

## How I fixed my HP Envy 15T-J100 Quad “Broken” Hinge

My daughter sent me the picture below from college (she’s in school in AZ, about 1500 miles from home)... she lifted the screen on her PC and the base cover popped off and the hinge & Kensington lock connector appeared to be broken... This was completely normal usage (opening a laptop screen) and appeared to be a manufacturing defect. However, as it was out of warranty, HP offered to fix it for \$250 (that’s roughly 1/3<sup>rd</sup> the purchase price) and have it back in about a week (overnighting to Indiana for repairs) and would give me a 3 month warranty on the repaired PC.

Being without a PC for a week is really tough for a college student, and I wasn’t looking forward to paying that much... and was honestly tempted to just put the money towards a different PC.

Note how the Kensington lock connector is angled in the picture... (that is part of the hinge...)



Once I got my hands on it (she brought it home at spring break), I decided to open it up to see what had happened. Basically the hinge has a bolt with a nut on it... and it was so tight that the hinge would not move... this now rigid piece of metal acted as a lever when the screen was opened and pulled the screws holding the hinge to the PC case and thus yanked out metal nuts from the case and in the process pushed the bottom cover open (popping out some screws here too...).

So confirmed... manufacturing defect (nut on a hinge allowed to get too tight from normal usage (opening & closing monitor) that the hinge no longer works... Locktite on the bolt / nut probably would have prevented this (stopping the nut from tightening up with normal usage).

The good news... it was completely repairable with a little patience and a Service Manual that I found on the HP site. I’ve tried to document the steps I took to repair this problem.

## Tools / Supplies:



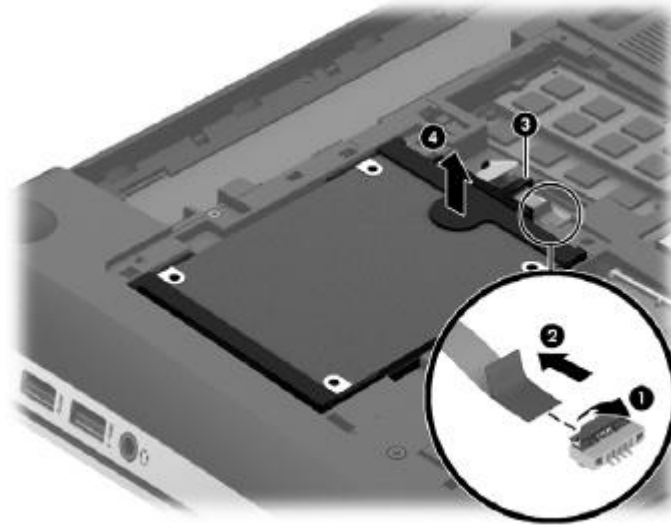
- 1) Small electronics screw drivers... various small phillips tips (Harbor Freight \$4)
- 2) Epoxy (Harbor Freight \$2)... paper plate to mix on and small wire to apply carefully...
- 3) Tweezers to grab small parts and repair nuts on PC case
- 4) Locktite – blue (Home Depot... ~\$4)
- 5) Angled needle nose pliers used to loosen hinge nut
- 6) Teflon scraper... used to carefully pry case open without scratching it
- 7) Anti-Static bag to store Hard Drive in (not shown... I had one from a video card)

What I did: (If you try this, you do so at your own risk... I am not advising you to do this.)

- 1) Backed up the hard drive... copied key documents... just in case I messed up (always a good idea)
- 2) Downloaded the Service Manual for this PC from HP site:
  - <http://support.hp.com/us-en/product/HP-ENVY-15-Notebook-PC-series/6521359/model/6521361/manuals>
- 3) Placed my PC upside down with the monitor open on top of a large box on a table (monitor hanging off back of box... but just touching the table so it was supported)
  - This placed the PC at working level (while I was standing) and allowed access without a lot of chance to generate static electricity (I was on a wood floor). Even so, I find it is best to be grounded (eg wrist strap) and to avoid touching electronics directly.
  - This also allowed the monitor & hinge to be in a good position for repair while giving me access to the bottom of the PC.
- 4) Followed the steps in the Service Manual for Customer Self Repair Items
  - Disconnecting Power
  - Removing the Battery
  - Removing the Service door
  - Removing the Hard Drive

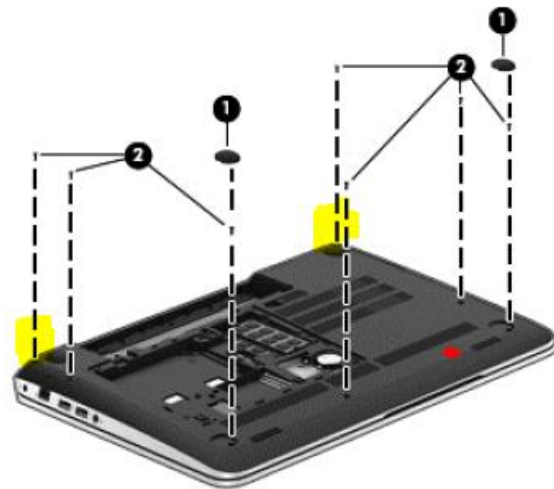
A note about the Hard Drive.

I should have paid attention to how the small flat cable attaches to the motherboard... it's a very easy to remove flat wire (a small latch opens basically freeing the flat wire), but it took me a little bit of thought to remember just how to place the flat wire and re-latch the connector when I reinstalled it.

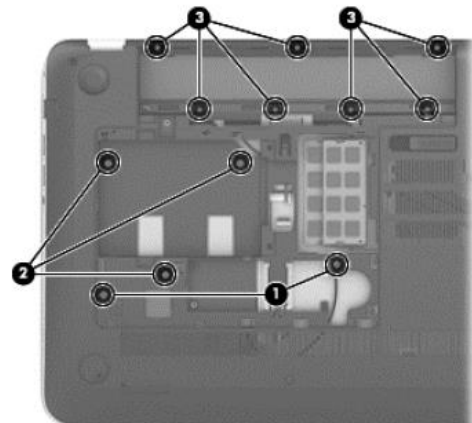


5) Removed the bottom cover... (no longer in the "Customer Self Repair" section)

- This was done in 2 steps in the Service Manual
- The first step notes the removal of seven (7) screws... there are **ACTUALLY 8**... however, since 2 in the back (highlighted) go through the cover and the hinges, one was missing (popped out) due to the damage incurred... the one NOT noted in the manual was under a black circular sticker as shown by the Red Circle... I had to remove that sticker to gain access.



- The second step showed twelve more screws in 3 different sizes... some located under the hard drive (previously removed).
- I made sure that I retrieved each screw and set them in containers so I could easily place them back into the right places when I reassembled it. I needed different phillips tips to remove these as they were slightly different in size / shape.



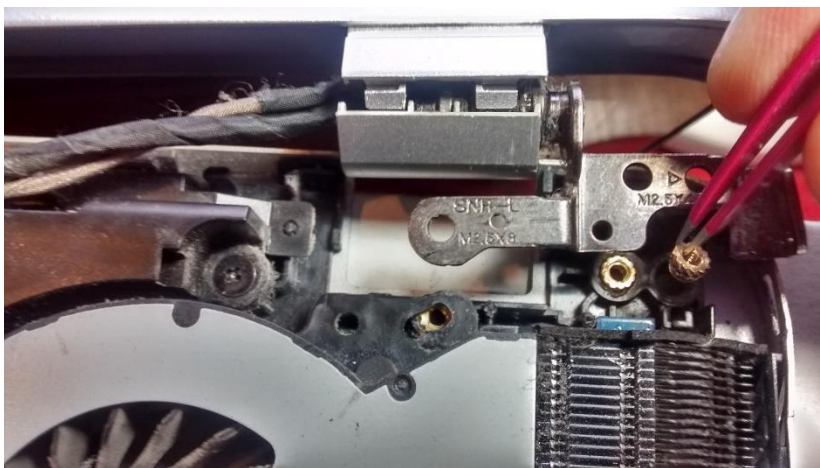
6) I then pried the case open (plastic snaps hold it together) with a Teflon scraper I had... we've had these scrapers since my wife sold Pampered Chef ages ago... good for cleaning pans or scraping paint... now also good for pulling apart PC cases I guess, truly the universal tool.

- I could have used a flat screw driver, but it would have been more likely to leave marks in the plastic of the case and I was afraid of pushing a metal tool into the PC case.



7) I removed the case and found the following:

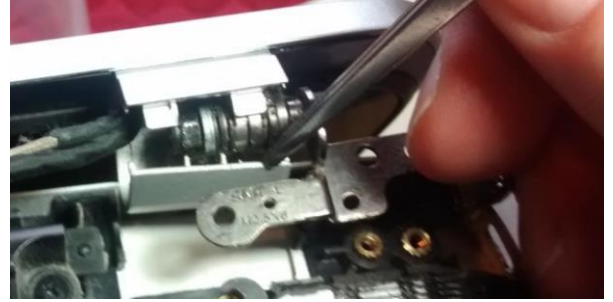
- The hinge had pulled out from the case (a screw was still in the leftmost and rightmost holes... but the nuts they went into were loose from the case).
- I had to be careful here. The other hinge was still connected and there were wires running through the hinge up into the monitor screen (for monitor, wifi, video camera, etc)



- Upon removing the hinge screws (I had to push a needle nose plier below to hold the nut... it was spinning freely)... I found that the nuts had irregular (star) shapes and had been pulled loose from the case... but I was fortunate... the plastic case wasn't broken, these nuts were just loose from the case (epoxy anyone?).
- HOWEVER... I couldn't just fix this, I found out that the hinge would NOT move freely... it was TOO TIGHT!

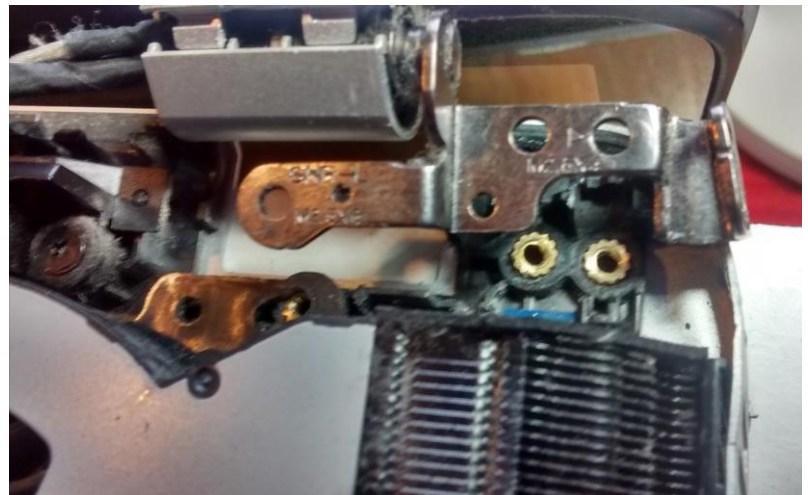
## 8) Fixing the issues...

- So, I carefully pried open the plastic hinge cover (being careful of those wires) and examined the hinge mechanism.
- I determined that there was a nut on the end of it and found that I could use angled needle nose pliers to loosen this nut and free up movement in the hinge.



- In doing this, I backed off the nut as far as I felt comfortable and then applied a little blue locktite to the threads and retightened it a bit... so it worked and moved freely...
- I am hoping that the blue locktite will prevent the nut from tightening again and preventing the hinge from working properly.

- Next, I needed to secure those star nuts back into the case.
- I mixed up some epoxy (good for metal and plastic) and used a thin wire to place epoxy, and put some on the outside of the nuts, then used tweezers to position the nut into the PC case.
- As I made a little mess, I did carefully thread a screw into it, then removed it and cleaned the threads to ensure I could thread the screw into it after it dried.



- Once dry (10 min for epoxy to set, but I left an hour to harden... full strength in 24 hours), I repositioned the hinge, ensuring the wires were routed properly, and screwed in the leftmost and rightmost screws (the center one is screwed in through the back cover once reinstalled).
- Images of the final fix shown below.

9) Final step was re-assembling the bottom cover, hard drive, service door and battery...

- I had to locate a few replacement screws (for the lost ones... I scavenged an old PC)
- I applied blue loctite to all threads.

