

LG G5 Mobile Device

May 19th, 2016

by Jennifer Lake



PennEngineering[®]

LG G5

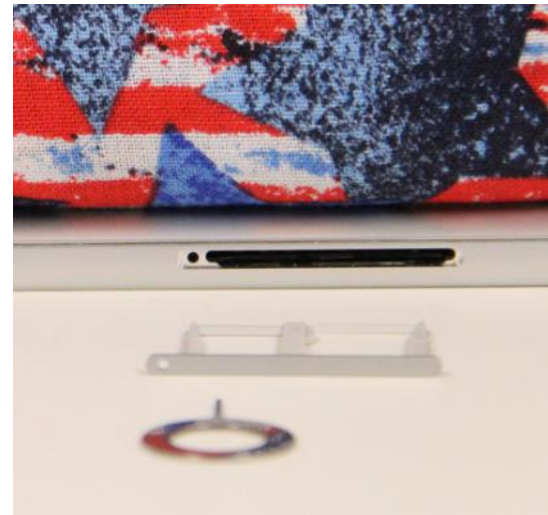


Details & Findings

Pictures and Description of the LG G5 and our disassembly process.

Removal of Sim Card Tray

- The SIM/microSD card tray was removed using the provided tray removal tool.



Removal of Battery

- It was later discovered that the button releases the battery on the battery module.
- Once the battery module was removed, the battery slid out of the phone for easy removal.



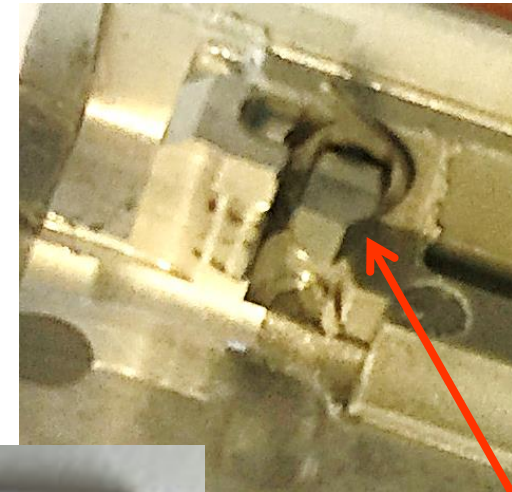
Removal of Battery

- An exploded view of the battery removal.



Removal of Release Button

- The battery module release assembly was removed by first removing the C-clip.
- The assembly consisted of a button, spring and C-clip.



Button Assembly



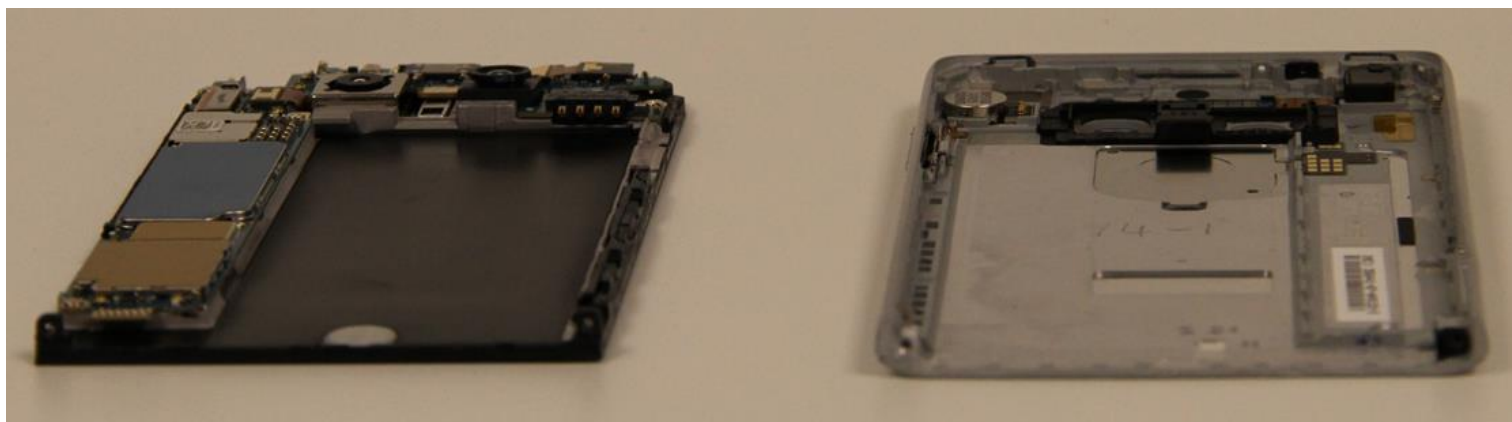
Separation of Screen

- The disassembly of the phone started with the removal of the two screws that were revealed. These screws were received into the outer casing
 - Screw Details
 - Thread Size – M1.4
 - 5.41 mm overall length
 - 0.8 mm head thickness
 - 2.6 mm head diameter
 - Phillips drive
 - Zinc plated steel
 - Locking patch
- These were removed with a Philips drive.



Screen Removal

- The screen and digitizer was removed using a pry tool.



Removal of Circuit Board

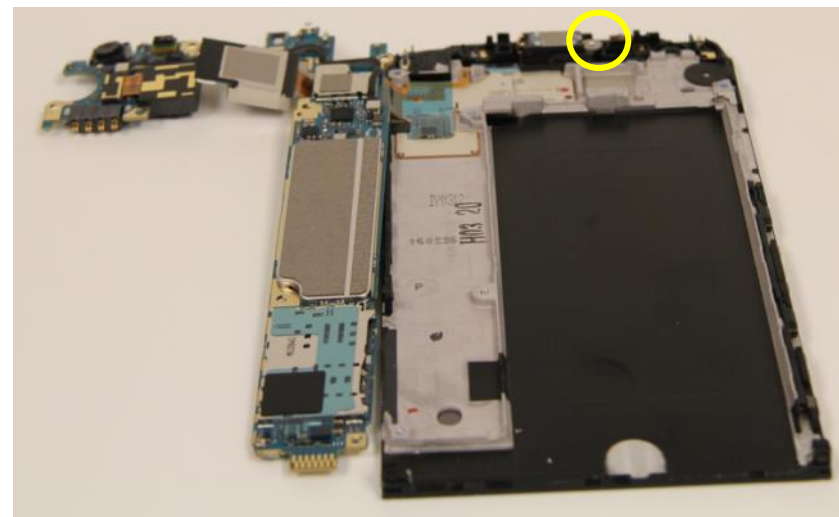
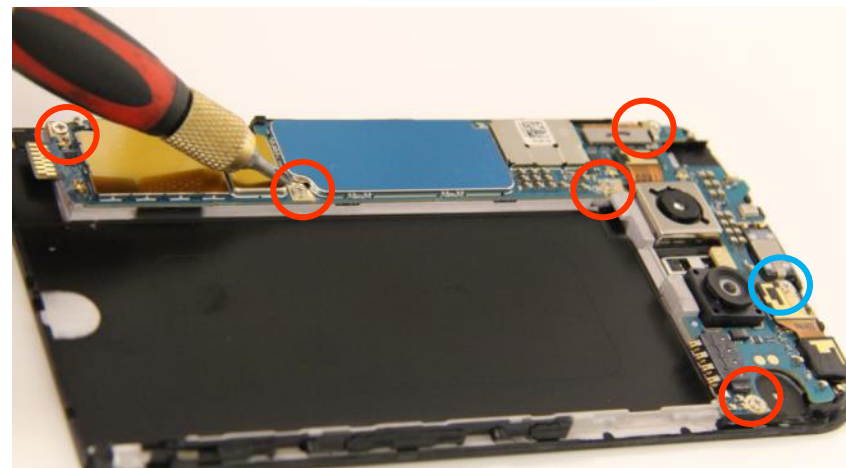
- The circuit board is held in place by six screws, five were received into a threaded bosses (red), one was received into a brass insert (blue).

- Six Screw Details

- Thread Size – M1.4
- 2.8 mm overall length
- 0.4 mm head thickness
- 2.6 mm head diameter
- Phillips drive
- Zinc plated steel
- Locking patch

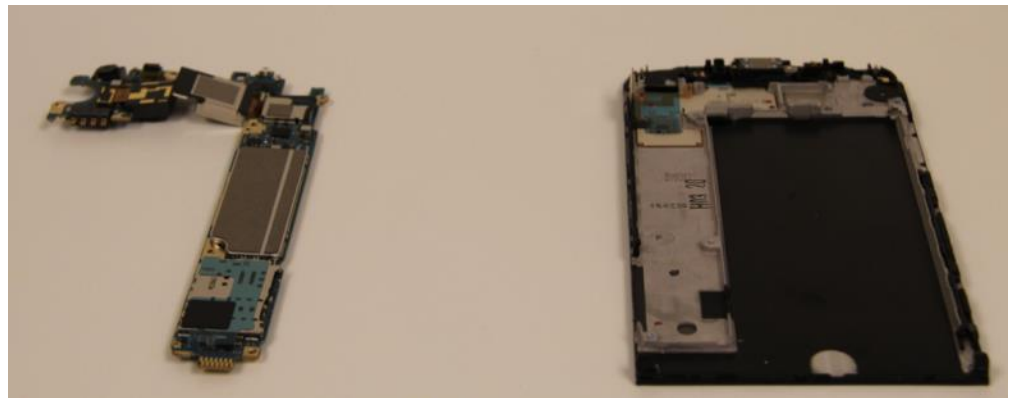
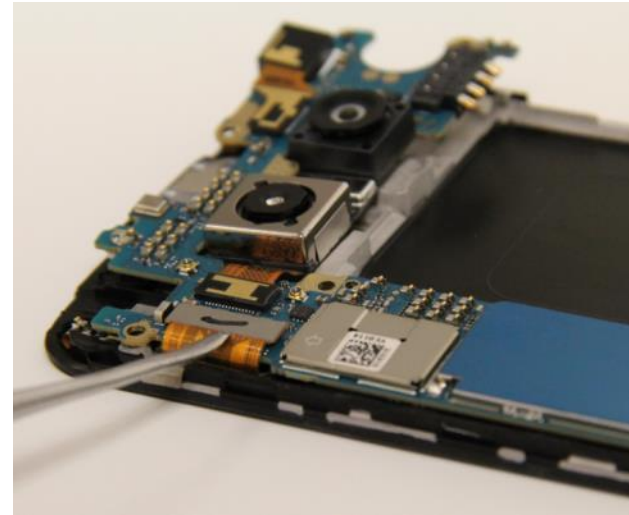
- Brass Insert Details (Yellow)

- Thread Size – M1.4
- 2.0 overall length
- 2.1 mm knurl diameter
- Brass material



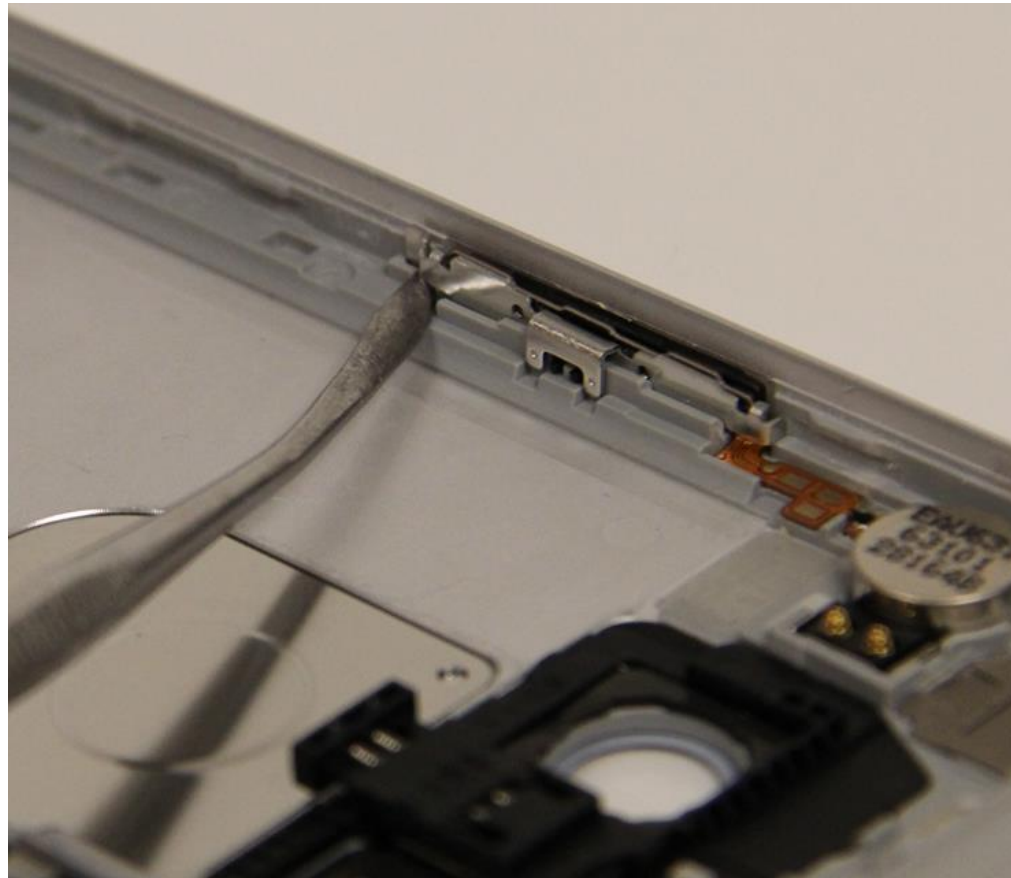
Removal of Circuit Board

- Once the screws were removed, the flexible circuit was removed from the circuit board using a pry tool. The circuit board then can be lifted from the assembly.



Removal of Button

- The volume button was removed by being lifted with a pry tool.
- The button was held in place with snap features.



Disassembly of Battery Module

- Two screws held the charging components to the battery module. The screws were received into threaded holes in the plastic housing.



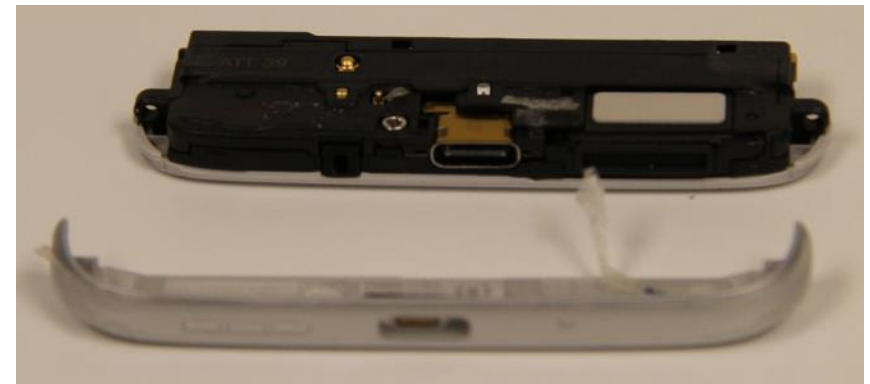
- Screw Details

- Thread Size – M1.4
- 5.0 mm overall length
- 0.5 mm head thickness
- 2.6 mm head diameter
- Phillips drive
- Zinc plated steel
- Locking patch



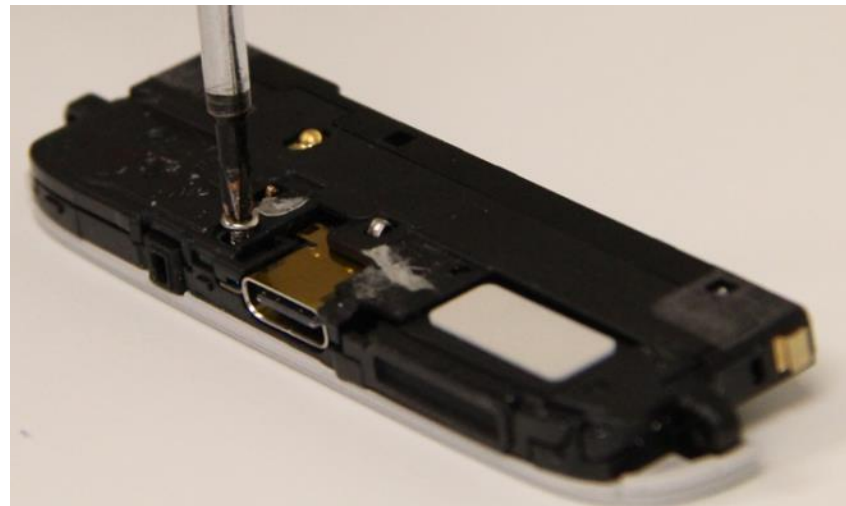
Disassembly of Battery Module

- The plastic cover is removed using a pry tool. This was held to the assembly with adhesives.



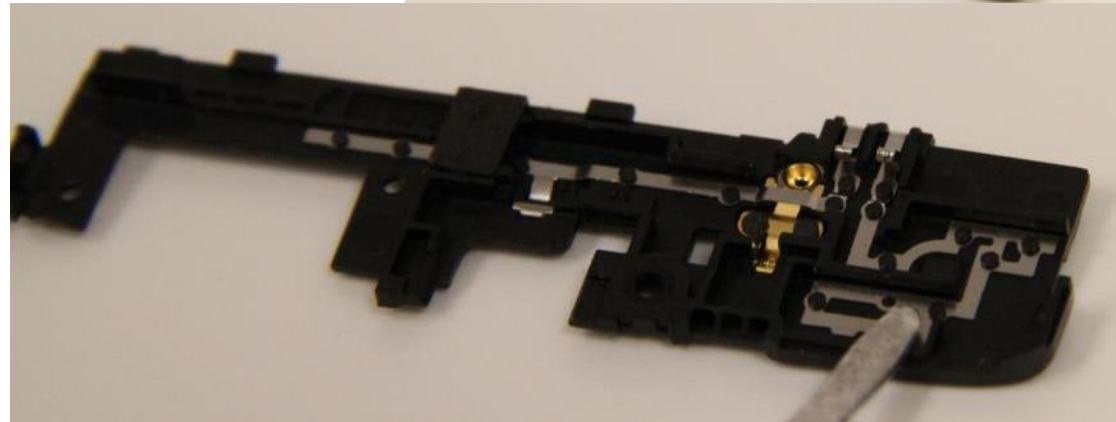
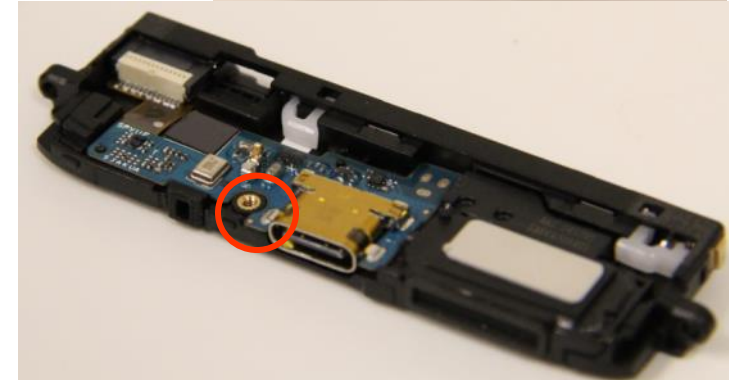
Disassembly of Battery Module

- One screw along with snap features held the plastic shells of the battery modules in place. The screw was received into a brass insert (details on slide 17).
- Screw Details
 - Thread Size – M1.4
 - 3.5 mm overall length
 - 0.6 mm head thickness
 - 2.6 mm head diameter
 - Phillips drive
 - Zinc plated steel
 - Locking patch



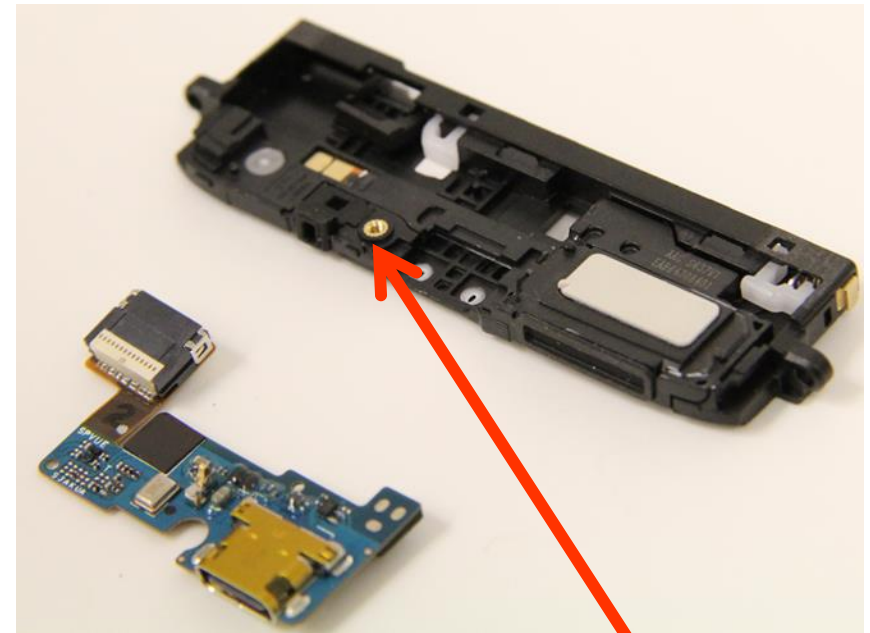
Disassembly of Battery Module

- A pry tool was used to separate the two halves of plastic surrounding the charger.
- When the upper portion was removed, it revealed heat stakes holding a stamping in place.
- The brass insert is revealed on the bottom part.



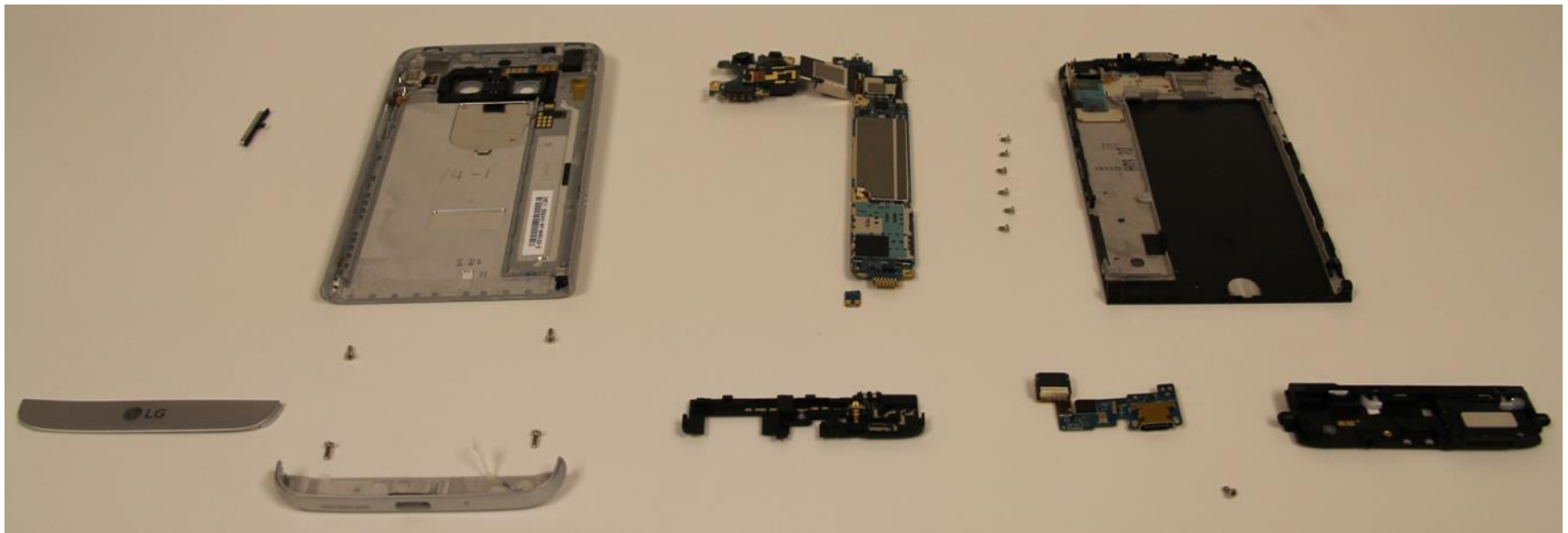
Removal of Circuit Board

- The circuit board was held in place with plastic alignment pins.
- This photo shows the brass insert from Slide 16.
 - Brass Insert Details
 - Thread Size – M1.4
 - 2.0 overall length
 - 2.1 mm knurl diameter
 - Brass material



Brass Insert

Exploded View



Fastener Summary



Fastener Summary

- 2 x

- Thread Size – M1.4
- 5.41 mm overall length
- 0.8 mm head thickness
- 2.6 mm head diameter
- Phillips drive
- Zinc plated steel
- Locking patch
- Reference Slide 8



- 6 x

- Thread Size – M1.4
- 2.8 mm overall length
- 0.4 mm head thickness
- 2.6 mm head diameter
- Phillips drive
- Zinc plated steel
- Locking patch
- Reference Slide 10



- 1 x

- Thread Size – M1.4
- 3.5 mm overall length
- 0.6 mm head thickness
- 2.6 mm head diameter
- Phillips drive
- Zinc plated steel
- Locking patch
- Reference Slide 15



- 2 x

- Thread Size – M1.4
- 2.0 overall length
- 2.1 mm knurl diameter
- Brass material
- Reference slide 10 & 17



Fastener Summary

- 2 x

- Thread Size – M1.4
- 5.0 mm overall length
- 0.5 mm head thickness
- 2.6 mm head diameter
- Phillips drive
- Zinc plated steel
- Locking patch
- Reference Slide 13



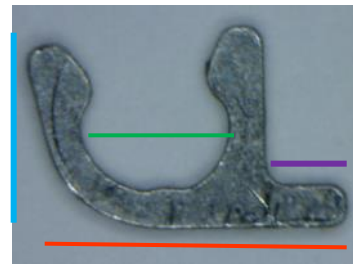
- 1x

- 0.3 mm wire diameter
- 2.5 mm uncompressed length
- 4.3 mm x 1.9 mm oval shape
- Reference Slide 7



- 1 x

- 3.4mm overall length (red line)
- 1.4 mm inside length (green line)
- 2.2 mm height (blue line)
- .9 mm overhang (purple line)
- 0.3 mm thick
- Zinc plated steel
- Reference Slide 7



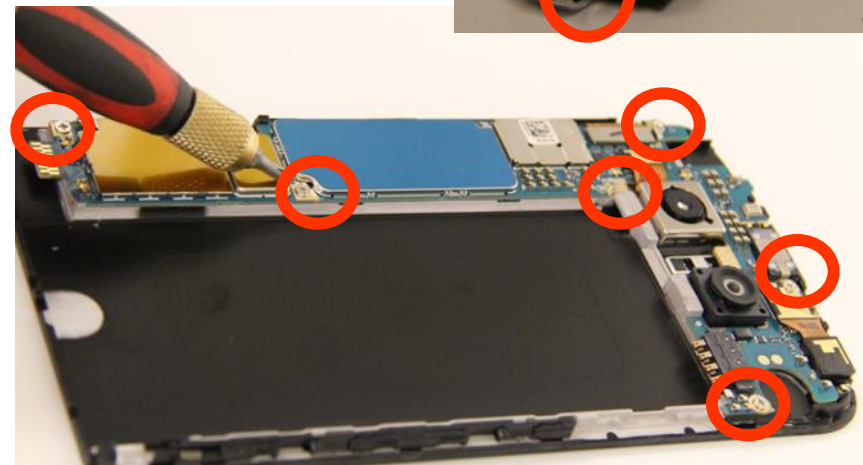
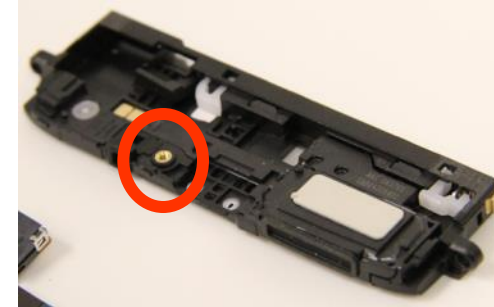
Alternate Solutions

PennEngineering® recommendations of alternate hardware and cost savings opportunities.



Alternative Solutions

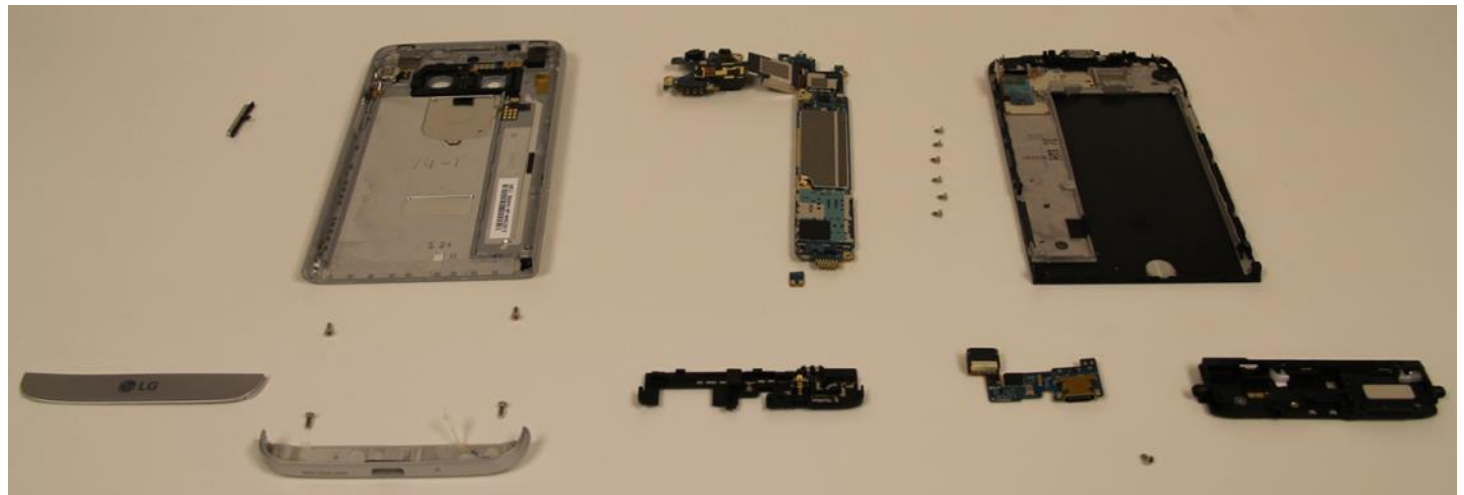
- The TackSert® can replace the threaded hole and the screw, thus eliminating the need for loose hardware, while providing a permanent solution, while installing with a simple pressing action instead of a more complicated turning action.
- The TackSert also eliminates the need for a tapped hole in the plastic casing.
- [For More Information Click Here.](#)





Alternative Solutions

- A microPEM® screw can be offered for this assembly. This would be a direct fit, non-permanent solution.
- [For More Information Click Here.](#)





Alternative Solutions

- The C-clip can be replaced with a micro button style TackSert® thus providing more permanent solution.
- This component is sold as one assembly, with a simple installation. The pin is pushed into the button, which then in turn is pushed into the chassis. The rubber gasket keeps the pin assembly into place as well as providing a seal.



Conclusions and Summary



Conclusions and Summary

- The LG G5 cellular phone is a intelligently designed device with some reparability in mind. The battery module is easily accessed, and can be replaced with a touch of a button.
 - Various screws in the assembly can be replaced with TackSerts, and microPEM® screws.
 - The button assembly for the battery release can be simplified with a special micro button solution.