XBOX CONTROLLER SAFETY & REPAIR INSTRUCTIONS

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This document and the information it contains are subject to change without notice. You can find the latest information on Xbox device servicing and repair at https://aka.ms/XboxSelfRepair. 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 Xbox devices and accessories using genuine Microsoft parts. It is intended for technically inclined individuals with the knowledge, experience, and 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, <u>DO NOT</u> 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

Glossary of Terms

The following terms are used throughout this guide.

- CRU – Customer Replaceable Units. Service parts that can be removed and replaced by the customer.
- ESD – Electro-Static Discharge
- I/O Board – Input / Output board. Used for button communication to the mainboard.
- IPA – Isopropyl alcohol which should be used to clean adhesive from device as detailed within process steps. Use 70% IPA in all cases.
- Motherboard or PCBA – Primary circuit board assembly
- PSA – Pressure Sensitive Adhesive.
- Spudger – A tool that is used to assist with opening, prying, installing, and removing components from objects such as electronics, usually plastic.

General Information, Precautions, Warnings

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

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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. 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 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 Xbox devices or accessories, see aka.ms/xbox-safety.

Repair-Specific Precautions and Warnings

⚠️ **WARNING** : Before opening a device, ensure it is powered off and disconnected from its power source for at least 30 seconds. 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:

- Connect the controller to a device wirelessly.
- Operate the device in wireless mode until the battery is fully discharged and the device powers off.

- As you remove each subassembly from the device, place the subassembly (and all accompanying screws) away from the work area to prevent damage to the device or to the subassembly.
- During all activities, check to ensure that no loose articles are on the battery or remain inside the device before reassembling it.

Internal Power Supplies

⚠️ **WARNING** : Failure to take the following steps during device repair or component replacement can result in serious personal injury or death from electric shock or in damage to your device.

- For optimum compatibility, performance, and product safety, we recommend using a genuine AC power supply and AC power cord for your Microsoft device.

⚠ Battery Safety

- This device contains either a built-in or removable (cartridge) 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** : Only handle battery by plastic enclosure. Bending, twisting, or impacting battery may damage the battery, damage the device, and/or result in severe personal injury or property damage. Always use two hands when handling the battery.

📝 **IMPORTANT:** Place the battery in a location where it cannot be accidentally contacted or damaged. When replacing the battery dispose of the old battery according to local laws and regulations.

- ⚠ 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 the 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 Safety Label

⚠️ **WARNING** : Only handle battery by plastic enclosure. Bending, twisting, or impacting battery may damage the battery, damage the device, and/or result in severe personal injury or property damage. Always use two hands when handling the battery.

Battery is replaceable by trained personnel; replacement must follow Microsoft procedure
See http://aka.ms/xbox-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)

Follow the safety instructions provided below:

- Battery replacement may be performed by individuals with the knowledge and skills needed to complete complex electronic repairs.
- All repairs must follow Microsoft procedure. See https://aka.ms/xbox-safety for important information.
- Risk of fire or burning.
- 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 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.

Report Battery Thermal Events to Microsoft

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

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

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

Actions To Take
- 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**: <u>DO NOT SHIP DAMAGED OR DEFECTIVE BATTERIES ALONE OR INSIDE DEVICES.</u> Damaged batteries and devices containing damaged batteries require special packaging and handling. See Handling Used, Damaged, or Defective Lithium-Ion Batteries (page 9) for additional information.

Stop Repair and Contact Microsoft

If any Microsoft device visually exhibits any of the following symptoms, cease all further repair efforts and contact Microsoft Xbox 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 Xbox Customer Support will ask you to provide the following information:
  - The model and serial number of the affected Microsoft device and/or accessory(ies).
  - A brief description of the damage found.

- Clear photographs depicting the symptoms observed.

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. Please do not dispose of waste lithium-ion batteries in your household garbage can or recycling bin as they may ignite if improperly managed.

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.

ELITE SERIES 2
XBOX CONTROLLER REPAIR

Table of Contents

Top Case Replacement

& Installation Instructions

Top Case Replacement & Installation Instructions

Required Tools and Components

Tools

- Anti-static wrist strap (1 MOhm resistance)
- Soft ESD (electrostatic discharge) safe mat
- Microfiber / lint free cloth
- Safety glasses
- Plastic pry tool (spudger)
- Dispenser bottle with Isopropyl alcohol (use 91% or greater)
- Cotton swab

Components

- Top Case (Xbox Elite Series 2) (Refer to Illustrated Service Parts List)

Prerequisite Steps

Discharge the battery

For devices with rechargeable lithium-ion batteries that power on, fully discharge the battery before beginning repair. To expedite the battery discharge process:

- Connect the controller to a device wirelessly.
- Operate the device in wireless mode until the battery is fully discharged and the device powers off.

Procedure – Removing the Top Case

> **NOTE:** Remove all removable paddles, D-pad, and Thumb stick caps before starting disassembly.

> **NOTE:** If any plastic snaps are damaged during removal of the Top Case, the Top Case must be replaced.

1. **Separate Top Case**

   Using a plastic pry tool, insert the edge between the parting line at the top of the controller, between the top and bottom cases. Press in gently until the snap releases. Work around the edge of the device, while slowly wiggling it up and down to release the rest of the snaps. Perform this around the entire controller and be sure to take your time.

2. Remove Top Case

After releasing all snaps, work your way around the device, slowly pulling the Top Case off the device. Note that the two PSA strips on the underside of the Top Case will cause some resistance when removing the part. Make sure you take your time to prevent damage and pull away to reduce any injury.

3. Remove PSA

If you're reusing the Top Case, we recommend peeling off the PSA off with a pair of tweezers. Clean any residue with isopropyl alcohol and a cotton swab to ensure a clean surface for new application.

Procedure – Installation (Top Case, Xbox Elite Series 2 Controller)

1. Install PSA

If you are reusing the Top Case, apply the four strips of PSA inside the inner part of the top case of the controller. You should see upon the removal where the previous PSA strips were at.

2. Install Top Case

When installing the new Top Case, align with the D-pad and thumb stick openings and simply press down onto the device, working around the edge to lock all snaps into place. There should not be any gaps or openings around the seam of the device once you are complete.

Mid-Frame Separation Process

Mid-Frame Separation Process

Required Tools and Components

Tools

- TR8 (Torx Security) driver
- Anti-static wrist strap (1 MOhm resistance)
- Soft ESD safe mat
- Microfiber / lint free cloth
- Plastic pry tool (spudger)
- Plastic tweezers
- Pliers (Elite Only)

Components

- Mid-Frame (Refer to Illustrated Service Parts List)
- Mid-Frame Screw (PN) Qty. 6, (Elite Only)

Prerequisite Steps

Discharge the battery

For devices with rechargeable lithium-ion batteries that power on, fully discharge the battery before beginning repair. To expedite the battery discharge process:

- Connect the controller to a device wirelessly.
- Operate the device in wireless mode until the battery is fully discharged and the device powers off.

Remove Top Case

Remove the top case as detailed in the Procedure – Removal (Top Case) for the appropriate device. ()

Procedure – Removal (Mid-frame)

1. Remove Screws

Using a TR8 (Torx Security) driver remove the 6 screws securing the back case to the mid-frame. Note that there is one screw under the tamper evidence sticker.

2. Separate Mid-Frame

Carefully lift out the mid-frame, separating it from the back case.
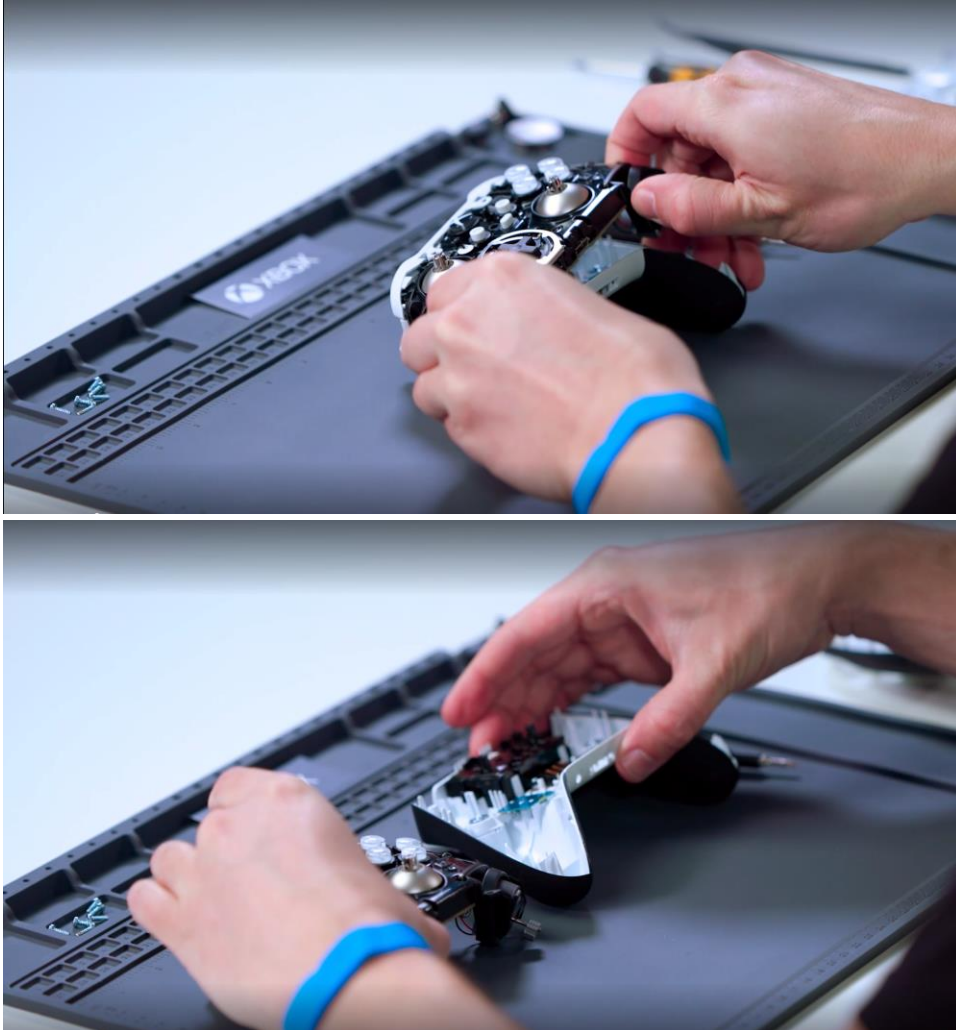
Procedure – Installation (Mid-frame)

1. **Install Mid-Frame**

   Ensure the trigger stops on the back case are set to the upper-most (full stroke) position.
   Pull the triggers halfway and lower the mid-frame onto the back case, ensuring no wires
   are pinched between the mid-frame and the back case. Verify that LT and RT function
   normally before proceeding.

2. Install Screws

Using a TR8 (Torx Security) driver, install the 6 screws securing the back case to the mid-frame. Turn each screw until finger tight, then turn another 1/8 turn (45-degrees), or until fully fastened.

3. Install Top Case

Install the top case as detailed in the Procedure – Installation (Top Case) for the appropriate device. (page 14)

Bumper Replacement Process

Bumper Replacement Process

Preliminary Requirements

Required Tools and Components

Tools

- Anti-static wrist strap (1 MOhm resistance)
- Soft ESD (electrostatic discharge) safe mat
- Microfiber / lint free cloth
- Plastic pry tool (spudger)
- Plastic tweezers

Components
- Bumper (Refer to Illustrated Service Parts List)

Prerequisite Steps

Discharge the battery

For devices with rechargeable lithium-ion batteries that power on, fully discharge the battery before beginning repair. To expedite the battery discharge process:
- Connect the controller to a device wirelessly.
- Operate the device in wireless mode until the battery is fully discharged and the device powers off.

Remove Top Case

Remove the top case as detailed in the Procedure – Removal (Top Case) for the appropriate device. (page 14)

Remove Mid-Frame

Remove the mid-frame as detailed in the Procedure – Removal (Mid-Frame) (page 20)

Procedure – Removal (Bumper)

1. **Remove Top Cap**

   Using a plastic pry tool, pry the top cap tabs up and off the locking posts on the mid-frame. Then slowly twist the cap off the top of the mid-frame.

2. **Unhook Bumper Clips**

   Using the pointed end of a plastic pry tool, unhook the edge clips on the right and left of the bumper.

   (i) **NOTE:** The clips on the bumper are fragile. Be careful not to push too hard/far or you could snap the clips.

3. Remove Bumper

Gently lift the bumper off the controller.

Procedure – Installation

1. Install Bumper Cap

Gently place the bumper on the controller, making sure that the inner posts slot into the controller, not over the mid-frame.

2. Hook Bumper Clips

Using a plastic pry tool, hook the left and right edge clips of the bumper to the mid-frame.

3. Install Top cap

Hook the bottom of the top cap to the bottom of the mid-frame and rotate into place. Using a plastic pry tool, pry the top cap tabs up and onto the locking posts on the mid-frame.

4. Verification

Verify that LB and RB buttons click normally before proceeding.

5. Install Mid-frame

Install the mid-frame as detailed in the Procedure – Installation (Mid-frame)

6. Install Top Case

Install the top case as detailed in the Procedure – Installation (Top Case)

Battery Replacement Process

Battery Replacement Process

Preliminary Requirements

Required Tools and Components

Tools

- T6 (Torx) driver
- Anti-static wrist strap (1 MOhm resistance)
- Soft ESD safe mat
- Microfiber / lint free cloth
- Gloves
- Safety glasses
- Bucket of sand (1 gallon)
- Clean, dry, untreated sand (0.5 gallons)
- Cotton swab
- Plastic pry tool (spudger)
- Plastic tweezers

Components
- Bumper (Refer to Illustrated Service Parts List)
- Battery Lid Screw (PN) Qty. 4

Prerequisite Steps

Discharge the battery

For devices with rechargeable lithium-ion batteries that power on, fully discharge the battery before beginning repair. To expedite the battery discharge process:
- Connect the controller to a device wirelessly.
- Operate the device in wireless mode until the battery is fully discharged and the device powers off.

Remove Top Case

Remove the top case as detailed in the Procedure – Removal (Top Case) for the appropriate device. (page 14)

Remove Mid-Frame

Remove the mid-frame as detailed in the Procedure – Removal (Mid-Frame)

Procedure – Removal (Battery)

> (i) **REMINDER:** Please read the Battery Safety warnings located in the Safety Instructions at the beginning prior to getting started.

1. Remove Battery Lid

Use a T6 (Torx) driver to remove the 4 screws from the battery lid. Lift lid out of back case.

2. Remove Contact Pins

Using your fingers, remove the battery contact pins from the back cover.
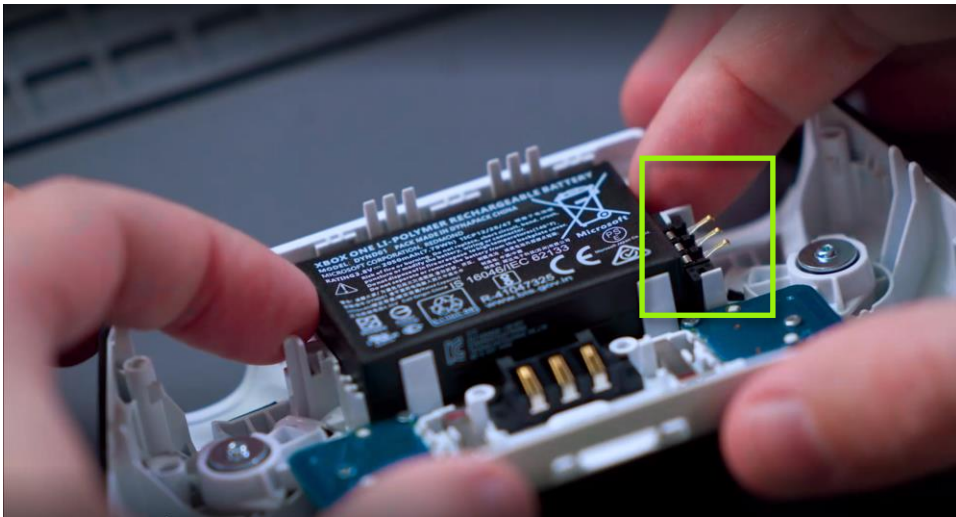
3. Lift out the battery

Gently lift the battery out of the well by pressing on the side of the battery and lifting. Set battery on a clean, flat surface.

> ⚠ **WARNING** : Only handle battery by the plastic enclosure. There is no plastic frame on the top of the battery to protect the battery cells from damage. Bending, twisting, or impacting battery may damage the battery, damage the device, and/or result in severe personal injury or property damage. Always use two hands when handling the battery. Do not press on the top of the battery (the side with text). There is no plastic frame on the top of the battery to protect the battery cells from damage.

> 📝 **IMPORTANT:** Place the battery in a location where it cannot be accidentally contacted or damaged. When replacing the battery dispose of the old battery according to local laws and regulations.
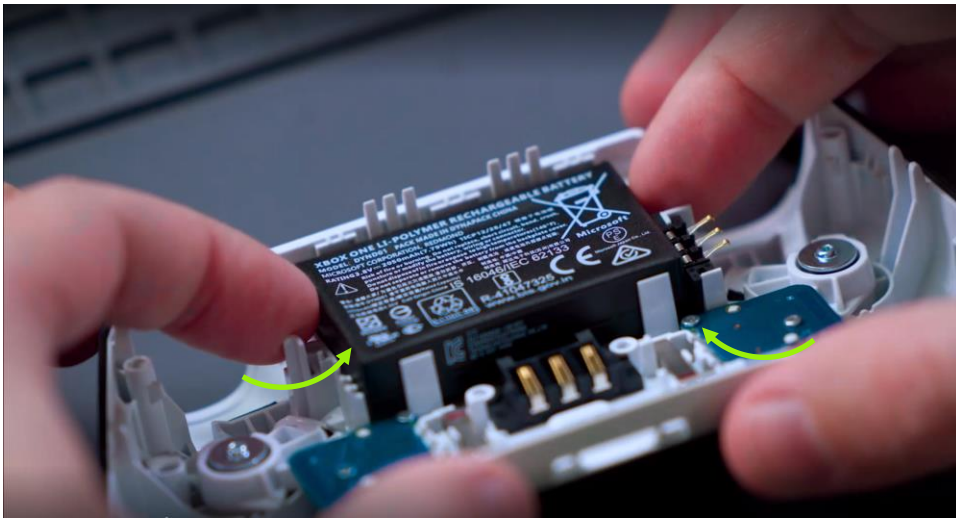
Procedure – Installation (Battery)

> 📝 **IMPORTANT:** Do not reuse the old battery when performing repairs. Always use a new battery when the old battery has been removed from the device.

Pre-Installation Device Inspection

Check the chassis for any loose articles that may be present.

- Verify all removed screws are accounted for and have not been misplaced inside the device

Insert New Battery

Check area under battery and battery lid for any loose screws/debris before installing new battery into the chassis. Carefully install the new battery into the device ensuring the battery is sitting to the far left of the battery compartment.

> ⚠CAUTION : If battery is dented or punctured during installation, discard the battery, and use a new battery pack.

> ⚠ WARNING : Only handle battery by plastic enclosure. There is no plastic frame on the top of the battery to protect the battery cells from damage. Bending, twisting, or impacting battery may damage the battery, damage the device, and/or result in severe personal injury or property damage. Always use two hands when handling the battery. In case of battery event submerge entire device in prepared bucket of sand. Do not attempt to pick up device.

1. Install Battery & Contact Pins

Inspect the battery contact pins for any bent pins or damage before installing. By hand, install the battery and then the pins in the right side of the battery compartment. Ensure that the slots on the contact pins align with the slots on the back case.

2. Install Battery Lid

Place battery lid over battery. Use a T6 (Torx) driver to install the 4 screws in the battery lid. Turn screws until finger tight then tighten by an additional 1/8 turn (45-degrees) or until fully fastened.
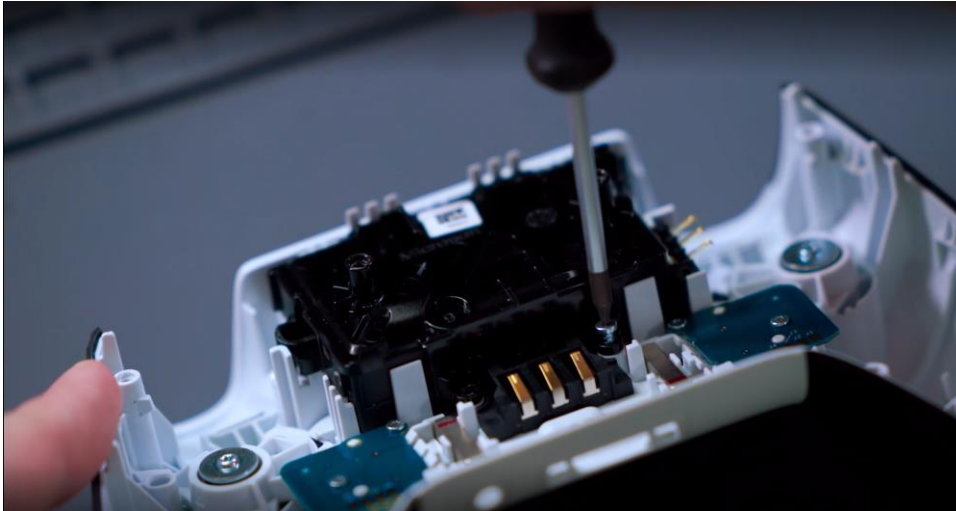
3. Install Mid-Frame

Install the mid-frame as detailed in the Procedure – Installation (Mid-frame) (page 20)

4. Install Top Case

Install the top case as detailed in the Procedure – Installation (Top Case) for the appropriate device. (page 14)

5. New Battery Charging

New batteries are shipped and stored at low states of charge in compliance with shipping regulations. They should be charged up 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 the device right-side up. Connect the power supply, and power it on.

Mainboard Replacement Process

Mainboard Replacement Process

Preliminary Requirements

Required Tools and Components

Tools

- T6 (Torx) driver
- Anti-static wrist strap (1 MOhm resistance)
- Soft ESD safe mat
- Microfiber / lint free cloth
- Cotton swab
- Plastic pry tool (spudger)
- Plastic tweezers

Components

- Mainboard (Refer to Illustrated Service Parts List)
- Mainboard Screw (PN) Qty. 2
- Trigger Screw (PN) Qty. 2

Prerequisite Steps

Discharge the battery

For devices with rechargeable lithium-ion batteries that power on, fully discharge the battery before beginning repair. To expedite the battery discharge process:
- Connect the controller to a device wirelessly.
- Operate the device in wireless mode until the battery is fully discharged and the device powers off.

Remove Top Case

Remove the top case as detailed in the Procedure – Removal (Top Case) for the appropriate device. (page 14)

Remove Mid-Frame

Remove the mid-frame as detailed in the Procedure – Removal (Mid-Frame) (page 20)

Remove Bumper

Remove the bumper as detailed in the Procedure – Removal (Bumper)

Procedure – Removal (Mainboard)

1. Position Device

Place midframe thumb stick down on ESD-safe surface.

2. Remove Antennas

Using a plastic pry tool disconnect the two coax antennas from the mainboard.

> ⓘ **NOTE:** The wires and pads on the mainboard are fragile. Take caution not to break pads from the mainboard.
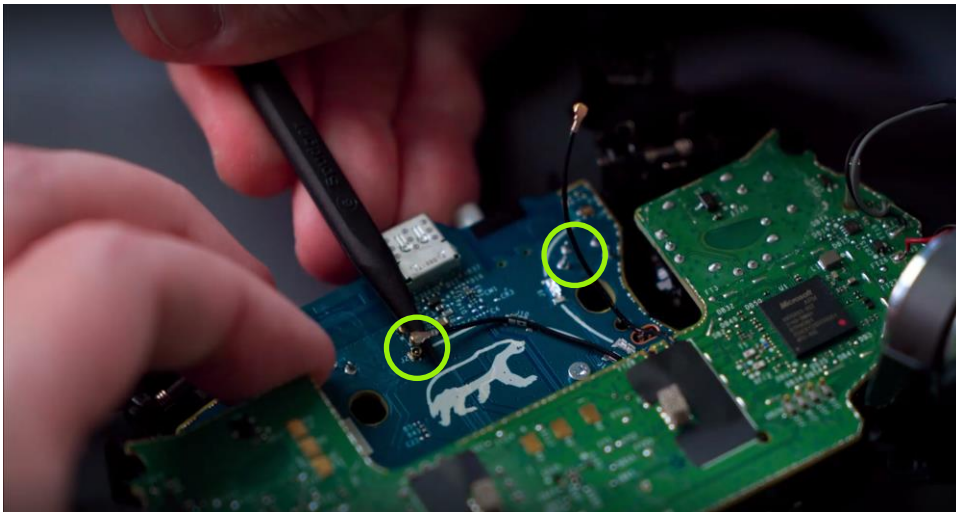
3. Remove Trigger Screw

Using a T6 (Torx) driver remove 1 screw from the left and right trigger.
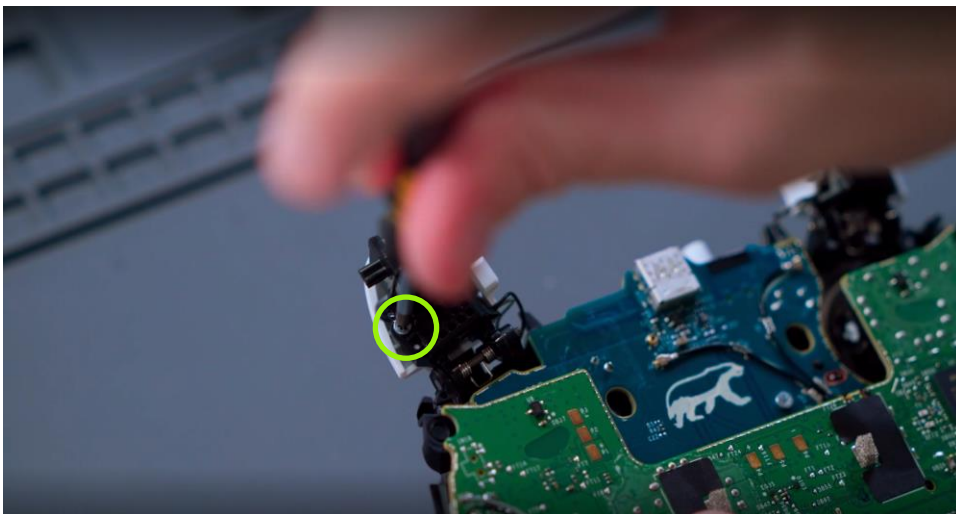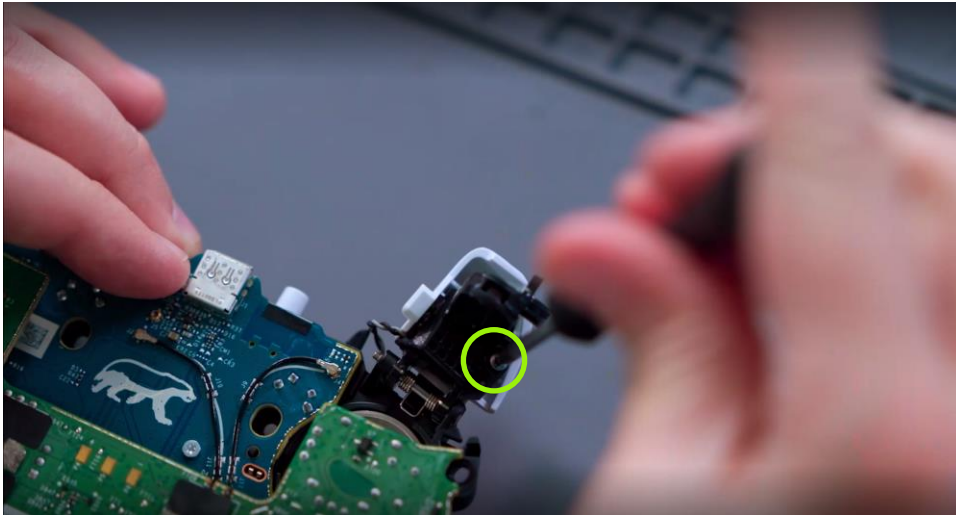
4. Remove Caps

Press the cap on the opposite side of the catch, shown below, and rotate off trigger.

5. Remove Trigger Motors

Gently remove the trigger rumble motors from the housing.

> (i) **NOTE:** The motors are soldered to the main board. This solder connection is very fragile at both the motor and board ends. Take care not to damage the soldered connection

6. Remove Wires

De-route the wires that go from the trigger caps, over the mid-frame, and to the mainboard.
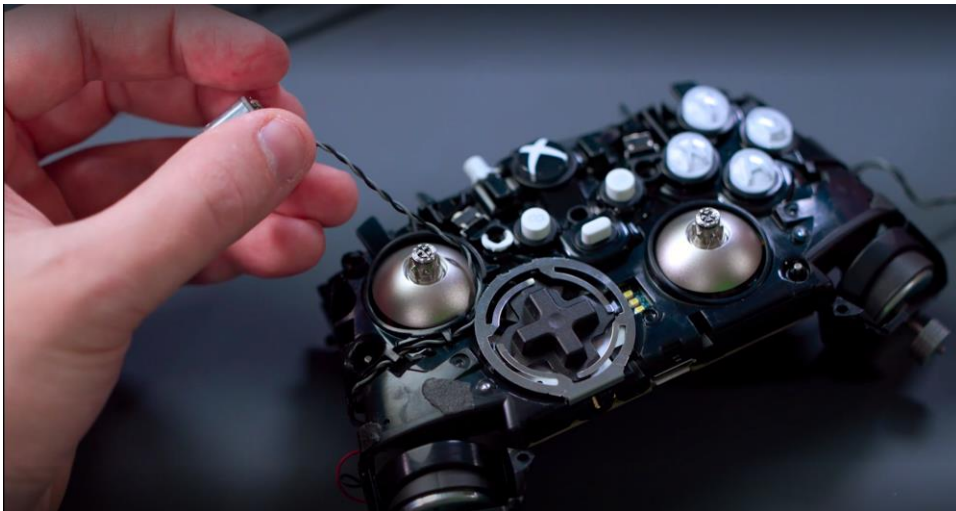
7. Remove Palm Motors

Remove the palm motors from the mid-frame using a plastic pry tool to gently pry the retention clip back while pushing up on motor from the bottom.

(i) **NOTE:** The motors are soldered to the mainboard. This solder connection is very fragile at both the motor and board ends. Take care not to damage the soldered connections.

8. Remove Thumb Stick Caps

Secure device in one hand and grip thumb stick cap around the base with pliers. Turn plier counterclockwise to unscrew thumb stick cap. If you wish to not use tools, you can also connect your thumbstick cap and twist counterclockwise to remove. Repeat for other thumb stick cap.

9. Remove Screws

Using a T6 (Torx) driver remove the two marked screws that secure the mainboard to the mid-frame.
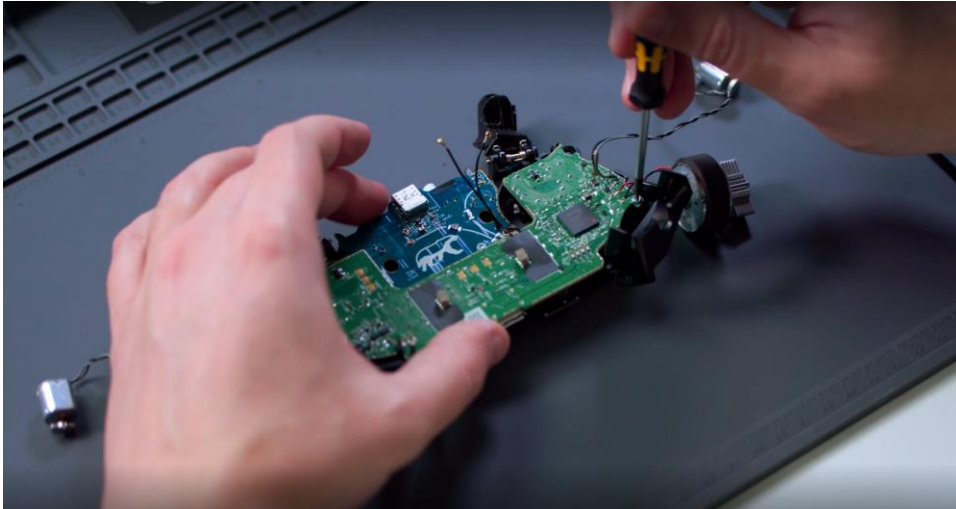
10. Lift Out Mainboard

Lift the mainboard out of the mid-frame, taking care not to damage the soldered connections to the motors.

> 📝 **IMPORTANT:** The mainboard is connected to the I/O board via a connector on the underside of the board. Light force may be required to separate the boards.

> ⓘ **NOTE:** The audio jack module is wedged between the mainboard and I/O board. It will fall out after removing the mainboard.

Procedure – Installation (Mainboard)

1. Install Audio Jack

Place audio jack on the I/O board as shown below.

2. Install Mainboard

Align locating holes on mainboard with locating posts in the mid-frame. Taking care not to damage the soldered connections to the motors and to align the connectors properly, lower the mainboard into place and pressing firmly to mate the connectors.
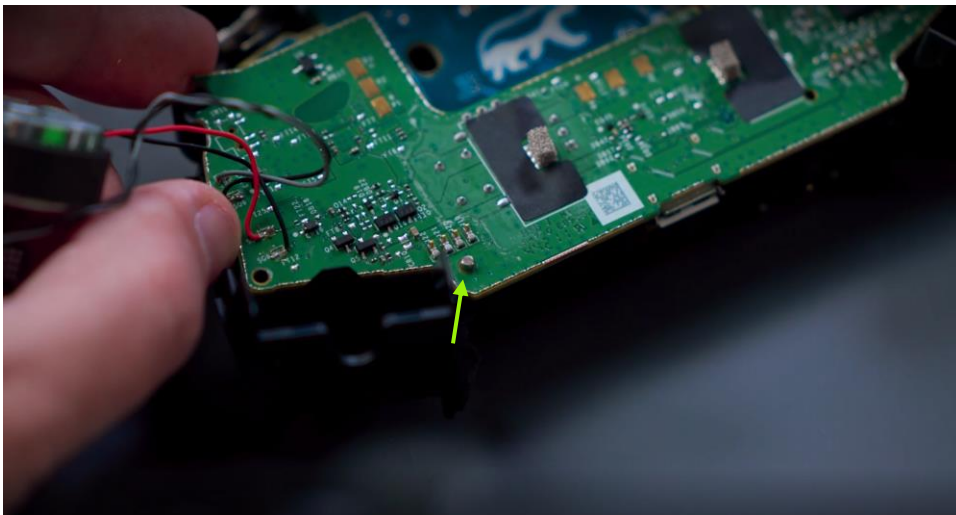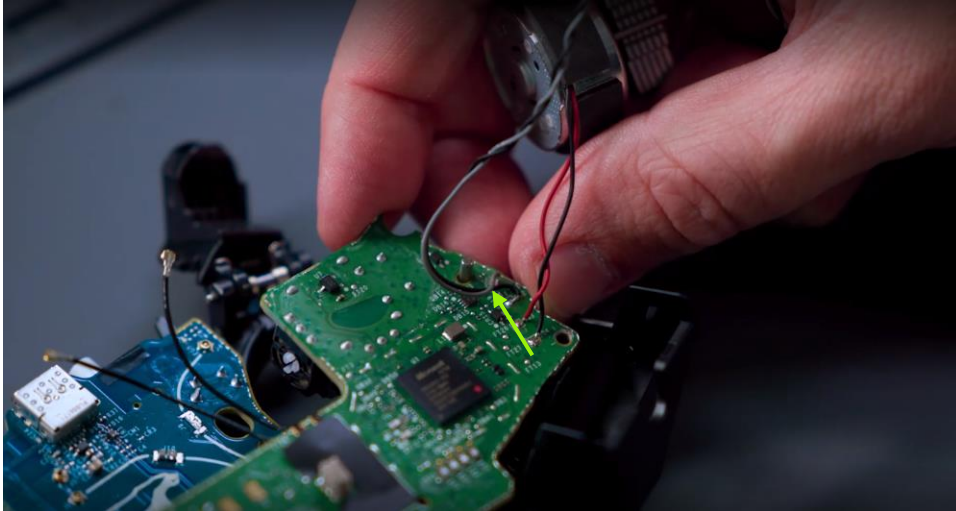
3. Install Screws

Using a T6 (Torx) driver install the two marked screws that secure the mainboard to the mid-frame. Turn screws until finger tight then tighten by an additional 1/8 turn (45-degrees) or until fully fastened.
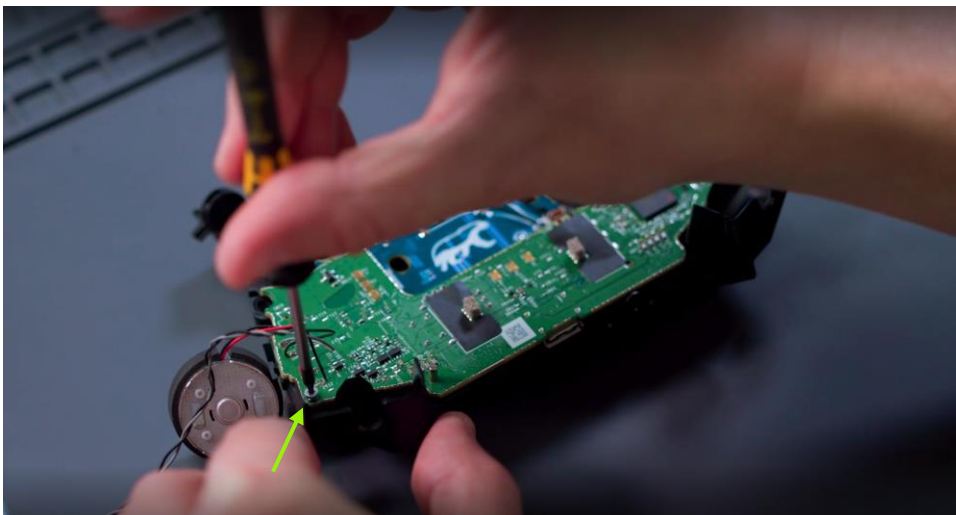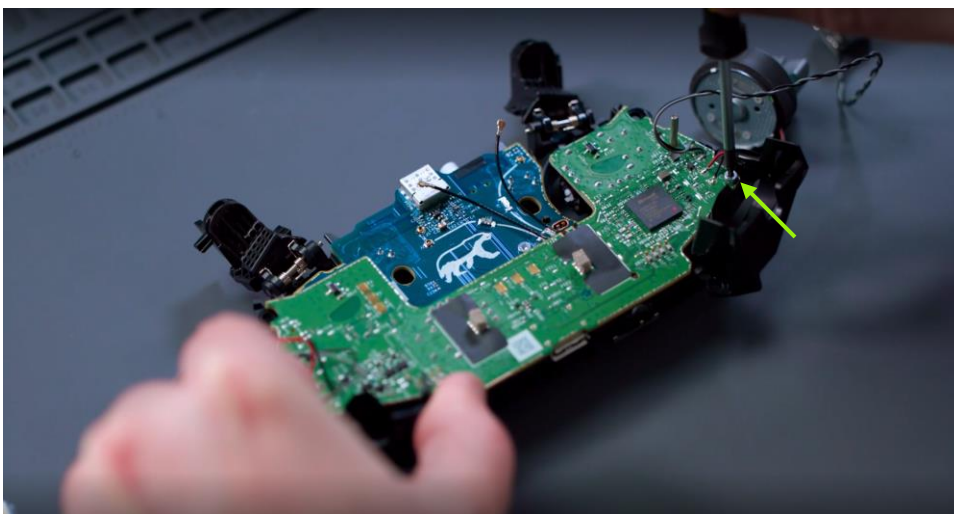
4. Install Palm Motors

Gently press each palm rumble motor into the mid-frame. A plastic pry tool may be required to gently bend the retention clip back.

ⓘ **NOTE:** The motors are soldered to the main board. This solder connection is very fragile at both the motor and board ends. Take care not to damage the soldered connection.

5. Route Wires

Repeating in reverse step 6 of the removal instructions, reroute the trigger motor wires through the side clip, and through the mid-frame retention tabs up to the triggers.

📝 **IMPORTANT:** Leave about 1 in. (25mm) of wire on the mainboard portion of the wire route to ensure wire length at the triggers is short enough to not be pinched at a later step.

6. Install Trigger Motors

Install the trigger motors in the housing, with wires facing towards the center of the mid-frame.

ⓘ **NOTE:** The motors are soldered to the main PCBA. This solder connection is very fragile at both the motor and PCBA ends. Take care not to damage the soldered connection.
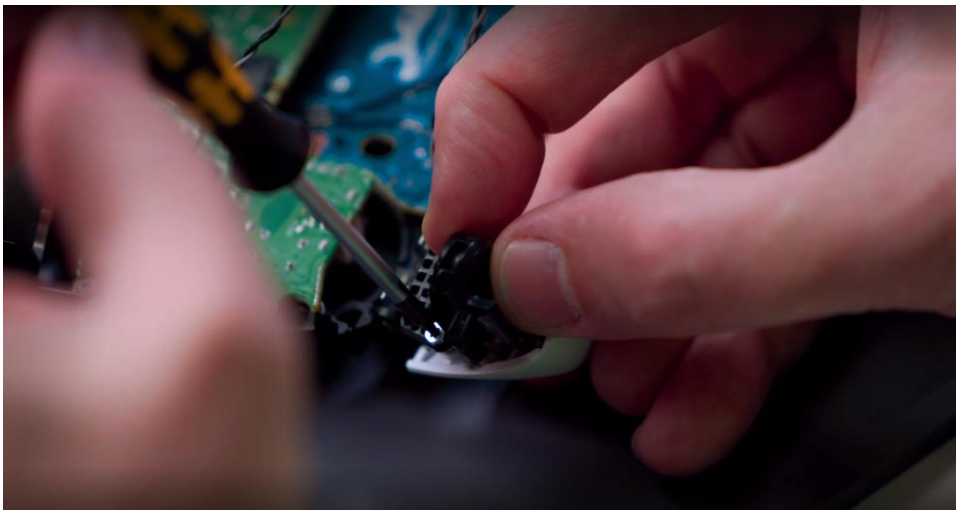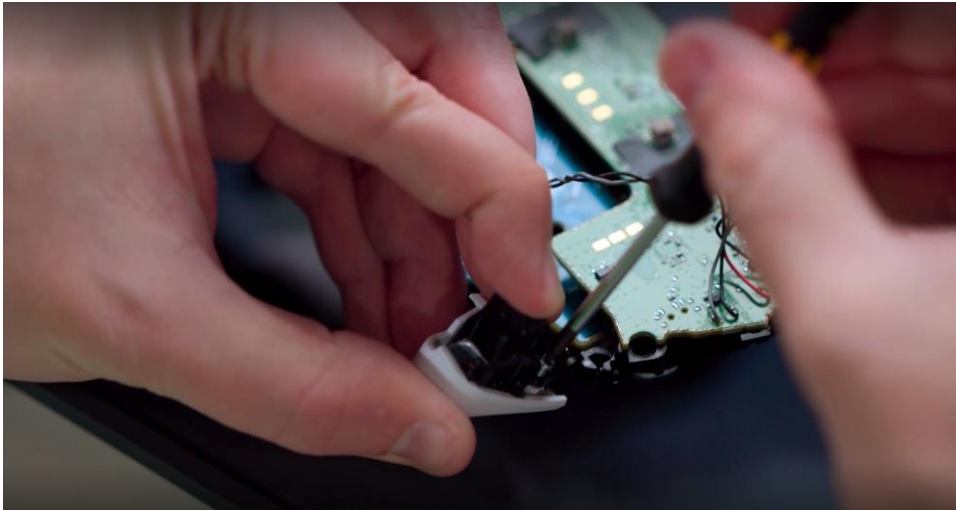
7. Install Caps

Slide tab on motor housing into opening on the side of the cap. Rotate cap into position, ensuring posts on cap align with holes on the trigger housing.

8. Install Screws

Using a T6 (Torx) driver install 1 screw in the left and right trigger. Turn screws until finger tight then tighten by an additional 1/8 turn (45-degrees) or until fully fastened.
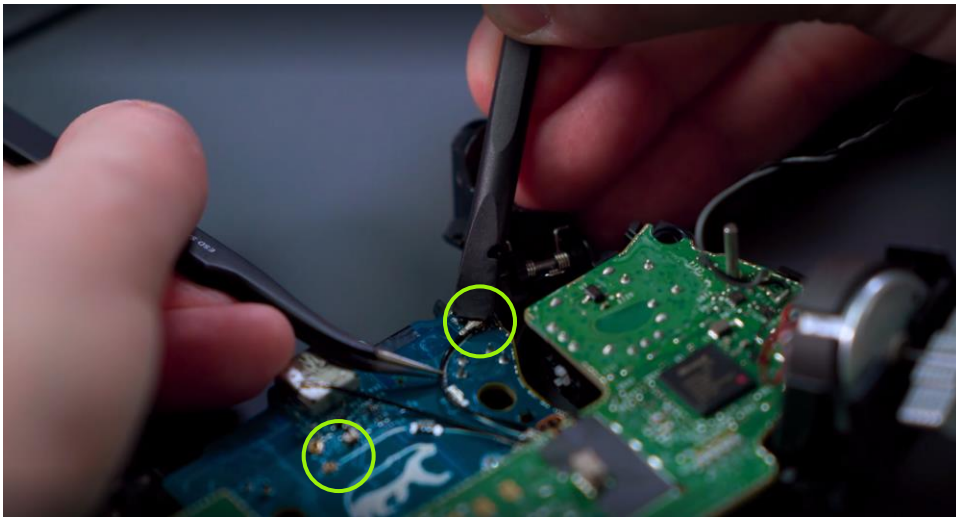
9. Install Antennas

Position the left antenna on the left connector on the mainboard and press down to connect. Repeat this process for the right antenna.

> ⓘ **NOTE:** The wires and pads on the mainboard are fragile. Take caution not to break the pads from the mainboard.

10. Install D-Pad

Install D Pad back on the mid frame if the retaining clip has been taken off. If not, proceed to step 11.

11. Install Mid-frame

Install the mid-frame as detailed in the Procedure – Installation (Mid-frame) (page 20)

12. Install Top Case

Install the top case as detailed in the Procedure – Installation (Top Case) (page 14)

I/O Board Replacement Process

I/O Board Replacement Process

Preliminary Requirements

Required Tools and Components

Tools

- T6 (Torx) driver
- Anti-static wrist strap (1 MOhm resistance)
- Soft ESD safe mat
- Microfiber / lint free cloth

Components

- I/O Board (Refer to Illustrated Service Parts List)
- I/O Board Screw (PN) Qty. 4

Prerequisite Steps

Discharge the battery

For devices with rechargeable lithium-ion batteries that power on, fully discharge the battery before beginning repair. To expedite the battery discharge process:

- Connect the controller to a device wirelessly.
- Operate the device in wireless mode until the battery is fully discharged and the device powers off.

Remove Top Case

Remove the top case as detailed in the Procedure – Removal (Top Case) for the appropriate device.

Remove Mid-Frame

Remove the mid-frame as detailed in the Procedure – Removal (Mid-Frame)

Remove Mainboard

Remove the mainboard as detailed in the Procedure – Removal (Mainboard)

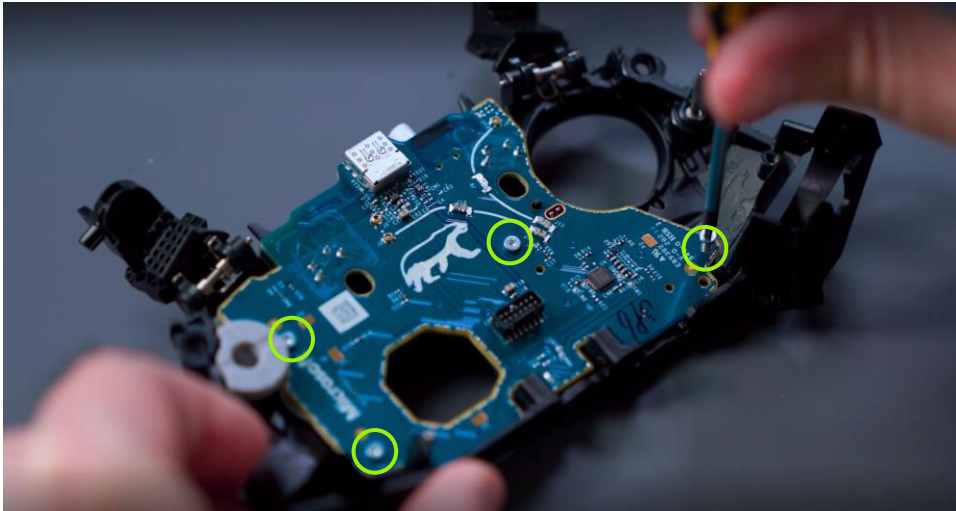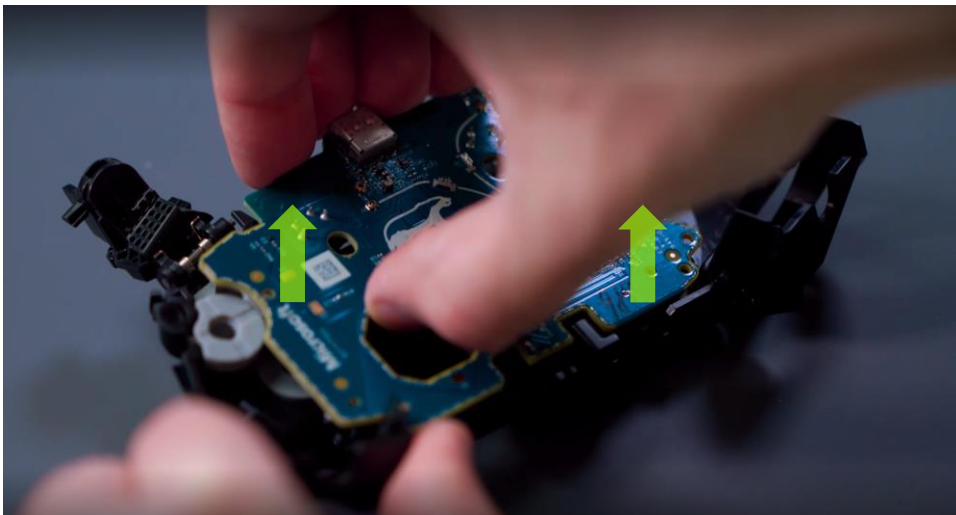# Procedure – Removal (I/O Board)

1. ## Remove Screws

   Using a T6 (Torx) driver remove the 4 screws securing the I/O board to the mid-frame.

2. ## Remove I/O Board

   Lift the I/O board out of the mid-frame.
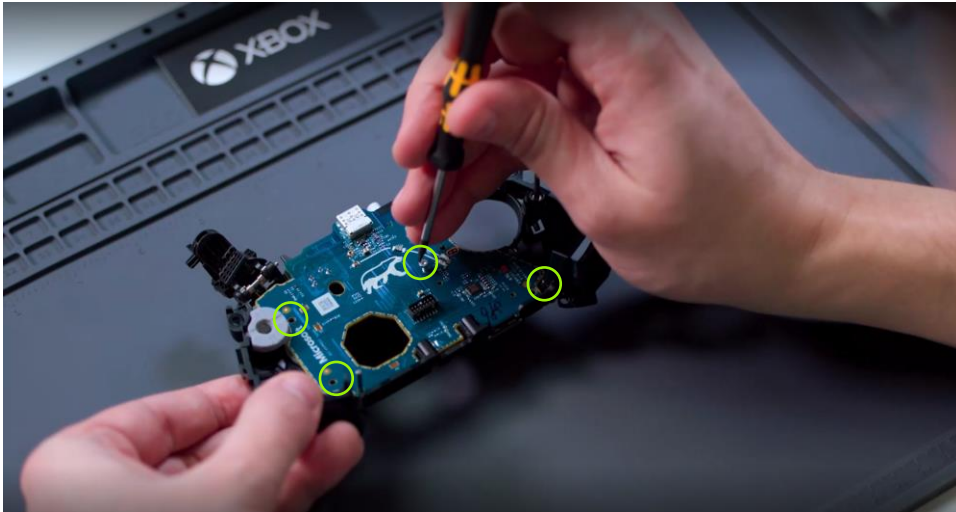

Procedure – Installation (I/O Board)

1. ## Insert I/O Board

Place the I/O board in the mid frame.

2. Install Screws

Using a T6 (Torx) driver install the 4 screws securing the I/O board to the mid-frame. Turn each screw until finger tight then tighten by an additional 1/8 turn (45-degrees) or until fully fastened.

3. Install Mainboard

Install the Mainboard as detailed in the Procedure – Installation (Mainboard)

4. Install Mid-frame

Install the mid-frame as detailed in the Procedure – Installation (Mid-frame)

5. Install Top Case

Install the top case as detailed in the Procedure – Installation (Top Case)

Button Replacement Process

Required Tools and Components

Tools

- Anti-static wrist strap (1 MOhm resistance)
- Soft ESD safe mat
- Plastic tweezers

Components

- ABXY Buttons (Refer to Illustrated Service Parts List)

Prerequisite Steps

Discharge the battery

For devices with rechargeable lithium-ion batteries that power on, fully discharge the battery before beginning repair. To expedite the battery discharge process:

- Connect the controller to a device wirelessly.
- Operate the device in wireless mode until the battery is fully discharged and the device powers off.

Remove Top Case

Remove the top case as detailed in the Procedure – Removal (Top Case) for the appropriate device. (page 14)

Remove Mid-Frame

Remove the mid-frame as detailed in the Procedure – Removal (Mid-Frame) (page 20)

Remove Bumper

Remove the Bumpers as detailed in the Procedure – Removal (Bumpers) (page 26)

Remove Mainboard

Remove the mainboard as detailed in the Procedure – Removal (Mainboard) (page 39)
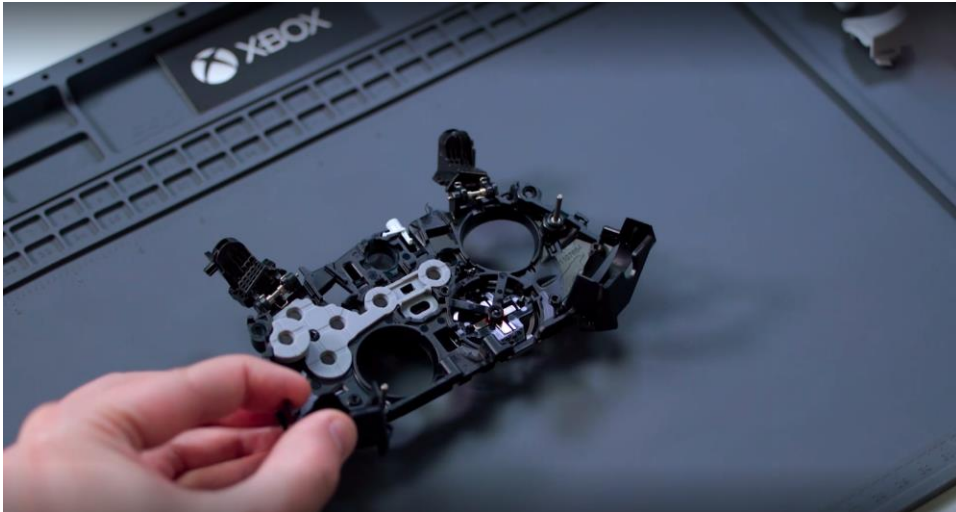
Remove I/O Board

Remove the I/O board as detailed in the Procedure – Removal (I/O board) (page 55)

Procedure – Removal (Buttons)

1. Remove Keypad

Lift keypad from the mid-frame.

2. Remove Buttons

Turn mid-frame over and allow buttons to fall out of mid-frame.

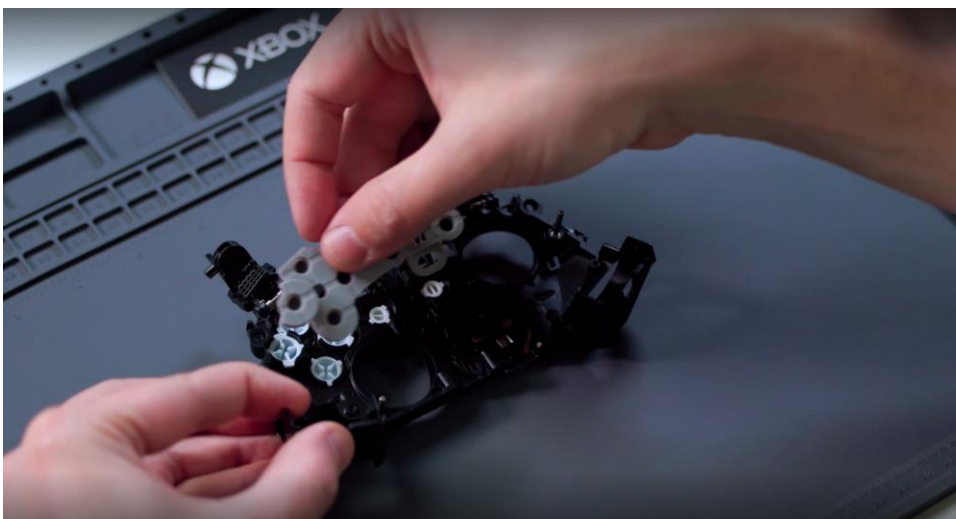## Procedure – Installation (Buttons)

1. **Install Buttons**

   Insert buttons into the mid-frame making sure the alignment posts align with the slots in the mid-frame.

   > 📝 **IMPORTANT:** Buttons are keyed and cannot be inserted into the incorrect position.

2. **Install Keypad**

   Install the keypad into the mid-frame, making sure that the keypad aligns with the buttons.

3. Install I/O Board

Install the I/O Board as detailed in the Procedure – Installation (I/O Board)

4. Install Mainboard

Install the Mainboard as detailed in the Procedure – Installation (Mainboard)

5. Install Bumper

Install the Bumpers as detailed in the Procedure – Installation (Bumpers)

6. Install Mid-frame

Install the mid-frame as detailed in the Procedure – Installation (Mid-frame)

7. Install Top Case

Install the top case as detailed in the Procedure – Installation (Top Case)