CubePro™

Prosumer 3D Printer

Print Jet Level Guide

Original Instructions

CONTENTS

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FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

NOTE: Changes or modifications to this equipment not specifically approved by 3D Systems may void the user's authority to operate this equipment.

KCC

이 기기는 가정용(B급) 전자파적합기기로서 주 로 가정에서 사용하는 것을 목적으로 하며, 모 든 지역에서 사용할 수 있습니다.

This equipment is home use (Class B) electromagnetic wave suitability equipment and to be used mainly at home and it can be used in all areas.

COMPLIANCE

This equipment conforms with International Electric Committee (IEC) 60950-1 and meets the requirements of the applicable EC directives.

CAN ICES-3 (B)/NMB-3(B)

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

WARRANTY

3D Systems warrants that the CubePro 3D Printer will be free from defects in materials and workmanship, during the applicable warranty period, when used under the normal conditions described in the documentation provided to you, including this User Guide. 3D Systems will promptly repair or replace the CubePro 3D Printer, if required, to make it free of defects during the warranty period. This warranty excludes (i) normal consumable or expendable parts (such as Material Cartridges), (ii) repairs required during the warranty period because of abnormal use or conditions (such as riots, floods, misuse, neglect or improper service by anyone except 3D Systems or its authorized service provider), and (iii) repairs required during the warranty period because of the use of non-integrated, non-approved or non-licensed materials with the CubePro 3D Printer. The warranty period for the CubePro 3D printer is the shorter of (i) 90 days from the date your CubePro 3D printer is activated or (ii) 24 months after the CubePro 3D Printer is shipped from 3D Systems to the end customer or intermediary. For consumers who are covered by consumer protection laws or regulations in their country of purchase or, if different, their country of residence, the benefits conferred by our ninety (90) day warranty are in addition to, and operate concurrently with, all rights and remedies conveyed by such consumer protection laws and regulations, including but not limited to these additional rights.

THIS WARRANTY IS THE ONLY WARRANTY PROVIDED FOR THE CUBEPRO 3D PRINTER. TO THE MAXIMUM EXTENT PERMITTED BY LAW, 3D SYSTEMS EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES FOR THE CUBEPRO 3D PRINTER AND EACH OF ITS COMPONENTS, WHETHER THOSE WARRANTIES ARE EXPRESS, IMPLIED OR STATUTORY, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR INTENDED OR PARTICULAR PURPOSES.

LIMITATION OF LIABILITY

3D SYSTEMS WILL NOT BE RESPONSIBLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, EXEMPLARY OR INCIDENTAL DAMAGES (SUCH AS LOSS OF PROFIT OR EMPLOYEE'S TIME) REGARDLESS OF THE REASON. IN NO EVENT SHALL THE LIABILITY AND/OR OBLIGATIONS OF 3D SYSTEMS ARISING OUT OF THE PURCHASE, LEASE, LICENSE AND/OR USE OF THE EQUIPMENT BY YOU OR OTHERS EXCEED THE PURCHASE PRICE OF THE CUBEPRO 3D PRINTER.

Warranty Hotline from the Americas	**Warranty Hotline from Europe**	**Warranty Hotline from Europe**
888-598-1440 inside the US and **+1 678-338-3480** outside the US weekdays during normal business hours or by email at **cubifysupport@cubify.com**.	**+44 1442 279 839 (UK)** or **+49 6151 357 499 (DE)** weekdays during normal business hours or by email at **cubifysupport@cubify.com**.	**+44 1442 279 839 (UK)** or **+49 6151 357 499 (DE)** weekdays during normal business hours or by email at **cubifysupport@cubify.com**.

2 IMPORTANT SAFETY INFORMATION

SAFETY SYMBOLS AND DEFINITIONS

HOT SURFACE HAZARD: A HOT SURFACE IS ACCESSIBLE IN THE VICINITY OF THIS SIGN OR AT THE PRINT JET. AVOID CONTACT WITH THESE AREAS. HOT SURFACES CAN CAUSE SEVERE BURNS.

Caution: Indicates something may happen that could cause loss of data, damage to equipment, or could cause personal injury.

Caution: Indicates a pinch point hazard that could cause personal injury.

SHOCK WARNING: INDICATES A POTENTIAL SHOCK HAZARD.

SAFETY GUIDELINES

- Follow all safety rules in this section and observe all cautions and warnings in this guide.
- Do not modify any safety features or make modifications to the CubePro. Doing so is prohibited and voids the warranty.
- Use of print materials other than genuine 3D Systems components may void the warranty.

WARNING: HAZARDOUS MOVING PARTS. KEEP FINGERS AND OTHER BODY PARTS AWAY.

HOT SURFACE HAZARD: DO NOT TOUCH THE PRINT JETS DURING SETUP AND OPERATION. THE PRINT JETS BECOME VERY HOT.

Caution: Read and follow all instruction prior to setting up the printer.

SHOCK WARNING: DUE TO RISK OF SHOCK, AVOID CONTACT WITH ALL INTERNAL ELECTRONIC COMPONENTS.

WARNING: THE CUBEPRO SHOULD ONLY BE SERVICED BY AUTHORIZED SERVICE TECHNICIANS. PRIOR TO ANY PART REPLACEMENT PROCEDURE, THE PRINTER MUST BE POWERED OFF AND DISCONNECTED FROM UTILITY POWER.

HOT SURFACE HAZARD: WHEN PRINTING WITH ABS MATERIAL, THE INTERIOR (PRINT CHAMBER) OF THE PRINTER WILL HEAT TO A PREDETERMINED TEMPERATURE. THE SURFACE OF THE PRINT CHAMBER HEATER WILL BE HOT. AVOID CONTACT WITH THE PRINT CHAMBER HEATER AND NOTE THAT OTHER COMPONENTS INSIDE THE PRINT CHAMBER MAY BE HOT.

To ensure safety, please exercise caution when operating your CubePro. Read and follow all safety precautions as outlined in this user guide. Be careful when operating your CubePro to ensure proper printing and be mindful of and avoid hot surfaces.

**EXTRUDER CARRIAGE ASSEMBLY**

Front
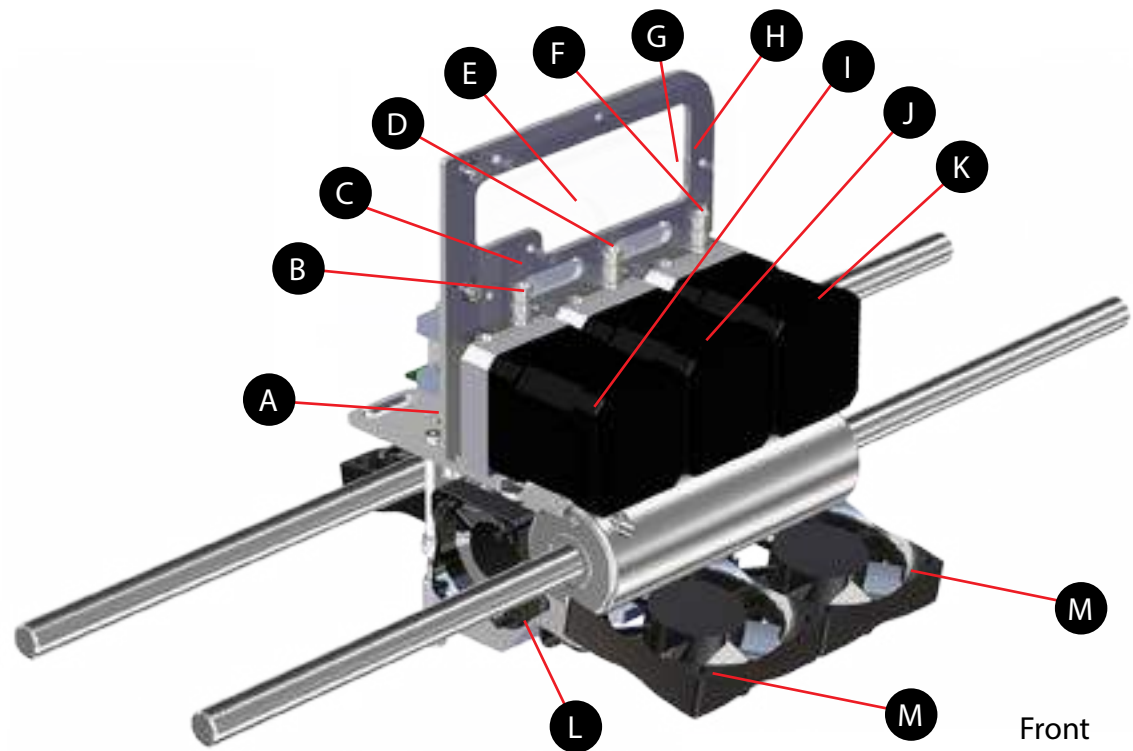
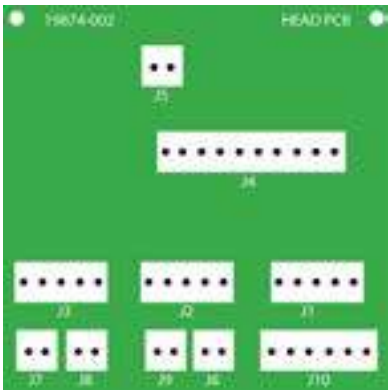|				
A	Delivery Tube Bracket	H	Delivery Tube Block
B	Delivery Tube Nut 1	I	Extruder 1
C	Delivery Tube 1	J	Extruder 2
D	Delivery Tube Nut 2	K	Extruder 3
E	Delivery Tube 2	L	Print Jet Cooling Fan
F	Delivery Tube Nut 3	M	Creation Cooling Fan
G	Delivery Tube 3		
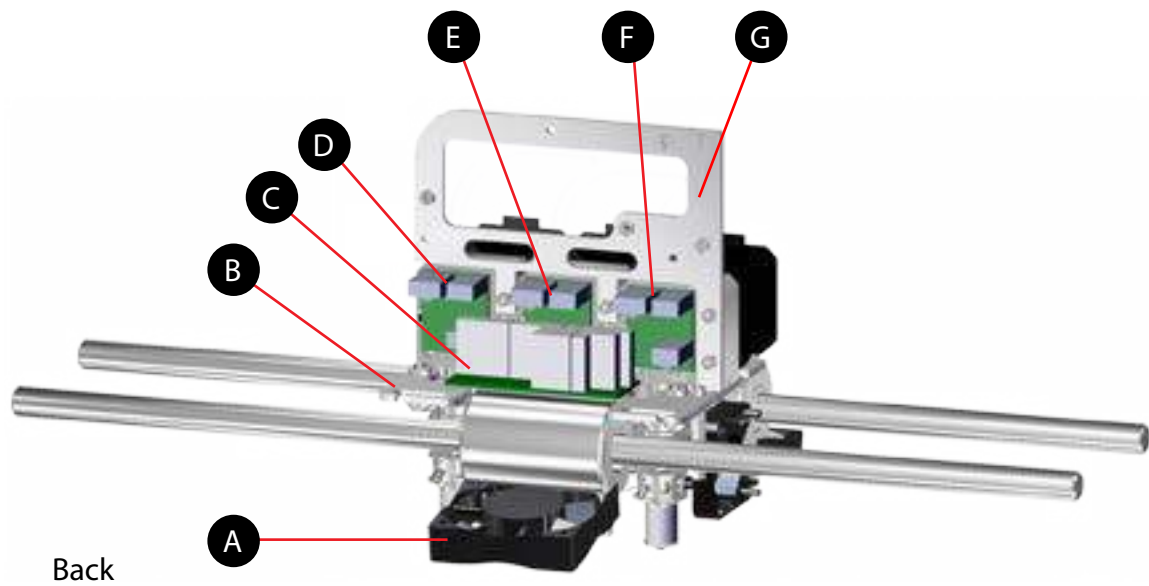
Back

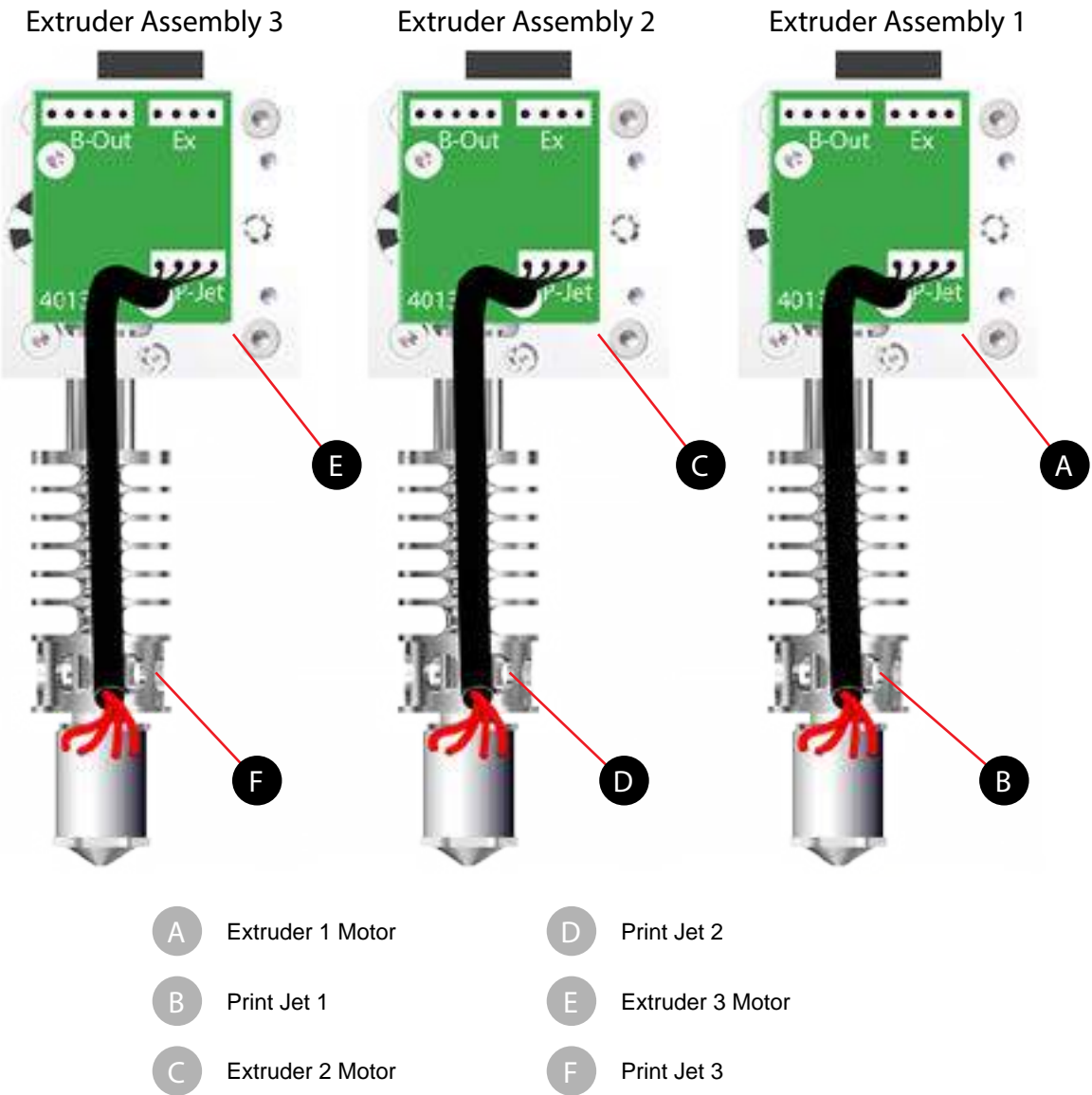|			
A	Creation Cooling Fan	E	Extruder 2 PCB
B	Carriage Plate	F	Extruder 1 PCB
C	Main Extruder PCB	G	Delivery Tube Bracket
D	Extruder 3 PCB		

Bottom

Front
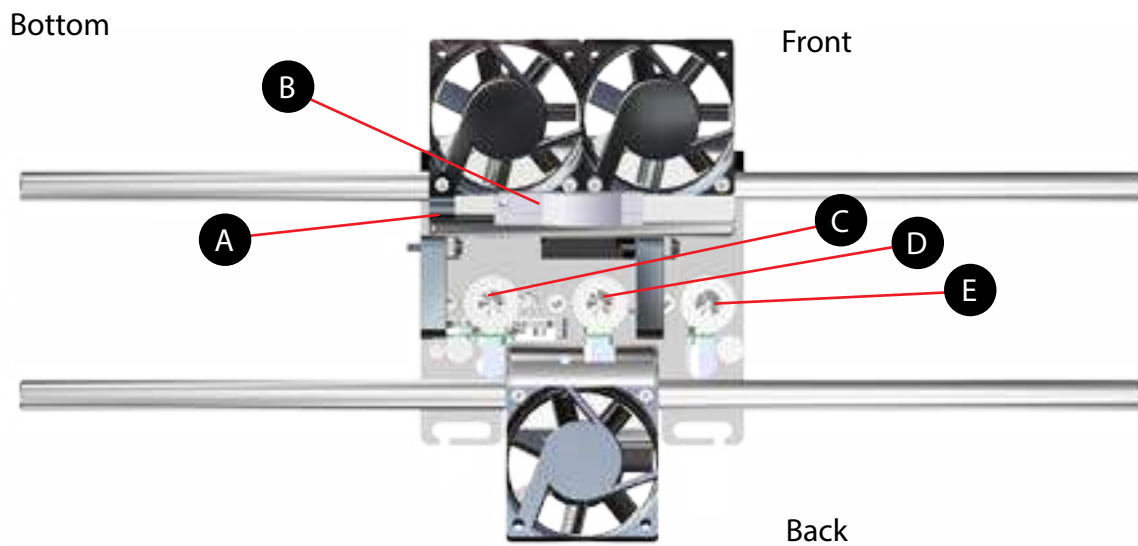
Back

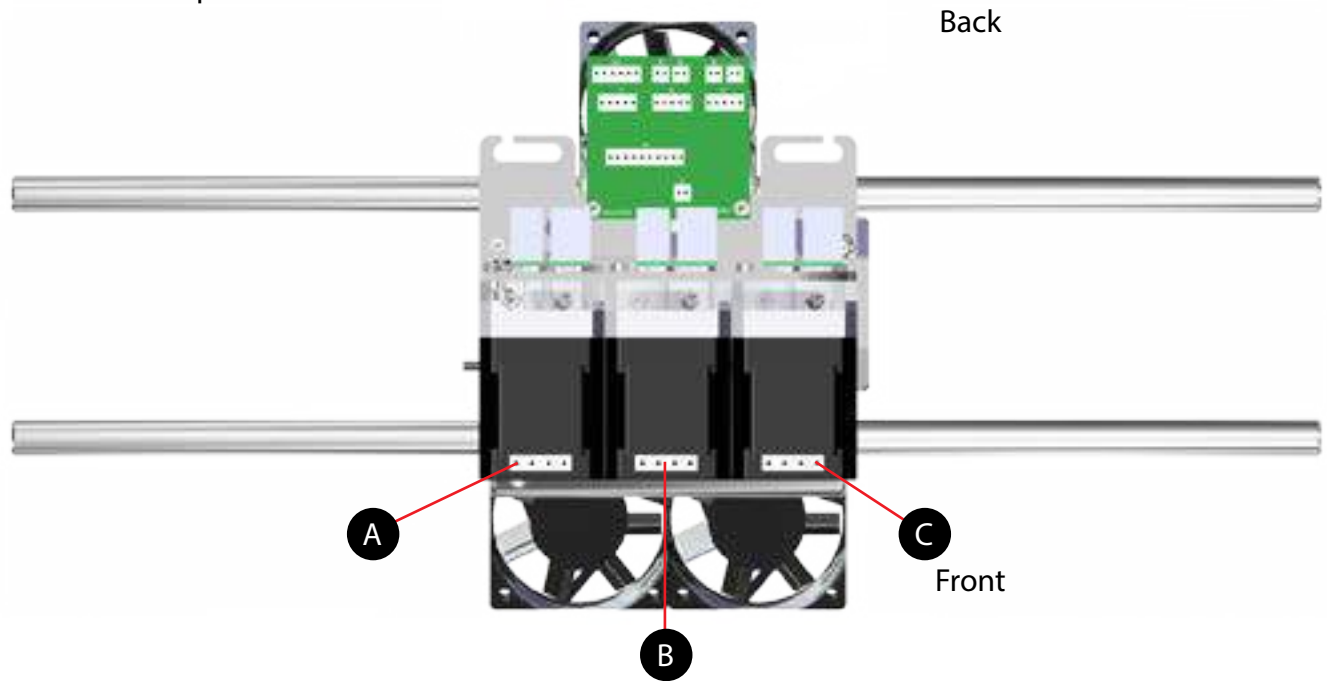|			
A	Fan Harness Cable Clamp	D	Print Jet 2
B	Print Jet LED	E	Print Jet 3
C	Print Jet 1		

Main Extruder PCB

View From Back

| Extruder Assembly 3 | Extruder Assembly 2 | Extruder Assembly 1 |

A	Extruder 1 Motor	D	Print Jet 2
B	Print Jet 1	E	Extruder 3 Motor
C	Extruder 2 Motor	F	Print Jet 3

View From The Top   Back

A   Extruder 1 Motor Connector

B   Extruder 2 Motor Connector

C   Extruder 3 Motor Connector

ELECTRICAL CONNECTIONS

Main Extruder PCB	Cable	Extruder PCB Connector	Component
	X1 (A) - 401889-00		Extruder 1 Motor: Junction
	X2 (A) - 401889-00		Extruder 2 Motor: Junction
	X3 (A) - 401889-00		Extruder 3 Motor: Junction
	X1 (B) - 401889-00	Extruder 1 PCB: Junction Ex	
	X2 (B) - 401889-00	Extruder 2 PCB: Junction Ex	
	X3 (B) - 401889-00	Extruder 3 PCB: Junction Ex	
J1	401888-00	Extruder 1 PCB: Junction B-Out	
J2	401888-00	Extruder 2 PCB: Junction B-Out	
J3	401888-00	Extruder 3 PCB: Junction B-Out	
	Print Jet 1	Extruder 1 PCB: Junction P-Jet	Extruder 1: 403022-00 (Print Jet 1)
	Print Jet 2	Extruder 2 PCB: Junction P-Jet	Extruder 2: 403022-00 (Print Jet 2)
	Print Jet 3	Extruder 3 PCB: Junction P-Jet	Extruder 3: 403022-00 (Print Jet 3)
J4	P3 - 401888-00		
J6	401887-00		CubePro LED Wire Harness 2
J7	401885-00		CubePro Fan Wire Harness 2 (Right Fan)
J9	401885-00		CubePro Fan Wire Harness 2 (Left Fan)
J10	401884-00		CubePro Fan Wire Harness 3

Jet Wiper Assembly
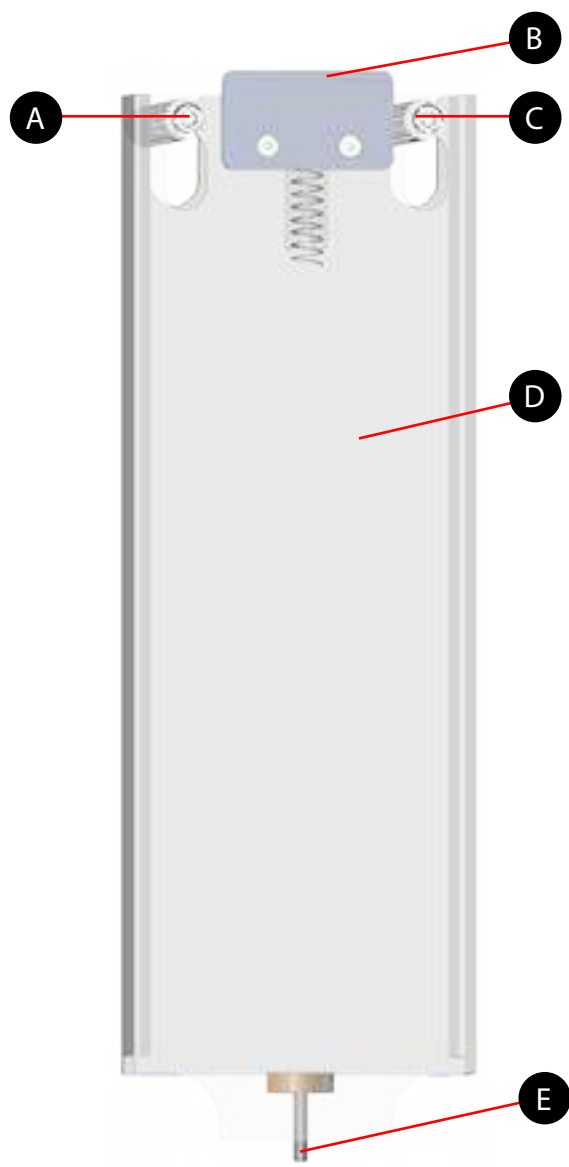
A	Left Mounting Post
B	Jet Wiper Blade
C	Right Mounting Post
D	Jet Wiper Assembly
E	Adjustment Thumbscrew

TOOLS NEEDED

• T10 Torx Driver

LEVEL THE PRINT JETS

⚠️ **SHOCK WARNING: EXERCISE CAUTION WHENEVER YOU ARE NEAR ELECTRICAL COMPONENTS.**

⚠️ **WARNING: BEFORE SERVICING THESE COMPONENTS, ENSURE YOU ARE WEARING A WELL-GROUNDED ELECTRO-STATIC DISCHARGE (ESD) STRAP. ESD PROTECTION IS REQUIRED.**

⚠️ **WARNING: NEVER PULL ON WIRES TO DISCONNECT THE CONNECTORS. THIS COULD DAMAGE THE WIRES AND THE CONNECTORS AND VOID THE MANUFACTURER'S WARRANTY.**

The following procedure is intended to provide instructions about how to level print jets for printers with more than 1 print jet.

1. For printers with two (2) or three (3) print jets, loosen the T10 torx screws on extruders 1 and 3.

   ⚠️ **CAUTION: There should be enough access to reach the torx screws using an insulated torx driver. Exercise caution when working around the PCBs.**

   📝 **NOTE: Print jet 2 should not need adjustments.**
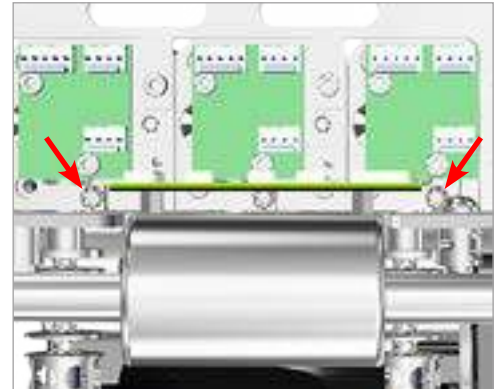
2. Connect the printer to utility power, turn on the main power switch and then turn on the display.

3. Navigate to the **Print Plate Calibration** screen and select **MOVE JETS**.

4. Select the Z: down arrow until the display reads -0.50.

   📝 **NOTE: For printers with 2 or three print jets, visually inspect the gap between the nozzle tip of print jet 2 and the print pad. If necessary, press the Z: down arrow until there is a gap.**

1. Press the X and Y adjustment arrows until print jet 2 is closely aligned above the front print pad adjustment knob.

   ✎ **NOTE: The red line in the illustration demonstrates an approximate alignment of print jet 2 and the front print pad adjustment knob.**
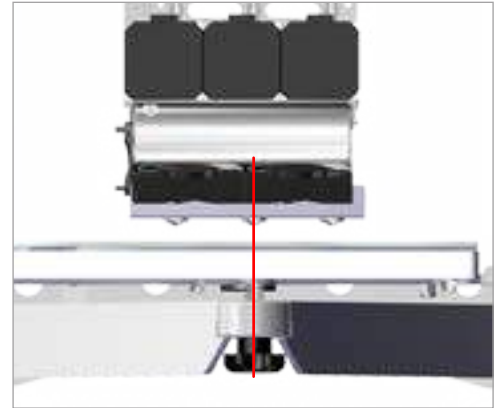
2. Press the Z: up arrow until the nozzle of print jet 2 lightly touches the print pad.

   ✎ **NOTE: If there is still a gap between the nozzle of print jet 2 and the print pad, and the Z: up arrow will not raise the print pad further, rotate the front print pad adjustment knob counter-clockwise (from the bottom side) until the nozzle lightly touches the print pad. If the adjustment knob was turned, turn it back the same amount and then be sure to perform the print pad leveling procedure.**

3. Verify that the nozzles of print jet 1 and print jet 3 are also touching the printpad.

4. When all of the print jet nozzles lightly touch the print pad, power off the printer and disconnect it from utility power.

5. Tighten the left and right print jet screws using a T10 torx driver.
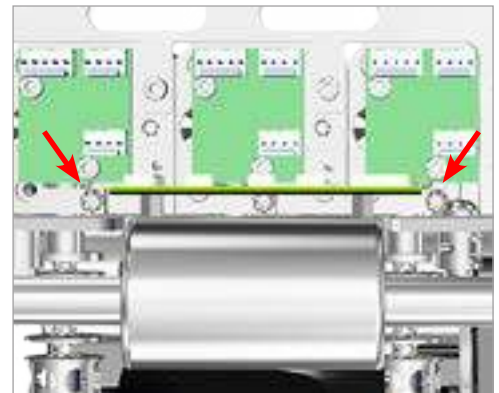
6. Connect the printer to utility power and power on the printer.

7. Ensure the print pad is at its lowest position.

8. Power off the printer and disconnect it from utility power.

1. Holding on to the extruder carriage assembly, gently position it over the jet wiper assembly.

View From Top

Front

Back
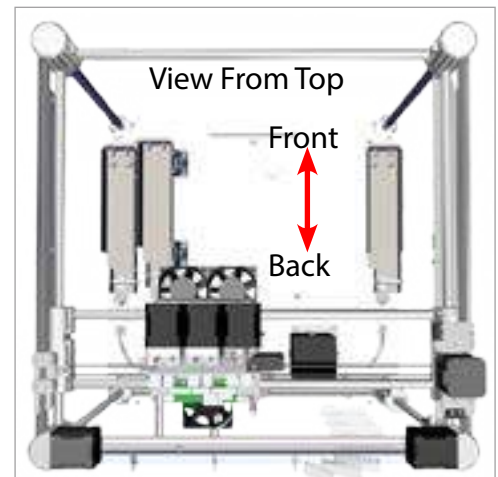
2. Verify the wiper blade meets the tapered portion (A) of the print jet nozzle. If it does, the jet wiper is properly adjusted. Proceed to step 17.

   NOTE: If the wiper tip is too high, proceed to the next step. If the wiper tip is too low, proceed to step 16.
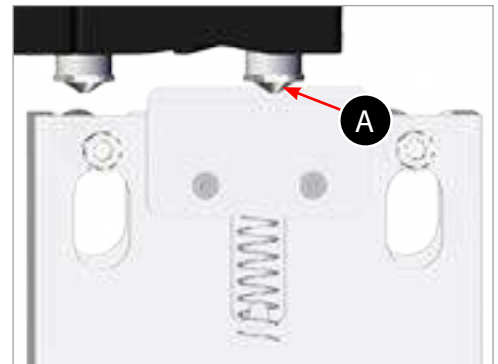
3. If the wiper blade is too high, remove the jet wiper assembly and turn the adjustment thumbscrew (A) clockwise. Reinstall the jet wiper and return to step 14.
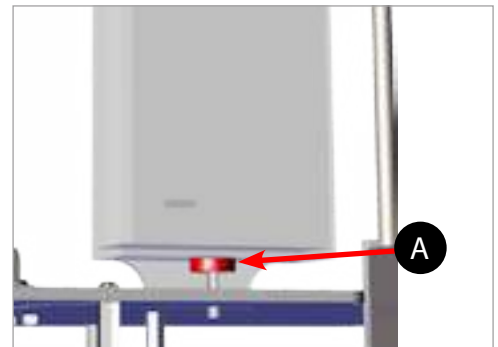
4. If the wiper tip is too low, remove the jet wiper assembly and turn the adjustment thumbscrew (A) counter-clockwise. Reinstall the jet wiper and return to step 14.
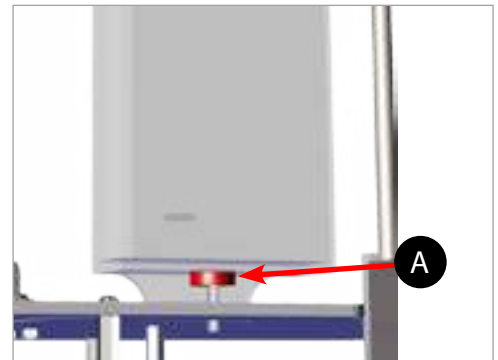
5. Once satisfied with the adjustment, connect your printer to utility power and power on the printer.

6. If necessary, calibrate the print pad.

7. Proceed to the Z-Gap and Level Gap procedure. Once the Z-Gap and Level Gap are correct, calibrate the offset jets.

CALIBRATING THE LEVEL GAP

Leveling the print jets is very important to ensure quality prints. Checking the Z-Gap becomes necessary after replacing a print jet, an extruder assembly or the print pad.

The Print Jet Level Gap calibration file requires **all** cartridge bays loaded with the same material type cartridges.

> **NOTE: Ensure the file used matches the printer model and the installed print material type. All installed cartridges must be of the same material type. (Ex. If the cartridge bays have ABS material cartridges installed, print the ABS Level Gap calibration file.)**

These files are available at **www.cubify.com/cubepro/activate**. The Level Gap Calibration files are available from the Calibration Files download link in the Free Files section of the web page.

The file names are listed below:

PLA:

- noz12_PLA_LEVELGap.cubepro (This file is for printing PLA on a CubePro Duo)
- noz123_PLA_LEVELGap.cubepro (This file is for printing PLA on a CubePro Trio)

ABS:

- noz12_ABS_LEVELGap.cubepro (This file is for printing ABS on a CubePro Duo)
- noz123_PLA_LEVELGap.cubepro (This file is for printing ABS on a CubePro Trio)

Nylon:

- noz12_NYL_LEVELGap.cubepro (This file is for printing nylon on a CubePro Duo)
- noz123_NYL_LEVELGap.cubepro (This file is for printing nylon on a CubePro Trio)

LEVEL GAP CALIBRATION PRINT OVERVIEW

The following illustration demonstrates what you would see when the print jets are properly leveled.
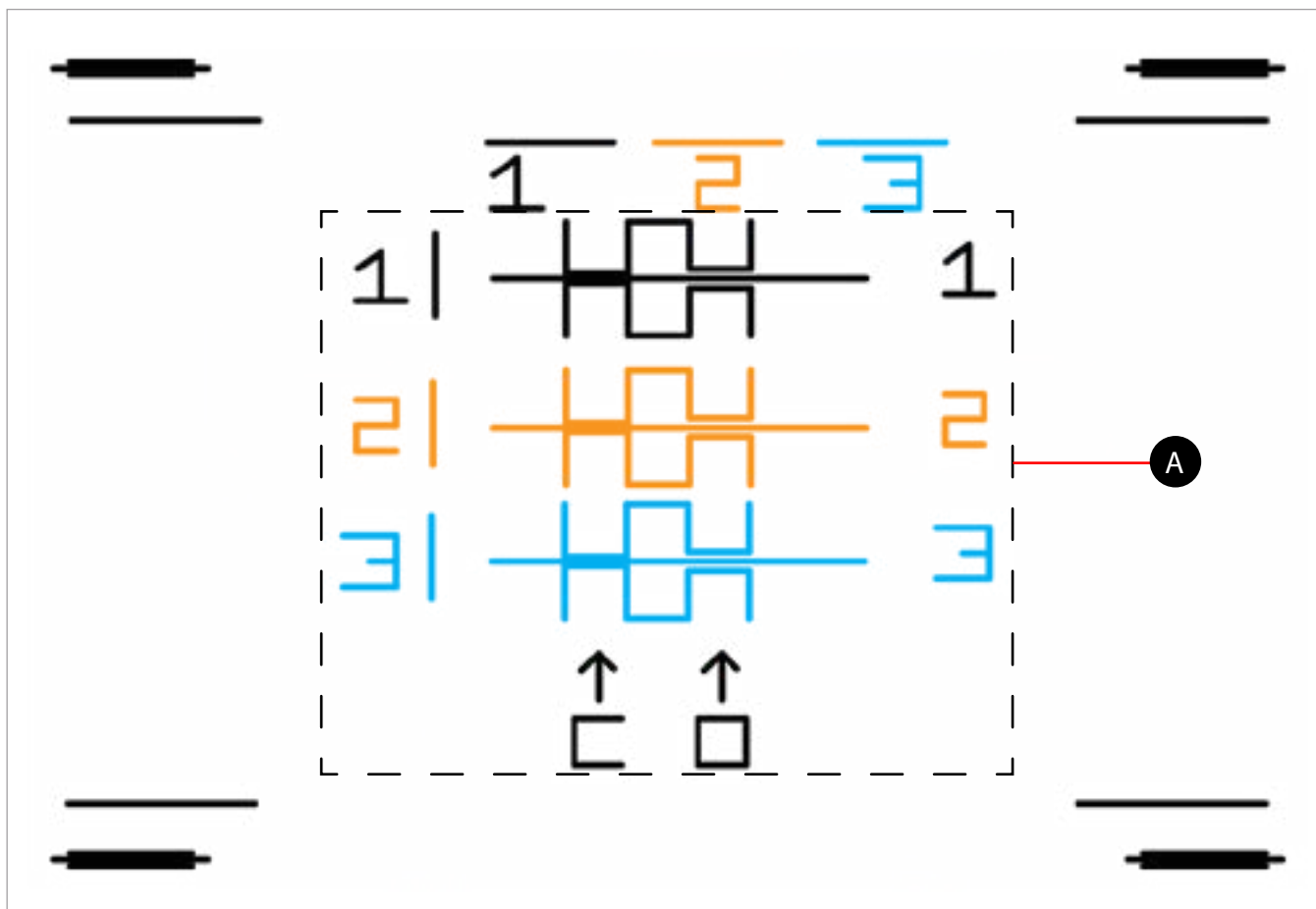
Ⓐ **Z-Gap** - The Z-Gap is the distance between the print pad and the print jet nozzles. The Z-Gap should always be checked and adjusted first before the Level Gap.

Printing The Level Gap Calibration File

📝 **NOTE: Ensure the print pad is completely clean from glue and printed parts before beginning this procedure.**

1. Download the calibration files from **www.cubify.com/cubepro/activate**.
2. Unzip the files to your USB mass storage device.
3. Insert the USB mass storage device into the USB host port on the printer.
4. Select **PRINT**.

5. Using the arrows, navigate to the appropriate Level Gap Calibration file and select **PRINT**.

   📝 **NOTE: There are several Level Gap Calibration files as well as Nozzle Offset Calibration files. Select the Level Gap Calibration file for the print material type installed in the printer.**
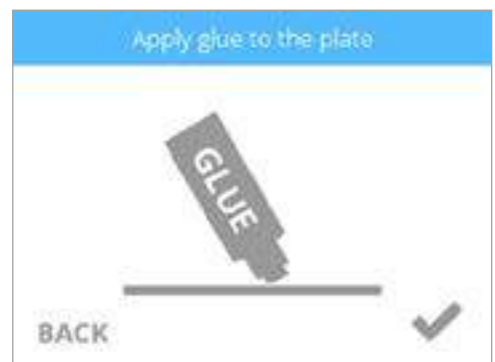

6. Apply two thin layers of Cube Glue to the print pad in an area of 50mm x 50mm. Select the **checkmark** to continue.

   📝 **NOTE: For more information, refer to the section titled Applying Cube Glue in the user guide.**

   📝 **NOTE: It may take about five (5) minutes to print the file.**

7. When finished, remove the print pad from the printer and verify the Level Gap.

   📝 **NOTE: If adjustments are needed, perform this procedure again after making adjustments. Make sure all glue and plastic residue have been removed prior to performing this procedure again.**

COMPARE PRINT JET Z-GAPS

Inspect the Z-Gap readings for each print jet. If any of the print jets have an incorrect Z-gap, they will need to be leveled again.
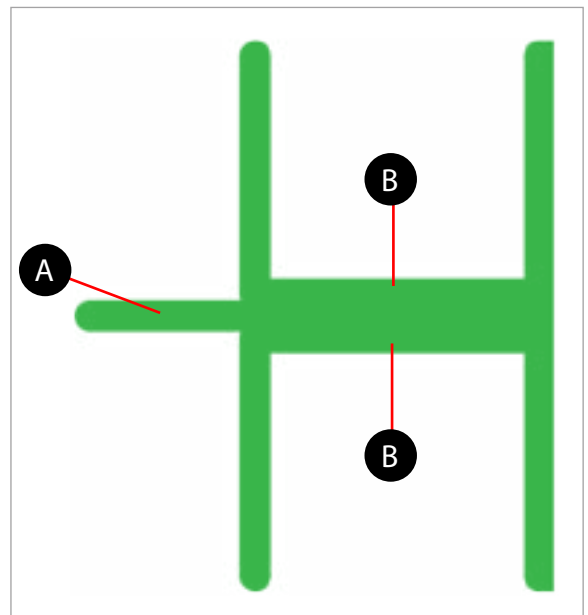
✎ **NOTE: The Closed Z-Gap (A) and the Open Z-Gap (B) are two different measurements but should be read together.**
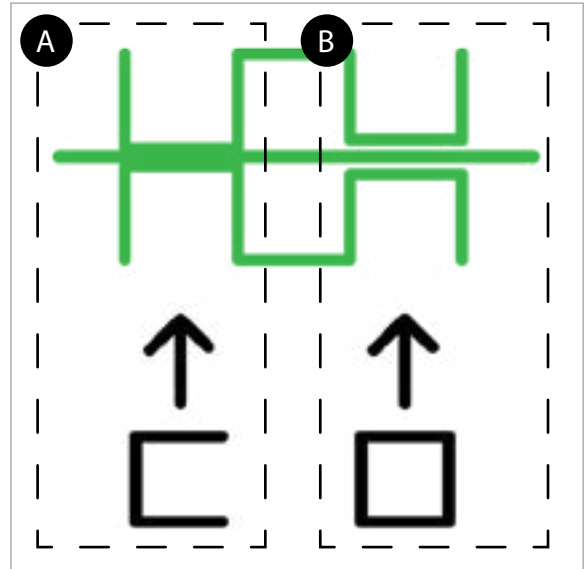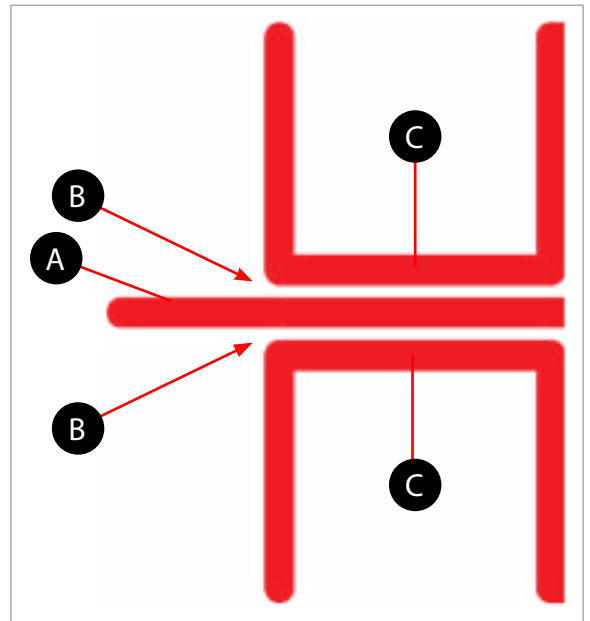

Correct Closed Z-Gap

The Closed Z-Gap bars (B) should touch the baseline (A). This should be consistent with the calibration print for each print jet.
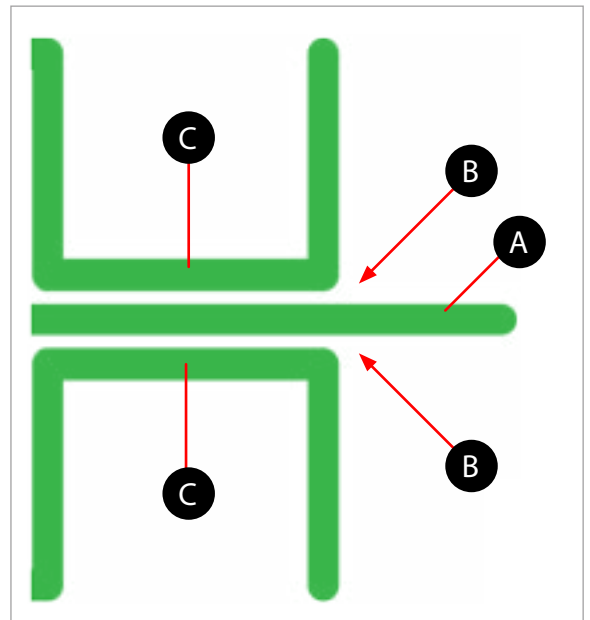
Incorrect Closed Z-Gap

If there is a gap (B) between the Closed Z-Gap bars (C) and the baseline (A), that print jet is too high and should be adjusted. Once it has been adjusted, print the calibration file again to verify that the print jets are level.
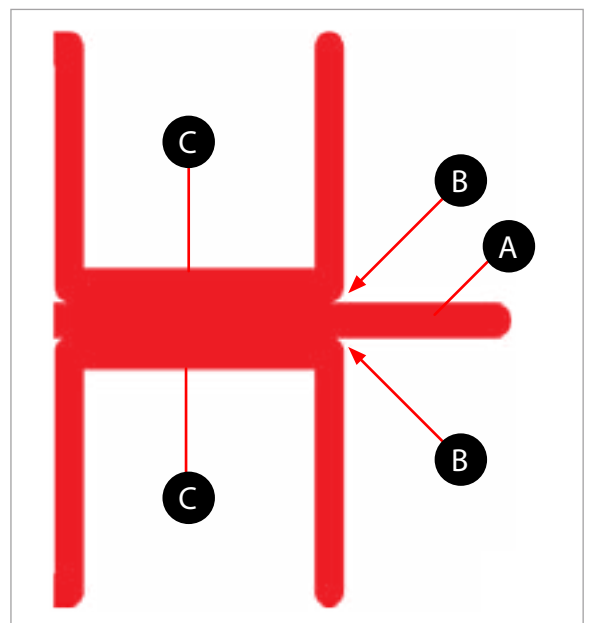

Correct Open Z-Gap

If there is a gap (B) between the Open Z-Gap bars (C) and the baseline (A) and there is no gap between the Closed Z-Gap bars and the baseline, that print jet is level.

Incorrect Open Z-Gap

If there is no gap (B) between the Open Z-Gap bars (C) and the baseline (A), that print jet is too low and should be adjusted. Once it has been adjusted, print the calibration file again to verify that the print jets are level.