LITTER ROBOT 3: SENSOR BYPASS & MODIFICATIONS GUIDE

INFO

After nearly 3 years of dealing with the LR3's various sensor problems, litter getting stuck in all the little holes, and constant light code troubleshooting, I had enough. I decided to do a complete teardown of my LR3 Connect and cleaned every single component. I mean every single screw, bolt, sensor, EVERYTHING. Then, I made some modifications to bypass the unneeded sensors (IMO) and the result has been great! No more of those pesky lights blinking at me because whatever sensor decided to die.

As I was putting everything back together with my new sensor bypasses, I decided to take some pictures and put together a quick guide for anyone looking to do the same, so here it is!

This will bypass the pinch detection sensor, the DFI sensor, and the bonnet sensor. This will NOT bypass the cat weight sensor because that is needed to indicate if a cat has entered for the robot to trigger a clean cycle or to pause a cycle. It will also go into the wiring and some modifications I made which have helped protect the electronics and keep everything clean.

What you'll need:

- Electrical tape
- Small zip ties
- Duct tape
- Snack-size ziplock bags
- Electrical connectors (optional)
- 2 standoffs
- 4 screws
- Hooked fastener (optional)
- Adhesive-backed silicone strip

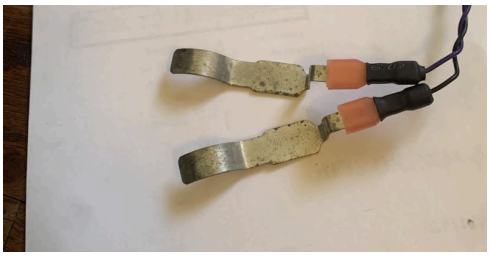
SENSOR BYPASSING

BONNET SENSOR (BYPASS)

What does it do?
This sensor uses metal contact leads to detect if the bonnet is on or not. If the bonnet is on, the contacts on the bonnet will touch the contacts on the base and complete the circuit, telling the robot that the bonnet has been detected.

Should I keep this sensor?
If you've had no problems with the bonnet sensor, then there is no harm in keeping it. It's one of the sensors that is less likely to fail (compared to DFI, for example).
That being said, if you're like me and like to do a deep clean of your robot every few months by spraying it down with a hose, taking the metal leads in and out of the plastic can be a bit annoying. Moreover, this sensor doesn't really have a point. The robot does not need the bonnet to rotate or function, so to streamline this, I decided to remove the leads out of the bonnet.

How do I remove this sensor?
STEP 1: Locate the bonnet sensor – this is the purple and black wire on with the terminal leads. Simply take the metal leads out of the base housing and out of the bonnet area. Take the wiring out as well.



STEP 2: Tape the leads together with electrical tape

STEP 3: Cable management
Bundle the battery terminal tires and the bonnet sensor wires with a zip tie.

Note: I plug my LR3 into the wall and don't use the battery terminals at all. If you do use these, don't wrap them up.

STEP 4: Put this bundle in a ziplock bag and duct tape the entrance closed. Label it.
Then put this bag in the right side "pocket" in the base.

Note: Do NOT skip bagging and taping the sensor, otherwise you may have to eventually replace your electronics. The bag is what will protect your electronics from humidity, ammonia in cat urine, and litter.

DFI SENSOR (BYPASS)

What does it do?
The DFI (drawer full indicator) sensor is an IR sensor that tells you if the drawer is full or not. An infrared beam is emitted from one side of the board and detected by the other side. If the beam is blocked (due to the litter in the drawer reaching a certain height), then the “drawer full” light comes on.

Should I keep this sensor?
This depends more on your routine of how often you empty your litter robot / how many cats you have. If you only have one cat, then maybe you only need to empty the robot once a week and the DFI sensor hasn’t been an issue, in which case you may not want to bypass it.
If you’ve reset the robot and continuously find yourself opening the drawer just to see it was not full, shaking the tray, and putting it back in, it can get pretty annoying.
Personally, I would constantly be alerted that the drawer was full and come to see that the litter just needed to settle. When more used litter was dumped into the tray, the rest of the litter would slide down and settle, so it was never really full, just shaped like a hill. So, I decided to bypass this sensor.

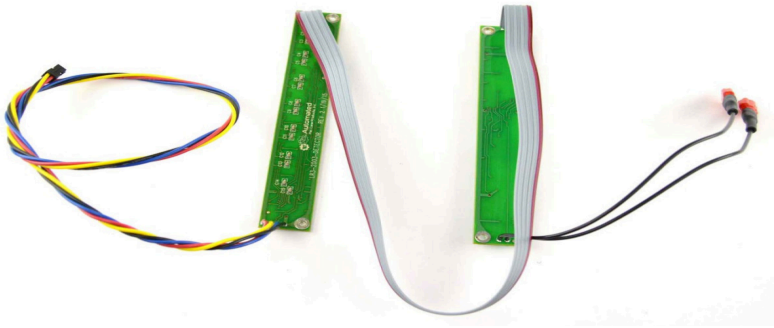
NOTE: If you bypass the DFI sensor, you won’t get an app notification / light indication. You will need to MANUALLY check if the LR is full. Honestly, this isn’t too hard, you’ll just have to figure out what works for your house. I have 2 cats, so I just made a phone reminder to simply empty the waste 2X/week. I recommend you monitor the LR usage for 1-2 weeks to see how long it takes to get full on average.

How do I remove this sensor?

STEP 1: Locate and remove the DFI sensor. Unscrew it from the base. Here’s a more in-depth guide from Whisker on the replacement – see section called “Remove old DFI Board Assembly”.

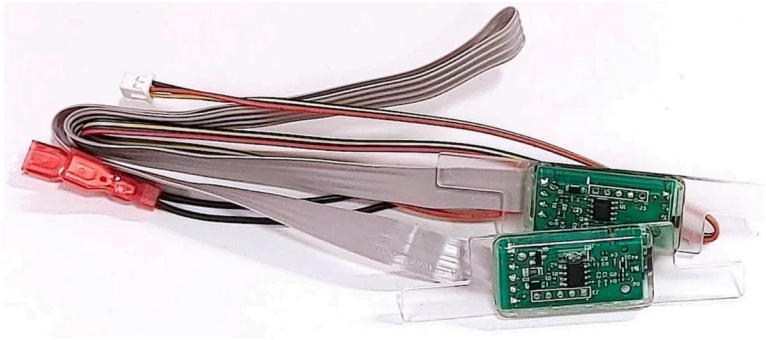
STEP 2: Connect the emitter and detector side of the sensor together using standoffs and screws.

If you have the old DFI sensor, it will look like this:

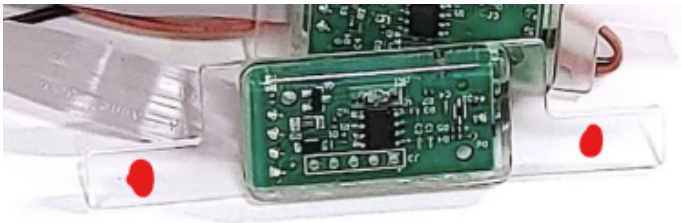


This version already has holes in the corners of the PCB, so you can just use a standoff to connect the two boards together with those holes.

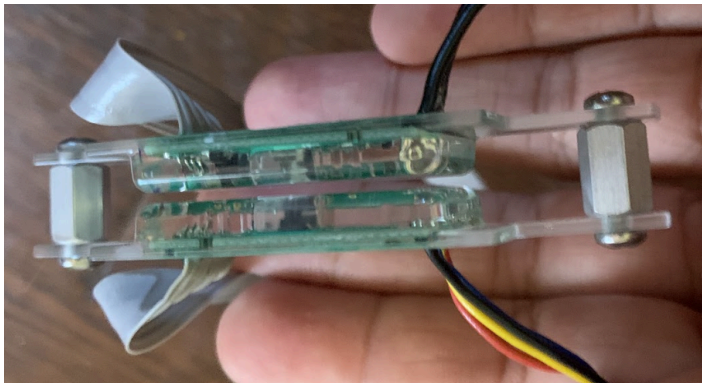
If you have the new DFI sensor, it will look like this:



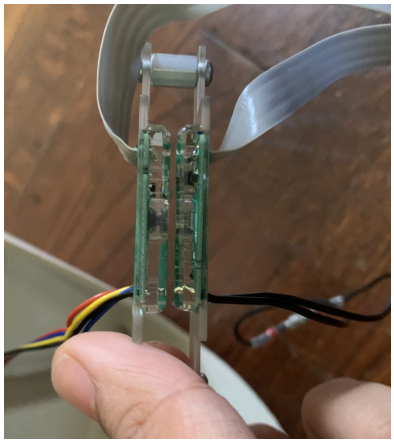
This version doesn't have holes, but it does have these plastic wings that you can drill holes into. Drill holes on each wing at locations shown below (red dots).



Now you can just use a standoff to connect the two boards together, like this:



Make sure to leave a little bit of space between the sensors, as shown below.

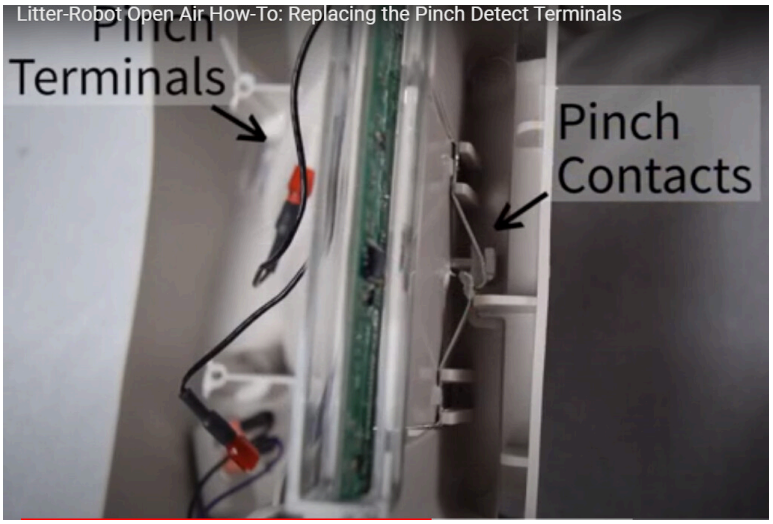


If you don’t have standoffs and screws, you can always tape them together for a temporary fix. See the next section on pinch contacts for wiring and storage info.

PINCH CONTACTS SENSOR (BYPASS)

What does it do?
This sensor uses metal contact leads to detect if a cat is getting caught/ pinched when the drum is rotating. If something gets pinched, it will push the plastic piece that the contacts sit in, causing the contacts to not touch, and breaking the circuit. This tells the robot that a cat has been pinched and to stop reverse and stop.

Should I keep this sensor?
This is one of the sensors that I HIGHLY recommend bypassing. This sensor often fails because the bare metal leads are right by the litter chute and may get corroded from moisture and ammonia from cat urine, litter, and dust. If a cat were to enter when the robot is on, the robot would stop spinning anyway, so this is an extra safety feature that really just gets in the way (IMO). To eliminate another possible failure point, just bypass this sensor by keeping the contacts always connected.
How do I remove this sensor?
STEP 1: Locate and remove the pinch contacts from the plastic base.



STEP 2: Connect the two ends of the wires together.
Some ways to do this:

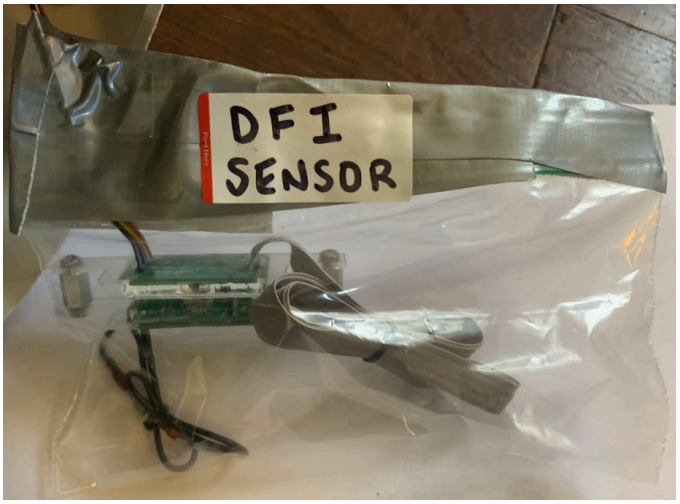
- Tape the leads together with electrical tape (like shown with the bonnet leads above)
- Take the leads off and just use one to connect the terminals together
- Splice the wire and use a lever nut or other quick connector to connect the wires
- Splice and strip the wires and permanently fix/ solder them together

Which method you use depends on the materials you have on hand, and anything is fine as long as it is secure.

Personally, I just chopped the ends off, stripped the wire, coated the wires with solder, and used solderless connectors I already had to join them together permanently.

STEP 3: Bundle your wires and zip-tie them together.

STEP 4: Put this bundle in a ziplock bag with the DFI sensor and duct tape the entrance closed. Label it. Then put this bag in the right side “pocket” in the base.

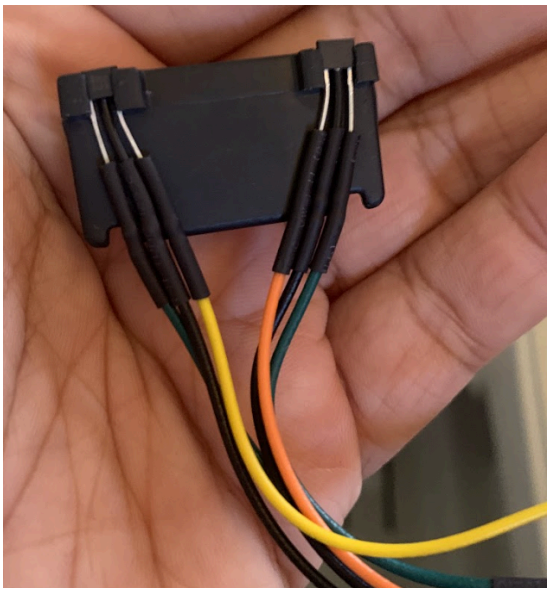


Note: Do NOT skip bagging and taping the sensors, otherwise you may have to eventually replace your electronics. The bag is what will protect your electronics from humidity, ammonia in cat urine, and litter.

MISC. MODIFICATIONS

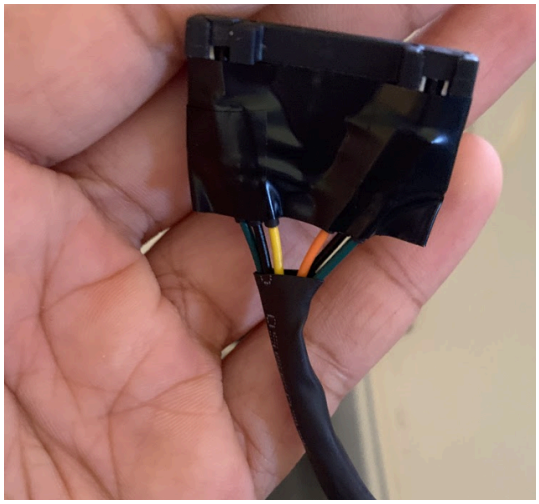
HALL EFFECT SENSOR (MODIFICATION)

What does it do?
Hall effect sensors detect the strength and direction of a magnetic field. In the case of the LR, the globe has magnets in it. The Hall sensor (located in the control panel, part of the wire harness) detects these magnets as the globe spins and uses this to determine the position of the globe. This way the globe can always orient the correct way regardless of how it is loaded in. You do NOT want to eliminate this sensor – it is critical for function.

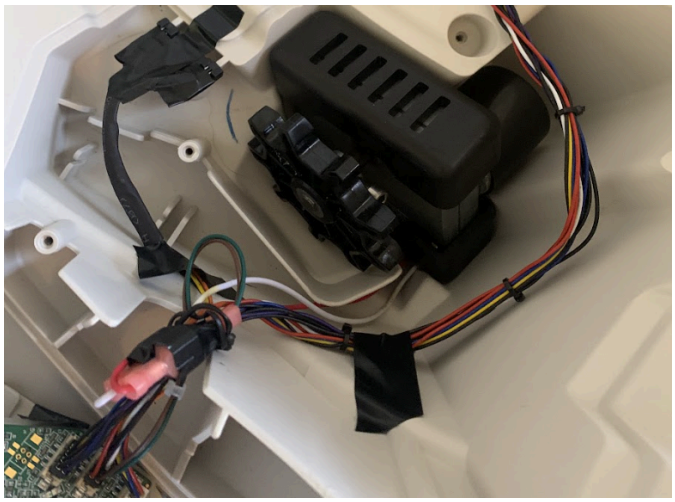


How do I modify this?
From what I could tell, most issues with Hall Effect sensors are due to them moving / falling out of the rubber holder. If they are not oriented correctly (as shown above), this can result in inaccurate position readings for the globe.

To fix this, I just secured the sensors in place with electrical tape.



Then, I taped the sensor down in the control panel housing in the base.



WASTE DRAWER (MODIFICATIONS)

To prevent litter from getting in this area, I cleaned the top and covered it with packaging tape.

I also put a piece of fastener on the waste drawer and on the back of the step mat, so it won't move when my cats jump off. I can take it off, dump out the litter, and fasten it back on.

Next, I cut a piece of polycarb and attached it to the little vertical tabs of the drawer using VHB.

This gives me a separate section to store trash bags. I use normal kitchen trash bags and put them around the whole waste drawer to prevent spillage.

BASE (MODIFICATIONS)

I added an adhesive-backed silicone lining strip to the waste chute area in the base to prevent litter buildup in this area.

To prevent litter from getting in the holes, I covered each hole with packaging tape (red dots):

PRODUCT RECOMMENDATIONS

CARBON FILTERS

The Litter Robot name-brand filters like these can be pricey ($5/each).
An off-brand carbon filter with the same size like these will work just as well and are cheaper ($1.37/each)

WASTE DRAWER LINERS

The Litter Robot name-brand waste drawer liners can be pricey. Any kitchen trash bag (13 gallons) will work fine for this.

LITTER TRACKING

If you have a problem with your cats tracking litter when they jump out, installing a fence at the globe entrance may help with reducing litter tracking.
Litter robot does sell a fence (here) but theirs does not come high up enough for cats that really kick up litter, so I would recommend something like this one – I also like that it is transparent so your cat does not think it is closed off and refuse to enter.
If this is still an issue, a litter trap mat might be a good option.