Replacing the Extruders on a MakerBot Replicator 2X

These are instructions for removing the extruders on the MakerBot Replicator 2X Experimental 3D Printer and replacing them with new ones. To complete this part replacement, you will need the 2.5 mm hex wrench that came with your MakerBot Replicator 2X, some masking tape, a marker and possibly a small flathead screwdriver.

Before you start working on your MakerBot Replicator 2X:
• Unload any filament.
• Turn off the MakerBot Replicator 2X
• Remove the filament guide tubes from the extruders
• Unplug power and USB cables

1. Remove the enclosure lid from the Replicator 2X

2. Remove the left fan assembly

Open the enclosure door to gain access to the inside of your MakerBot Replicator 2X. Use the 2.5 mm hex wrench that came with your 3D printer to remove the bolts at the lower edge of the left extruder fan. Pull the bolts, fan guard, fan, spacers and heat sink off of the extruder as one piece, and rest them on the frame of the MakerBot Replicator 2X.

3. Detach the extruder cable from the MakerBot Replicator 2X

The extruder cable is secured with zip ties to the plastic guide at the back of the extruder carriage and to another guide at the top of the MakerBot Replicator 2X’s back panel. Snip both zip ties to free the cable. Be careful -- make sure you clip only the zip ties and avoid any of the wires going into the extruder cable.

4. Remove the extruders from the extruder carriage

Use the 2.5 mm hex wrench to remove the two bolts on the underside of the extruder carriage. There is one bolt all the way at the right of the extruder
carriage and another all the way at the left. Set the bolts aside. Tilt the extruders to free them from the extruder carriage and set them aside.

5. Turn the MakerBot Replicator 2X onto its left side

To access the Mightyboard, you will need to remove the electronics cavity cover. Carefully turn your MakerBot Replicator 2X onto its left side so you have a clear view of the underside of your 3D printer.

6. Remove the electronics cavity cover

The cover is secured with four M3X6 bolts. Use the 2.5 mm hex wrench to remove them. Set the bolts aside and remove the electronics cavity cover.

Removing Cables from the Mightyboard

In the following steps, you will disconnect the cables that link the extruders to the Mightyboard. To make connecting the cables from your new extruders easier, use masking tape and a marker or pen to label the parts of the Mightyboard where each cable connects. You can also label the cables on your old extruders as you’re disconnecting them and use them as a visual reference when you’re installing the new extruders.

7. Detach the main extruder cable from the Mightyboard

The extruder cables from your two extruders are each composed of four pairs of twisted wires. They connect to the Mightyboard at two ports along the lower edge of the board, labeled A and B. Use tape and a marker to label the extruder cable ports before you detach the cables. Gently pull the plastic connectors to disconnect the cables.

8. Detach the thermocouples from the Mightyboard

The thermocouples from the two extruders attach to a set of terminals at the lower right of the Mightyboard. These terminals are also marked A and B. Use tape and a marker to label the terminals before detaching the thermocouples from the board.

If the terminals are secured by buttons, push the buttons on the terminals to release the red and yellow leads. If the terminals are secured by screws, use a small flathead screwdriver to loosen the screws until you can remove the leads.

9. Reattach the fan assembly
Add the heat sink, spacers, fan, and fan guard that you removed in step 2 to the left extruder. Use the 2.5 mm hex wrench to thread the fan assembly bolts back into the extruder motor.

10. Set the extruders aside

The extruders are now completely detached from your MakerBot Replicator 2X. Set them aside and unpack the new extruders.

11. Separate the extruder wires into two bundles

Separate the wires coming from the right extruder from the wires coming from the left extruder. You may have to unwrap the cable completely to find out which bundle is which, but it's very important. Make sure the right and left wire bundles are labeled before proceeding.

12. Attach the new extruders to the Mightyboard

The new extruders have two thermocouples and two main extruder cables, just like the old ones. Plug the extruder cables into the ports from which you removed the old cables. Make sure the right cable is being plugged into the terminal labeled “A” and the left cable is being plugged into the terminal labeled “B.”

Next, attach the thermocouples. Make sure you're inserting the thermocouple leads into the same terminals you removed the old ones from. The right thermocouple leads go to the terminals labelled “A” and the left thermocouple leads go to the terminals labeled “B.” The terminals are also labeled with color names—be sure to insert the yellow and red leads into the right places.

For terminals with buttons, press the buttons on the terminals, slide the leads all the way in, and release the buttons. For terminals with screws, slide the leads in and tighten the screws. Tug on the leads to make sure they're secure. You may find that it's easier to reconnect one lead at a time.

13. Return the electronics cover to the bottom of your MakerBot Replicator 2X

Bolt it into place with the 2.5 mm hex wrench and the four bolts you set aside earlier.

14. Turn your MakerBot Replicator 2X upright again

Make sure the wrapped extruder cable routes through the notch at the back of the 3D printer.
15. **Remove the left fan assembly**

Use the 2.5 mm hex wrench to remove the bolts, fan guard, fan, spacers and heat sink of the left extruder as one piece.

16. **Bolt the new extruders onto the extruder carriage**

Angle the dual extruders into the extruder carriage. The fans should face the front of the 3D printer and the motors should face the back. Bolt them into place using the 2.5 mm hex wrench and the two bolts you set aside earlier.

17. **Reattach the left fan assembly**

Now that the extruders are on the extruder carriage, you can bolt the fan assembly into place using the 2.5 mm hex wrench.

18. **Push the extruder cable into place**

Push the extruders all the way to the front left of the MakerBot Replicator 2X to ensure that there’s enough slack. Then push the cable into the brackets at the back of your 3D printer.

That’s it—the new extruders are installed. You can plug in your MakerBot Replicator 2X, turn it on, load filament and return to printing.