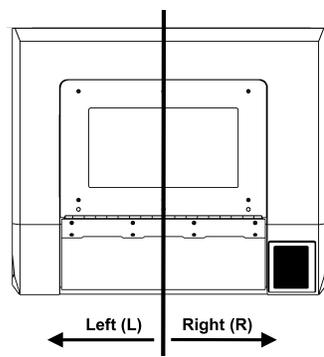




Title	LMC Replacement
Models	Bolt Pro
Version	1.0
Revision date	06-08-2018
Expected duration	60 minutes

Description
<p>This guide explains how to replace the Leapfrog Motor Control board (LMC) also known as motherboard. The LMC controls all motors, sensors and heating elements. The electronic components involved in this procedure are sensitive and therefore this procedure requires cautious handling of all parts.</p> <p>Remember to use protective gloves, glasses, anti-static band and clothing for each of these activities. Always remove the power cord before adjusting, connecting or disconnecting any cables.</p>

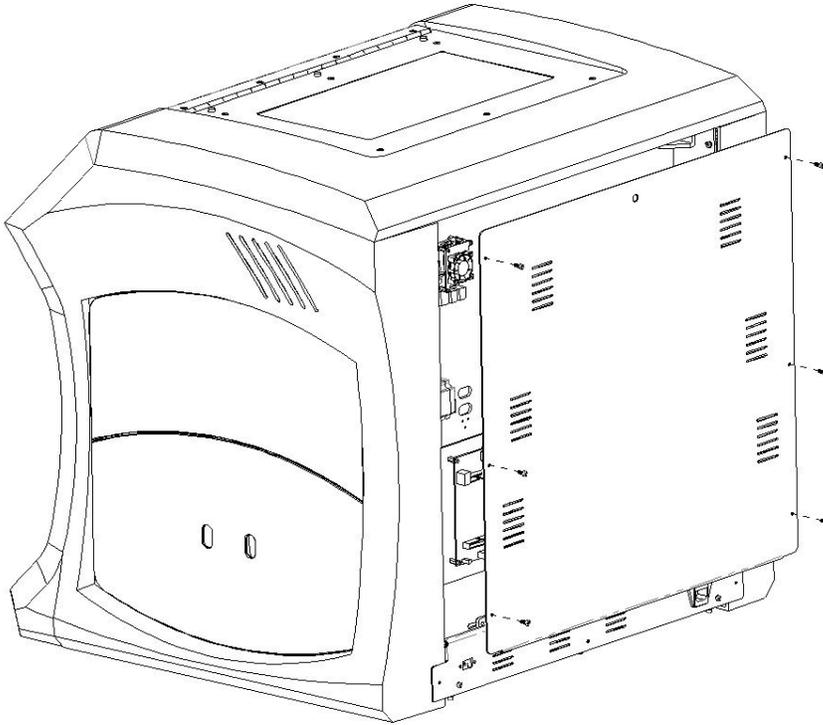
Guideline	
<ul style="list-style-type: none"> • In this guide, some cables will be referenced with Left or Right. This is always relative to looking from the front of the machine. • This guide can also be used to update your LMC Setup from Version 1 to Version 2. • Before starting the procedure make sure all parts listed below are included. • When removing cables, never pull the wires. Always pull the connector instead. • Some cable connectors may be secured to the LMC using glue This glue can be removed. 	

Tools
Allen wrench 5
Cutting plier

Parts
Y-motor copy cable
Left Y-axis Motor Cable LMC Setup Version 2
Labels
Replacement LMC (with firmware pre-installed)
Circuit board jumpers
Tye-ribs

Step 1

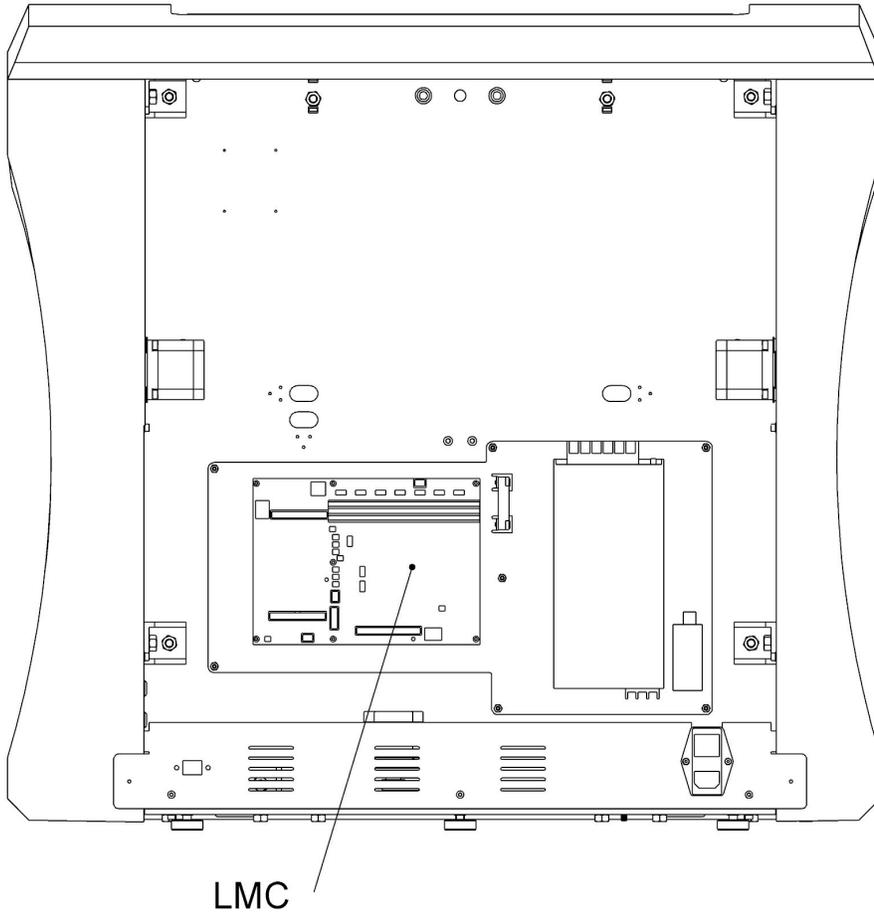
Removing covers



- | | |
|----|---|
| a. | Before starting this procedure. Make sure your machine is switched off. |
| b. | Disconnect the power cable. |
| c. | Remove all 6 bolts on the back cover using Allen Key size 5. |

Step 2

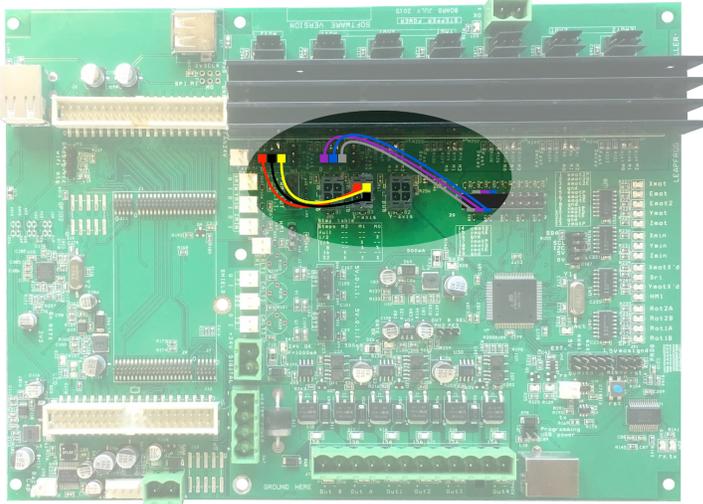
Locate the LMC



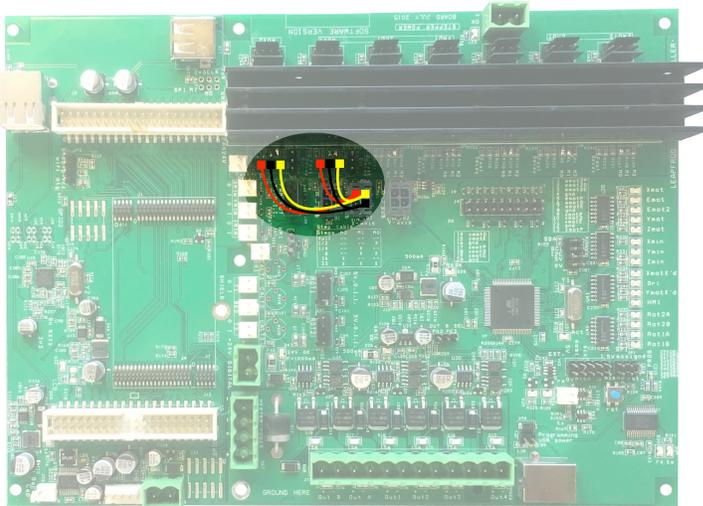
a.

Visually locate the LMC

Step 4 LMC Setup Version 1 or Version 2 ?



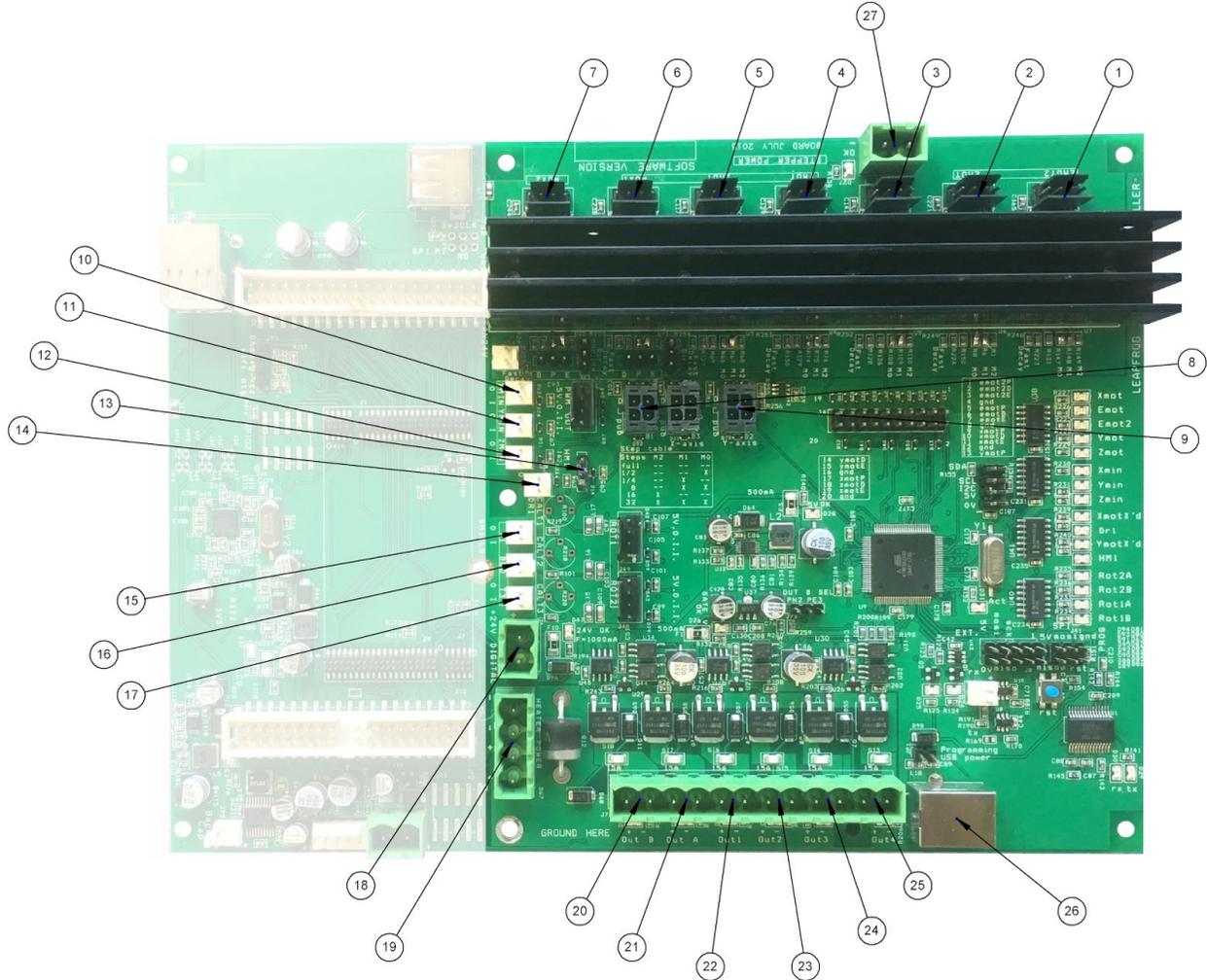
LMC Setup Version 1



LMC Setup Version 2

- | | |
|----|---|
| a. | Take a closer look to the LMC and determine which LMC Setup Version is being used. |
| b. | Make sure to prepare the replacement LMC with the wiring similar to LMC Setup Version 2 |

Step 5 Apply Cable Labeling

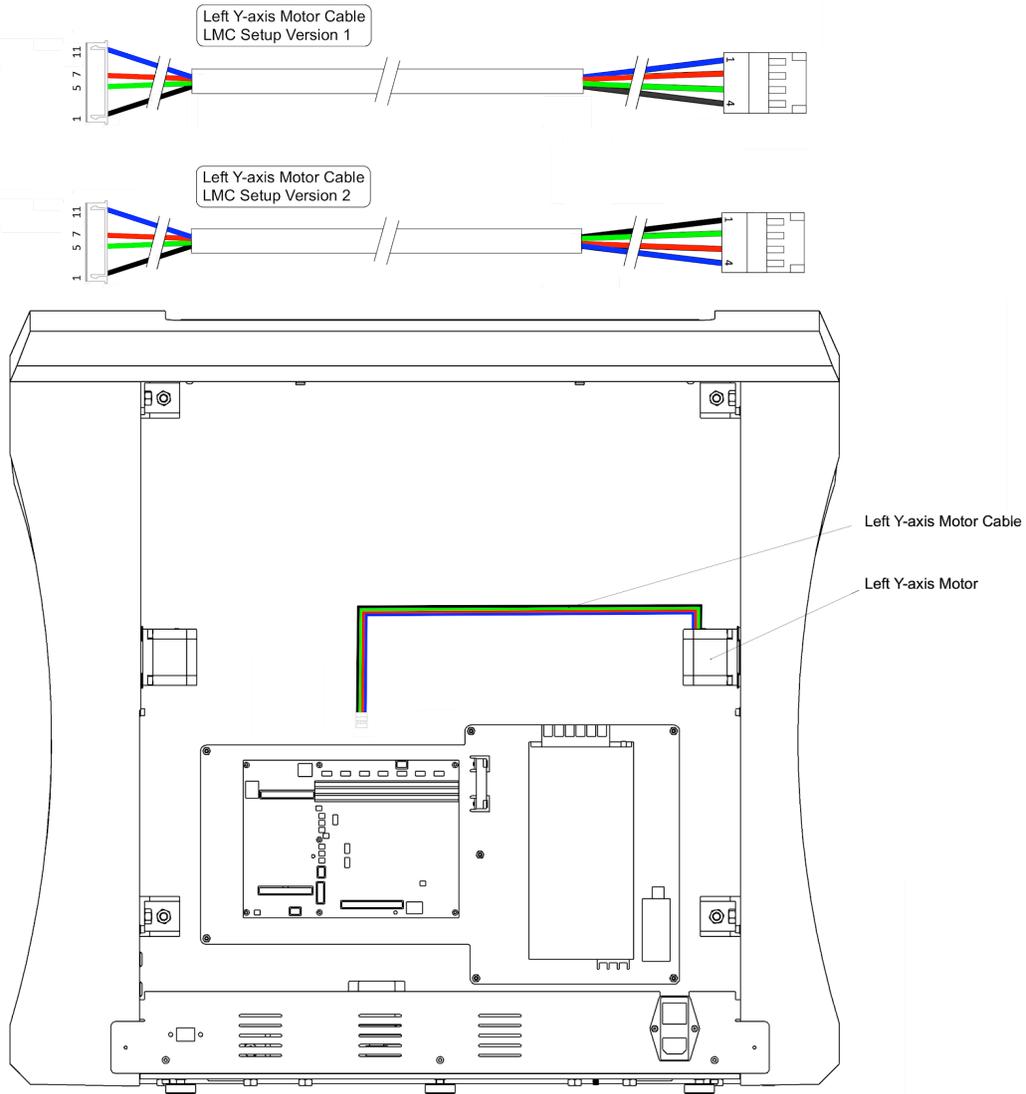


- a. Apply cable labeling on all numbered connections. Use the table on the next page to determine the correct labeling. **Be sure only to use the table that corresponds with your LMC Setup Version.**

Table A: LMC Setup Version 1			
No.	LMC ID:	Cable ID:	Description
1	EMOT2	L-EMOT	Left Extruder Motor
2	EMOT	R-EMOT	Right Extruder Motor
3	XMOT	R-XMOT	Right X-axis Motor
4	YMOT	R-YMOT	Right Y-axis Motor
5	ZMOT	ZMOT	Z-axis Motor
6	AUX1	L-YMOT	Left Y-axis Motor
7	AUX2	L-XMOT	Left X-axis Motor
8	B1	R-H/L	Right High/Low temp detect
9	B2	L-H/L	Left High/Low temp detect
10	XMIN	L-XMIN	Left X-axis endstop
11	YMIN	YMIN	Y-axis endstop
12	ZMIN	ZMIN	Z-axis zero position endstop
13	HM1	R-XMIN	Right X-axis endstop
14	DR1	ZMAX	Z-axis max position endstop
15	T1	R-Temp	Right Extruder Temperature
16	BED	B-Temp	Bed Temperature
17	T3	L-Temp	Left Extruder Temperature
18	+24V Digital	-	24V: + (Red) - (Black)
19	Heater Power	-	24V: ++ (Red) -- (Black)
20	Out B	-	Cooling Fans (Left + Right)
21	-	-	-
22	Out1	-	Bed Heating
23	Out2	-	Right Printhead Heating
24	Out3	-	Left Printhead Heating
25	Out4	-	-
26	J35	-	USB B port (to Raspberry PI)
27	+24V Digital	-	24V: + (Red) - (Black)
Please note that “L” and “R” notation applies when looking from the front of the machine			

Table B: LMC Setup Version 2			
No	LMC ID:	Cable ID:	Description
1	EMOT2	L-EMOT	Left Extruder Motor
2	EMOT	R-EMOT	Right Extruder Motor
3	XMOT	R-XMOT	Right X-axis Motor
4	YMOT	L-XMOT	Left X-axis Motor
5	ZMOT	ZMOT	Z-axis Motor
6	AUX1	L-YMOT	Left Y-axis Motor
7	AUX2	R-YMOT	Right Y-axis Motor
8	B1	R-H/L	Right High/Low temp detect
9	B2	L-H/L	Left High/Low temp detect
10	XMIN	L-XMIN	Left X-axis endstop
11	YMIN	YMIN	Y-axis endstop
12	ZMIN	ZMIN	Z-axis zero position endstop
13	HM1	R-XMIN	Right X-axis endstop
14	DR1	ZMAX	Z-axis max position endstop
15	T1	R-Temp	Right Extruder Temperature
16	BED	B-Temp	Bed Temperature
17	T3	L-Temp	Left Extruder Temperature
18	+24V Digital	-	24V: + (Red) - (Black)
19	Heater Power	-	24V: ++ (Red) -- (Black)
20	Out B	-	Cooling Fans (Left + Right)
21	-	-	-
22	Out1	-	Bed Heating
23	Out2	-	Right Printhead Heating
24	Out3	-	Left Printhead Heating
25	Out4	-	-
26	J35	-	USB B port (to Raspberry PI)
27	+24V Digital	-	24V: + (Red) - (Black)
Please note that “L” and “R” notation applies when looking from the front of the machine			

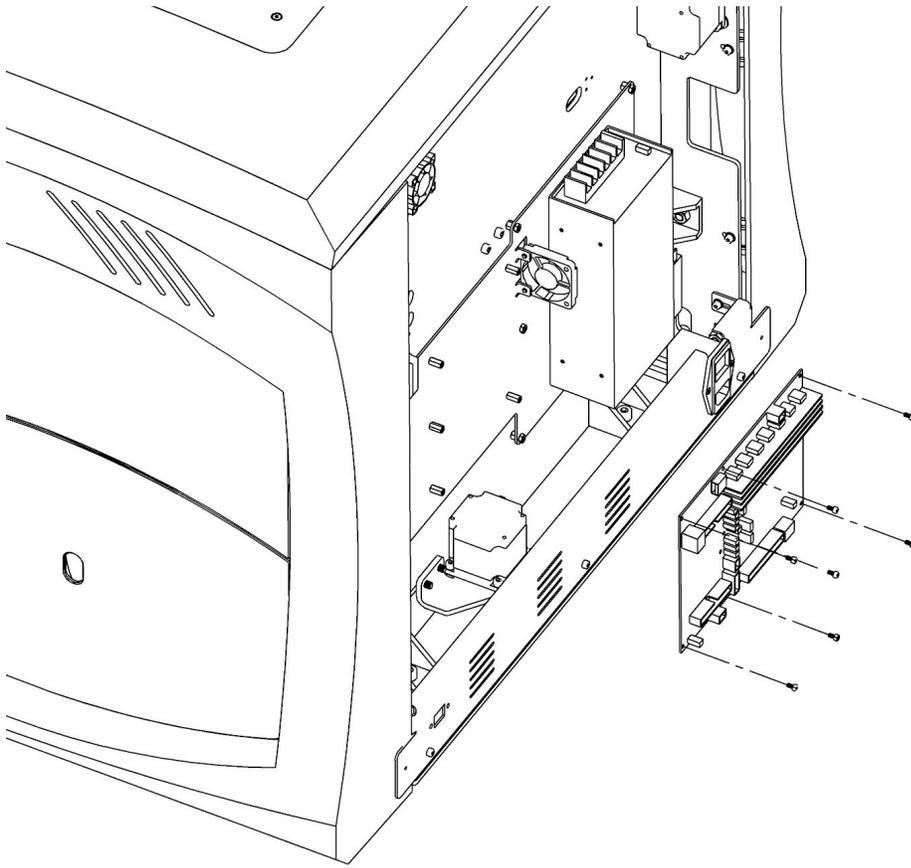
Step 6 Change the left Y-motor cable



This step is only necessary when your Bolt PRO machine is currently LMC Setup Version 1

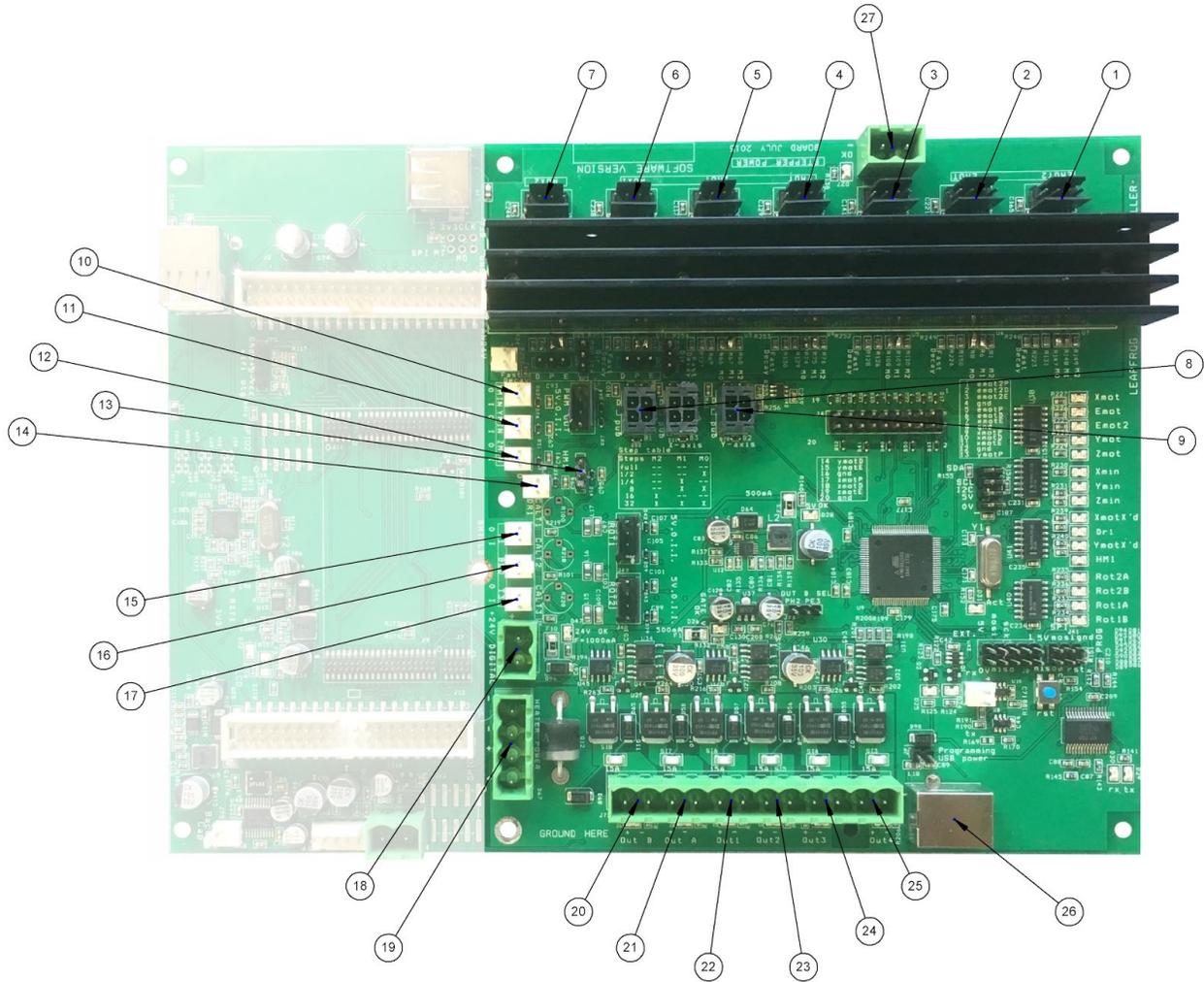
- | | |
|----|--|
| a. | Remove the Left Y-axis Motor Cable LMC Setup Version 1 |
| b. | Install the Left Y-axis Motor Cable LMC Setup Version 2. The connector that will be installed on the LMC will be attached in the step. |

Step 7 Removing the defective LMC and Installing the replacement LMC



- | | |
|----|---|
| a. | Loosen all 7 bolts using allen wrench size 2.5. Remove the defective LMC |
| b. | Place the replacement LMC and tighten all 7 bolts using allen wrench size 2.5 |

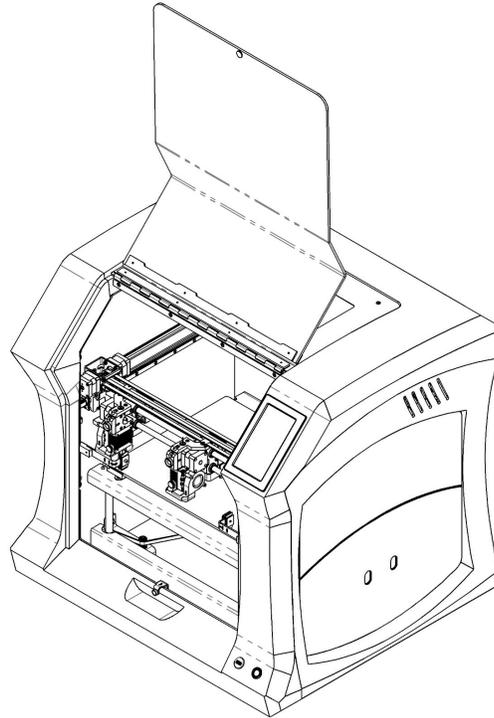
Step 8 Connect all Cables



- a. Apply cable labeling on all numbered connections. Use the table on the next page to determine the correct labeling. **Be sure only to use the table that corresponds with your LMC Setup Version.**

Table B: LMC Setup Version 2			
No.	LMC ID:	Cable ID:	Description
1	EMOT2	L-EMOT	Left Extruder Motor
2	EMOT	R-EMOT	Right Extruder Motor
3	XMOT	R-XMOT	Right X-axis Motor
4	YMOT	L-XMOT	Left X-axis Motor
5	ZMOT	ZMOT	Z-axis Motor
6	AUX1	L-YMOT	Left Y-axis Motor
7	AUX2	R-YMOT	Right Y-axis Motor
8	B1	R-H/L	Right High/Low temp detect
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10	XMIN	L-XMIN	Left X-axis endstop
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15	T1	R-Temp	Right Extruder Temperature
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18	+24V Digital	-	24V: + (Red) - (Black)
19	Heater Power	-	24V: + + (Red) - - (Black)
20	Out B	-	Cooling Fans (Left + Right)
21	-	-	-
22	Out1	-	Bed Heating
23	Out2	-	Right Printhead Heating
24	Out3	-	Left Printhead Heating
25	Out4	-	-
26	J35	-	USB B port (to Raspberry PI)
27	+24V Digital	-	24V: + (Red) - (Black)
Please note that “L” and “R” notation applies when looking from the front of the machine			

Step 9 Initial test

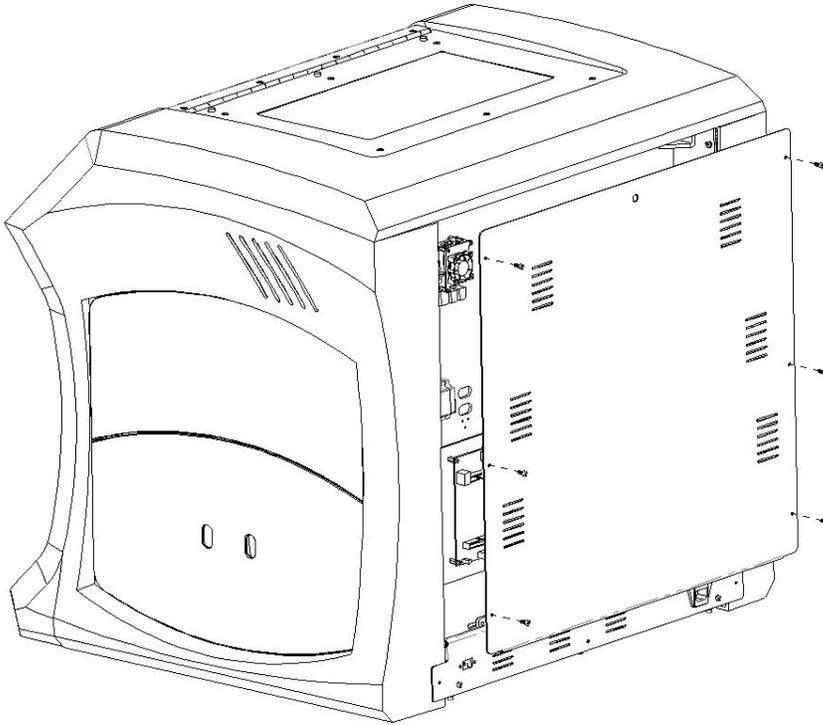


This step requires two persons. These will be described as Person A and Person B.

a.	Switch on the machine and wait for the startup screen to appear on the display. temperature error? either the bed, left printhead or right printhead is not connected correctly. Or contact support Printer offline? LMC not powered or USB-B wired incorrectly. Or contact support
b.	While person A presses begin homing, person B is ready to flip the switch to turn the machine off in case something unexpected happens. Collision of either printhead or bed? Please turn off machine and L+R motor wiring. Or contact support. Printhead not homing fully? Please turn off machine and inspect endstop wiring. Or contact support.
c.	Navigate to settings / Update and complete all updates. We strongly recommend using a LAN connection for this.
d.	Navigate to Settings / Head Maintenance and pre-heat the left extruder. Right printhead being heated? Please turn off machine, inspect temperature / heating wiring. Or contact support. No heating at all? Please turn off machine and inspect temperature and heating wiring.Or contact support
e.	Navigate to Settings / Head Maintenance and pre-heat the right extruder. Right printhead being heated? Please turn off machine, inspect temperature / heating wiring. Or contact support. No heating at all? Please turn off machine and inspect temperature and heating wiring.Or contact support
f.	Load PLA filament in both printheads and Navigate to settings / calibrate extruders and complete the procedure.

Step 10

Install the back panel



- | | |
|----|---|
| a. | Before starting this procedure. Make sure your machine is switched off. |
| b. | Install all 6 bolts on the back cover using Allen Key size 5. |