Pixel 9 Recycling Guide

Version 1.0

Environmental sustainability at Google

At Google, operating in an environmentally sustainable way has been a core value from our beginning.

As our business has evolved to include the manufacturing of electronic products, we've continually expanded our efforts to improve each product's environmental performance and minimize Google's impact on the world around us.

This report details how recyclers can disassemble the Pixel 9 to recover raw materials.

To provide feedback or for questions about this guide, please email Recycling@Google.com.

Who is this Guide for?

This guide is intended for professional recyclers who are trained in electronics recycling and understand the risks involved with doing so. This recycling guide is not intended in any way to serve as repair instructions.

Please follow all relevant local-federal regulations and applicable international standards for electronic recycling as you follow this guide.

Table of Contents

Directive 2012/19/EU Annex VII Components Requiring Selective Treatment

The Google Pixel smartphone contains the following materials and components as listed in Annex VII in the European Union WEEE (recast) Directive 2012/19/EU.

Substance or Component	Location	Removal Instructions
Display & Cover Glass Cover glass and organic light-emitting diode (OLED) display if the surface is greater than 100 cm^2	**Main Display**	Step 8
PCB Printed circuit board if the surface area is greater than 10 cm^2	**Main Logic Board** This device employs a mid-frame architecture. MLB is located within the device enclosure and can be accessed through the back cover.	Steps 1 - 11
PCB Printed circuit board if the surface area is greater than 10 cm^2	**OLED FPC** Organic light-emitting diode flexible printed circuit	Step 15 - 16
Battery	**Battery** Battery is located within the device enclosure and can be accessed through the back cover.	Steps 1 - 7
Charger External electric cables	**Charge Cable** External charging cable is removable.	Step 1

Give Your Device New Life

Before you recycle this device to recover materials, please consider whether the useful lifespan of this device can be extended in other ways.

Repair your device

Link

Trade-In your device

Link

Sell your device

Link

Google Mail-In Take-Back Program

Link

Recycle Properly

Again, this guide is intended for technicians and operators who are trained in electronics recycling and understand the risks involved with electronic recycling.

If you are not trained, equipped and capable of properly recycling this device, please use Google's complementary take back program.

Personal Safety

Operators should always wear personal protective equipment (PPE) including protection from thermal events, fires and hazardous materials.

- Hand protection
- Protective Clothing
- Eye protection
- Burn Protection
- Breathing protection
- HazMat Protection

Environmental Health & Safety

Operate in a safe, well-ventilated environment. Follow safety and ergonomic best practices. Outfit your workspace with fire and hazardous material mitigation equipment.[1]

- Ergonomics
- Fire Equipment
- Ventilation
- HazMat Equipment
- Training

⚠ Always remember to ensure strict compliance with all local applicable health and safety rules.

Battery Safety

Improper disassembly can be dangerous—especially if individuals are unfamiliar with safety critical components, such as lithium ion batteries.

Discharge Battery

Do not inhale hazardous fumes

Do not damage battery

Be fully prepared for thermal runaway

Other Battery Handling Tips

Battery must be carefully handled, and can be dangerous when damaged.

- Fully discharge device battery before attempting disassembly.
- Never bend, dent or puncture battery.
- Do not use tools that may accidentally damage battery.
- Store batteries in a safe environment to prevent inadvertent damage.
- Take care not to store large quantities of batteries together.
- Take care to prevent shorting of battery terminals.
- If a battery begins to vent or a thermal runaway occurs, immediately cover in sand or use gloves and tongs to place battery in a fire safe.

Battery Transport and Storage Safety

Follow regulations and best practices for lithium-ion battery safety.

Here are some resources that may help recyclers.

Topic	Resource
Damaged, Defective or Recalled (DDR) lithium cell batteries Learn how to identify a lithium cell battery that may be swollen, damaged, defective or recalled. Follow all Department of Transportation guidelines. This QR code links to a PDF file from the United States Department of Transportation entitled “Understanding the Risks of Damaged, Defective or Recalled (DDR) Lithium Batteries”	Link
Transporting Lithium Batteries This QR code links to a webpage from the United States Department of Transportation entitled “Transporting Lithium Batteries”	Link

Device Specific Warnings

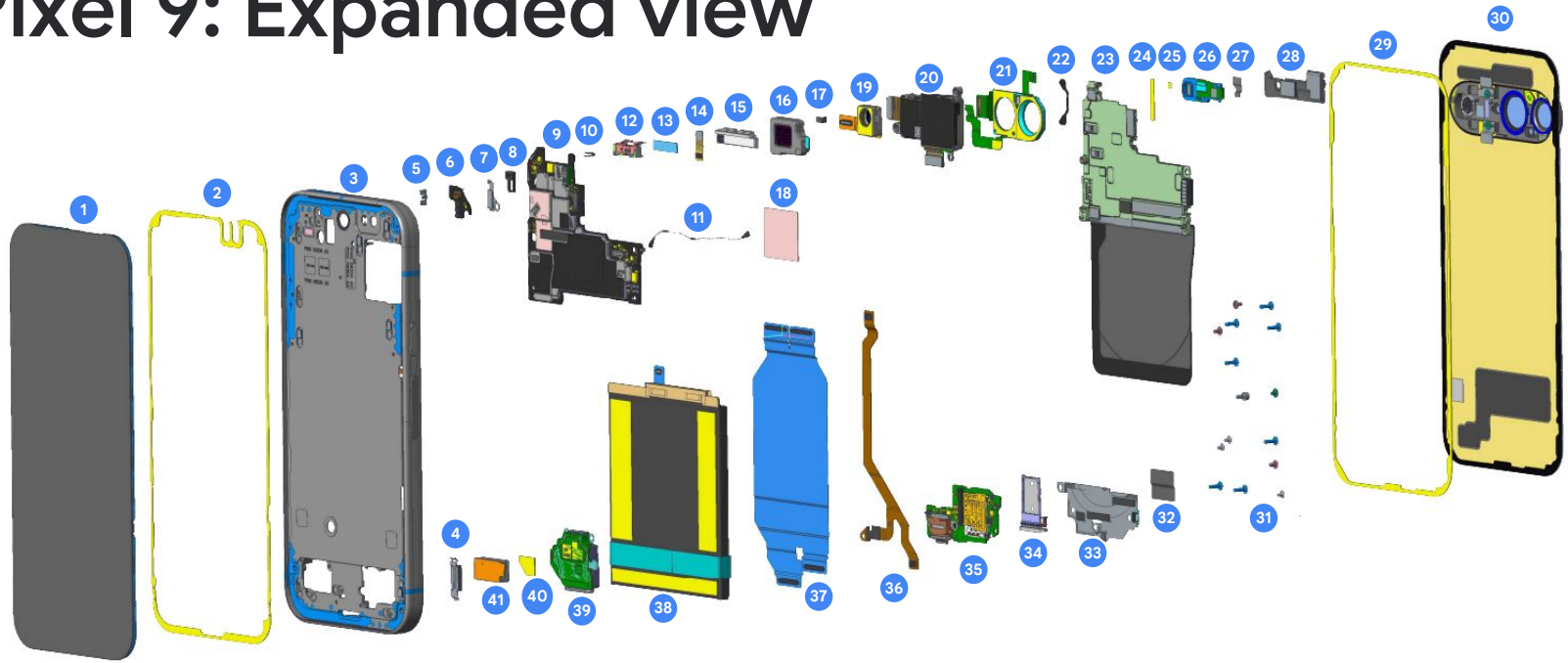
⚠ Caution

Pixel 9 contains a class 1 laser module

The design of the device incorporates optics and protective housing such that there’s no access to a level of laser radiation above class 1 during normal use or approved servicing.

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Pixel 9: Expanded view



Pixel 9 Part ID

1	Display module	8	P-sensor foam	15	mmWave module	22	Flam left tape	29	BG adhesive	36	RJ flex
2	Display adhesive	9	Logic board	16	Top speaker	23	NFC/WLC cowling	30	BG Sub	37	DJ flex
3	Enclosure	10	FCAM FoF	17	Top speaker FoF	24	Adhesive BG SC	31	Screw	38	Battery
4	Display cowling	11	Cable	18	TIM SOC	25	Adhesive flam FSS	32	DJ flex tape	39	Bottom speaker
5	Speaker clip	12	Heatsink-mmWave	19	FCAM	26	Flam FSS flex	33	CLB cowling	40	Vibrator pad
6	ANT4 board	13	mmWave tim	20	RCAM	27	FSS flex tape	34	SIM tray	41	Vibrator
7	ANT4 cowling	14	mmWave flex	21	LDAF flex	28	Top cowling	35	Chin board		

Battery Location

There is one lithium-ion cobalt battery located in this device.

The approximate location of the battery is outlined.

Screw map

These are the screws used in the Pixel 9:

Screw G250-07204-00	Screw G250-07189-00	Screw G250-07197-00	Screw G250-07191-00	Screw G250-07322-00
				
Torx Plus 3IP	Torx Plus 3IP	Torx Plus 3IP	Torx Plus 3IP	Standoff 2.5 mm

- Not hidden
- Hidden

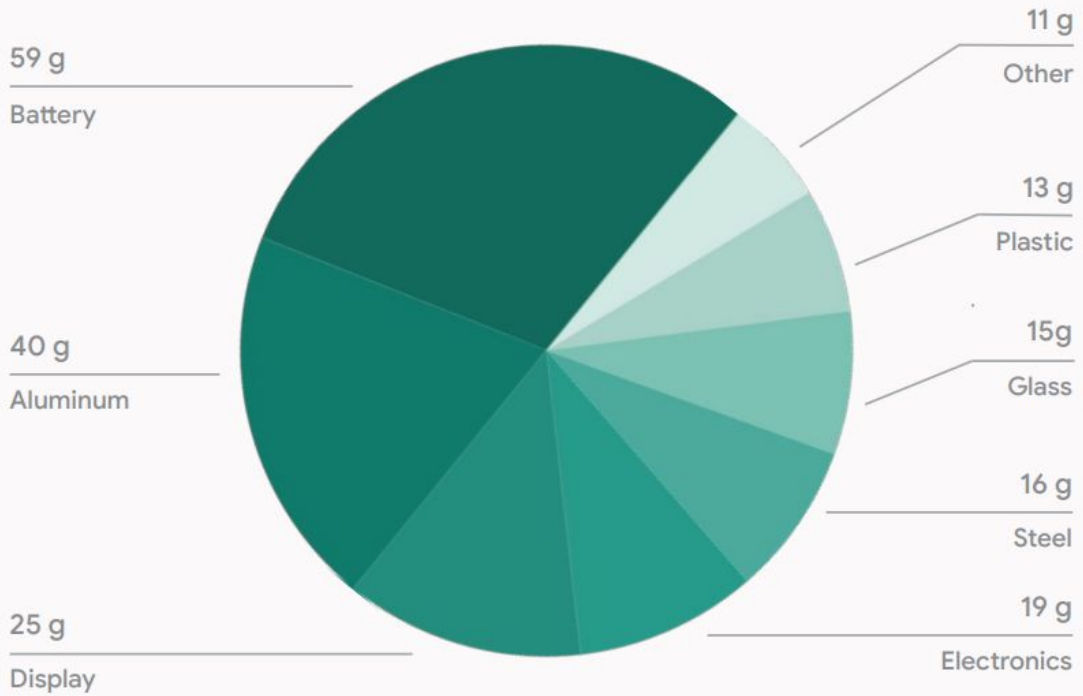
Note

This is what the device looks like once the back cover is removed.

What materials can be found in this device?

Materials used in Pixel 9

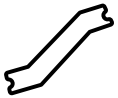
Total materials:[11] 198 g



What Tools Are Recommended to Disassemble This Device?

Flat Head Screwdriver

Prying Implement

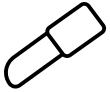


Pliers

99.9% Isopropyl Alcohol

Torx IP 3 Driver

Universal disassembly shim or miniature pry tool



SIM Card Tray Ejector Pin

Heat Gun, Heat Pad or Heating Tools

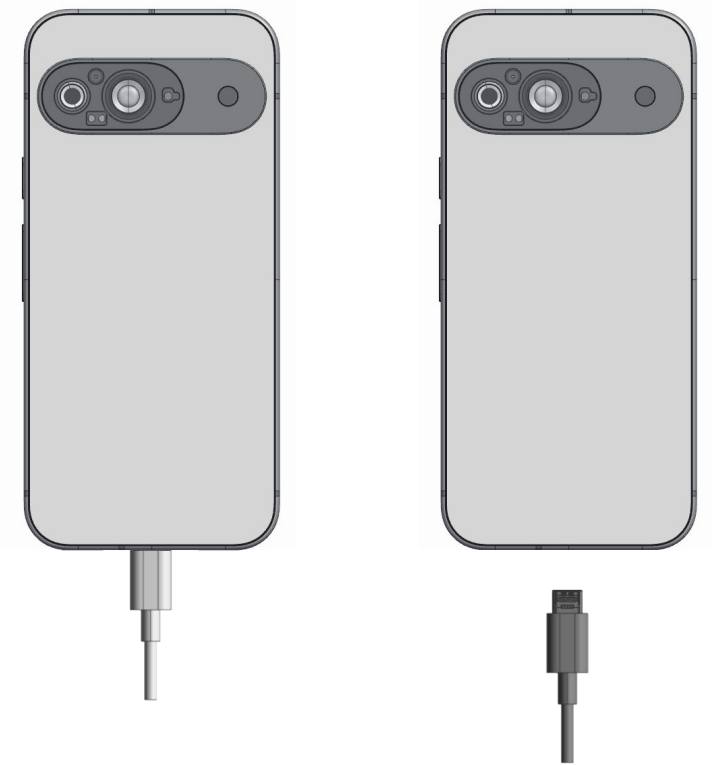
01

Remove Charge Cable

Turn off device. Unplug Charge cable and allow the device to drain battery charge.

Target Recyclable Materials:

- Copper in Cable

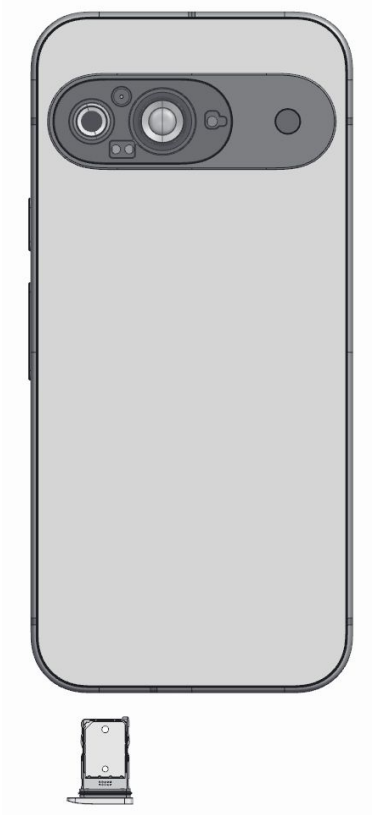


02

Remove SIM Tray

Use Small Push Pin Ejector.

Aluminum and plastic SIM Tray	Gold coating on SIM Card
	



03

Remove Back Cover

If possible, heat device to loosen adhesive. Use prying device with thin edge to lift back cover off of the enclosure.

Target Recyclable Materials:

- Aluminum Visor
- Back Glass

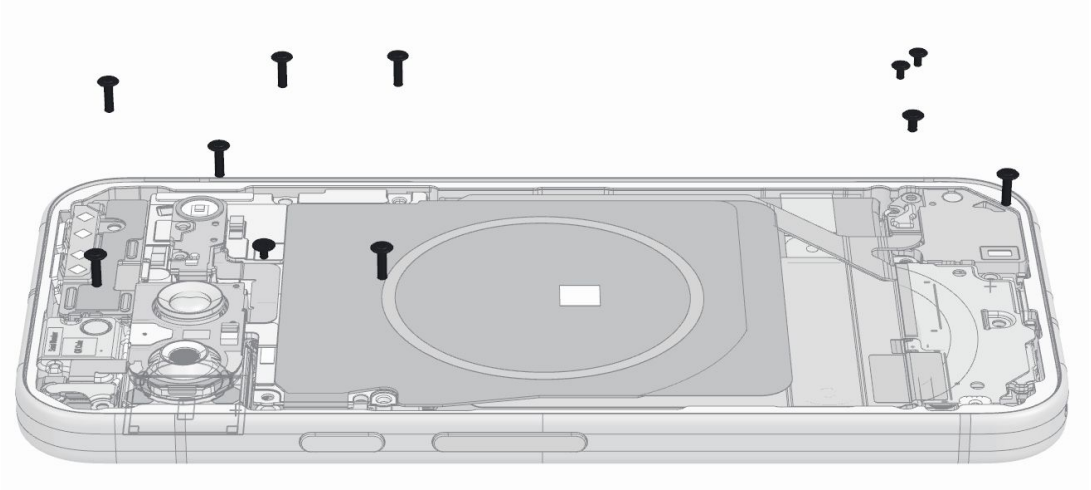
Note

Do not insert prying device too far into device as doing so may damage the battery pack.

04

Remove Screws

Use a screwdriver to remove the **11** screws that secure the inner and antenna housing to the logic board.



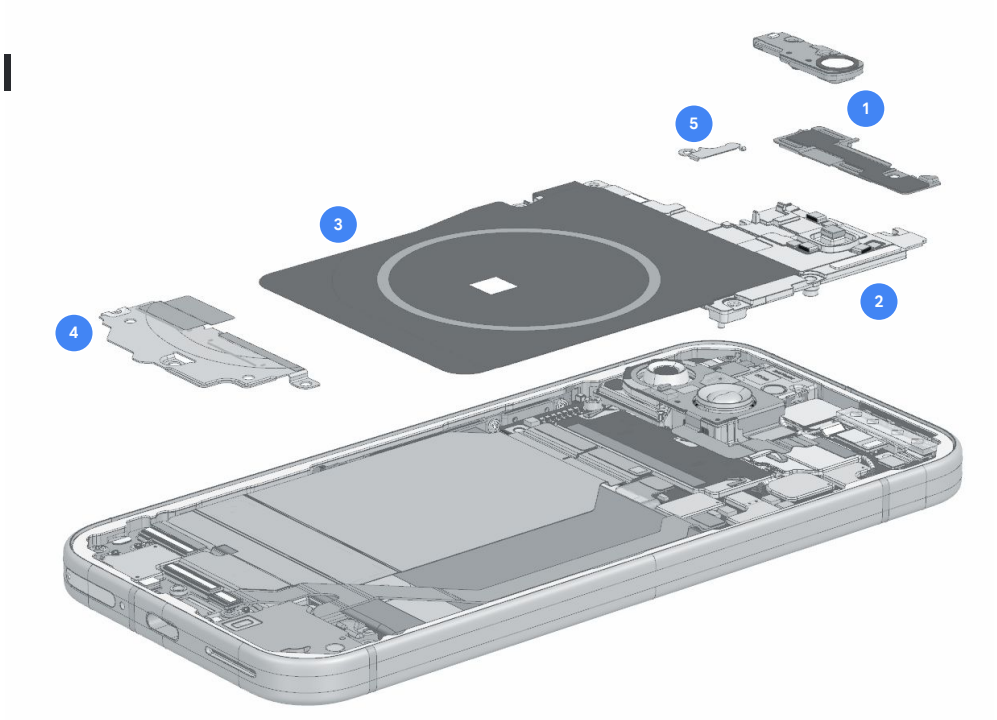
05

Remove Cowlings and NFC Coil

1. Disconnect FSS flex with from the NFC/WLC cowling
2. Remove the NFC/WLC cowling
3. Remove NFC
4. Remove the CLB cowling
5. Remove the ANT4 cowling

Target Recyclable Materials:

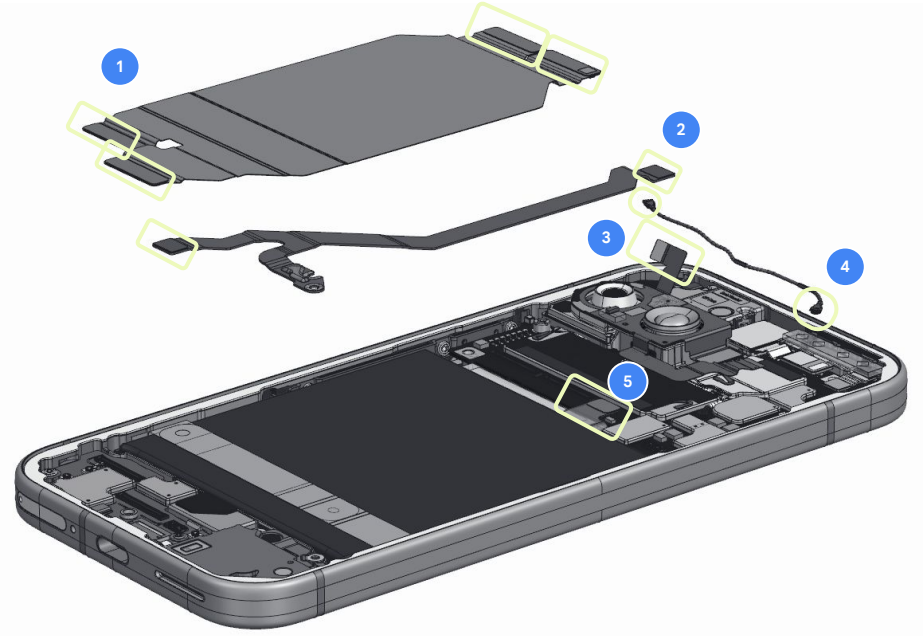
- Copper Wireless Charging Coil
- SUS 316 Stainless Steel (ANT4 cowling)
- SUS 304 Stainless Steel (CLB cowling)



06

Remove Flex Cables

1. Detach four DJ flex connectors from the logic board and the chin board.
2. Detach two RJ flex connectors from the logic board and the chin board.
3. Detach the LDAF flex connector from the ANT4 board with the ESD spudger.
4. Loosen the cable from the ANT4 board and the logic board with the ESD spudger.
5. Detach the battery connector from the logic board.



Target Recyclable Materials:

- Gold plating on connectors of flex cable
- Copper Flex Cable

07

Remove Battery

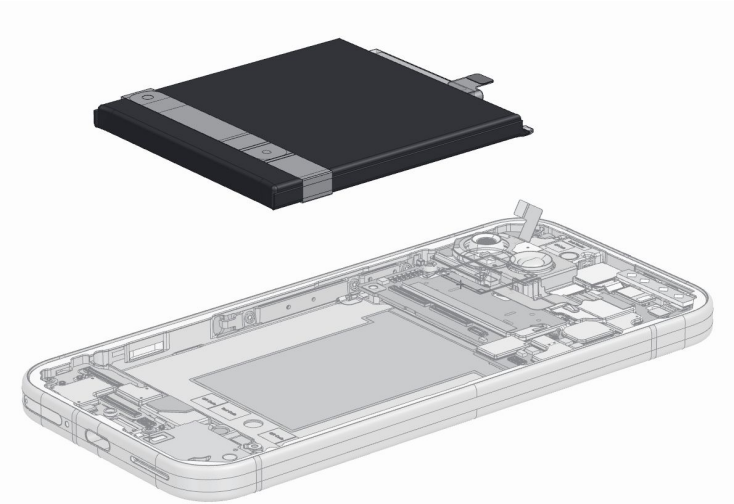
Although some recyclers may pry the battery out, we recommend first applying 99.9% isopropyl alcohol under the battery to compromise the adhesive.

Alternatively, a recycler could heat the adhesive under the battery to 158°F (70 °C) to weaken the adhesive bond. We recommend a duration of 10 minutes on the hot plate. Use caution. The heating plate is a hot surface and it could cause burns.

Battery must be recycled with specialized processes such as pyrometallurgy or hydrometallurgy.

Target Recyclable Materials:

- Cobalt
- Lithium
- Nickel
- Copper
- Precious Metals
- Gold plating on connectors of flex cable



08

Remove Display & Cover Glass

If possible, heat device to loosen adhesive. Use prying device with thin edge to lift back cover off of the enclosure.

The display also includes a number of flexible printed circuit boards, which can be pried off.

Target Recyclable Materials:

- Glass
- Copper Film Backing
- Copper in Display Flex Cable
- Steel
- Gold plating on flex cable Connector

Note

Wear protective gloves and safety glasses when handling damaged parts.

09

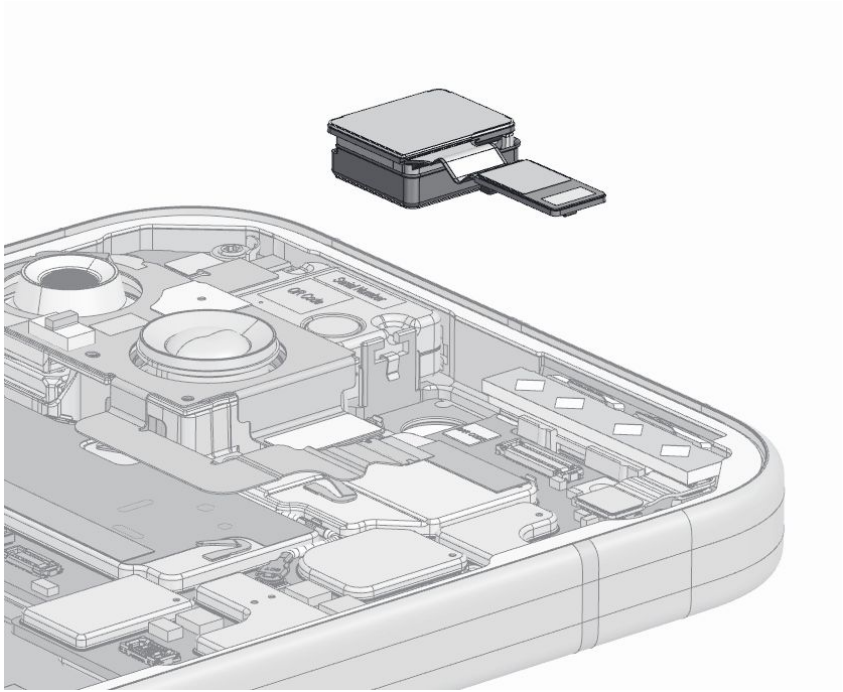
Front Camera

A recycler may wish to remove the front camera module from the main logic board.

Here the front camera module is highlighted.

Target Recyclable Materials:

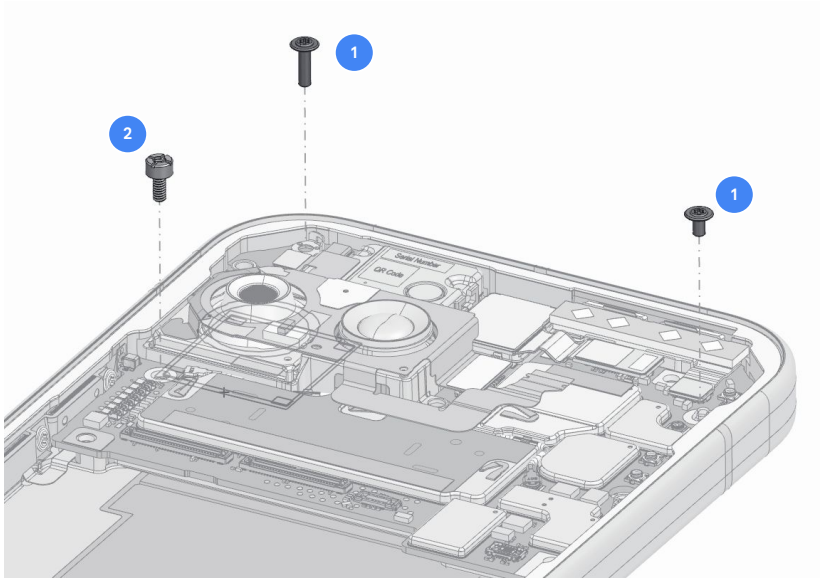
- SUS (sheet) Front Cam Backer
- Minimal Amount (0.06 g) Rare Earth Element in Front Cam Magnet
- Gold plating on flex cable Connector



10

Remove MLB Screws

1. Remove the logic board screw with the torx plus 3IP screwdriver.
2. Remove the logic board screw with a standoff 2.5 mm screwdriver.



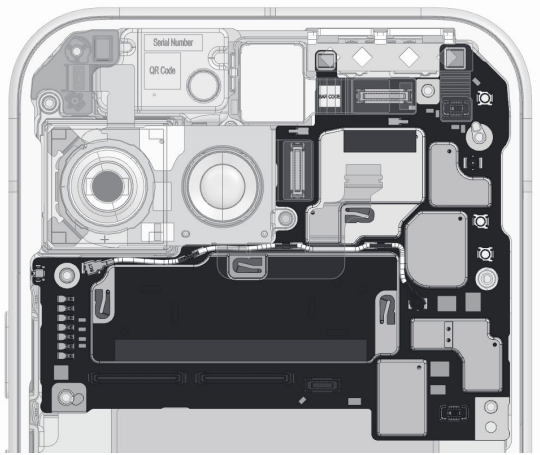
11

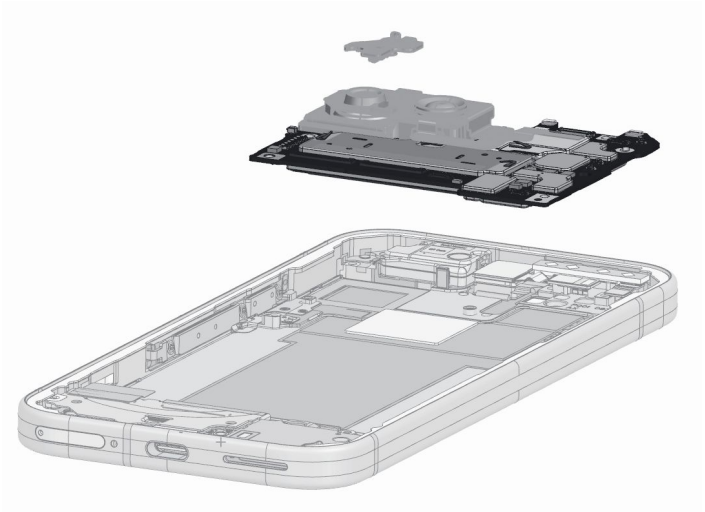
Main Logic Board (and ANT4 board)

Use Prying tool, if necessary, to lift the main logic board and components out of enclosure.

This component includes small quantities of a number of notable materials that could be recovered, including:

Target Recyclable Materials:
- Copper
- Precious metal coatings
- Silicone





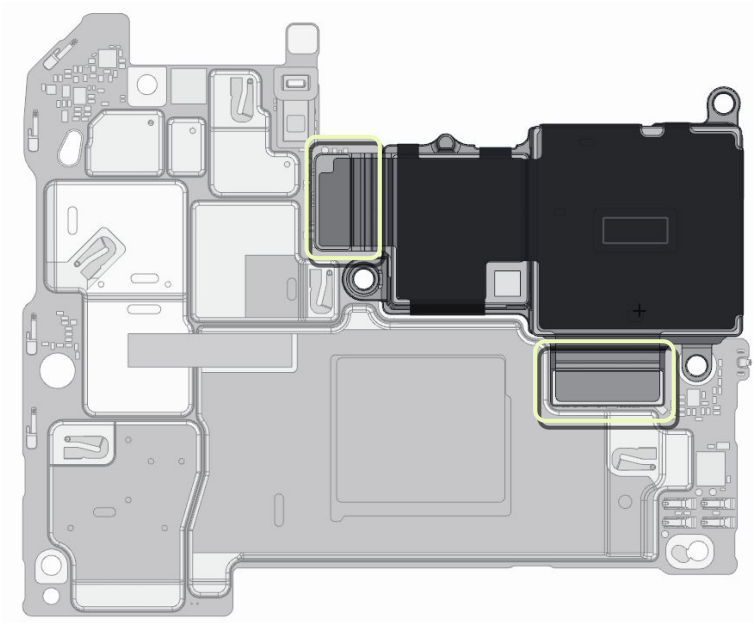
12

Rear Camera

Detach two rear camera flex connectors and lift module off of MLB.

Target Recyclable Materials:

- SUS (sheet) Rear Cam Backer
- Minimal Amount (0.13 g) copper
- Minimal Amount (0.30 g) Rare Earth Element in Front Cam Magnet
- Gold plating on flex cable Connector
- Neodymium (Rare Earth Element) Magnets in Wide Rear Cam

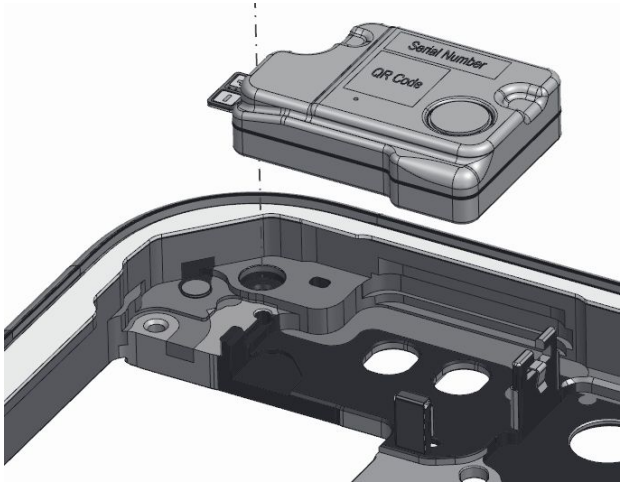


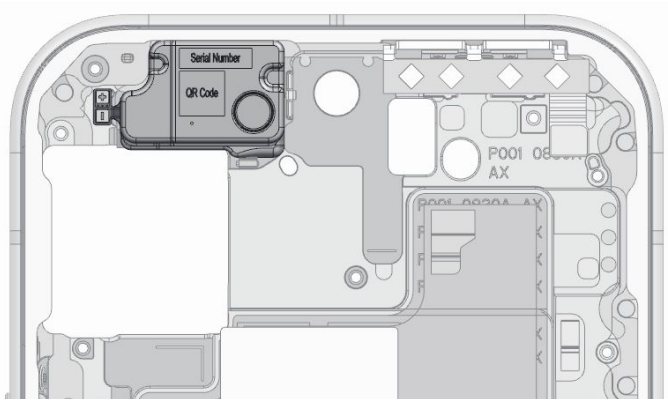
14

Top Speaker

Use prying tool to lift up the top speaker.

Target Recyclable Materials:
- Neodymium (Rare Earth Element) Magnets in Speaker
- Steel Casing

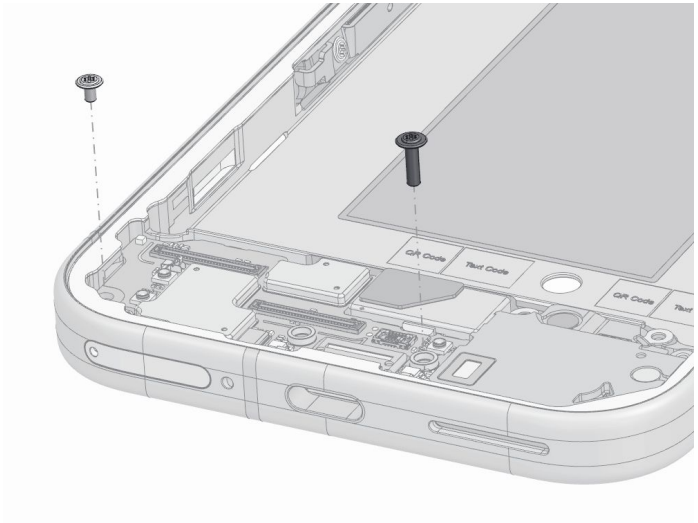




15

Remove Screws Chin Board

Remove the two screws that secure the chin board to the enclosure.



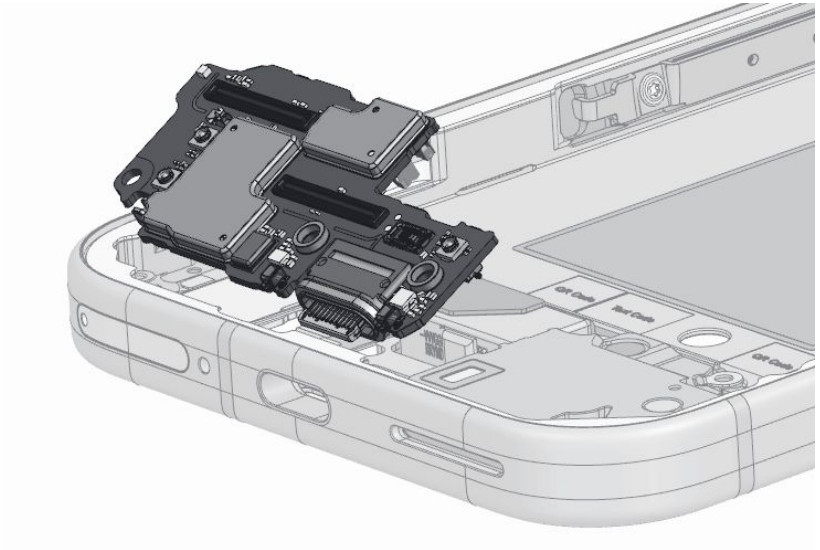
16

Remove Chin Board

Push the chin board by hand from the CG side and remove the chin board.

Target Recyclable Materials:

- Copper
- Precious metal coatings
- Silicone



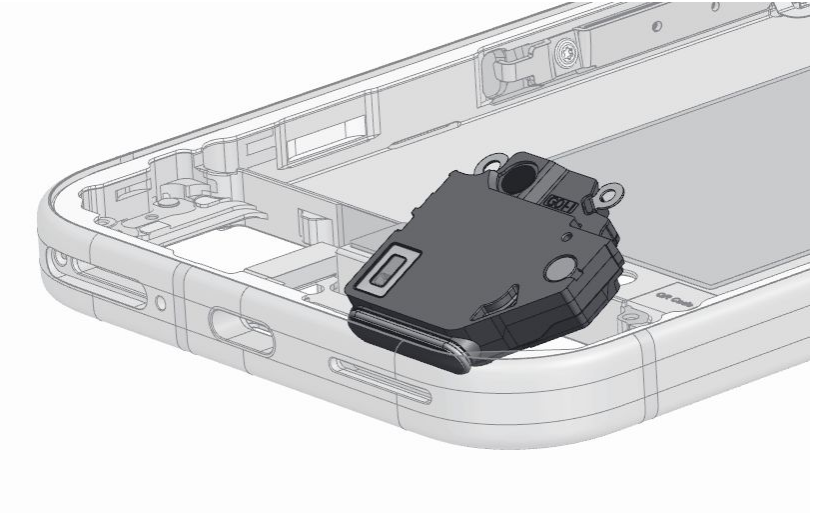
17

Remove Bottom Speaker

Push the bottom speaker by hand from the CG side and remove it.

Target Recyclable Materials:

- Neodymium (Rare Earth Element) Magnets in Speaker
- Polycarbonate Casing
- Sheet Steel (internal)



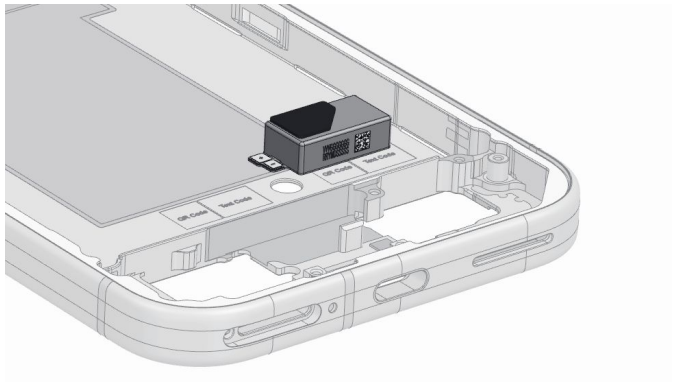
18

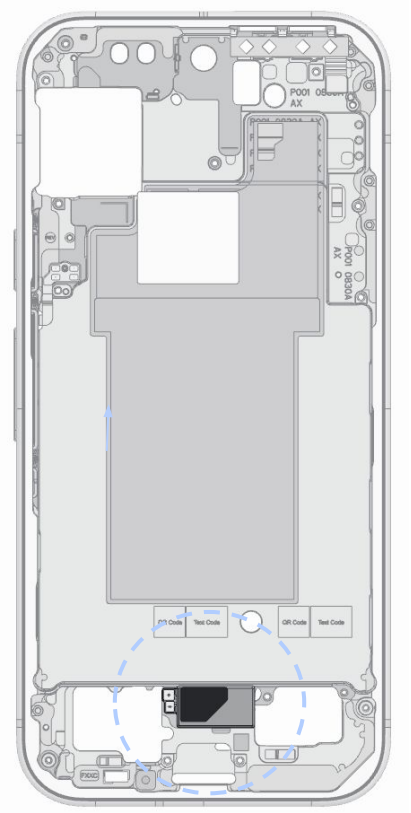
Haptics / Vibrator

Use the prying tool to remove the haptics vibrator from the enclosure.

Target Recyclable Materials:

- Neodymium (Rare Earth Element) Magnets in Speaker
- Tungsten Alloy in vibrator mass
- SUS (sheet)
- Copper





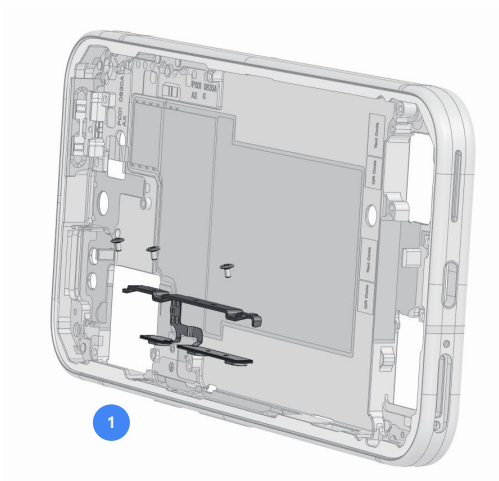
19

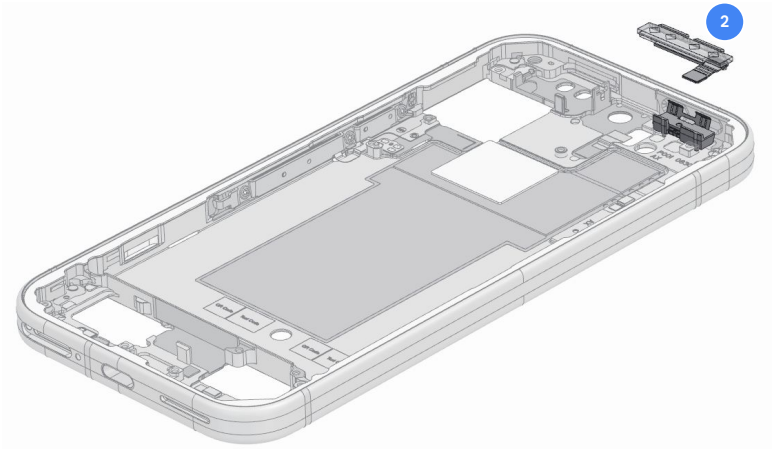
Other (Side Key and Heat Sink)

1. Remove side key screws and pry out the FPCA flex cable, keys and bracket.
2. Pry out mmWave heat sink.

Target Recyclable Materials:

- SUS (304) Steel
- Copper
- Aluminum (heatsink)





Frequently Asked Questions

Questions	Answer
Is there information related to repair?	This recycling guide is for professional recyclers and is not intended in any way to serve as repair instructions. For repair information or access to repair manuals, please visit: https://store.google.com/magazine/repaircenter 
Does Google offer spare parts to recyclers to refurbish or repair smartphones?	This recycling guide is for recyclers and is not intended in any way to serve as instructions to test, refurbish or repair. For access to Pixel spare parts, please visit: https://www.ifixit.com/Parts/Google_Phone 
How long does it take on average to recycle this device?	Recycling times vary widely and depend on the how thoroughly the device is disassembled for material recovery and the specific tools and operational processes employed. To follow the steps in this guide, we estimate the device processing time will take approximately 1:30 - 5:00 minutes for a well-trained recycling technician.
What hazards might there be when disassembling a device?	The main hazards related to the end-of-life processing of this device are: 01. Damaging the battery in such a way that a thermal runaway occurs; 02. Broken glass causing cuts or abrasions; 03. Chemical inhalation–especially if thermal runaway occurs and 04. Exposure to the class 1 laser module