

WorkBee CNC

Limit Switches & Wire Routing

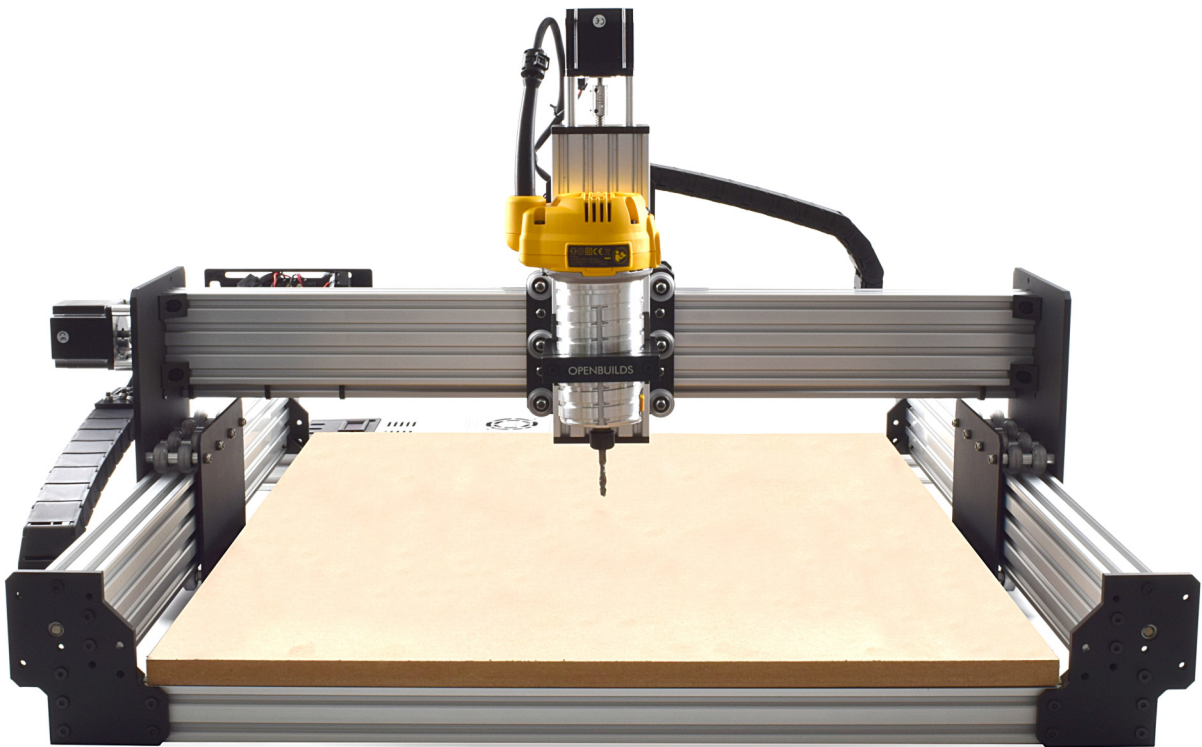


Table of Contents

1.0	Getting Started	3
1.1	Notes on Assembly	4
2.0	Limit Switches & Wire Routing	5
2.1	Limit Switches	6
2.1.2	Z-Axis Limit Switch.....	8
2.2	Wire Routing	9
2.2.2	Screw Driven - Gantry Wire Routing	10
2.2.3	Belt Driven - Gantry Wire Routing	11
2.2.4	Screw Driven - Y-Axis Wire Routing - Part 1	12
2.2.5	Screw Driven - Y-Axis Wire Routing - Part 2	13
2.2.6	Belt Driven - Y-Axis Wire Routing	14

1.0 Getting Started

1.1 Notes on Assembly

This manual has been written for the construction of a 750 x 750mm screw driven version of the WorkBee. If you have a different version everything is exactly the same, with the exception of longer V-Slot extrusions and wire routing.

It is recommended that you read through the whole manual before beginning the build in order to get a full picture of the assembly process. Before beginning each step, make sure you have studied the diagram and have the required parts in front of you. A PDF version of the manual is available on our website and this will allow you to zoom in on the diagrams if needed.

Be very careful to not over tighten the nuts and bolts on the plastic parts, otherwise they may crack. Everything should easily fit together, and so if it isn't, take a step back and re-read the instructions.

Assembly of this kit involves the use of electricity and therefore you should take appropriate precautions to ensure you are assembling the kit in a safe manner. When following wiring diagrams, double check that everything is connected correctly. Before carrying out any work on the electrics make sure that the machine is switched off.

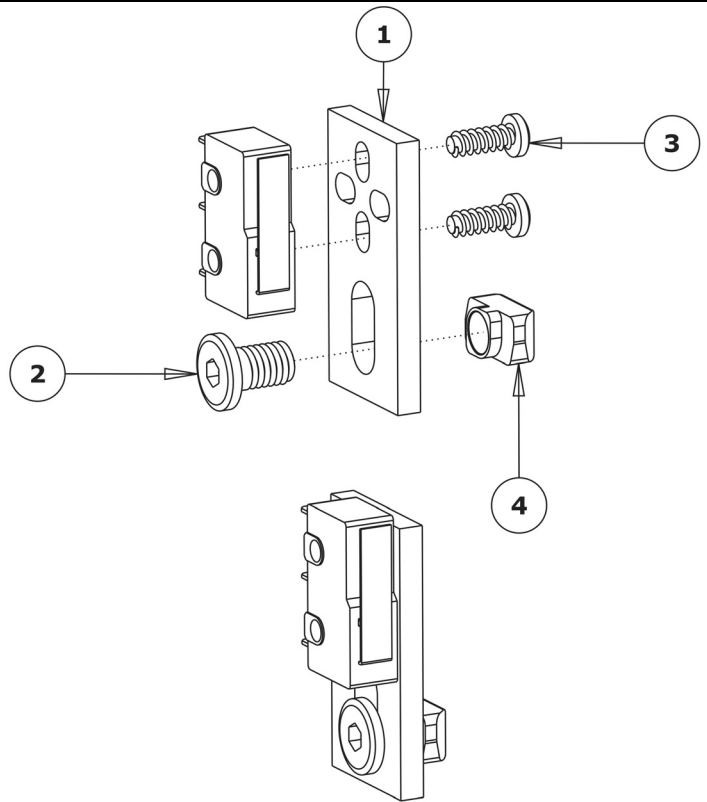
The polarity is indicated by the color of the wire, not by the color of the connectors at each end. For the AC IEC input, the live wire is brown, neutral blue, and earth is green and yellow. For the DC Wiring of the machine a positive wire is red, negative is black, and earth is green and yellow.

2.0 Limit Switches & Wire Routing

2.1 Limit Switches

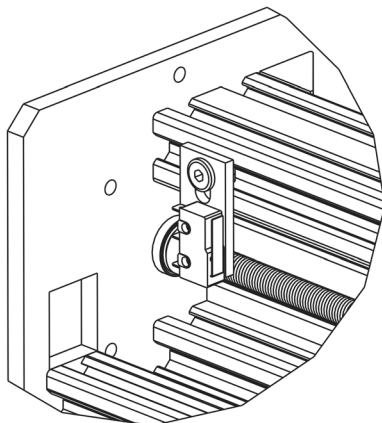
2.1.1 X & Y Limit Switches

ITEM NO	DESCRIPTION	QTY
1	LIMIT-SWITCH-PLATE	2
2	M5-LOW-PROFILE-8MM	2
3	PLASTITE-SCREW-M3-8MM	4
4	M5-DROP-IN-TEE-NUT	2

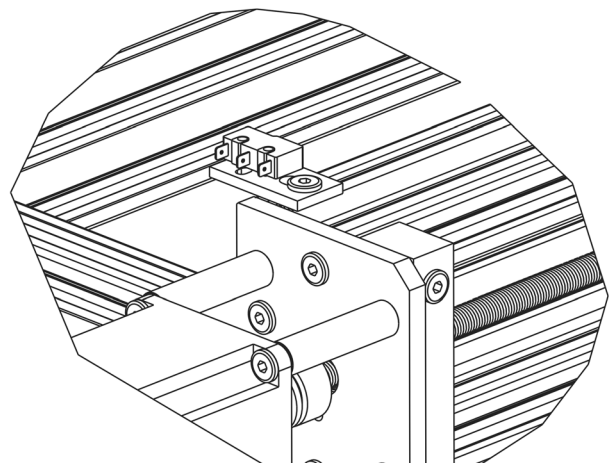


X-AXIS-LIMIT-SWITCH-ASSEMBLY

Y-AXIS-LIMIT-SWITCH-ASSEMBLY



X-Axis-Limit-Switch-Assembly Position

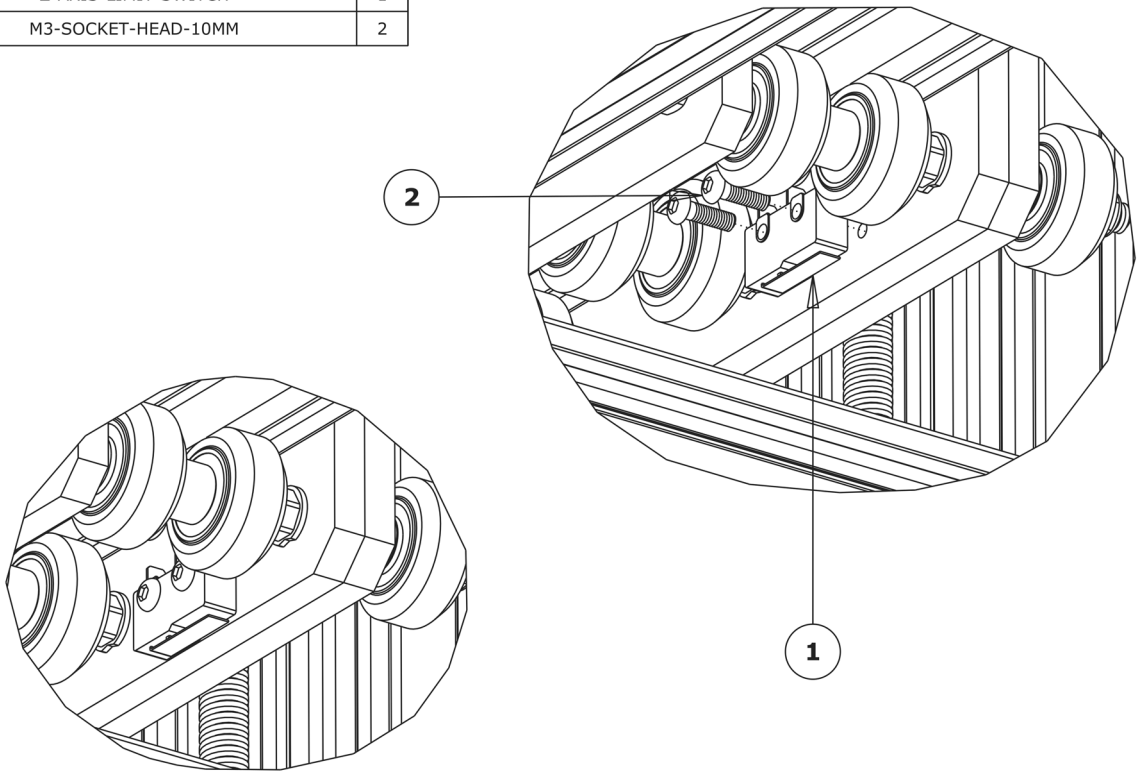


Y-Axis-Limit-Switch-Assembly Position

- A.** Carefully attach the Limit-Switch that was inserted in Section 2.1.5 to a Limit-Switch-Plate using 2 x Plastite-Screw-M3-8mms. The Plastite-Screw-M3-8mms self thread, the best technique is to screw in a couple of turns, then back out, and then back in a few more turns than last time, and so forth, until the Limit-Switch is firmly secured. Do not over tighten as you can shatter the switch. Make sure the Limit-Switch is orientated as the Y-Axis-Limit-Switch-Assembly above. Finally attach a M5-Low-Profile-8mm bolt, and on the end slightly thread a M5-Drop-In-Tee-Nut.
- B.** Repeat Step A for the X-Axis-Limit-Switch, this one has not been inserted anywhere yet. Note the different orientation as seen in the X-Axis-Limit-Switch-Assembly above.
- C.** Attach the Y-Axis-Limit-Switch-Assembly to the left hand Y-Axis C-Beam extrusion (if looking from the front). It should be attached to the inner slot on the far end of the C-Beam extrusion. The distance between the Limit-Switch-Plate and the end of the extrusion should be 13mm.
- D.** Attach the X-Axis-Limit-Switch-Assembly to the back side of the X-Axis C-Beam extrusion. It should be attached to the top slot on the far left side (if looking from the back). The distance between the Limit-Switch-Plate and the end of the extrusion should be 10mm.

2.1.2 Z-Axis Limit Switch

ITEM NO	DESCRIPTION	QTY
1	Z-AXIS-LIMIT-SWITCH	1
2	M3-SOCKET-HEAD-10MM	2

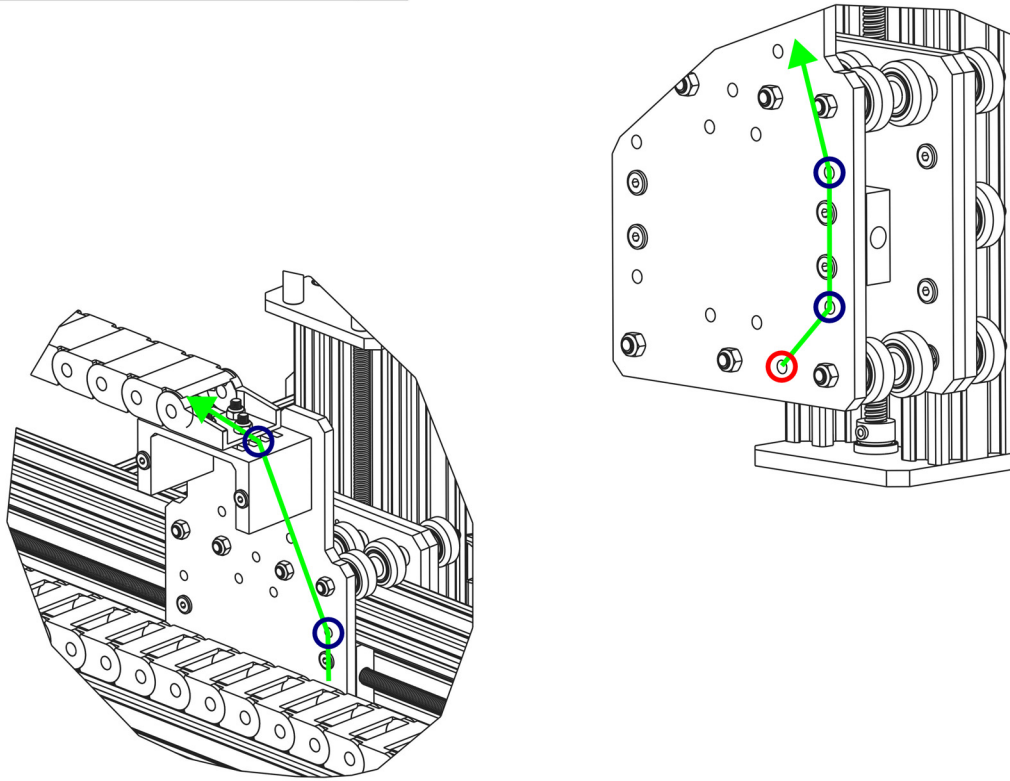


- A.** Attach the Z-Axis limit switch to the threaded holes on the X-Plate-Front using 2 x M3-Socket-Head-10mm bolts, in the orientation above. Do not over tighten as you can shatter the switch.

2.2 Wire Routing

2.2.1 Z-Axis Limit Switch Wiring

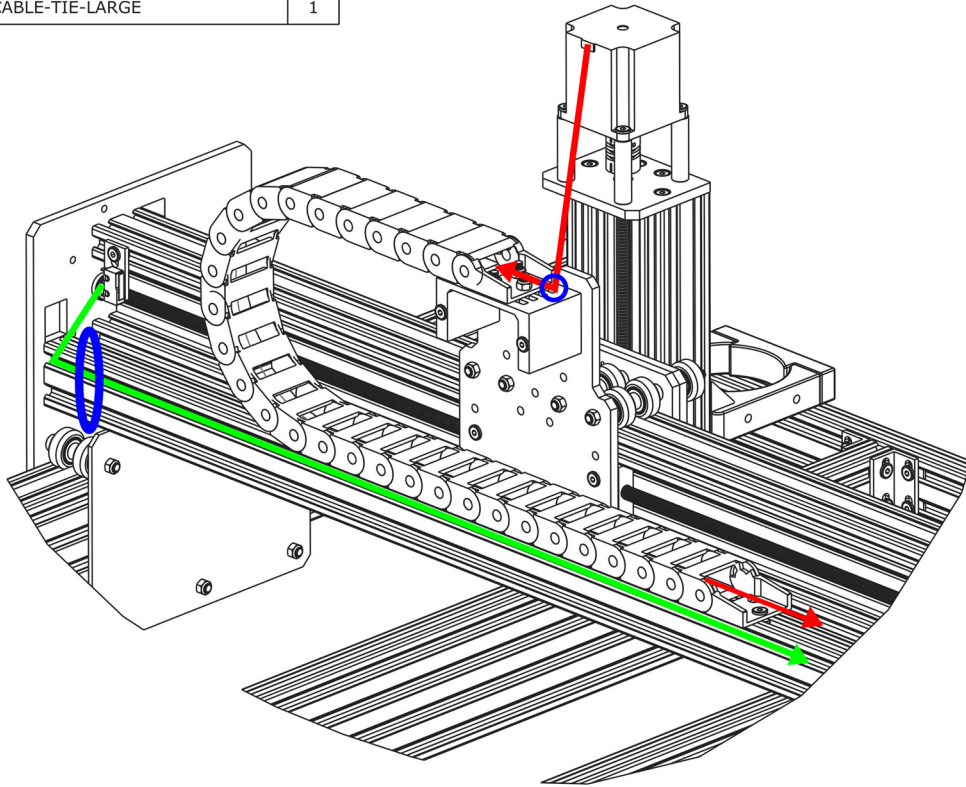
ITEM NO	DESCRIPTION	QTY
1	CABLE-TIE-SMALL	3



- A.** The Z-Limit-Switch sits in-between two sets of wheels. Directly opposite there is a hole. Feed the wires through this hole (Red circle above). If there is a connector on the end of the wire, this will need to be removed to get it through the hole. To do this, on the back side of the connector there is a row of 3 slits. Push a small screwdriver into this slit, while pulling on the corresponding wire. The wire should release. Repeat for the second wire. Re-attach the connector after feeding the wires through the hole. The wires should go back inside the connector the same order as the other limit switches in the kit.
- B.** As shown by the green line above bring the Z-Limit-Switch wires up the X-Plate-Back, and feed it through the X-Drag-Chain. Secure the wires using Cable-Tie-SmallS to the points marked with blue circles above. To stop it snagging on anything the wire should be pulled taught.

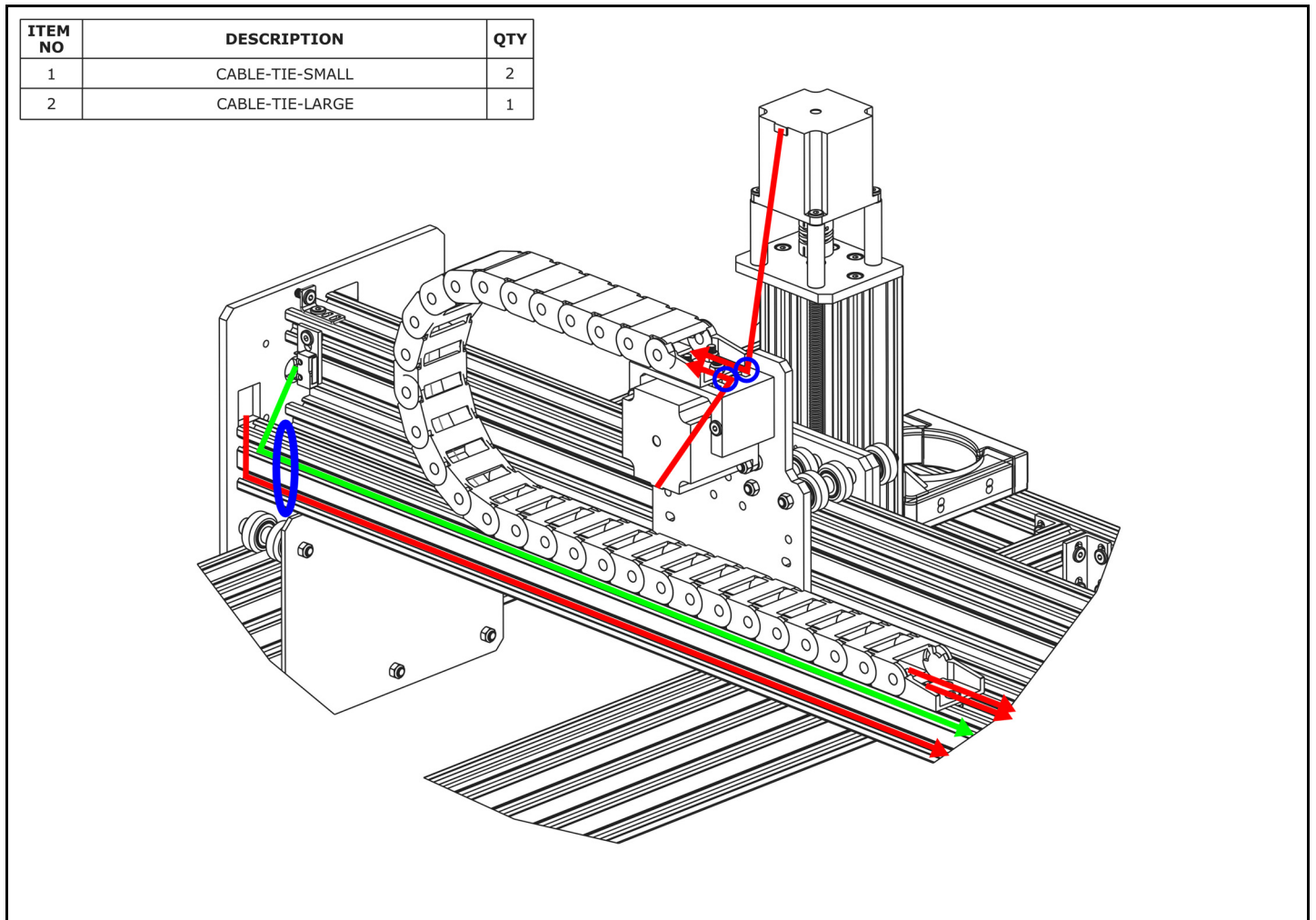
2.2.2 Screw Driven - Gantry Wire Routing

ITEM NO	DESCRIPTION	QTY
1	CABLE-TIE-SMALL	1
2	CABLE-TIE-LARGE	1



- A.** For the Z-Axis Motor Wire that is inside the X-Drag-Chain, connect it to the pigtail on Z-Axis stepper motor. Making sure there is enough slack for the full travel of the Z-Axis, secure the wire to the X-Drag-Moving-End-Mount using a Cable-Tie-Small, shown by the small blue circle above.
- B.** The lead on the X-Axis limit switch should be secured to the V-Slot-2040-750mm using a Cable-Tie-Large at the position shown by the blue oval above. Then run the lead along to the other end of V-Slot-2040-750mm - it can be tucked into one of the slots.

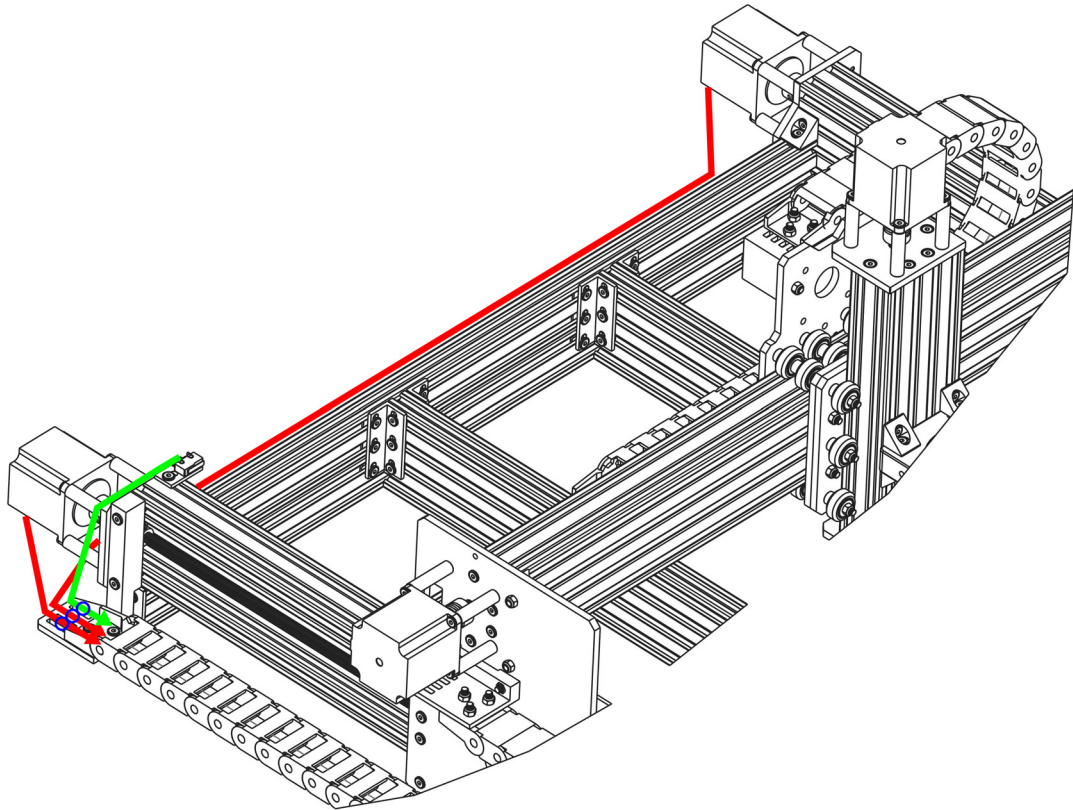
2.2.3 Belt Driven - Gantry Wire Routing



- A.** For the Z-Axis motor wire that is inside the X-Drag-Chain, connect it to the pigtail on Z-Axis stepper motor. Making sure there is enough slack for the full travel of the Z-Axis, secure the wire to the X-Drag-Moving-End-Mount using a Cable-Tie-Small, shown by the small blue circle above.
- B.** For the X-Axis motor wire connect it to the pigtail on the X-Axis stepper motor wire. Secure it to the X-Drag-Moving-End-Mount in a similar fashion as in Step A
- C.** Connect the right Y-Axis motor wire to the pigtail on the right hand Y-Axis stepper motor (as if looking from the front). Feed it through the square hole on the Y-Plate. The lead on the X-Axis limit switch and stepper motor wire should be secured to the V-Slot-2040-750mm using a Cable-Tie-Large at the position shown by the blue oval above. Then run the wires along to the other end of V-Slot-2040-750mm - they can be tucked into the slots.

2.2.4 Screw Driven - Y-Axis Wire Routing - Part 1

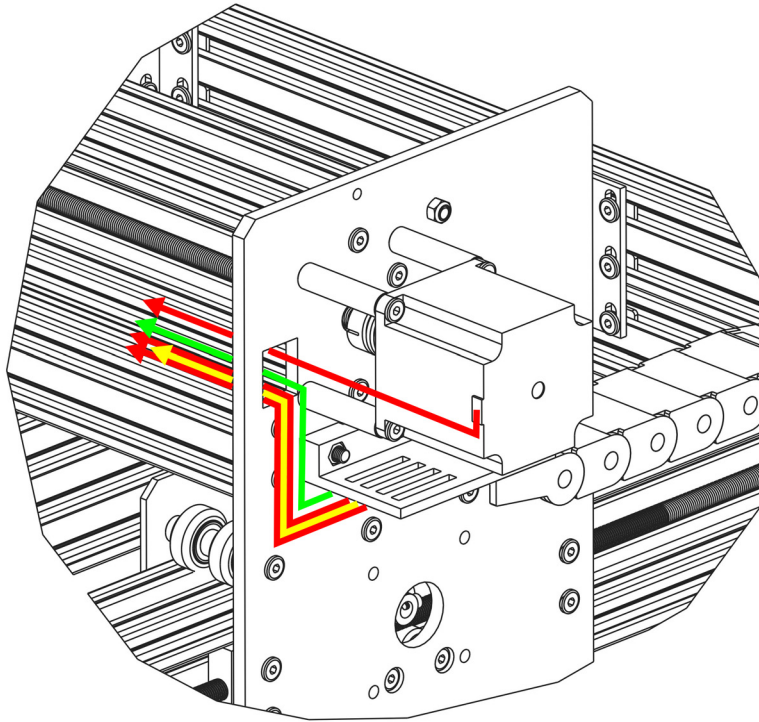
ITEM NO	DESCRIPTION	QTY
1	CABLE-TIE-SMALL	3



- A.** Connect the two stepper motor wires in the Y-Drag-Chain to their corresponding pig-tails on the Y-Axis stepper motors. The longer wire should connect to the right hand stepper motor.
- B.** Secure the stepper motor wires to the Y-Axis-Fixed-End-Mount using Cable-Tie-Small. The wire for the right hand stepper motor can be tucked into a slot on one of the extrusions along the back.
- C.** Secure the lead on the Y-Axis limit switch to the Y-Axis-Fixed-End-Mount using a Cable-Tie-Small.

2.2.5 Screw Driven - Y-Axis Wire Routing - Part 2

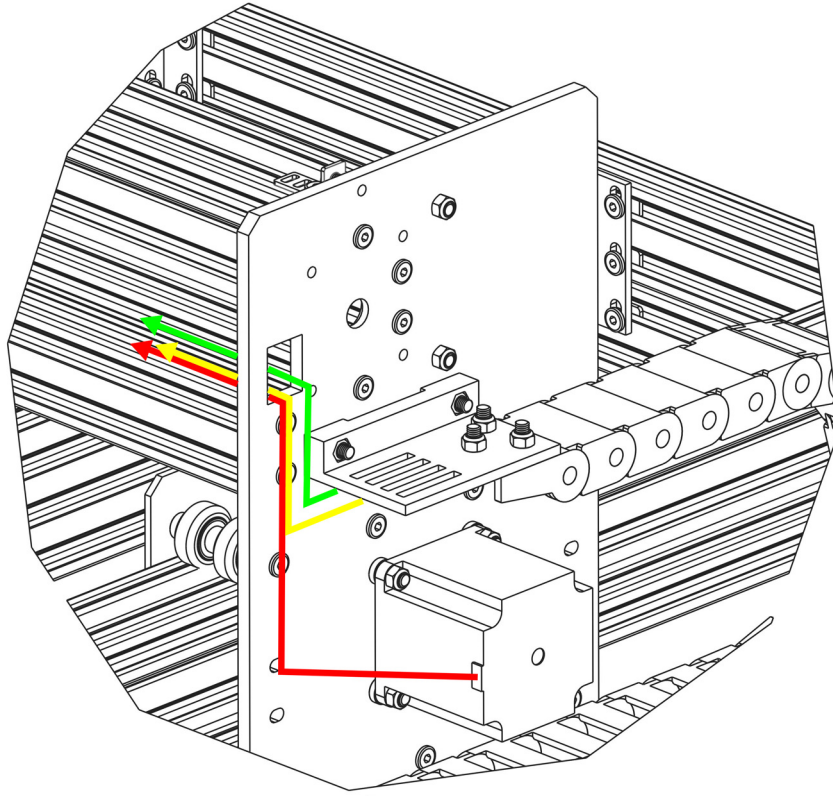
ITEM NO	DESCRIPTION	QTY
1	CABLE-TIE-SMALL	5



- A.** Connect the X-Axis motor wire to the pigtail on the X-Axis stepper motor and feed it through the square hole on the Y-Plate
- B.** Inside the Y-Drag-Chain there should be two stepper motor wires (red above), a power supply wire (yellow above), and a limit switch wire (green above). Feed all of these through the square hole on the Y-Plate. Remove any slack inside the Y-Drag-Chain, and then secure these 4 wires to the Y-Drag-Chain-Moving-End-Mount using Cable-Tie-Small.

2.2.6 Belt Driven - Y-Axis Wire Routing

ITEM NO	DESCRIPTION	QTY
1	CABLE-TIE-SMALL	3



- A.** Connect the left Y-Axis motor wire to the pigtail on the left hand Y-Axis stepper motor (if looking from the front) and feed it through the square hole on the Y-Plate
- B.** Inside the Y-Drag-Chain there should be a power supply wire (yellow above), and a limit switch wire (green above). Feed all of these through the square hole on the Y-Plate. Remove any slack inside the Y-Drag-Chain, and then secure these 2 wires to the Y-Drag-Chain-Moving-End-Mount using Cable-Tie-Small.

