable is installed on the right side connector and the black cable is installed on the left side connector.



6. **Install Antenna Cable Mylar** – Install a new mylar cover onto the WiFi Module as pictured below.



7. **Install C-cover** – Follow steps for Procedure – Installation (C-Cover Keyboard) on (page 21). Leaving C-Cover screws uninstalled.
8. **Run SDT** – Power on device and connect USB drive with SDT Configuration Files. Run SDT to ensure all device features and functions operate as expected. If no further repairs are required procced to final steps.
9. **Install new C-Cover screws** – Install new MM20065I030 Screws as detailed on page 23.

D-Bucket Replacement Process

Preliminary Requirements

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

Required Tools and Components

- **Tools:**
  - USB Thumb drive with Surface Diagnostic Toolkit Configuration Files
  - Plastic Opening tool / Spudger
  - PH0 driver
  - Torx T6 driver
  - Anti-static wrist strap (1M Ohm resistance)

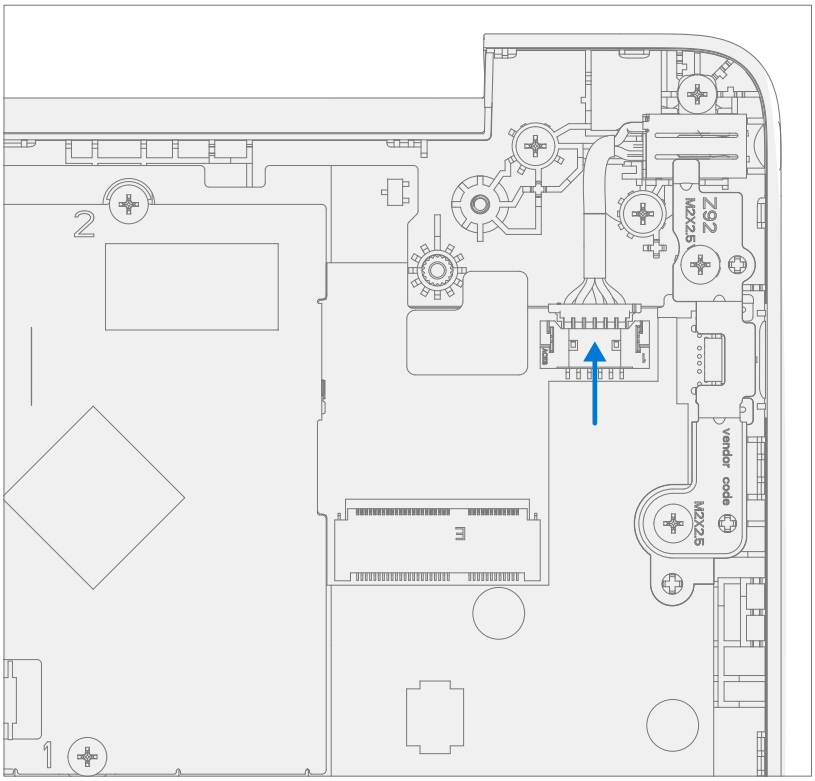
- **Components:**
  - D-Bucket (Refer to Illustrated Service Parts List)
  - C-Cover Screws (MM20065I030) Qty. 7
  - USB Bracket / WiFi Module / DC Power Port / Battery Screws (MS20025I070) Qty. 12
  - PCBA Screws (MS20015I220) Qty. 2
  - AB-Cover Hinges (MS25040I060) Qty. 4

Prerequisite Steps:

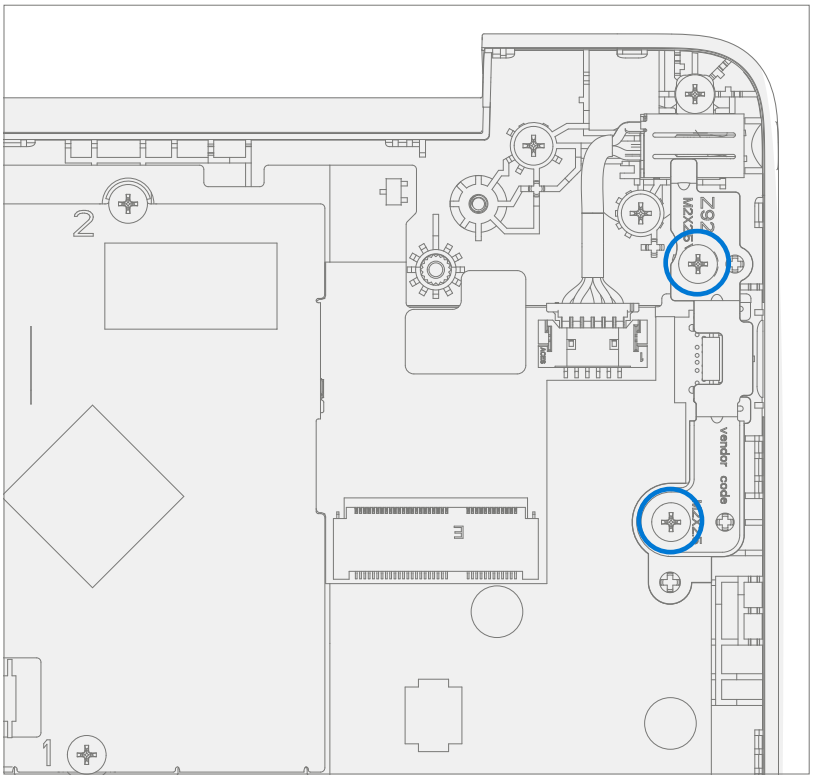
- **Device Serial Number Notation** – The Surface device serial number for this model is located on the D-Bucket portion of the device. When the D-Bucket is replaced during service/repair, the device serial number becomes physically disconnected from the customer's device. To ensure the customer has the best experience if any future Microsoft support is required, it is recommended to create a notation of the device serial number and provide it to the customer upon completion of the repair.
- **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 device. Refer to Prior to Device Disassembly section (page 15) for details.
- **Position device** – Place device onto a clean surface free of debris with the bottom facing up.
- **Remove C-cover** – Follow steps for Procedure – Removal (C-cover Keyboard) on (page 18).
- **Remove Power Port** – Follow steps for Procedure – Removal (Power Port) on (page 25).
- **Remove Battery** – Follow steps for Procedure – Removal (Battery) on (page 25).
- **Remove WiFi Module** – Follow steps for Procedure – Removal (WiFi Module) on (page 32).
- **Remove Motherboard** - Follow steps for Procedure – Removal (Motherboard PCBA) on (page 37).
- **Remove Speakers** – Follow steps for Procedure – Removal (Speakers) on (page 31).
- **Remove AB-Cover** - Follow steps for Procedure – Removal (AB-Cover Display Assembly) on (page 47).

Procedure – Removal (D-Bucket)

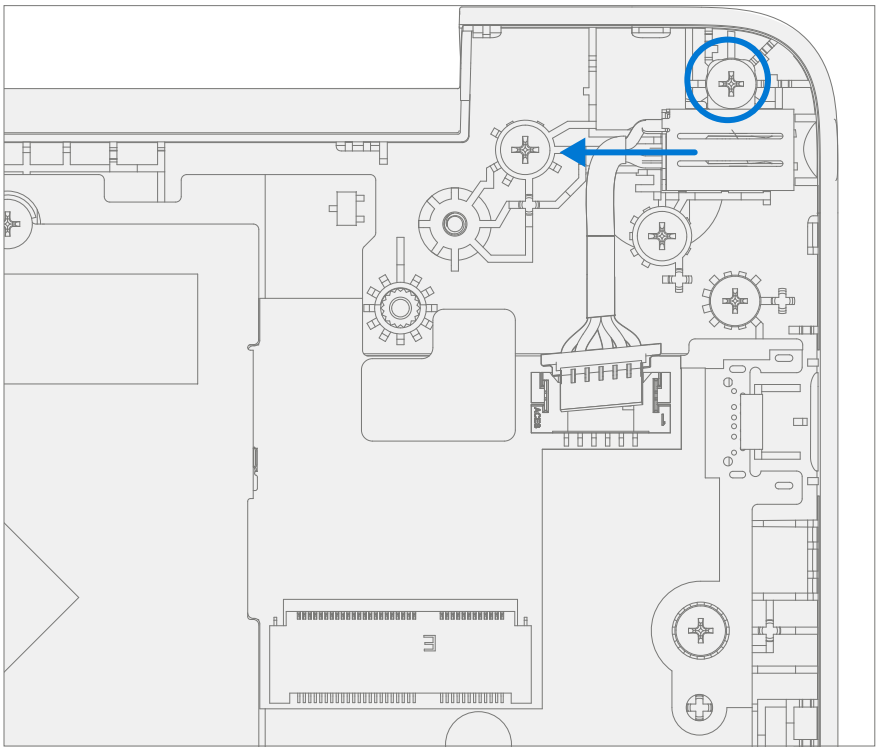
1. **Disconnect DC Power Cable** – Using a plastic tool / spudger to disconnect the DC power cable from the PCBA.



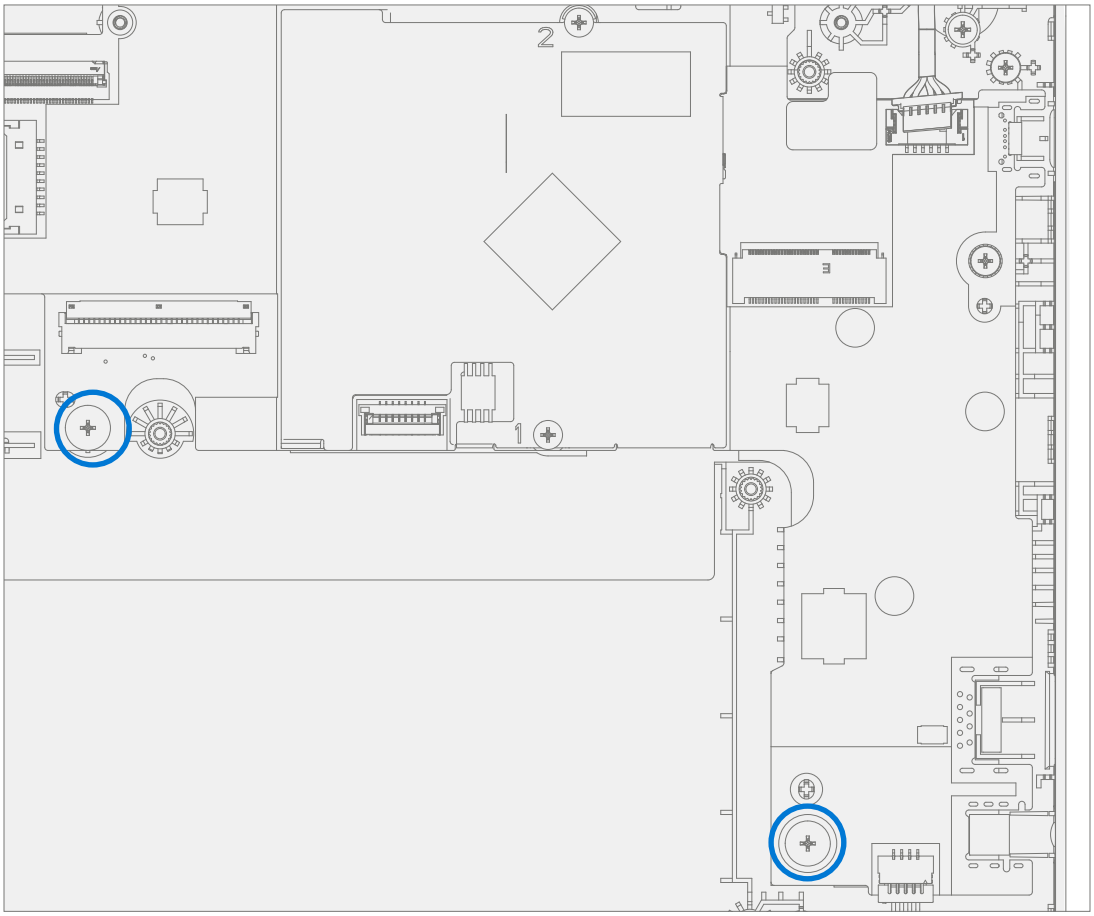
2. **Remove USB Bracket** – Using a PH0 driver remove the two screws from the USB bracket. Remove the bracket form the D-Bucket.



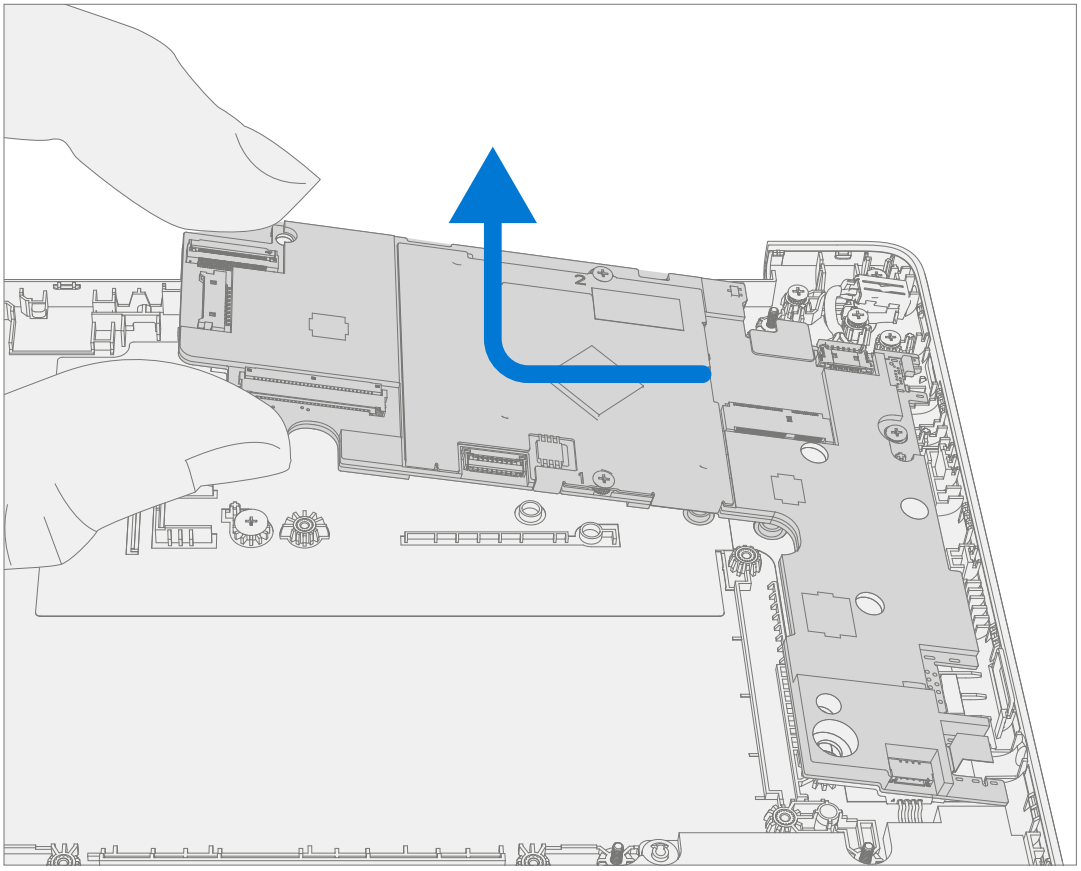
3. **Remove DC Power Port** – Using a PH0 driver remove the screw from the DC power port. Remove the DC power port from the D-Bucket.



4. **Remove PCBA screws** – Using a PH0 driver remove the two screws from the PCBA.

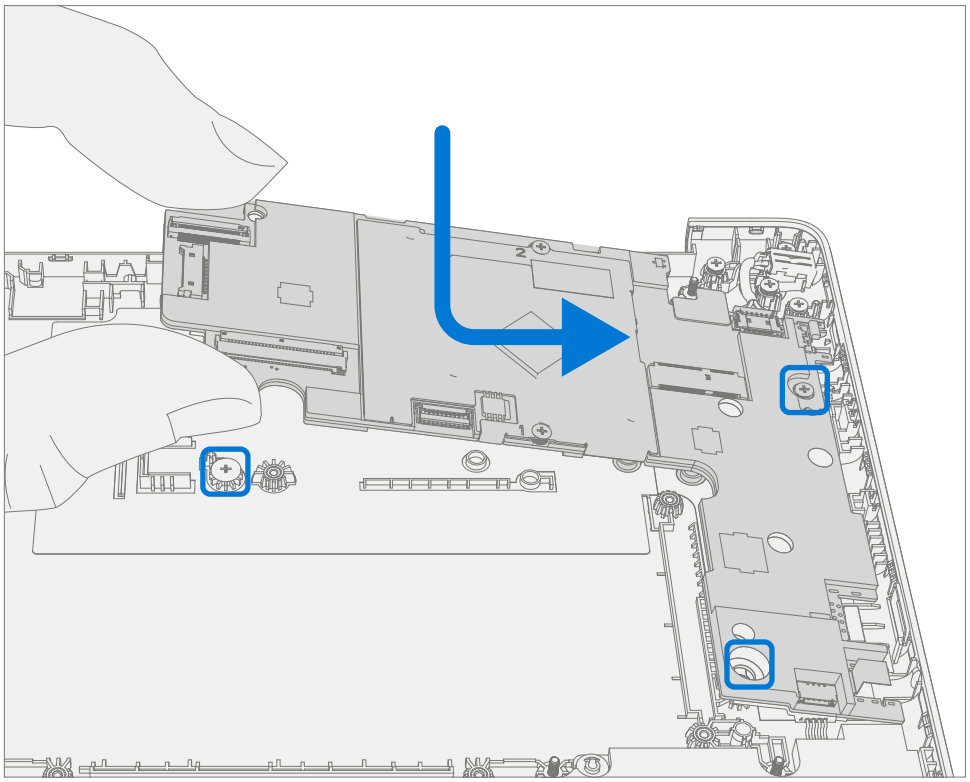


5. **Remove PCBA** – Remove PCBA from the D-Bucket.

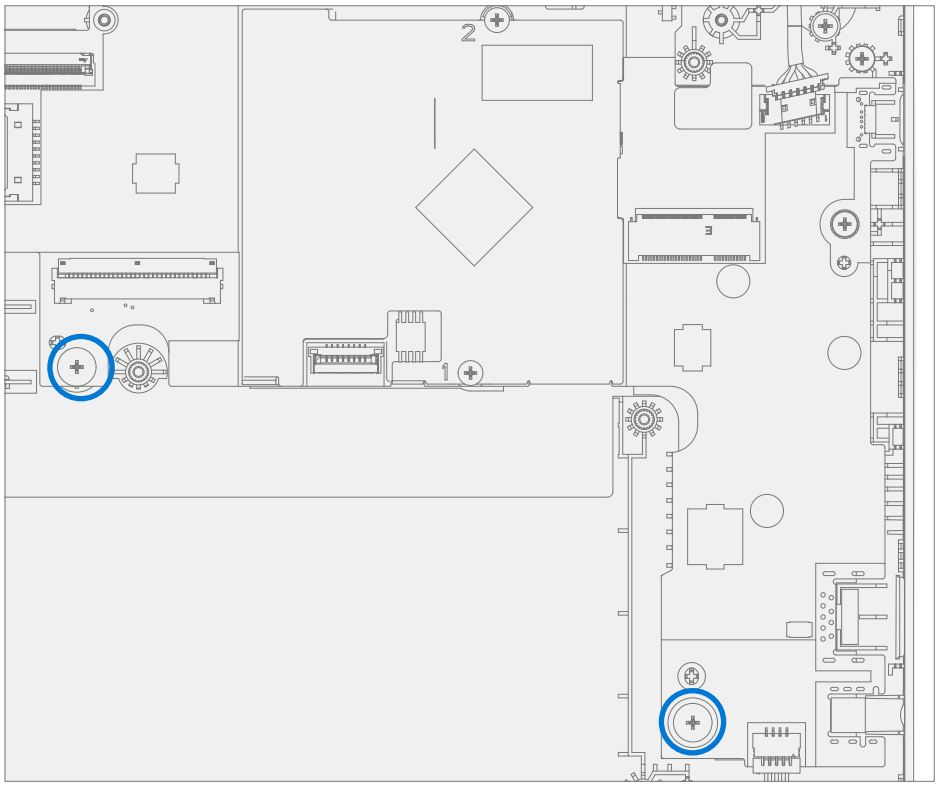


Procedure – Installation (New D-Bucket)

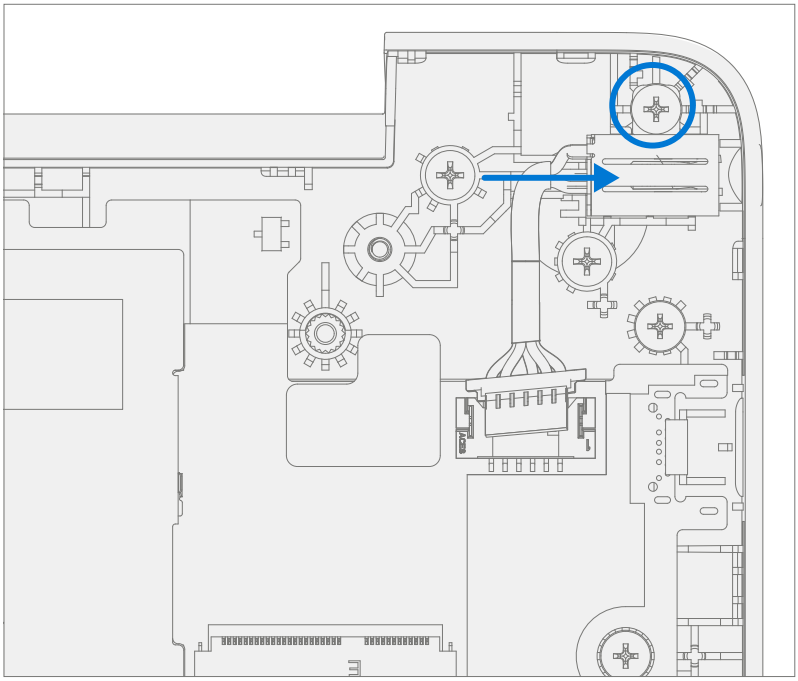
1. **Install PCBA** – Align PCBA into the D-Bucket. Ensure USB and audio ports are aligned to the holes in the D-Bucket. The PCBA should be centered on the locating posts as pictured below.



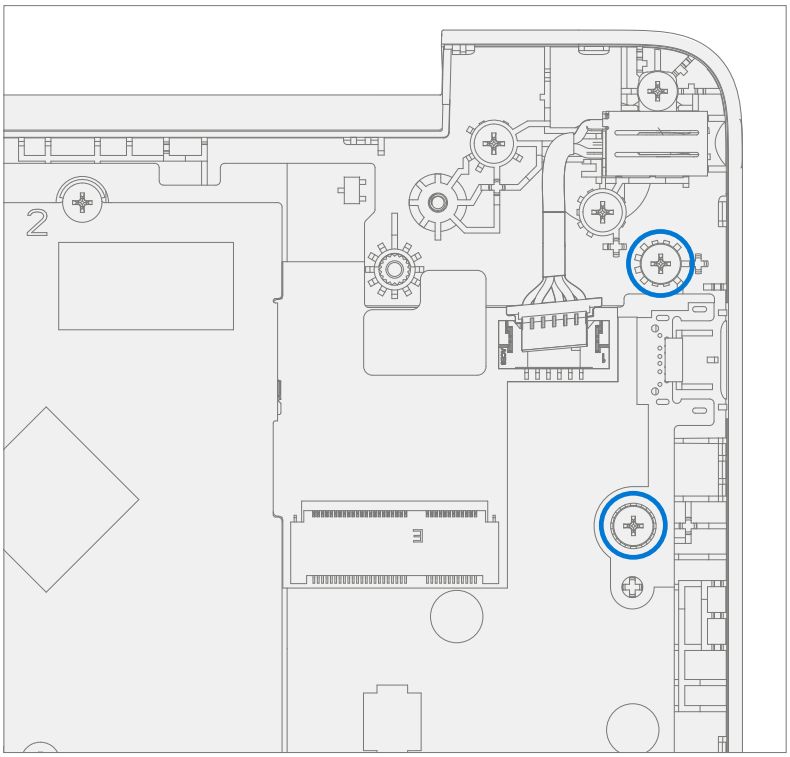
2. **Install New PCBA screws** – Using a PH0 driver install two new MS20015I220 screws into the PCBA. Turn all the screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



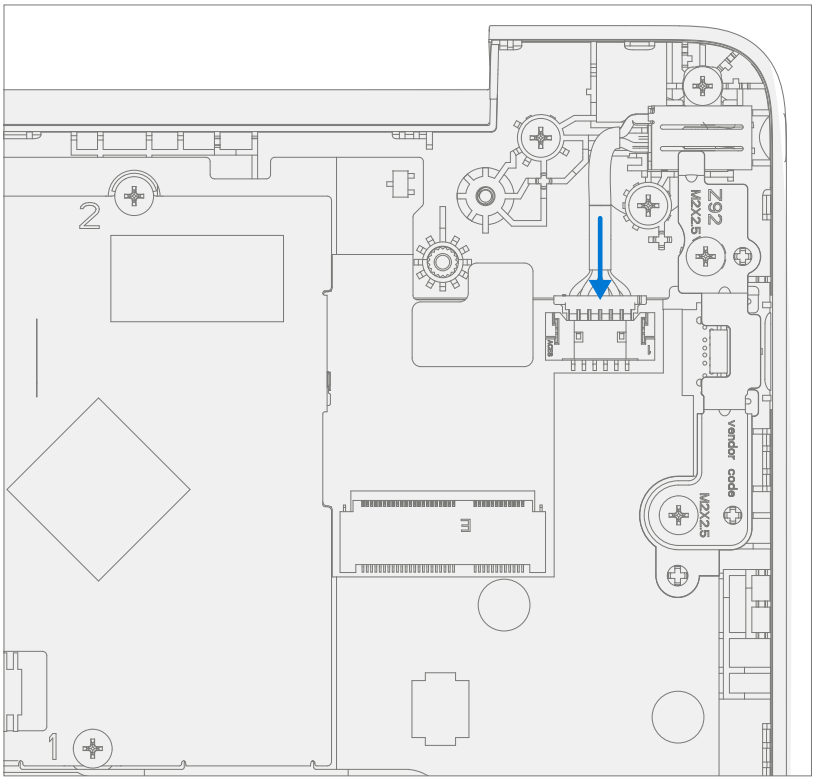
3. **Install DC Power Port** – Place the DC power port removed from the old D-Bucket into the new D-Bucket. Ensure the port is aligned with the hole in the D-Bucket. Using a PH0 driver install a new MS20025I070 screw into the DC power port. Turn the screw until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.



4. **Install USB Bracket** – Place the USB bracket removed from the old D-Bucket into the new D-Bucket. Using a PH0 driver install two new MS20025I070 screws into the USB bracket. Turn all the screws until just snug and seated, and then turn another 45-degrees (1/8 turn) or until fully fastened.

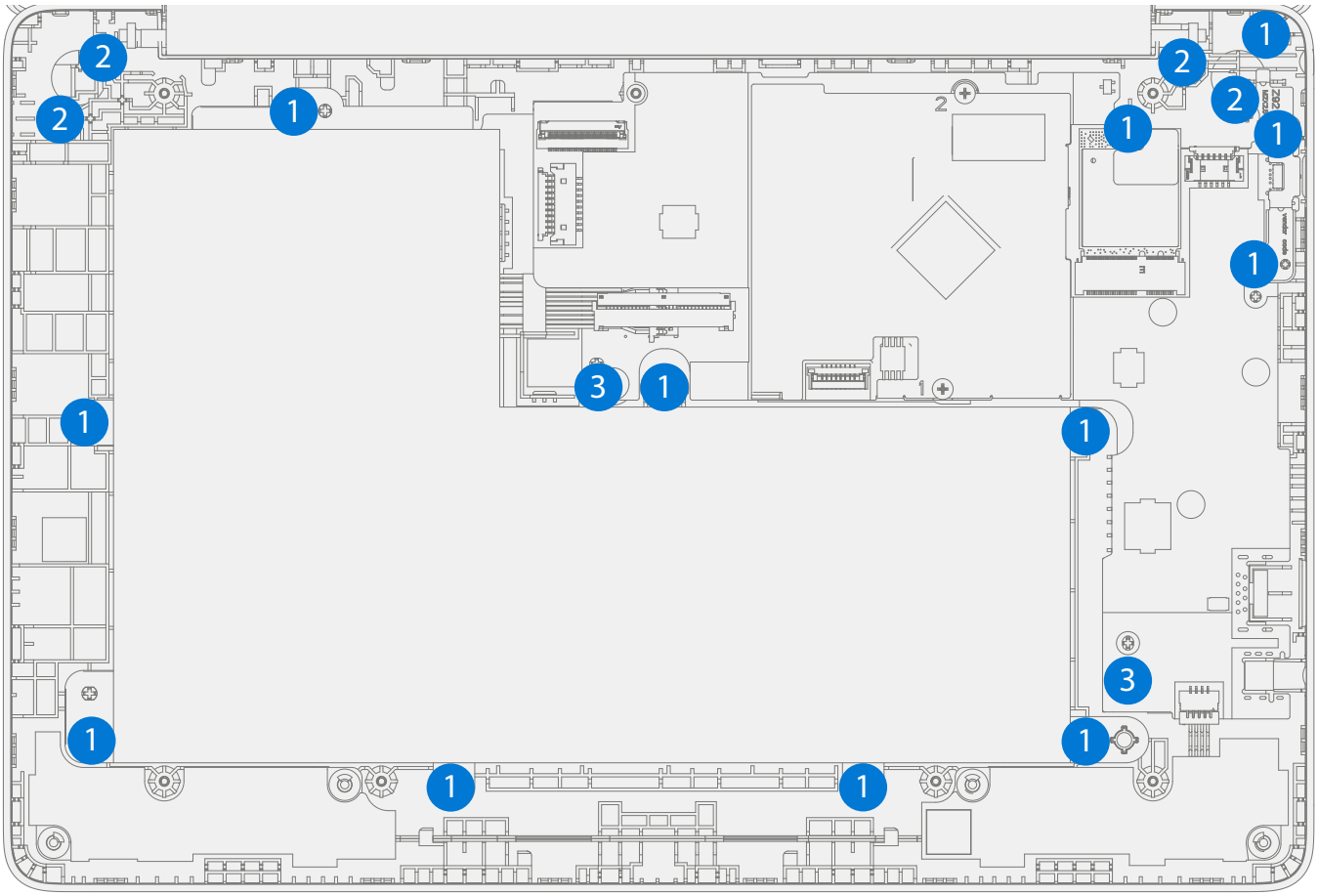


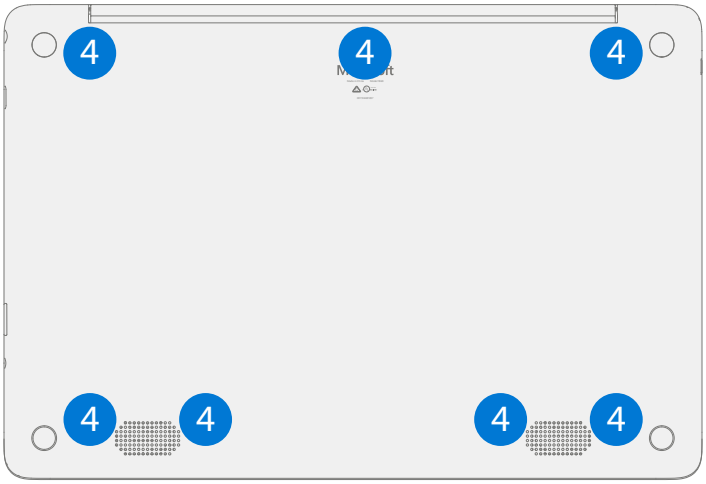
5. **Connect DC Power Cable** – Connect the DC power cable into the PCBA.



6. **Install WiFi Module** – Follow steps for Procedure – Installation (WiFi Module) on (page 39).
7. **Install Speakers** – Follow steps for Procedure – Installation (Speakers) on (page 45).
8. **Install Battery** – Follow steps for Procedure – Installation (Battery) on (page 30).
9. **Install AB-Cover** – Follow steps for Procedure – Installation (AB-Cover Display Assembly) on (page 49).
10. **Install C-cover** – Follow steps for Procedure – Installation (C-Cover Keyboard) on (page 21). Leaving C-Cover screws uninstalled.
11. **Run SDT** – Power on device and connect USB drive with SDT Configuration Files. Run SDT to ensure all device features and functions operate as expected. If no further repairs are required procced to final steps.
12. **Install new C-Cover screws –** Install new MM20065I030 Screws as detailed on (page 23).

Illustrated Screw List





Item	Component	Part No.
(1)	SCREW M2.0*2.5-I (BUWZN) (NYLON PATCH) IRON	MS20025I070
(2)	SCREW M2.5*4.0-I (BUWZN) (NYLON PATCH) IRON	MS25040I060
(3)	SCREW M2*1.5-I (NI) (NYLOK) IRON	MS20015I220
(4)	SCREW M2.0*6.5-I (MATT ZN, NY, D4.5T0.8) STL	MM20065I030

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