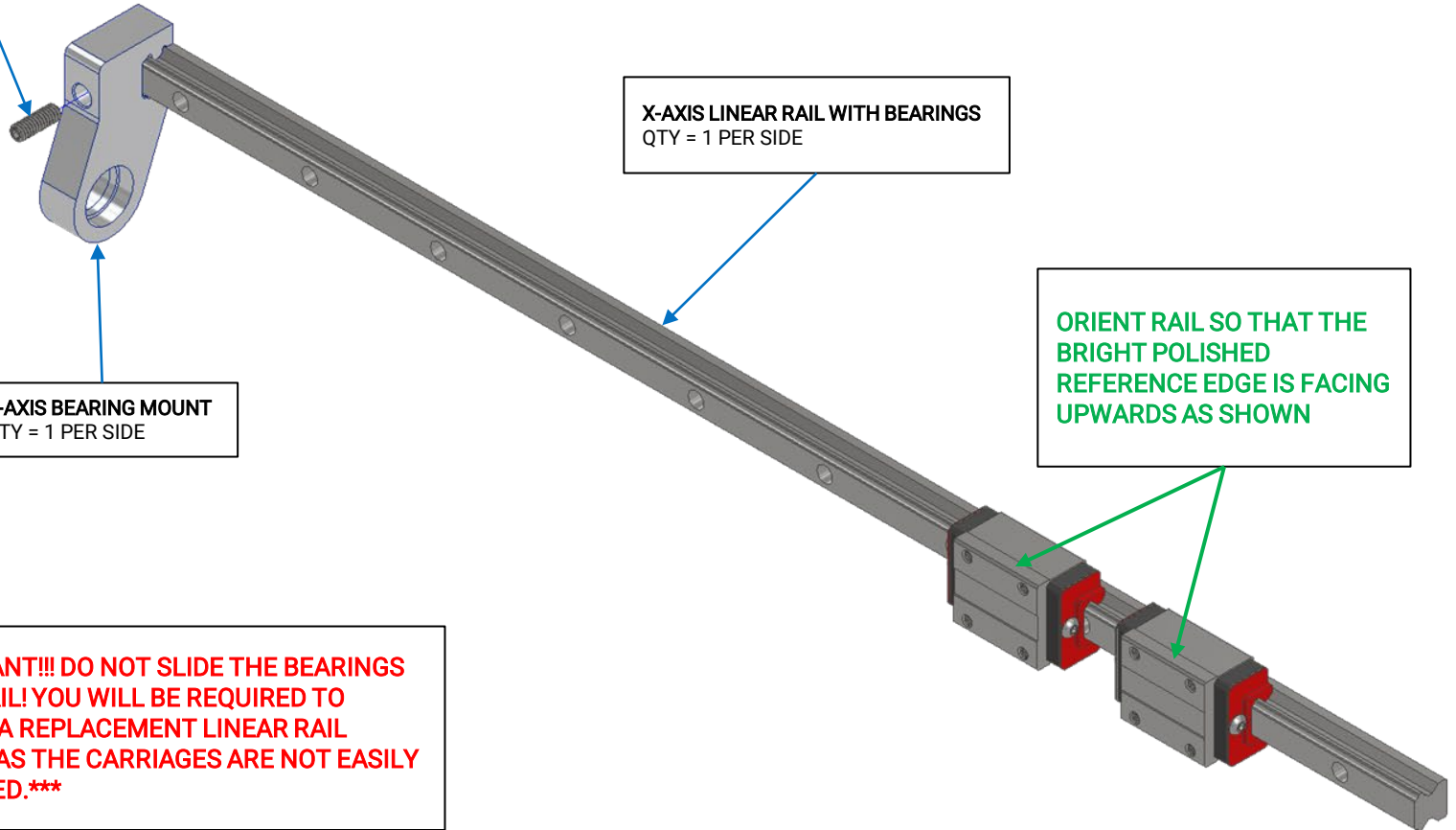
1: X-Axis Motion

The first step in the assembly process is to assemble all components necessary for X-axis motion.

LEFT HAND ASSEMBLY SHOWN

SET SCREW, ¼-20 X ¾"
BAG #11
QTY = 1 PER SIDE



X-AXIS LINEAR RAIL WITH BEARINGS
QTY = 1 PER SIDE

X-AXIS BEARING MOUNT
QTY = 1 PER SIDE

ORIENT RAIL SO THAT THE BRIGHT POLISHED REFERENCE EDGE IS FACING UPWARDS AS SHOWN

IMPORTANT!!! DO NOT SLIDE THE BEARINGS OFF THE RAIL! YOU WILL BE REQUIRED TO PURCHASE A REPLACEMENT LINEAR RAIL ASSEMBLY AS THE CARRIAGES ARE NOT EASILY REINSTALLED.

Materials

Parts

- (1) X-Axis Bearing Mount
- (1) X-Axis Linear Rail with Bearings

Hardware

- (1) SET SCREW, ¼-20 X ¾”

Tools

- ⅛” Hex Key

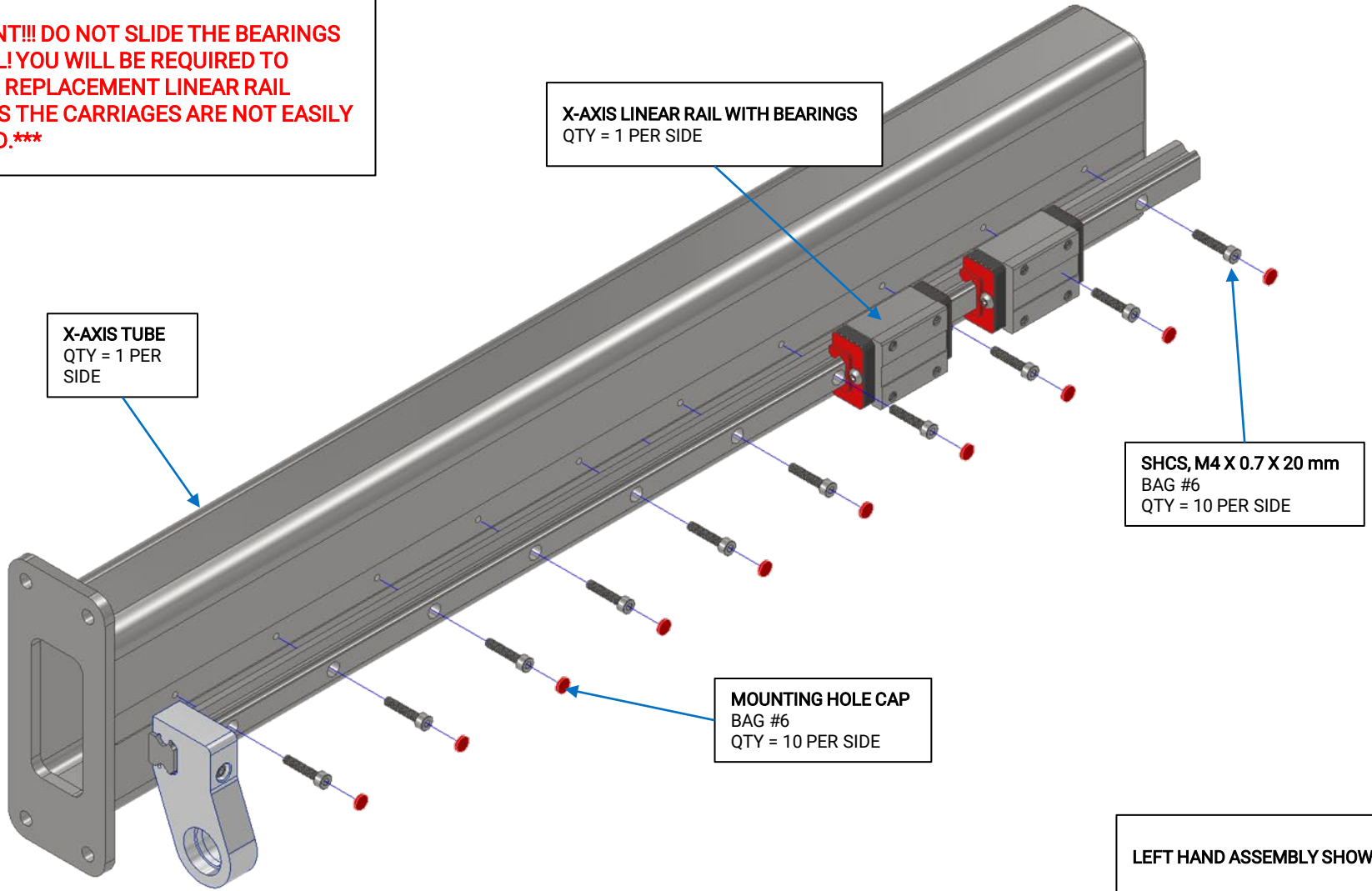
Instructions

A1. Slide the **X-Axis Bearing Mount** on to one end of the **X-Axis Linear Rail With Bearings** as shown. The bearing mount should sit flush with the end of the linear railing.

A2. Ensure the bright polished reference edges are oriented as shown, relative to the X-Axis Bearing Mount.

A3. Install one ¼-20 set screw as shown into each **X-Axis Bearing Mount** and tighten until the assembly is secured in place.

IMPORTANT!!! DO NOT SLIDE THE BEARINGS OFF THE RAIL! YOU WILL BE REQUIRED TO PURCHASE A REPLACEMENT LINEAR RAIL ASSEMBLY AS THE CARRIAGES ARE NOT EASILY REINSTALLED.



LEFT HAND ASSEMBLY SHOWN

Materials

Parts

- (1) X-Axis Linear Rail with Bearings
- (10) Mounting Hole Cap
- (1) X-Axis Tube

Hardware

- (10) SOCKET HEAD CAP SCREW, M4 X 0.7 X 20 mm

Tools

- 3mm Hex Key
- Small Hammer/Mallet

Instructions

B1. Locate the **X-Axis Linear Rail and Bearing assemblies**. Note that the **X-Axis Linear Rails** are 24” in length. Be sure to install the correct ones.

[Warning Symbol] LINEAR RAIL BEARINGS

IMPORTANT: Do not either deliberately or accidentally remove the linear bearings from the linear rail. It is nearly impossible without specialized tools to reinstall a linear bearing once removed. The replacement cost of the linear rail assembly will not be covered by warranty.

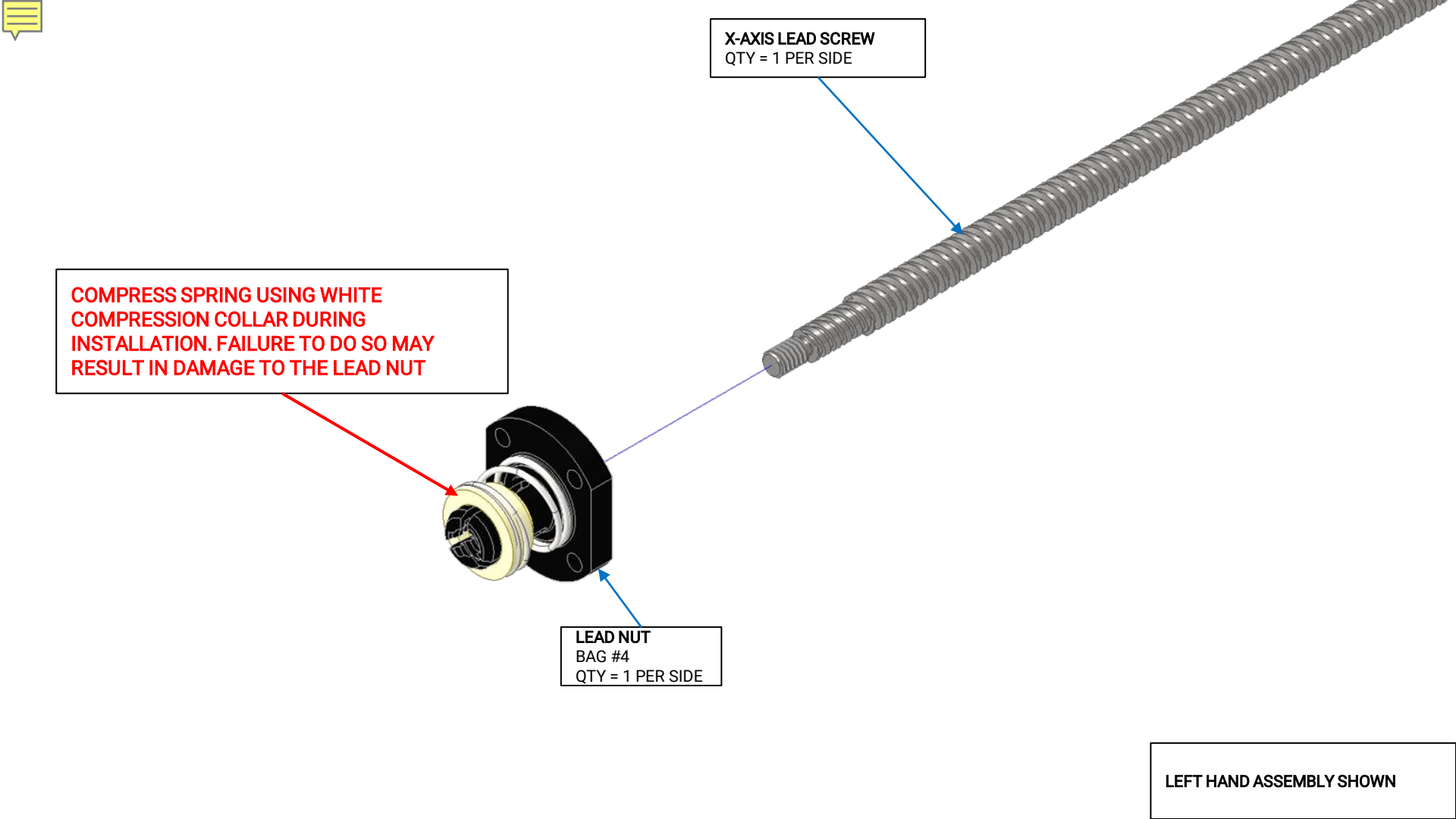
B2. Thoroughly clean and brush the **X-Axis Tube** mounting surfaces as well as the bottom surface of the linear rails. Any debris in these critical joints will decrease the accuracy of the backgage.

B3. Install the **X-Axis Linear Rail** using the fasteners shown.

[Warning Symbol] LINEAR BEARING ORIENTATION

WARNING: Be sure to double check that the orientation of the Linear Rail Bearings are correct before inserting the mounting hole caps. Once installed the mounting hole caps cannot be removed without destroying them.

B4. Using a small mallet, lightly tap one mounting hole cap into each mounting hole. The goal is to only insert the cap until it is flush to the surface of the linear rail. Verify that each linear bearing can glide across the mounting holes without resistance.


X-AXIS LEAD SCREW
QTY = 1 PER SIDE
COMPRESS SPRING USING WHITE COMPRESSION COLLAR DURING INSTALLATION. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE LEAD NUT
LEAD NUT
BAG #4
QTY = 1 PER SIDE
LEFT HAND ASSEMBLY SHOWN

Materials

Parts

- (1) Lead Nut
- (1) X-Axis Lead Screw

Hardware

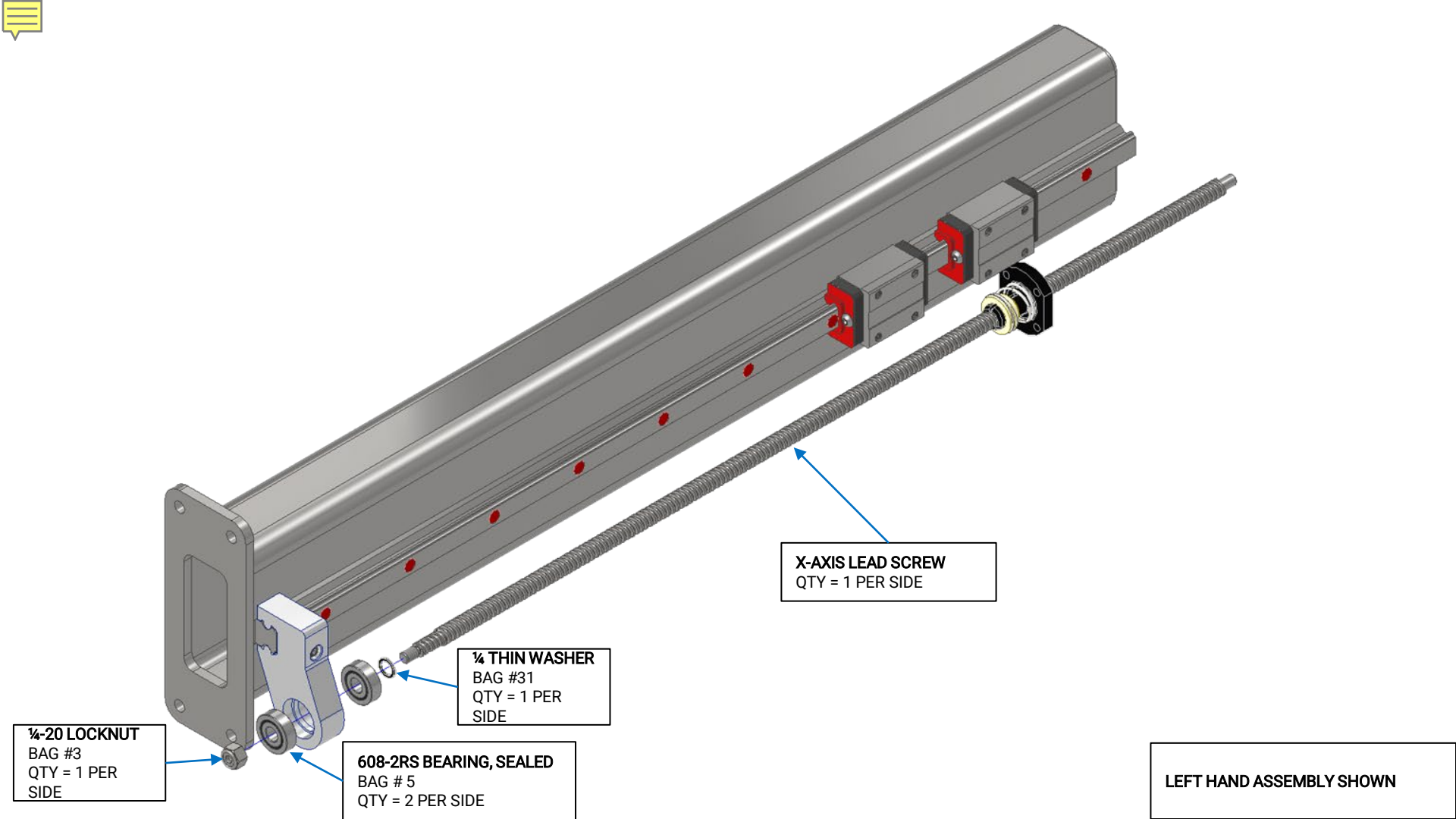
Tools

Instructions

C1. Use the white compression collar to compress the spring on the **Lead Nut.**

C2. With the spring held in the compressed position, thread the **Lead Nut** on to the threaded end of the **X-Axis Lead Screw**, with the flange of the Lead Nut oriented as shown.

C3. Continue to compress the Lead Nut spring and thread the **Lead Nut** until it is approximately halfway up the **X-Axis Lead Screw**.


X-AXIS LEAD SCREW
QTY = 1 PER SIDE
¼ THIN WASHER
BAG #31
QTY = 1 PER SIDE
¼-20 LOCKNUT
BAG #3
QTY = 1 PER SIDE
608-2RS BEARING, SEALED
BAG # 5
QTY = 2 PER SIDE
LEFT HAND ASSEMBLY SHOWN

Materials

Parts
- (1) X-Axis Lead Screw

Hardware
- (2) 608-2RS BEARING, SEALED
- (1) ¼-20 LOCKNUT
- (1) ¼ THIN WASHER

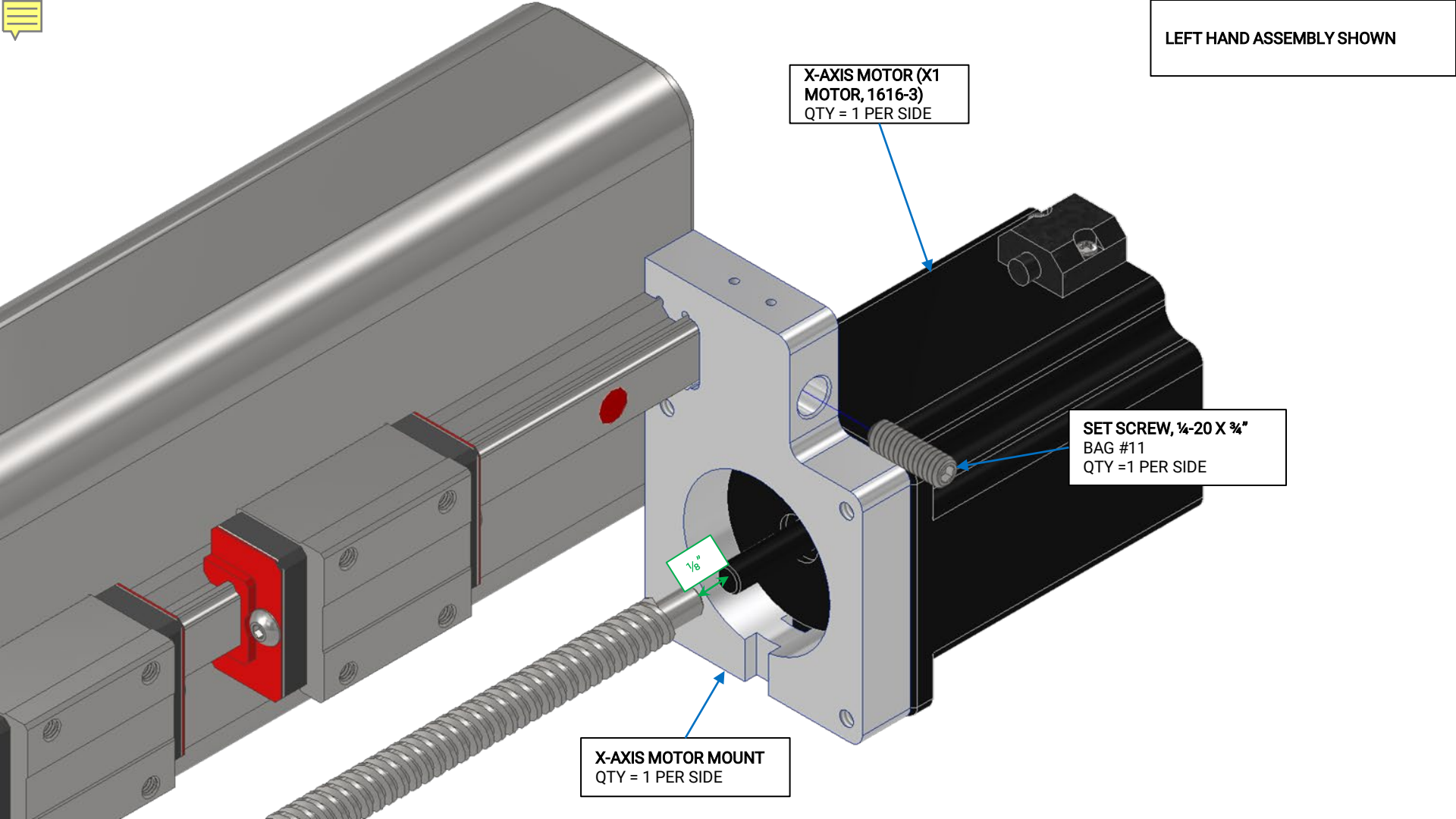
Tools

Instructions

D1. Install the **608-2RS Bearings** into the counterbores of the **X-Axis Bearing Mount** as shown.

D2. While holding the bearings in their respective counterbores, slide the ¼ thin washer on to the threaded end of the **X-Axis Lead Screw** and insert the threaded end of the lead screw through both bearings.

D3. Install the ¼-20 locknut to the threaded end of the **X-Axis Lead Screw**. **Leave the locknut loose for now** (about ¼ turn from hand tight).


LEFT HAND ASSEMBLY SHOWN
X-AXIS MOTOR (X1 MOTOR, 1616-3)
QTY = 1 PER SIDE
SET SCREW, ¼-20 X ¾"
BAG #11
QTY =1 PER SIDE
⅛"
X-AXIS MOTOR MOUNT
QTY = 1 PER SIDE

Materials

Parts
- (1) X-Axis Motor Mount
- (1) X-Axis Motor (1616-3)

Hardware
- (1) SET SCREW, ¼-20 X ¾”

Tools
- ⅛” Hex Key

Instructions

E1. Slide the **X-Axis Motor Mount** on to the end of the linear rail closest to the non threaded end of the lead screw.

E2. With one hand, hold the motor in place, as it would be installed into the mount. With the other hand push the lead screw back into the 608 2RS Bearings and align it concentric with the **X-Axis Motor Shaft**.

E3. Slide the **X-Axis Motor Mount** forwards or backwards until the distance between the end of the motor shaft and the lead screw is approximately ⅛”.

E4. Remove the **X-Axis Motor** from the **X-Axis Motor Mount**, taking care not to shift the motor mounts position, and install the ¼-20 x ¾” set screw. Tighten the set screw until the motor mount stays firmly in place.

SHCS, 4-40 X 3/8
BAG #18
QTY = 4 PER COUPLER

MOTOR COUPLER
BAG #18
QTY = 1 PER LEAD SCREW

Materials

Parts

- (1) Motor Coupler

Hardware

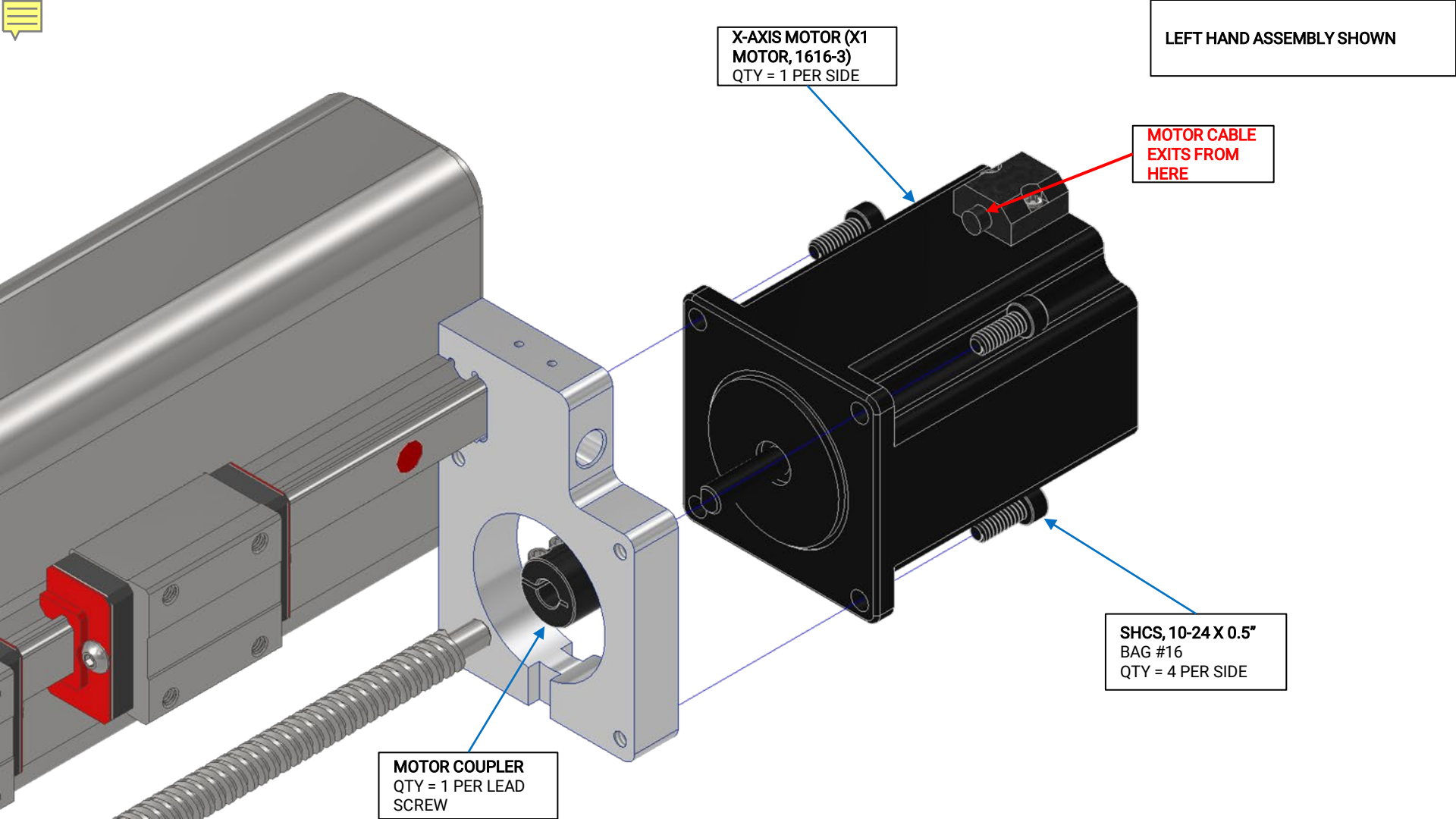
- (4) SOCKET HEAD CAP SCREW, 4-40 X 5/16

Tools

- 3/32” Hex Key

Instructions

F1. Loosely install the socket head cap screws into the 4 threaded holes.


LEFT HAND ASSEMBLY SHOWN
X-AXIS MOTOR (X1 MOTOR, 1616-3)
QTY = 1 PER SIDE
MOTOR CABLE EXITS FROM HERE
SHCS, 10-24 X 0.5"
BAG #16
QTY = 4 PER SIDE
MOTOR COUPLER
QTY = 1 PER LEAD SCREW

Materials

Parts

- (1) Motor Coupler
- (1) X-Axis Motor

Hardware

- (4) SOCKET HEAD CAP SCREWS, 10-24 X 0.5”

Tools

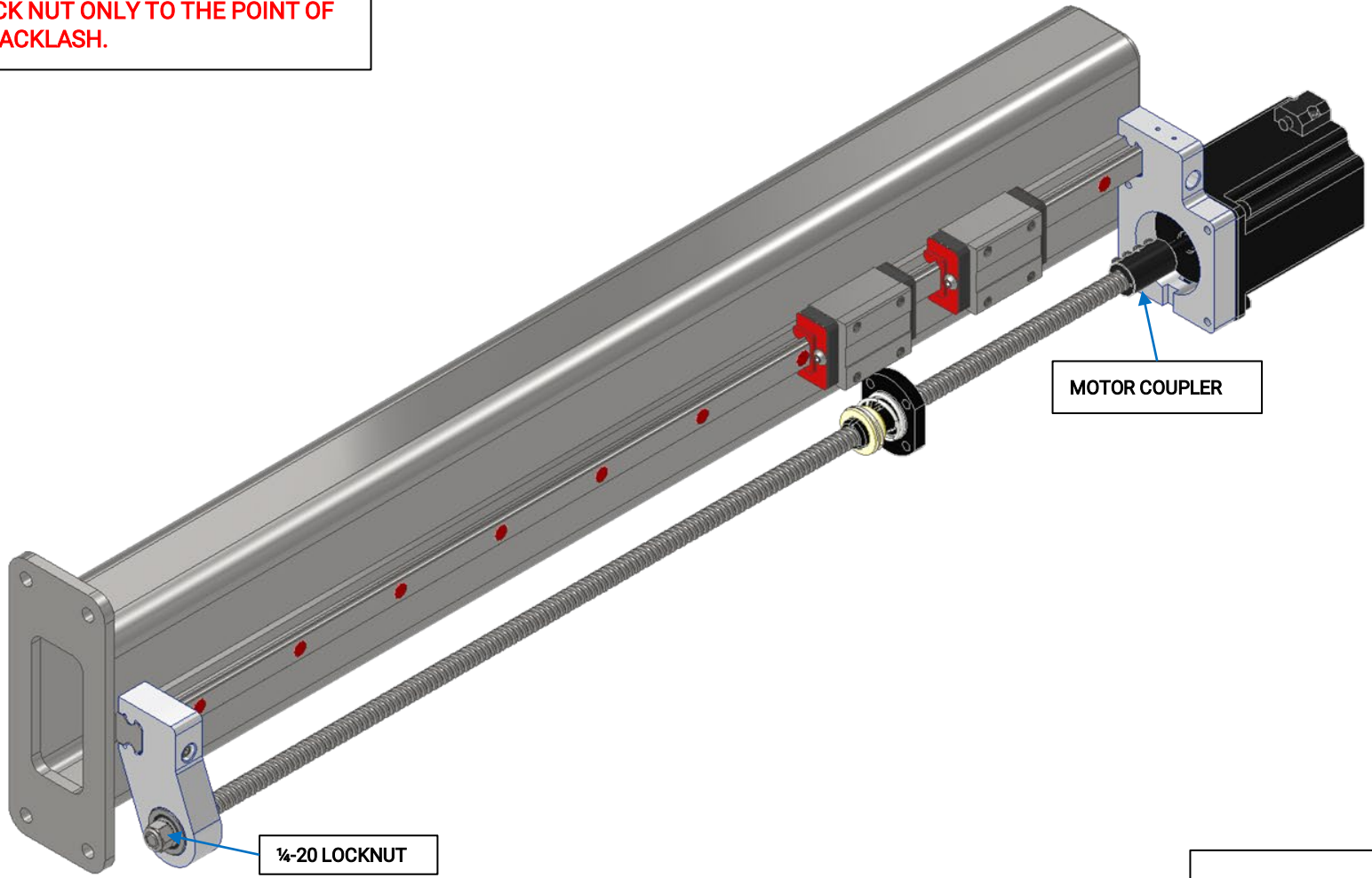
- 5/32” Hex Key

Instructions

G1. Insert the **Motor Coupler** onto the end of the lead screw.

G2. Insert the **X-Axis Motor** shaft into the coupler and install the **X-Axis Motor** on to the mount as shown.

TIGHTEN LOCK NUT ONLY TO THE POINT OF REMOVING BACKLASH.



LEFT HAND ASSEMBLY SHOWN

Materials

Parts

Hardware

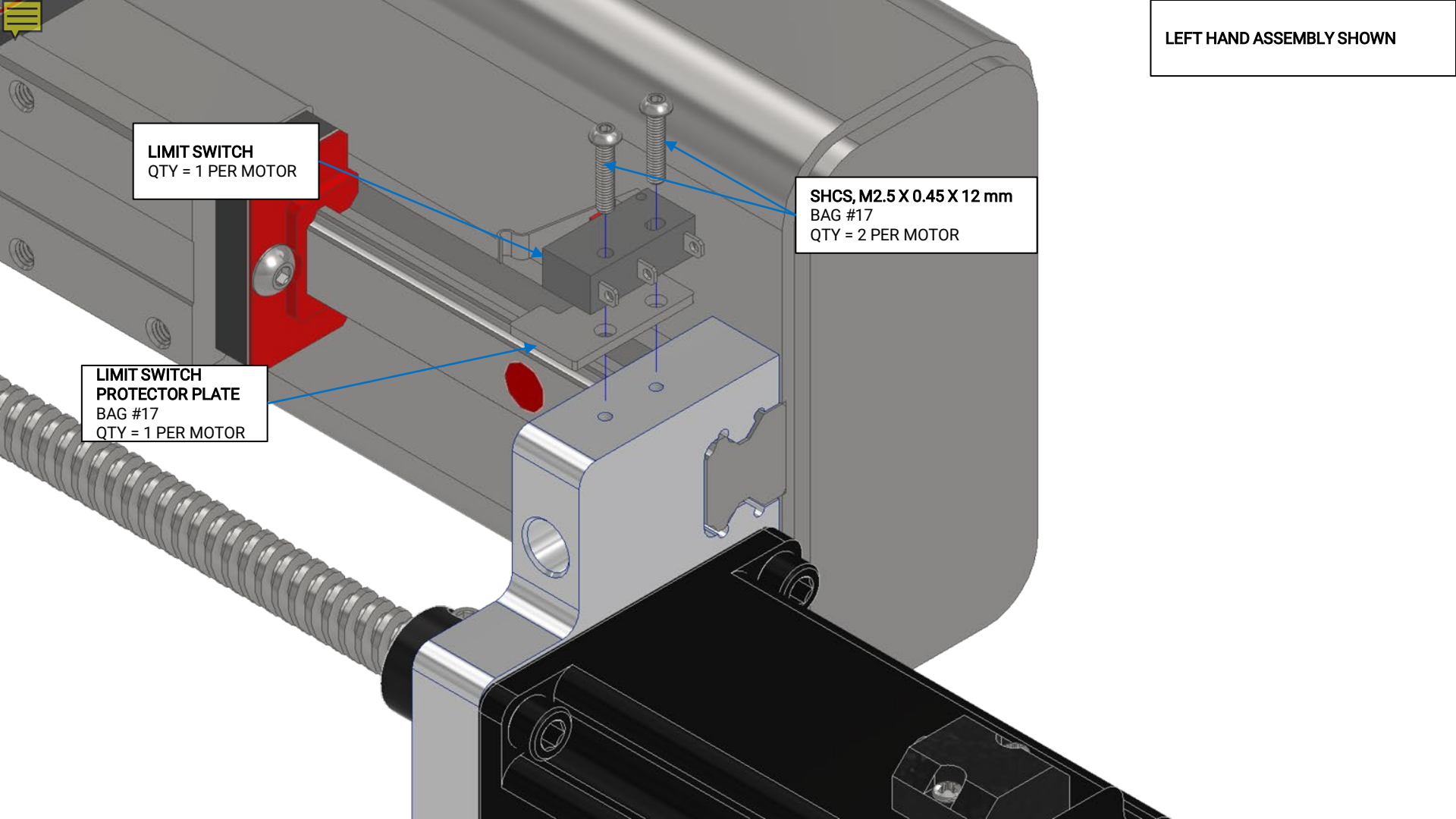
Tools

- Padded Pliers
- 3/32” Hex Key
- 7/16” Wrench

Instructions

H1. Using pliers with protection on the jaws, grip the **X-Axis Lead Screw** thread next to the **X-Axis Bearing Mount** to prevent the screw from rotating. The objective when tightening the lock nut is to remove all backlash without excessively preloading the bearings. If done correctly, the lead screw should be able to rotate freely with no observable axial play when pushing/pulling on the screw.

H2. Tighten the middle two screws of the **Motor Coupler**. Next, tighten the outboard screws. Again, further tighten the middle two screws followed by the outboard screws.



LEFT HAND ASSEMBLY SHOWN

Materials

Parts

- (1) Limit Switch
- (1) Limit Switch Protector Plate

Hardware

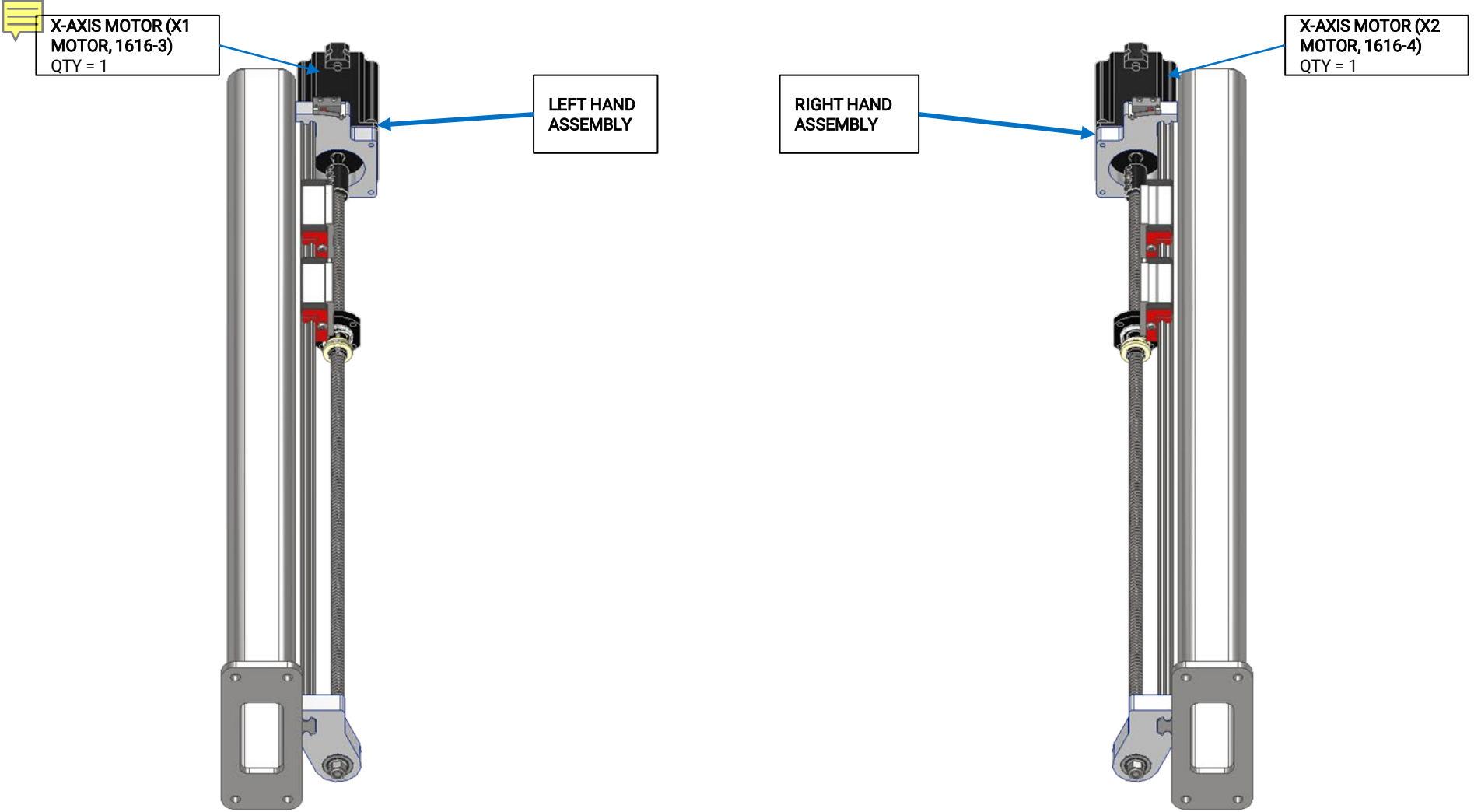
- (2) SOCKET HEAD CAP SCREWS, M2.5 X 0.45 X 12 mm

Tools

- 1.5 mm Hex Key

Instructions

I1. Install the Limit Switch and Limit Switch Protector Plate as shown.


X-AXIS MOTOR (X1 MOTOR, 1616-3)
QTY = 1
LEFT HAND ASSEMBLY
RIGHT HAND ASSEMBLY
X-AXIS MOTOR (X2 MOTOR, 1616-4)
QTY = 1

Materials

Parts

Hardware

Tools

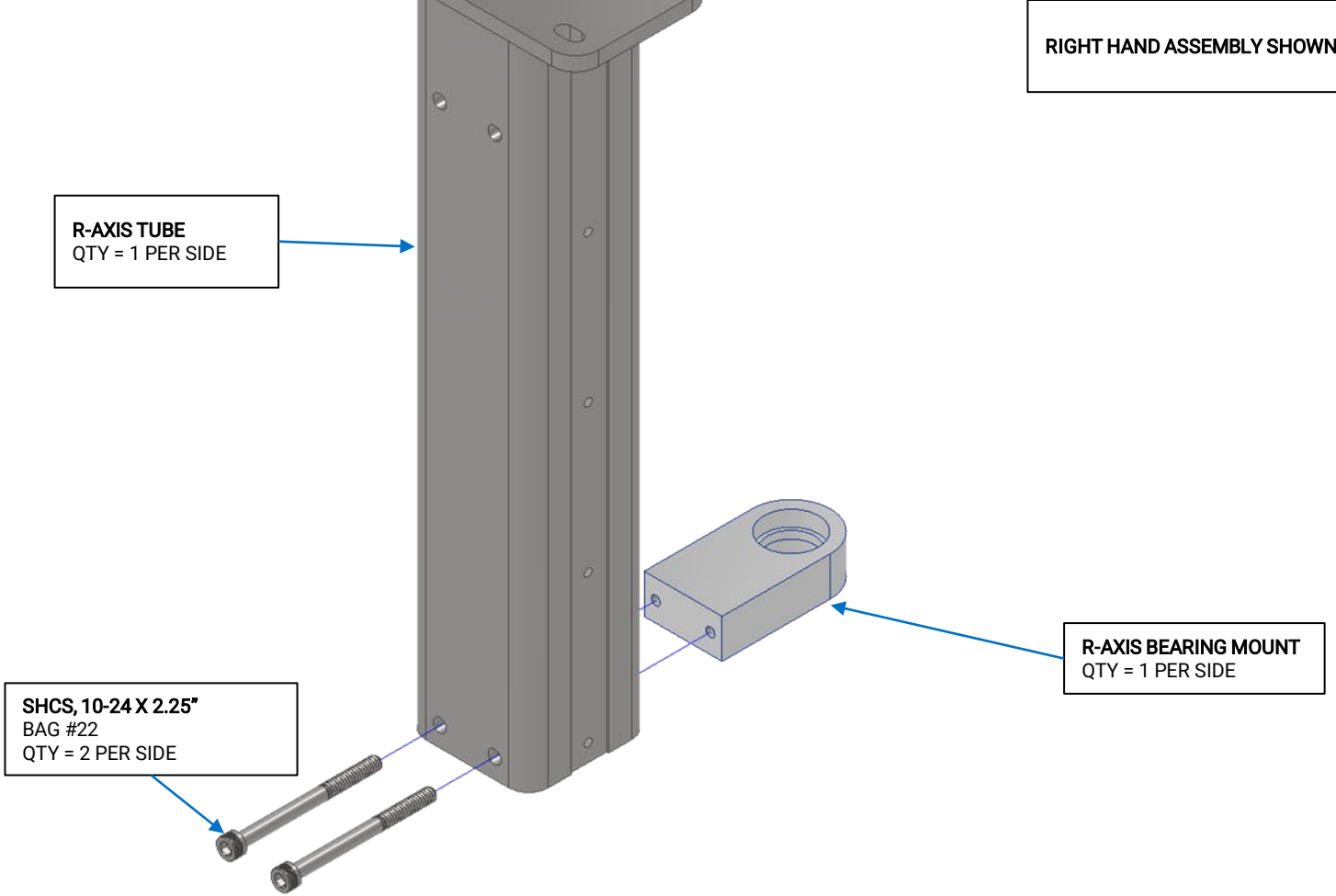
Instructions

J1. Repeat Steps A1-I1 for the **Right Hand X-Axis Assembly**. Note that the **Right Hand X-Axis Assembly** is a mirror of the previously assembled **Left Hand X-Axis Assembly**. The **Right Hand X-Axis Assembly** will use the **X2 motor, 1616-4**.

2: R-Axis Motion

The next step in the assembly process is to assemble all components necessary for R-axis motion.

RIGHT HAND ASSEMBLY SHOWN



Materials

Parts

- (1) R-Axis Bearing Mount
- (1) R-Axis Tube

Hardware

- (2) SOCKET HEAD CAP SCREWS, 10-24 X 2.25”

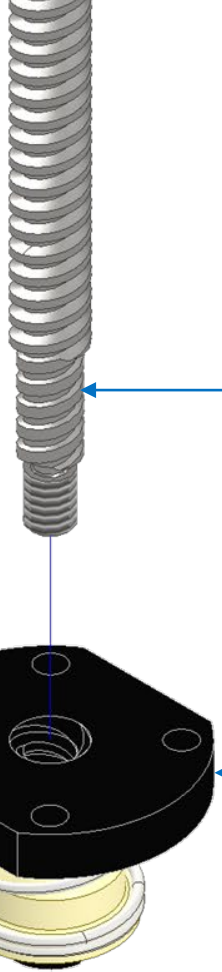
Tools

- 5/32” Hex Key

Instructions

A1. Bolt the **R-Axis Bearing Mount** to the **R-Axis Tube**, taking care to orient the linear rail slot as shown. **Leave the 10-24 Screws approximately ¼ turn from tight**.

RIGHT HAND ASSEMBLY SHOWN



R-AXIS LEAD SCREW
QTY = 1 PER SIDE

LEAD NUT
BAG #4
QTY = 1 PER SIDE

COMPRESS SPRING USING WHITE COMPRESSION COLLAR DURING INSTALLATION. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE LEAD NUT

Materials

Parts

- (1) Lead Nut
- (1) R-Axis Lead Screw

Hardware

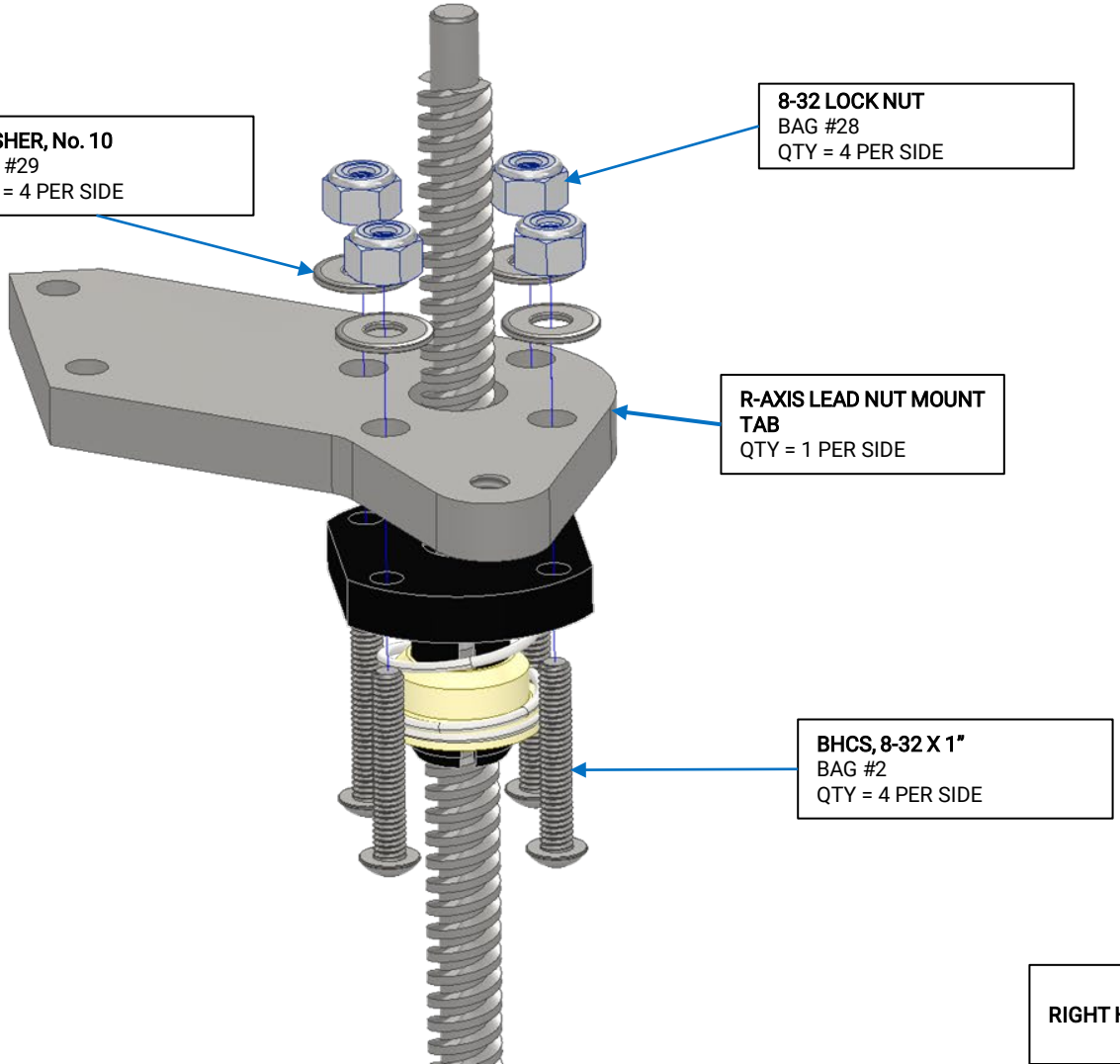
Tools

Instructions

B1. Use the white compression collar to compress the spring on the **Lead Nut.**

B2. With the spring held in the compressed position, thread the **Lead Nut** on to the threaded end of the **R-Axis Lead Screw**, with the flange of the Lead Nut oriented as shown.

B3. Continue to compress the Lead Nut spring and thread the **Lead Nut** until it is approximately halfway up the **R-Axis Lead Screw**.



RIGHT HAND ASSEMBLY SHOWN

Materials

Parts

- (1) R-Axis Lead Nut Mount Tab

Hardware

- (4) WASHER, No. 10
- (4) 8-32 LOCK NUT
- (4) BUTTON HEAD CAP SCREW, 8-32 X 1”

Tools

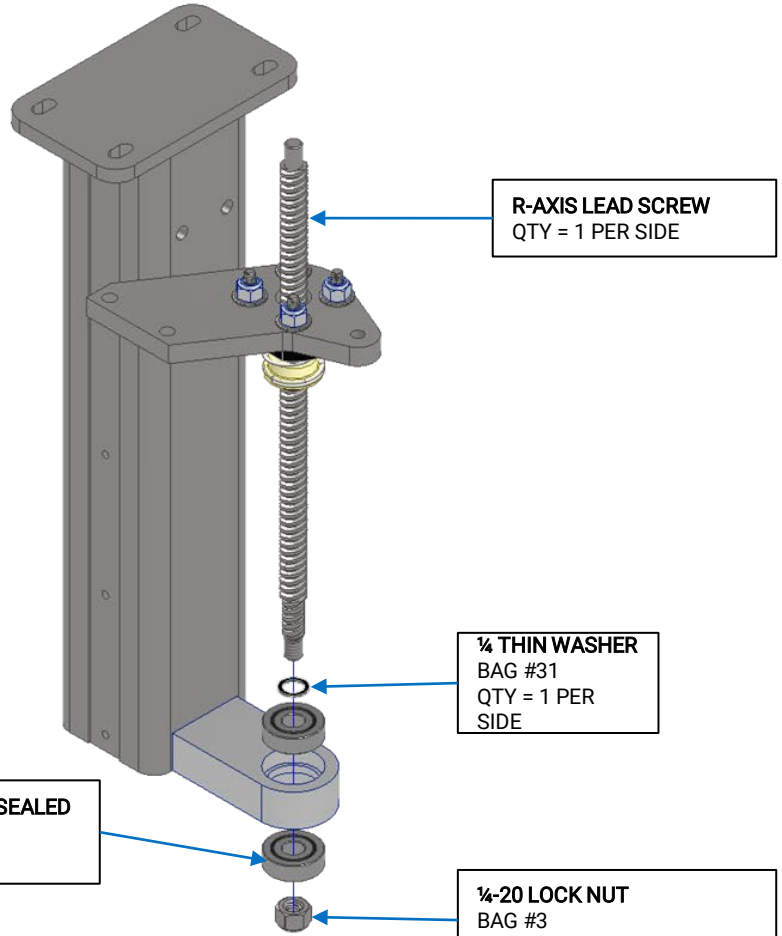
- 3/32 Hex Key

Instructions

C1. Slide the **R-Axis Lead Nut Mount Tab** on to the non threaded end of the **R-Axis Lead Screw**.

C2. Bolt the **R-Axis Lead Nut Mount Tab** to the **Lead Nut** as shown. **Leave the 8-32 cap screws ¼ turn from tight**.

RIGHT HAND ASSEMBLY SHOWN



Materials

Parts

- (1) R-Axis Lead Screw

Hardware

- (2) 608-2RS BEARING, SEALED
- (1) ¼ THIN WASHER
- (2) ¼-20 LOCK NUT

Tools

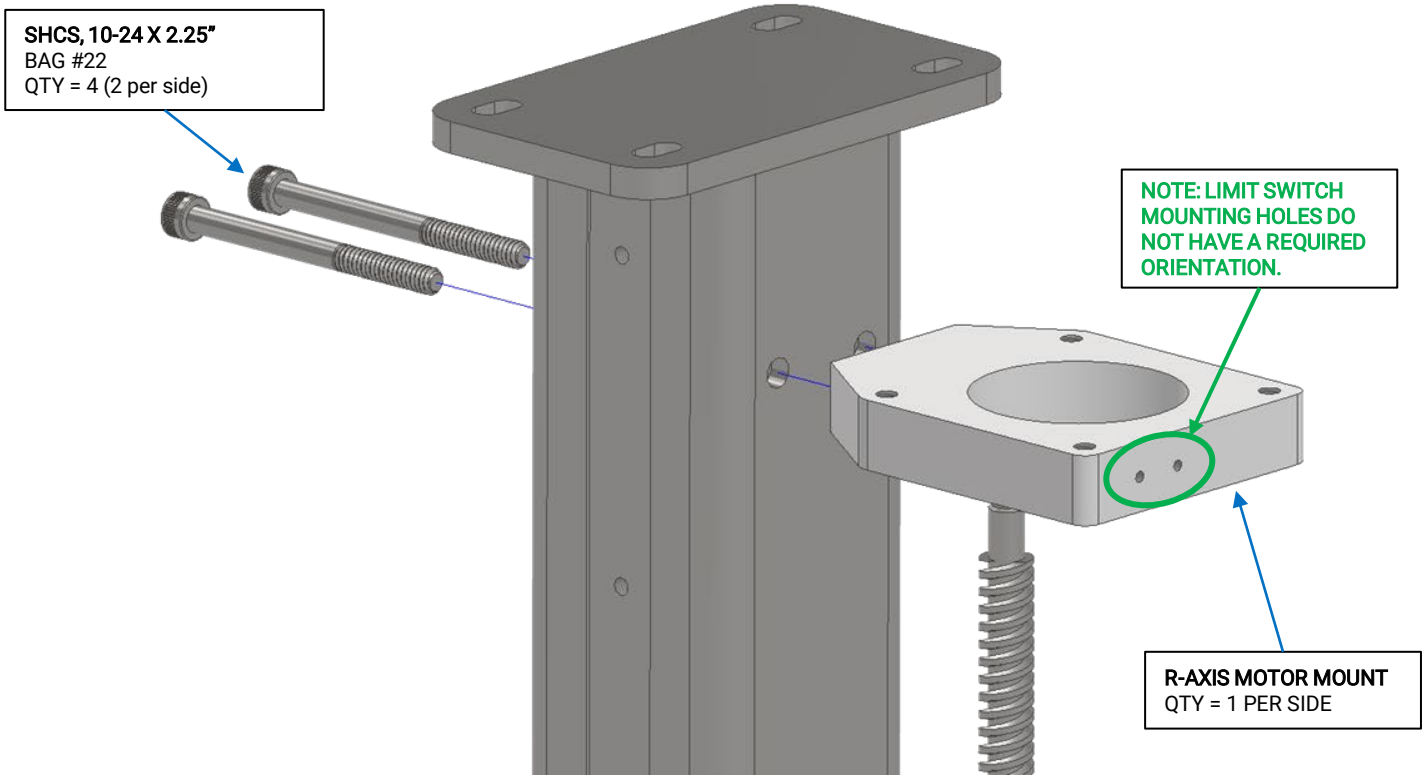
Instructions

D1. Install the **608-2RS Bearings** into the counterbores of the **R-Axis Bearing Mount** as shown.

D2. While holding the bearings in their respective counterbores, slide the ¼ thin washer on to the threaded end of the **R-Axis Lead Screw** and insert the threaded end of the lead screw through both bearings.

D3. Install the ¼-20 locknut on to the threaded end of the **R-Axis Lead Screw**. **Leave the locknut loose for now** (about ¼ turn from hand tight).

RIGHT HAND ASSEMBLY SHOWN



Materials

Parts

- (1) R-Axis Lead Screw

Hardware

- (2) 608-2RS BEARING, SEALED
- (1) ¼ THIN WASHER
- (2) ¼-20 LOCK NUT

Tools

Instructions

D1. Install the **608-2RS Bearings** into the counterbores of the **R-Axis Bearing Mount** as shown.

D2. While holding the bearings in their respective counterbores, slide the ¼ thin washer on to the threaded end of the **R-Axis Lead Screw** and insert the threaded end of the lead screw through both bearings.

D3. Install the ¼-20 locknut on to the threaded end of the **R-Axis Lead Screw**. **Leave the locknut loose for now** (about ¼ turn from hand tight).

SHCS, 4-40 X 5/16
BAG #18
QTY = 4 PER COUPLER

MOTOR COUPLER
BAG #18
QTY = 1 PER LEAD SCREW

Materials

Parts

- (1) Motor Coupler

Hardware

- (4) SOCKET HEAD CAP SCREW, 4-40 X 5/16

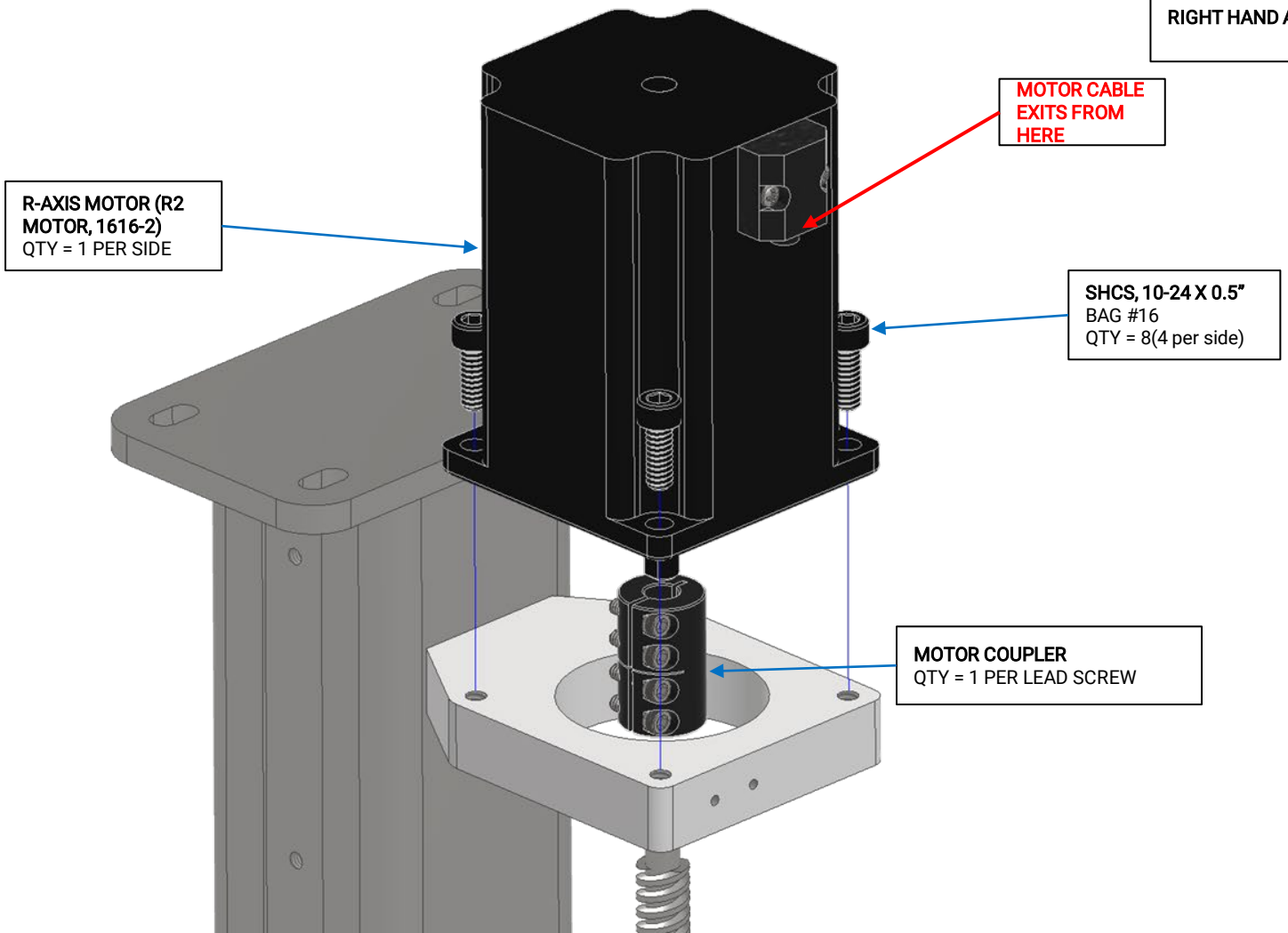
Tools

- 3/32” Hex Key

Instructions

F1. Loosely install the socket head cap screws into the 4 threaded holes.

RIGHT HAND ASSEMBLY SHOWN



Materials

Parts
- (1) Motor Coupler
- (1) R-Axis Motor (R2 Motor, 1616-2)

Hardware
- (4) SOCKET HEAD CAP SCREWS, 10-24 X 0.5”

Tools
- 5/32” Hex Key

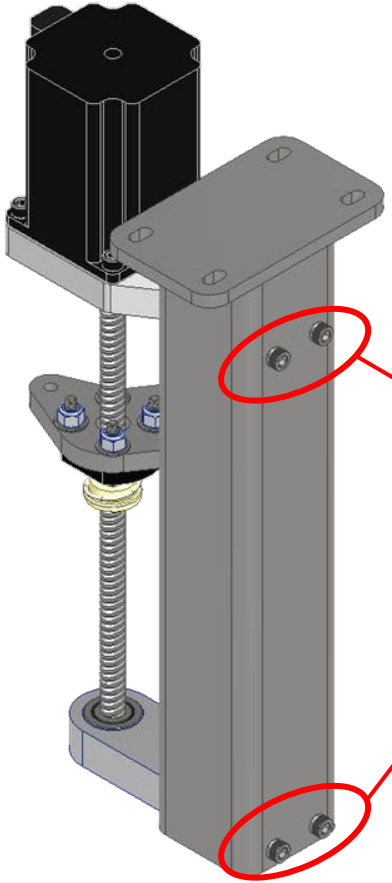
Instructions

G1. Slide the **Motor Coupler** on to the non-threaded end of the lead screw.

G2. While holding the **Motor Coupler** on the lead screw, slide the **R-Axis Motor** shaft in to coupler and install the **R-Axis Motor** on to the mount as shown.

TIGHTEN LOCK NUT ONLY TO THE POINT OF REMOVING BACKLASH.

RIGHT HAND ASSEMBLY SHOWN



TIGHTEN THESE FASTENERS ONLY AFTER FULLY INSTALLING R-AXIS MOTION COMPONENTS TO ENSURE PROPER ALIGNMENT

Materials

Parts

Hardware

Tools

- Padded Pliers
- 3/32” Hex Key
- 5/32” Hex Key
- 7/16” Wrench

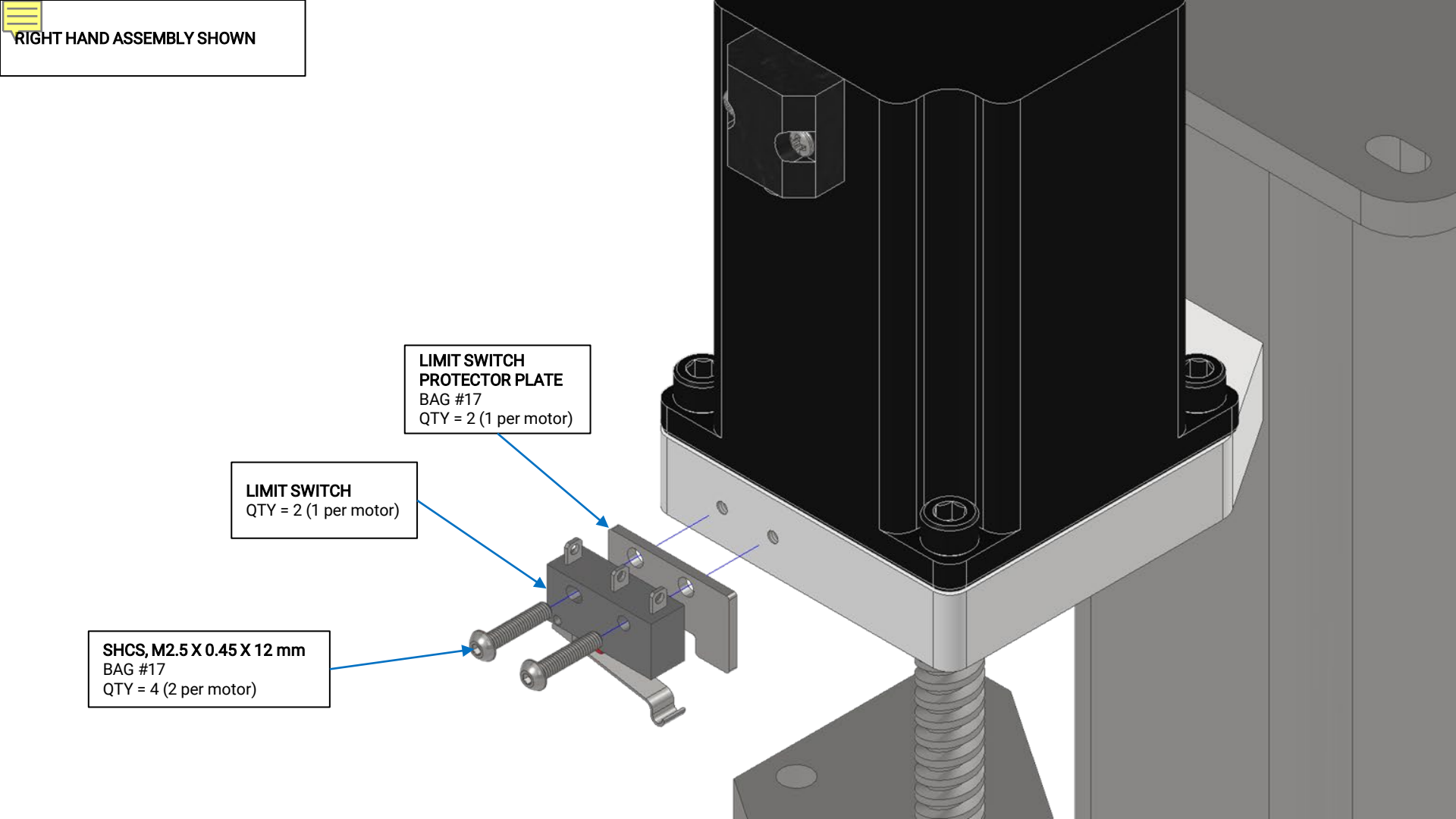
Instructions

H1. Using pliers with protection on the jaws, grip the **X-Axis Lead Screw** thread next to the **X-Axis Bearing Mount** to prevent the screw from rotating. The objective when tightening the lock nut is to remove all backlash without excessively preloading the bearings. If done correctly, the lead screw should be able to rotate freely with no observable axial play when pushing/pulling on the screw.

H2. Tighten the middle two screws of the **Motor Coupler**. Next, tighten the outboard screws. Again, further tighten the middle two screws followed by the outboard screws.

H3. Tighten the 10-24 cap screws securing the R-Axis Motor and Bearing mounts.

RIGHT HAND ASSEMBLY SHOWN



Materials

Parts

- (1) Limit Switch
- (1) Limit Switch Protector Plate

Hardware

- (2) SOCKET HEAD CAP SCREWS, M2.5 X 0.45 X 12 mm

Tools

- 1.5 mm Hex Key

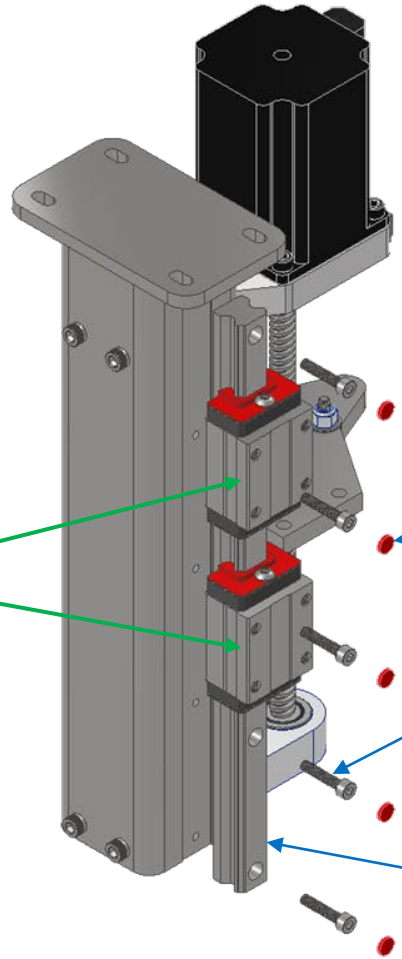
Instructions

I1. Install the Limit Switch and Limit Switch Protector Plate as shown.

RIGHT HAND ASSEMBLY SHOWN

IMPORTANT!!! DO NOT SLIDE THE BEARINGS OFF THE RAIL! YOU WILL BE REQUIRED TO PURCHASE A REPLACEMENT LINEAR RAIL ASSEMBLY AS THE CARRIAGES ARE NOT EASILY REINSTALLED.

ORIENT RAIL SO THAT THE BRIGHT POLISHED REFERENCE EDGE IS FACING AWAY FROM THE R-AXIS MOTOR AS SHOWN



MOUNTING HOLE CAP
BAG #6
QTY =5 PER SIDE

SHCS, M4 X 0.7 X 20 mm
BAG #6
QTY = 5 PER SIDE

R-AXIS LINEAR RAIL WITH BEARINGS
QTY = 1 PER SIDE

Materials

Parts

- (1) Limit Switch
- (1) Limit Switch Protector Plate

Hardware

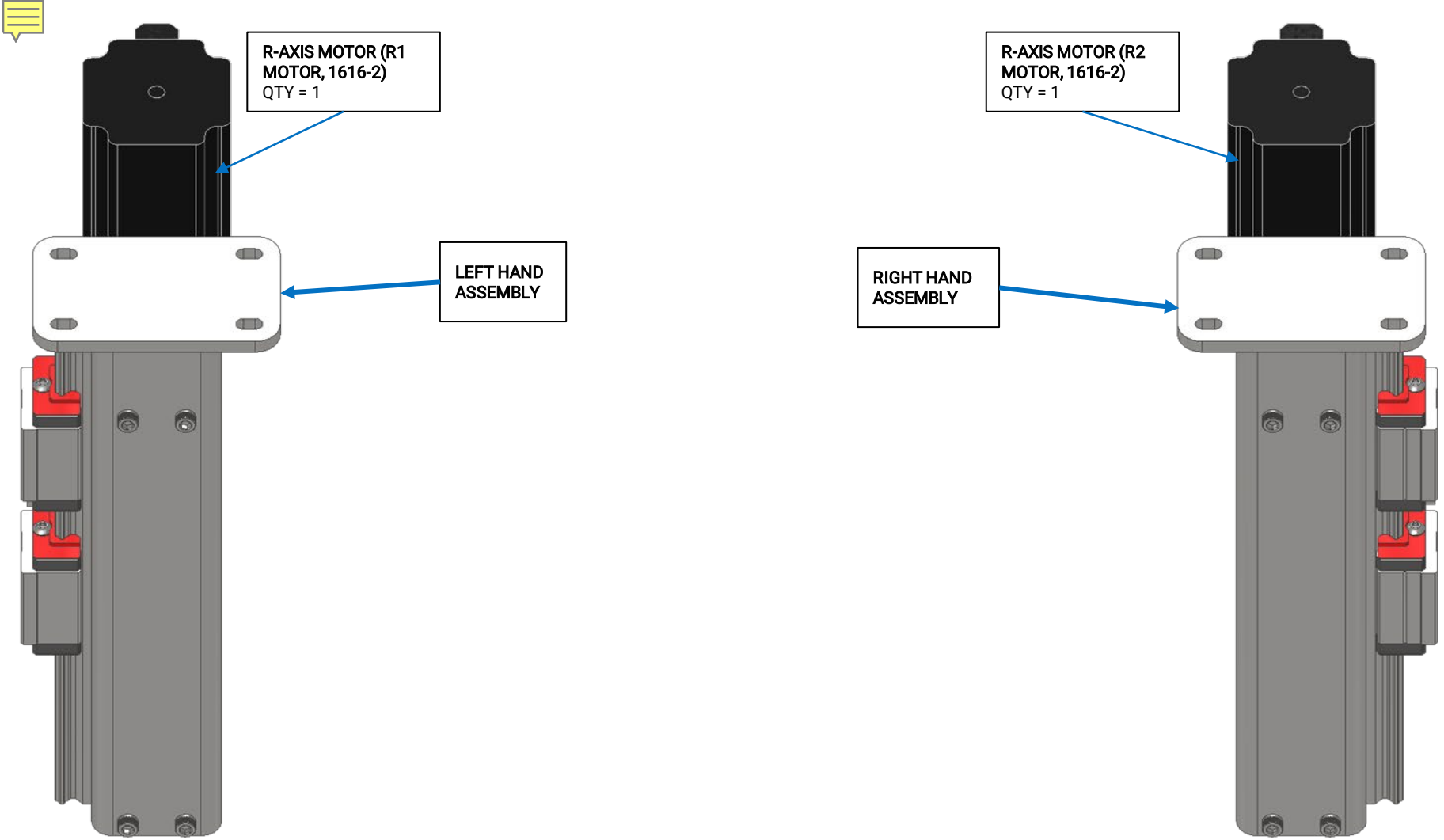
- (2) SOCKET HEAD CAP SCREWS, M2.5 X 0.45 X 12 mm

Tools

- 1.5 mm Hex Key

Instructions

I1. Install the Limit Switch and Limit Switch Protector Plate as shown.


R-AXIS MOTOR (R1 MOTOR, 1616-2)
QTY = 1
LEFT HAND ASSEMBLY
R-AXIS MOTOR (R2 MOTOR, 1616-2)
QTY = 1
RIGHT HAND ASSEMBLY

Materials

Parts

Hardware

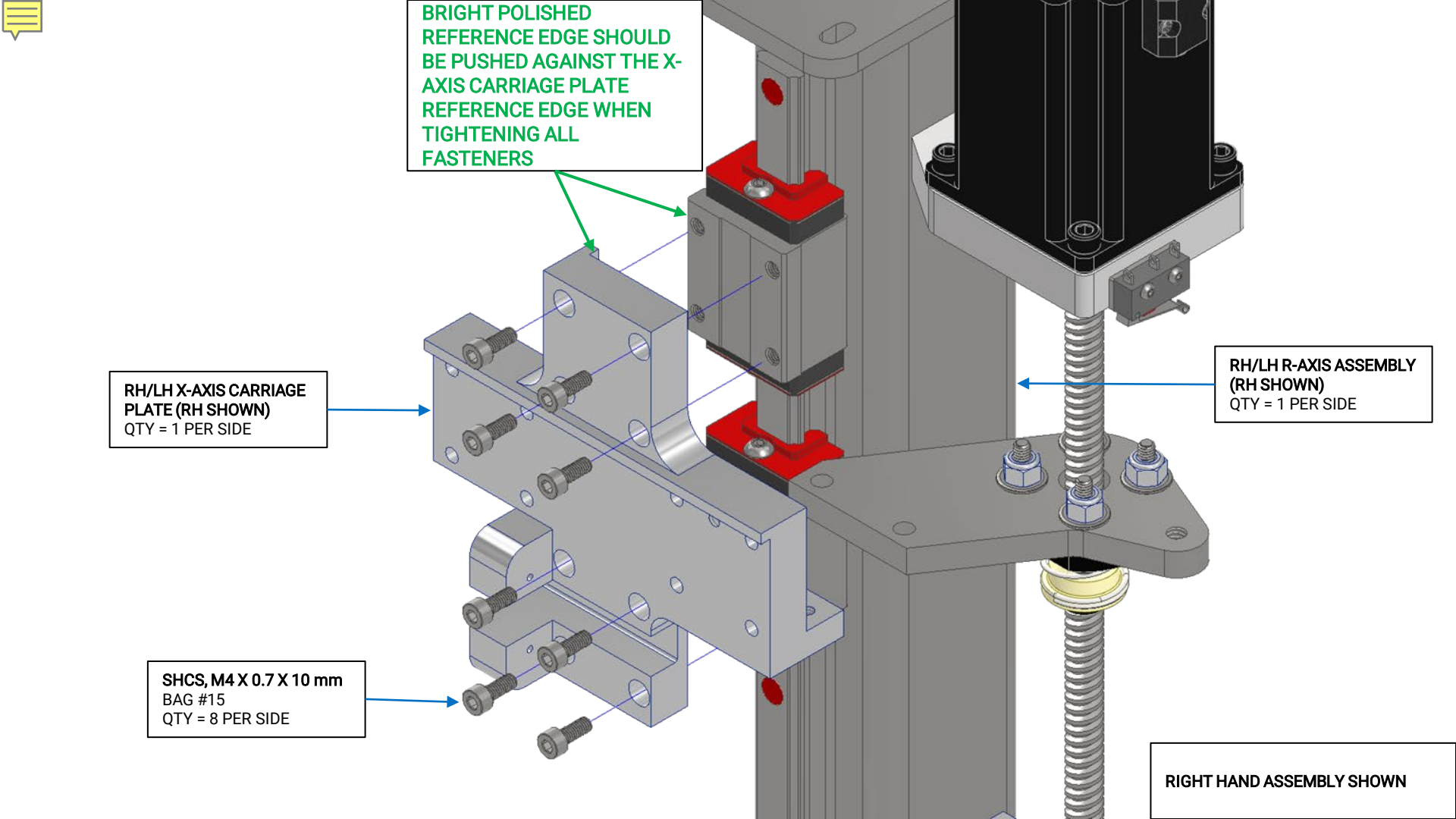
Tools

Instructions

K1. Repeat Steps A1-J4 for the **Left Hand R-Axis Assembly**. Note that the **Left Hand R-Axis Assembly** is a mirror of the previously assembled **Right Hand R-Axis Assembly**. The **Left Hand R-Axis Assembly** will use the **R1 Motor, 1616-1**.

3: Connecting R and X-Axis

The next step in the assembly process is to connect the R Axis to the X-Axis.


BRIGHT POLISHED REFERENCE EDGE SHOULD BE PUSHED AGAINST THE X-AXIS CARRIAGE PLATE REFERENCE EDGE WHEN TIGHTENING ALL FASTENERS
RH/LH X-AXIS CARRIAGE PLATE (RH SHOWN)
QTY = 1 PER SIDE
RH/LH R-AXIS ASSEMBLY (RH SHOWN)
QTY = 1 PER SIDE
SHCS, M4 X 0.7 X 10 mm
BAG #15
QTY = 8 PER SIDE
RIGHT HAND ASSEMBLY SHOWN

Materials

Parts
- (1) RH X-AXIS CARRIAGE PLATE

Hardware
- (8) SOCKET HEAD CAP SCREW, M4 X 0.7 X 10 mm (8 per side)

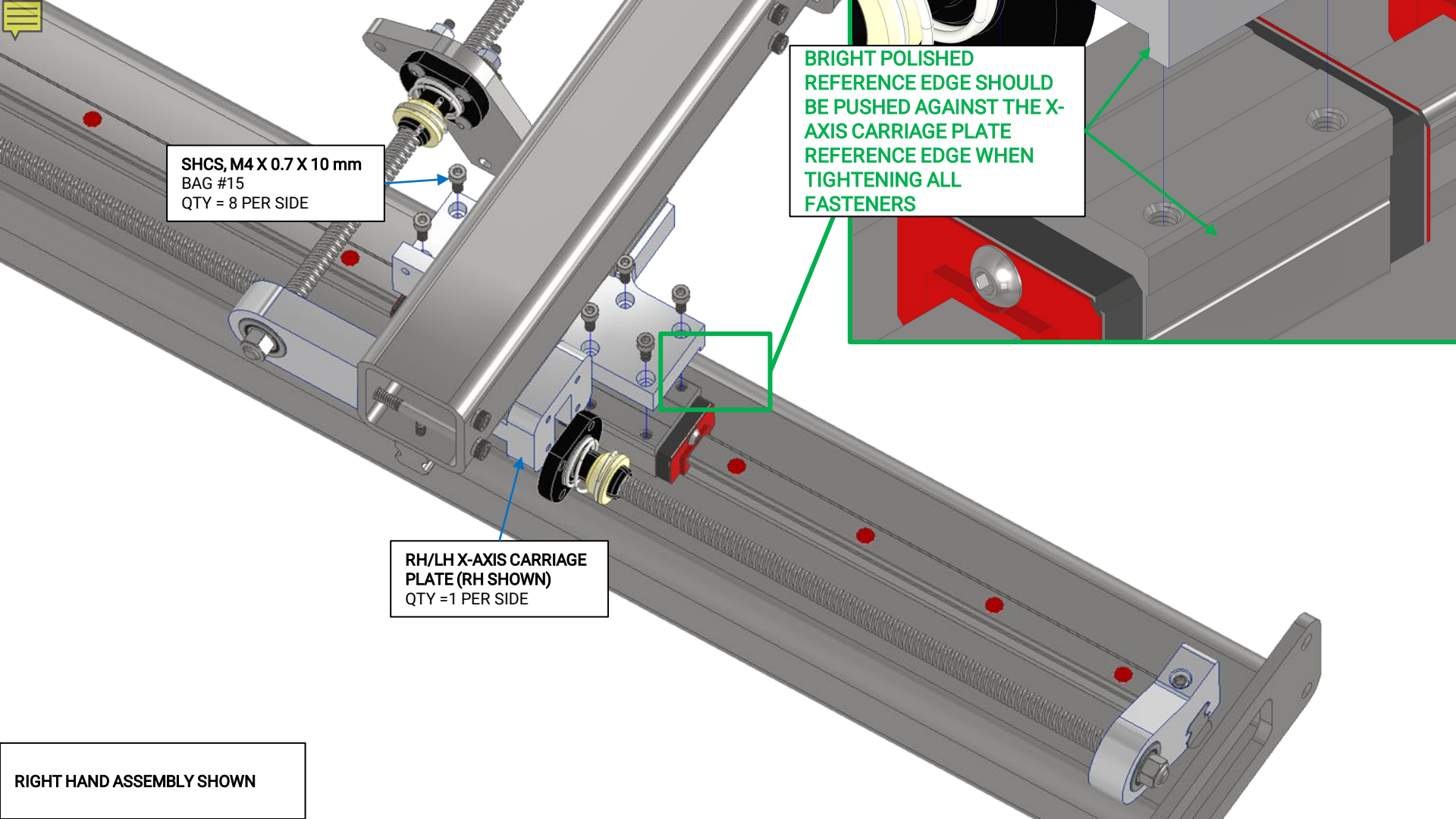
Tools
- 3mm Hex Key

Instructions

A1. Locate the **Right Hand X Axis Carriage Plate** and the **RH R-Axis Assembly**(previously assembled).

A2. Loosely Install the RH X-Axis Carriage Plate using the fasteners as shown.

A3. Push the edge of the RH X-Axis Carriage Plate against the reference edges of the linear bearing blocks and tighten the M4 cap screws.


SHCS, M4 X 0.7 X 10 mm
BAG #15
QTY = 8 PER SIDE
BRIGHT POLISHED REFERENCE EDGE SHOULD BE PUSHED AGAINST THE X-AXIS CARRIAGE PLATE REFERENCE EDGE WHEN TIGHTENING ALL FASTENERS
RH/LH X-AXIS CARRIAGE PLATE (RH SHOWN)
QTY =1 PER SIDE
RIGHT HAND ASSEMBLY SHOWN

Materials

Parts
- (1) RH X-AXIS CARRIAGE PLATE

Hardware
- (8) SOCKET HEAD CAP SCREW, M4 X 0.7 X 10 mm (8 per side)

Tools
- 3mm Hex Key

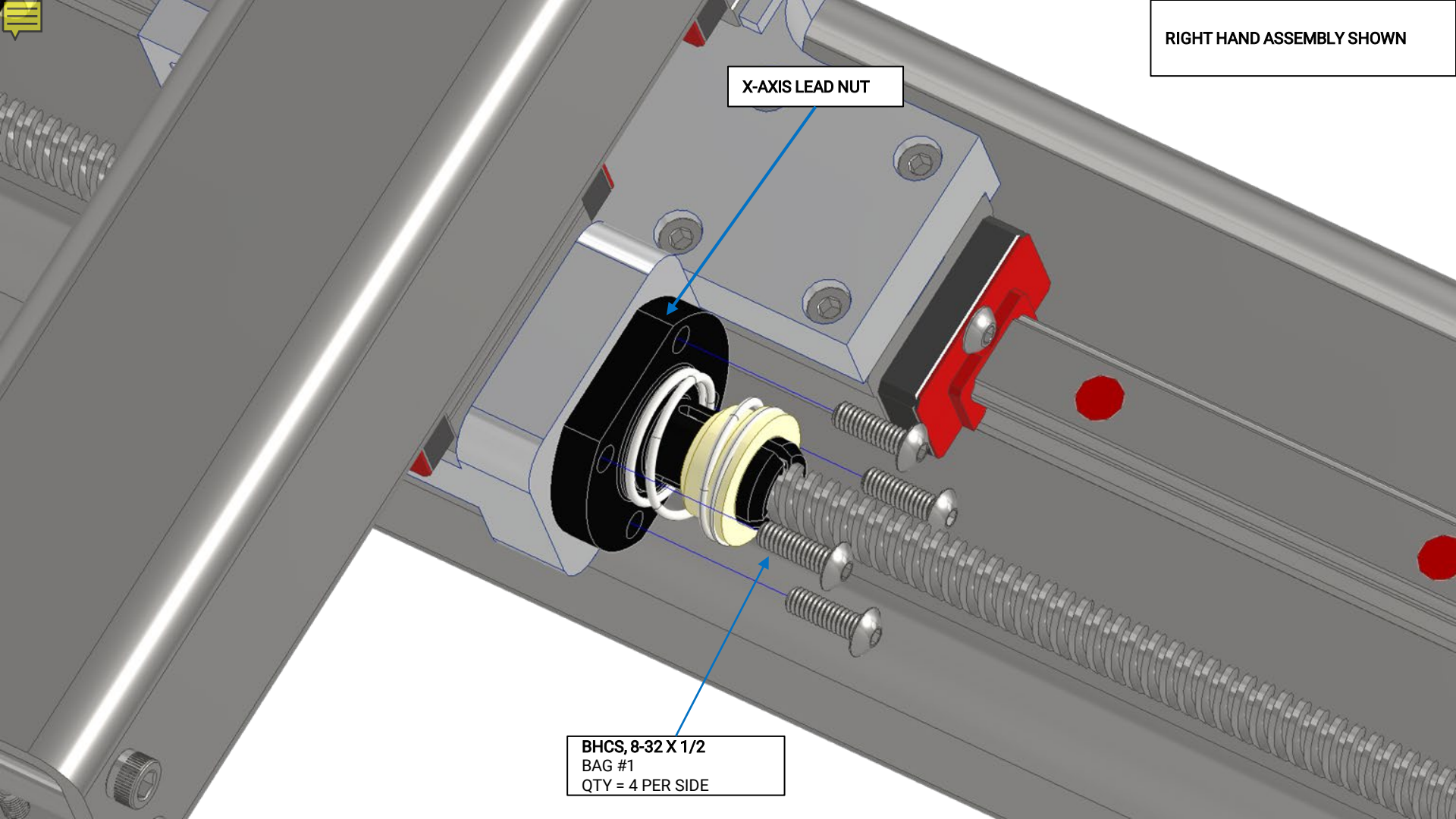
Instructions

A1. Locate the **Right Hand X-Axis Assembly**(previously assembled).

A2. Slide the **RH X-Axis Carriage Plate** into a position such that the **R-Axis Lead Nut Mount Tab** will not interfere with the installation of the Carriage Plate fasteners.

A2. Loosely attach the **RH X-Axis Carriage Plate** to the **X-Axis Linear Rail Bearing Blocks** using the fasteners as shown.

A3. Push the edge of the **RH X-Axis Carriage Plate** against the reference edges of the **X-Axis Linear Bearing Blocks** and tighten the M4 cap screws.


RIGHT HAND ASSEMBLY SHOWN
X-AXIS LEAD NUT
BHCS, 8-32 X 1/2
BAG #1
QTY = 4 PER SIDE

Materials

Parts

Hardware

- (4) BUTTON HEAD CAP SCREW ⅜ X 1/2

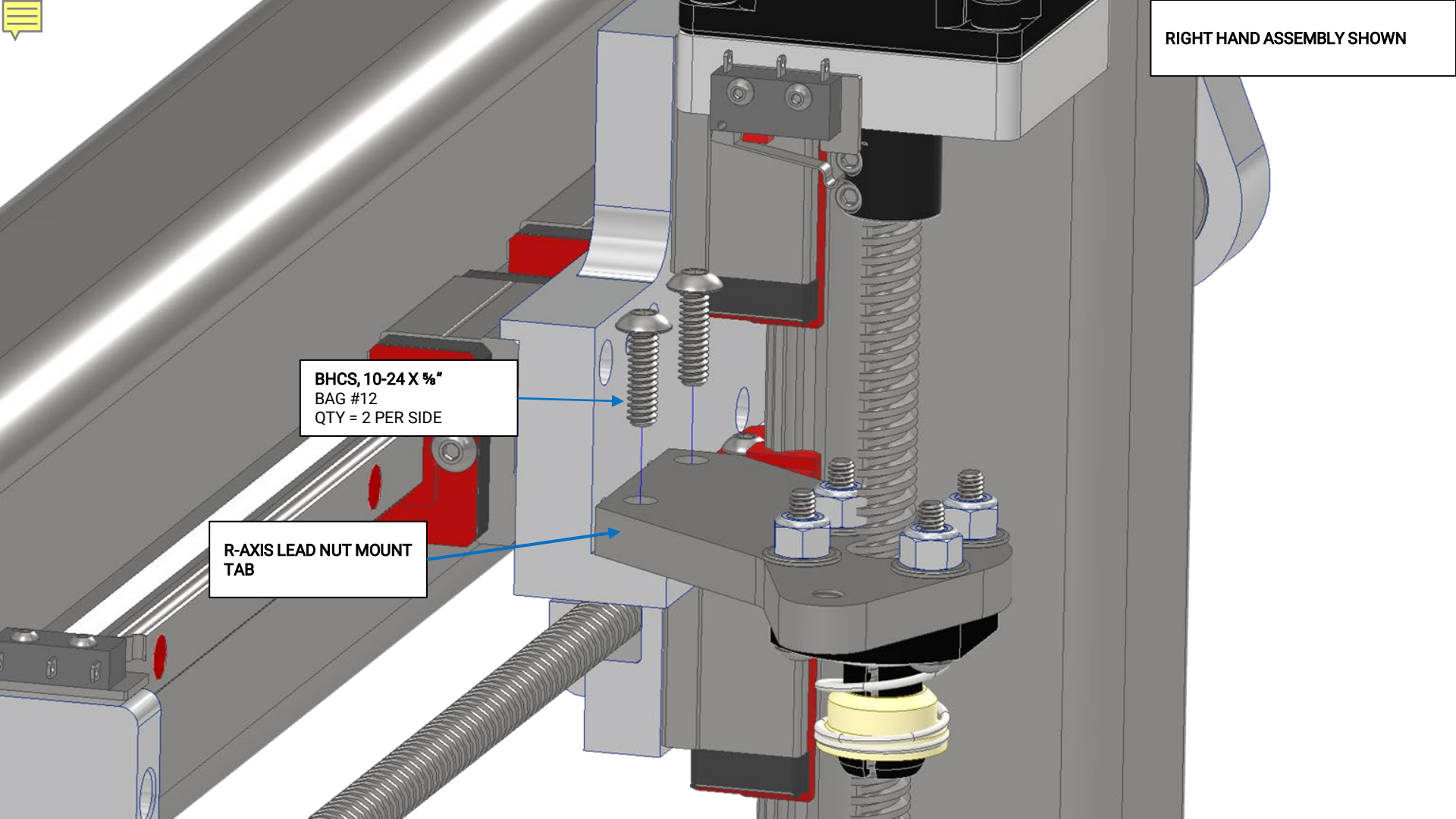
Tools

- 3/32 Hex Key

Instructions

C1. Slide the **X-Axis Carriage Plate** up against the **X-Axis Lead Nut**, rotating the Lead Nut as necessary such that the mounting holes align with the corresponding mounting holes on the X-Axis Carriage Plate.

C2. Fasten the **X-Axis Lead Nut** to the **X-Axis Carriage Plate** as shown. **Leave the 8-32 cap screws ¼ turn from tight**.


RIGHT HAND ASSEMBLY SHOWN
BHCS, 10-24 X ⅝"
BAG #12
QTY = 2 PER SIDE
R-AXIS LEAD NUT MOUNT TAB

Materials

Parts

Hardware

- (4) BUTTON HEAD CAP SCREW, 10-24 X ⅝”

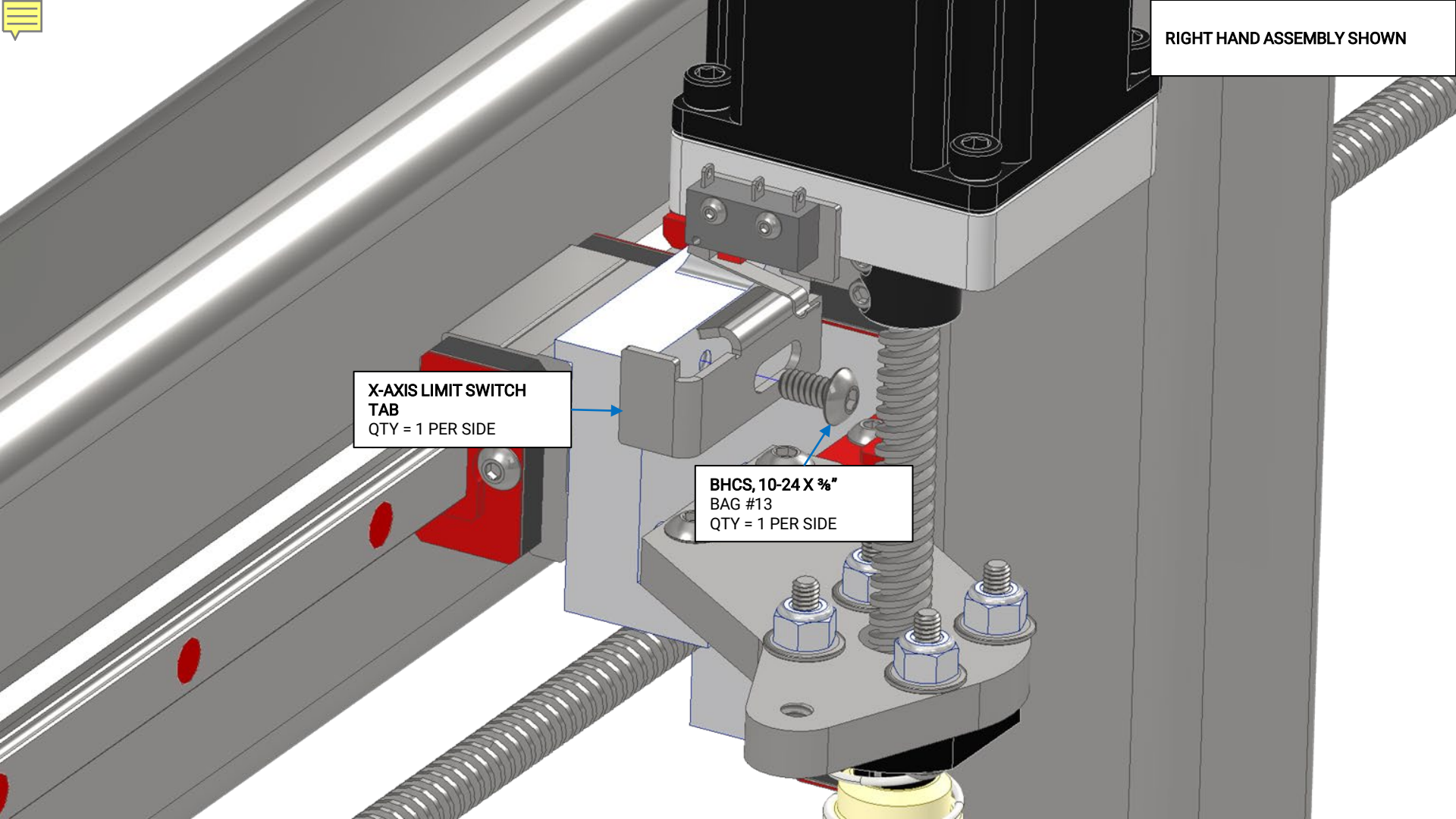
Tools

- ⅛” Hex Key

Instructions

D1. Slide the **R Axis Tube Assembly** such that the **R-Axis Lead Nut Mount Tab** sits against the **X-Axis Carriage Plate**, rotating the **R-Axis Lead Nut** as necessary such that the mounting holes align with the corresponding mounting holes on the **X-Axis Carriage Plate**.

D2. Fasten the **R-Axis Lead Nut Mount Tab** to the **X-Axis Carriage Plate** as shown.


RIGHT HAND ASSEMBLY SHOWN
X-AXIS LIMIT SWITCH TAB
QTY = 1 PER SIDE
BHCS, 10-24 X ⅜"
BAG #13
QTY = 1 PER SIDE

Materials

Parts

- (1) X-Axis Limit Switch Tab

Hardware

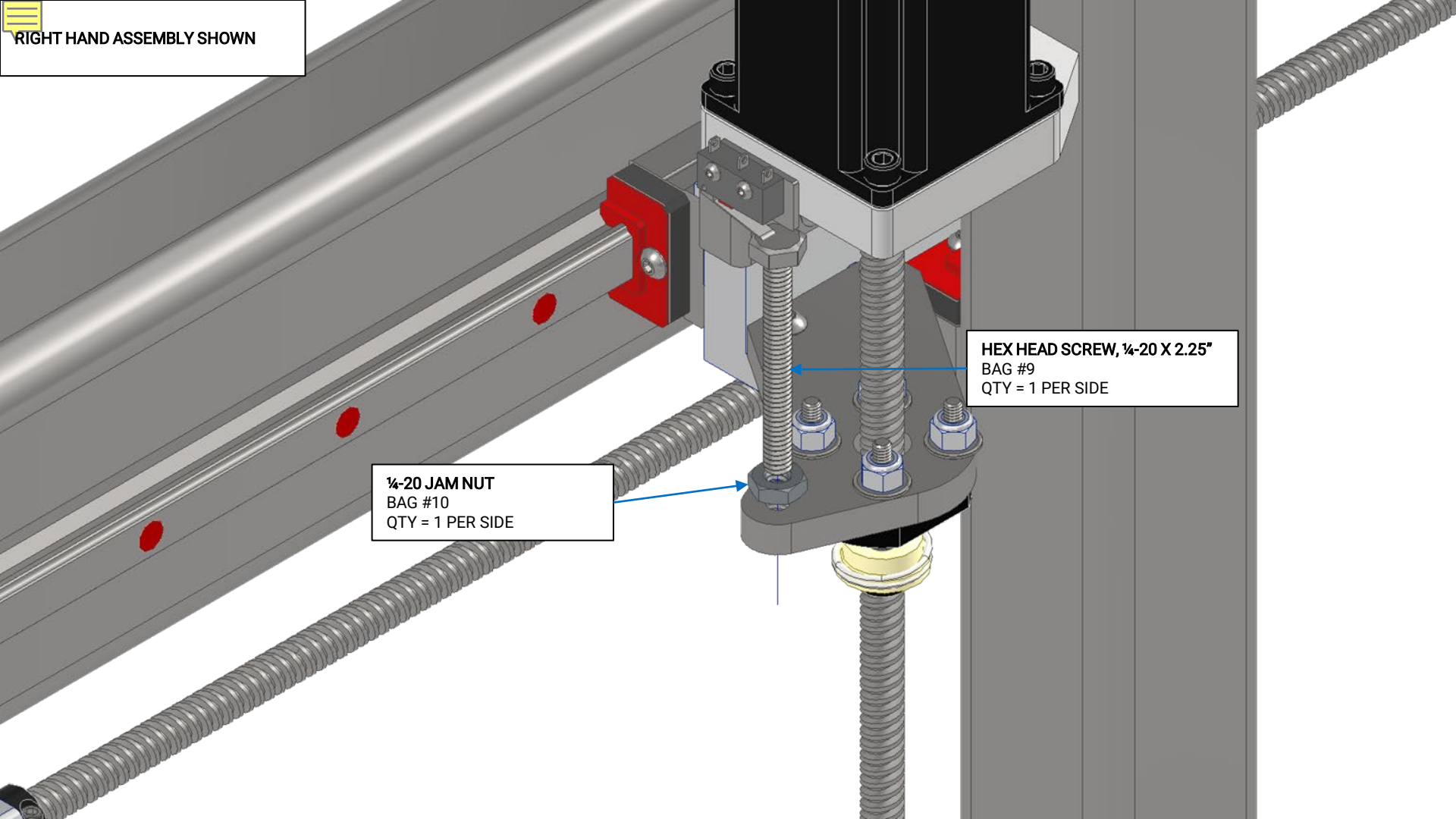
- (1) BUTTON HEAD CAP SCREW, 10-24 X ⅜”

Tools

- ⅛” Hex Key

Instructions

E1. Fasten the **X-Axis Limit Switch Tab** on to the **X-Axis Carriage Plate** as shown. Ensure the tab is pushed to the back of the slot such that it sits flat against the X-Axis Carriage.


RIGHT HAND ASSEMBLY SHOWN
HEX HEAD SCREW, ¼-20 X 2.25"
BAG #9
QTY = 1 PER SIDE
¼-20 JAM NUT
BAG #10
QTY = 1 PER SIDE

Materials

Parts

Hardware

- (1) HEX HEAD SCREW, ¼-20 X 2.25”
- (1) ¼-20 JAM NUT

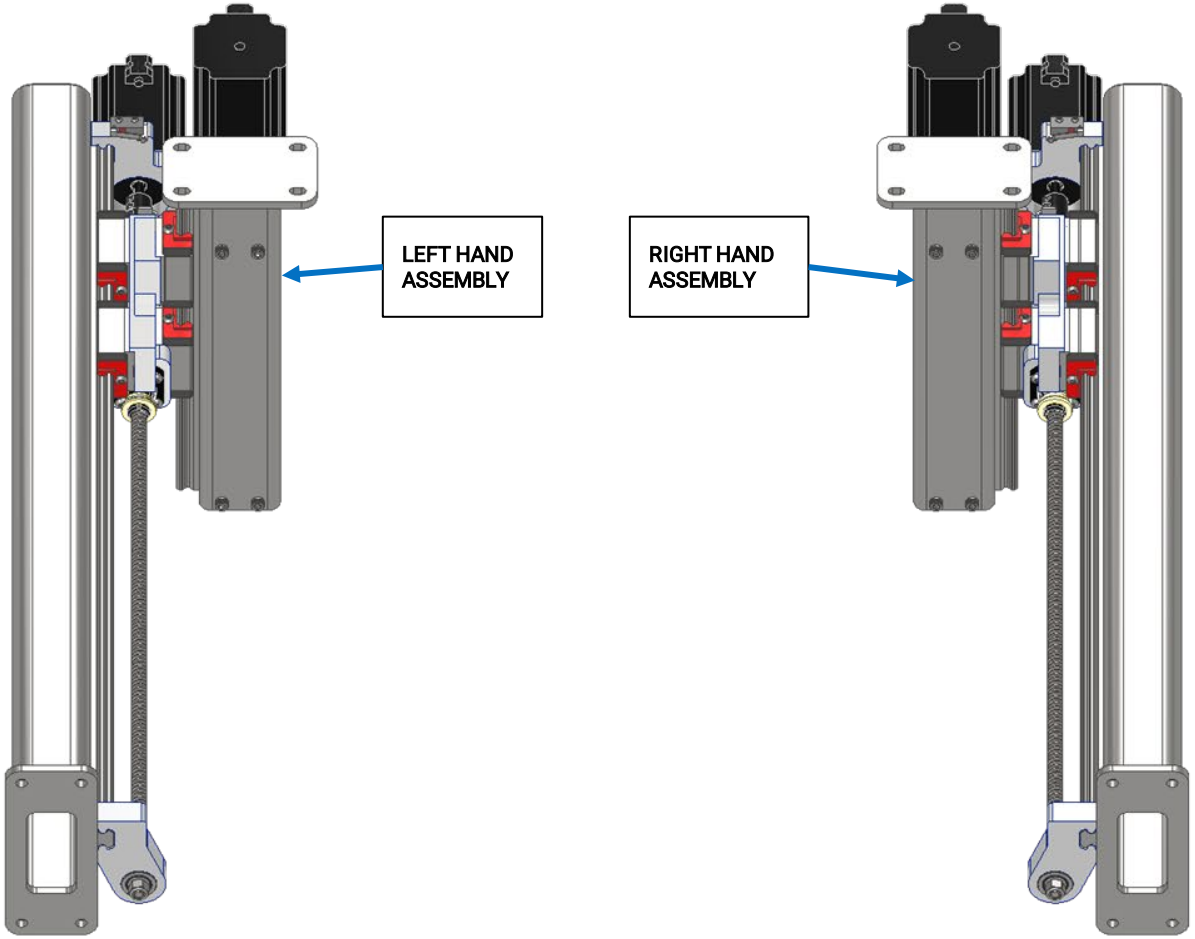
Tools

- 7/16 Wrench

Instructions

F1. Thread the ¼-20 jam nut approximately 1.5” up the hex head screw.

F2. Thread the hex head screw into the **R-Axis Lead Nut Mount Tab** as shown. At Least 1” of thread should protrude from the bottom of the mount tab.


LEFT HAND
ASSEMBLY
RIGHT HAND
ASSEMBLY

Materials

Parts

Hardware

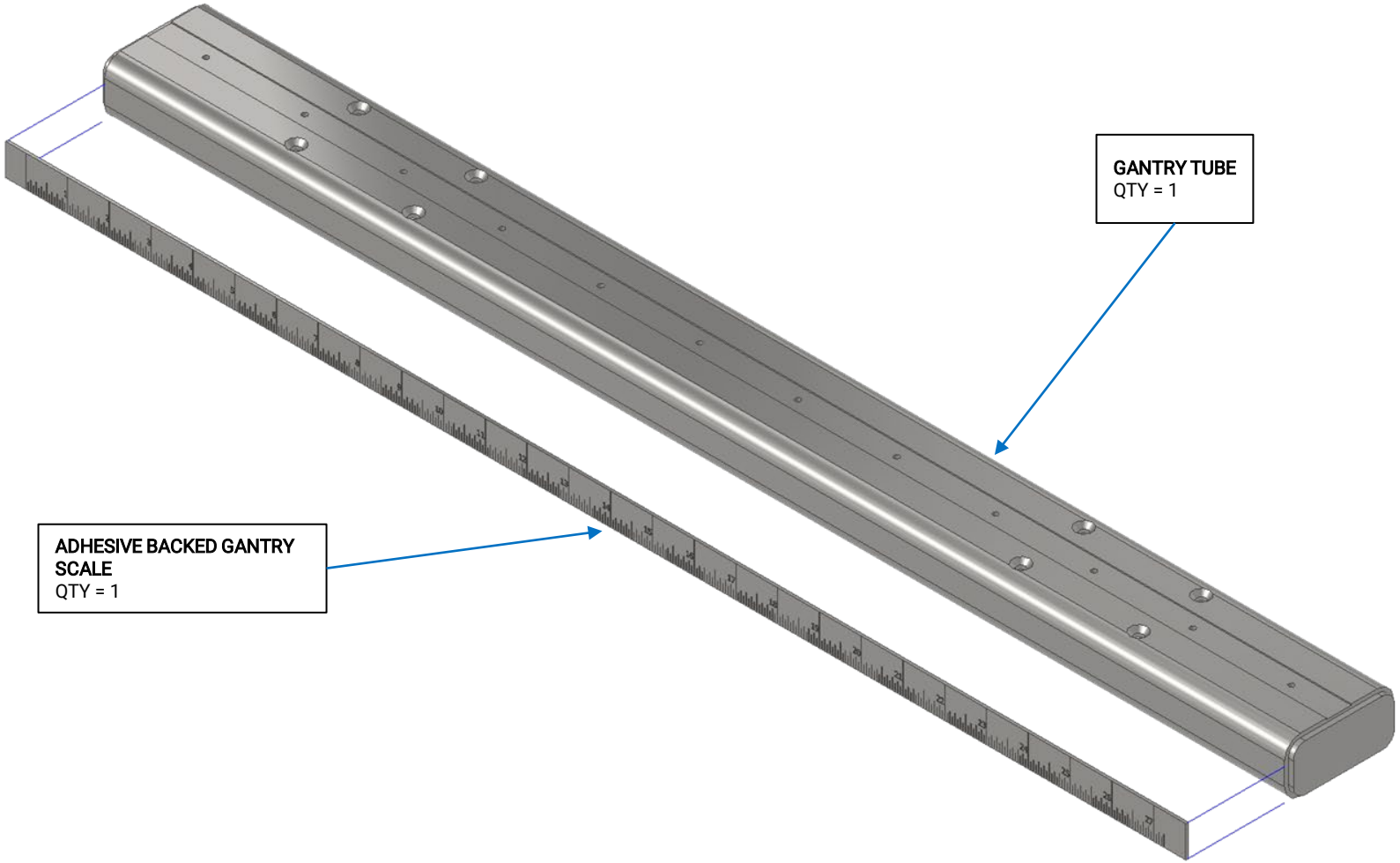
Tools

Instructions

G1. Repeat Steps A1-F2 for the **Left Hand R-Axis and X-Axis Assemblies**. Note that the **Left Hand R-Axis and X-Axis Assemblies** are a mirror of the previously assembled **Right Hand Assembly**.

4: Gantry Assembly

The next step in the assembly process is to assemble the Backgauge Gantry


GANTRY TUBE
QTY = 1
ADHESIVE BACKED GANTRY SCALE
QTY = 1

Materials

Parts
- (1) Gantry Tube
- (1) Adhesive Backed Gantry Scale

Hardware

Tools
- Scissors or Tin Snips
- Towel or paper towel
- Rubbing alcohol

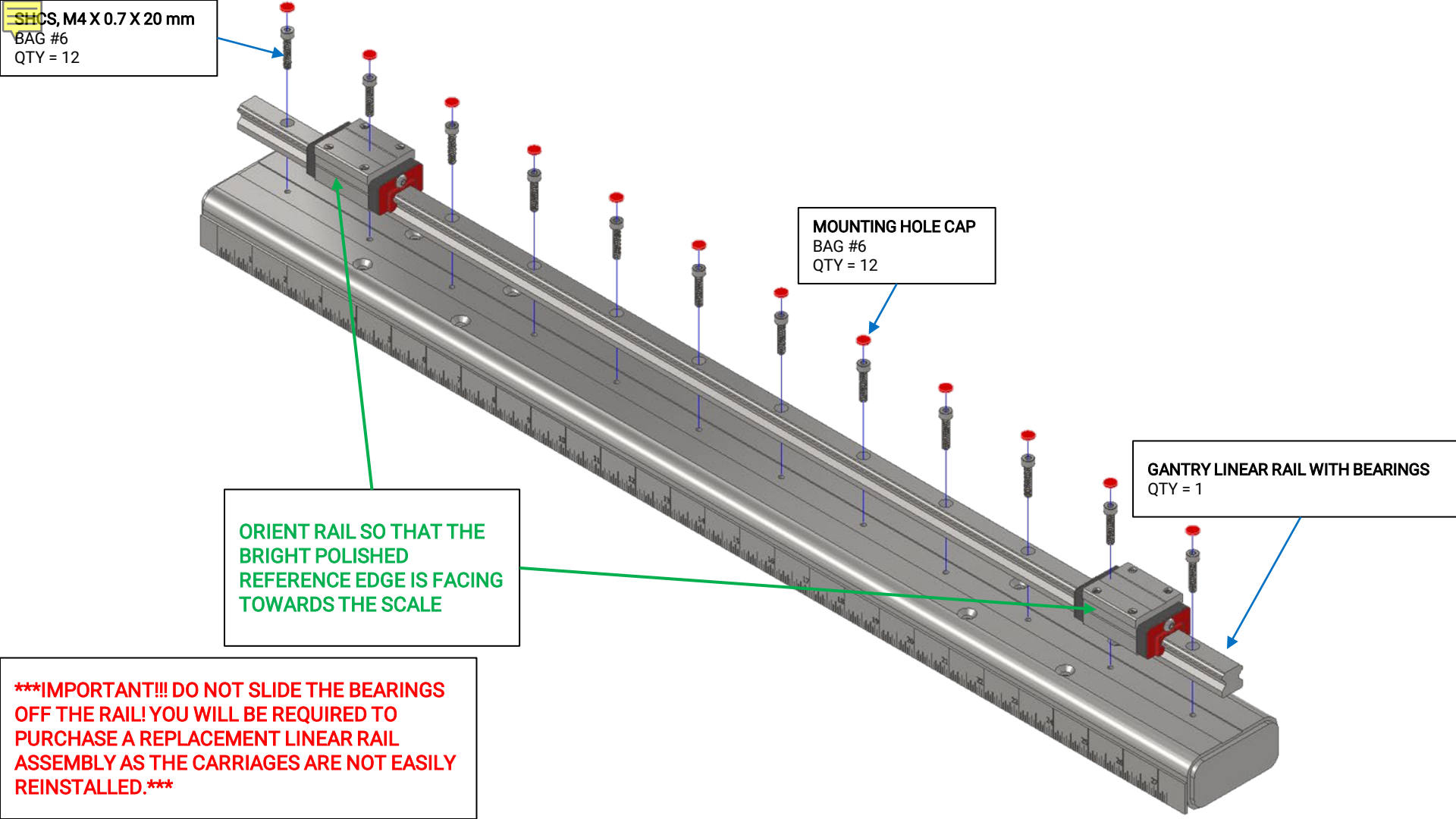
Instructions

A1. Cut of the excess blank section at the beginning of the **Adhesive Backed Gantry Scale** then cut to a length of 28-¼”.

A2. Wipe down the **Gantry Tube** with rubbing alcohol to remove any oil that may affect adhesion of the scale.

A3. Remove the protective film from the back of the **Adhesive Backed Gantry Scale**.

A4. Attach the **Adhesive Backed Gantry Scale** to the **Gantry Tube** as shown. Ensure the Scale is vertically and horizontally centered on the side face of the Gantry Tube. Apply firm pressure along the entire scale to ensure good adhesion to the tube.


SHCS, M4 X 0.7 X 20 mm
BAG #6
QTY = 12
MOUNTING HOLE CAP
BAG #6
QTY = 12
GANTRY LINEAR RAIL WITH BEARINGS
QTY = 1
ORIENT RAIL SO THAT THE BRIGHT POLISHED REFERENCE EDGE IS FACING TOWARDS THE SCALE
IMPORTANT!!! DO NOT SLIDE THE BEARINGS OFF THE RAIL! YOU WILL BE REQUIRED TO PURCHASE A REPLACEMENT LINEAR RAIL ASSEMBLY AS THE CARRIAGES ARE NOT EASILY REINSTALLED.

Materials

Parts
- (1) Gantry Linear Rail with Bearings
- (12) Mounting Hole Cap

Hardware
- (12) SOCKET HEAD CAP SCREW, M4 X 0.7 X 20 mm

Tools
- 3mm Hex Key
- Small Hammer/Mallet

Instructions

B1. Locate the **Gantry Linear Rail and Bearing assembly**. Note that the **Gantry Linear Rail** is 28.25” in length. Be sure to install the correct one.

[Warning Symbol] LINEAR RAIL BEARINGS

IMPORTANT: Do not either deliberately or accidentally remove the linear bearings from the linear rail. It is nearly impossible without specialized tools to reinstall a linear bearing once removed. The replacement cost of the linear rail assembly will not be covered by warranty.

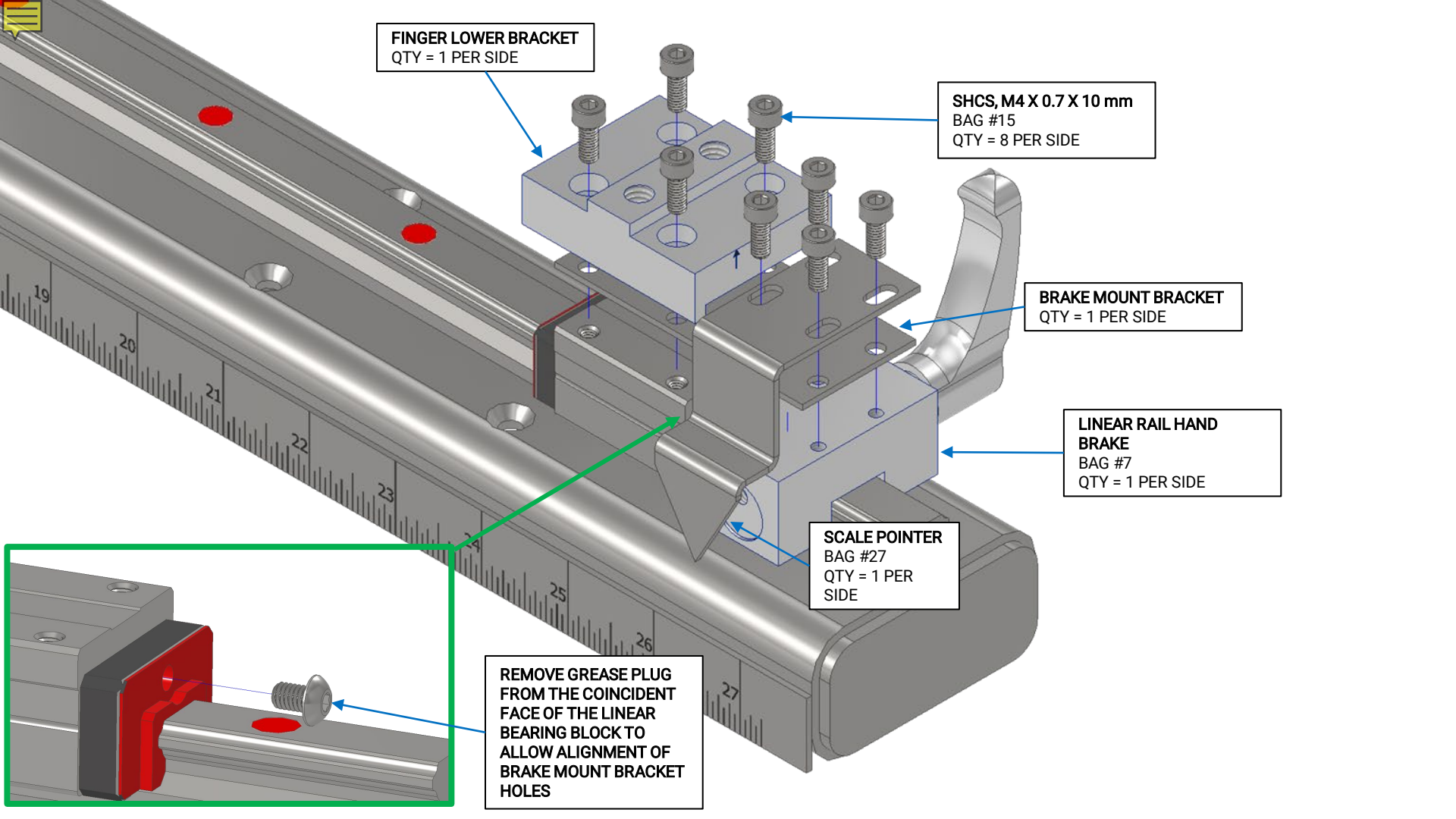
B2. Thoroughly clean and brush the **Gantry Tube** mounting surface as well as the bottom surface of the linear rail. Any debris in these critical joints will decrease the accuracy of the backgage.

B3. Install the **Gantry Linear Rail** using the fasteners shown.

[Warning Symbol] LINEAR BEARING ORIENTATION

WARNING: Be sure to double check that the orientation of the Linear Rail Bearings are correct before inserting the mounting hole caps. Once installed the mounting hole caps cannot be removed without destroying them.

B4. Using a small mallet, lightly tap one mounting hole cap into each mounting hole. The goal is to only insert the cap until it is flush to the surface of the linear rail. Verify that each linear bearing can glide across the mounting holes without resistance.


FINGER LOWER BRACKET
QTY = 1 PER SIDE
SHCS, M4 X 0.7 X 10 mm
BAG #15
QTY = 8 PER SIDE
BRAKE MOUNT BRACKET
QTY = 1 PER SIDE
LINEAR RAIL HAND BRAKE
BAG #7
QTY = 1 PER SIDE
SCALE POINTER
BAG #27
QTY = 1 PER SIDE
REMOVE GREASE PLUG FROM THE COINCIDENT FACE OF THE LINEAR BEARING BLOCK TO ALLOW ALIGNMENT OF BRAKE MOUNT BRACKET HOLES

Materials

Parts

- (2) Finger Lower Bracket
- (2) Brake Mount Bracket
- (2) Scale Pointer
- (2) Linear Rail Hand Brake

Hardware

- (16) SOCKET HEAD CAP SCREW, M4 X 0.7 X 10 mm (8 per side)

Tools

- 3mm Hex Key
- 2.5mm Hex Key

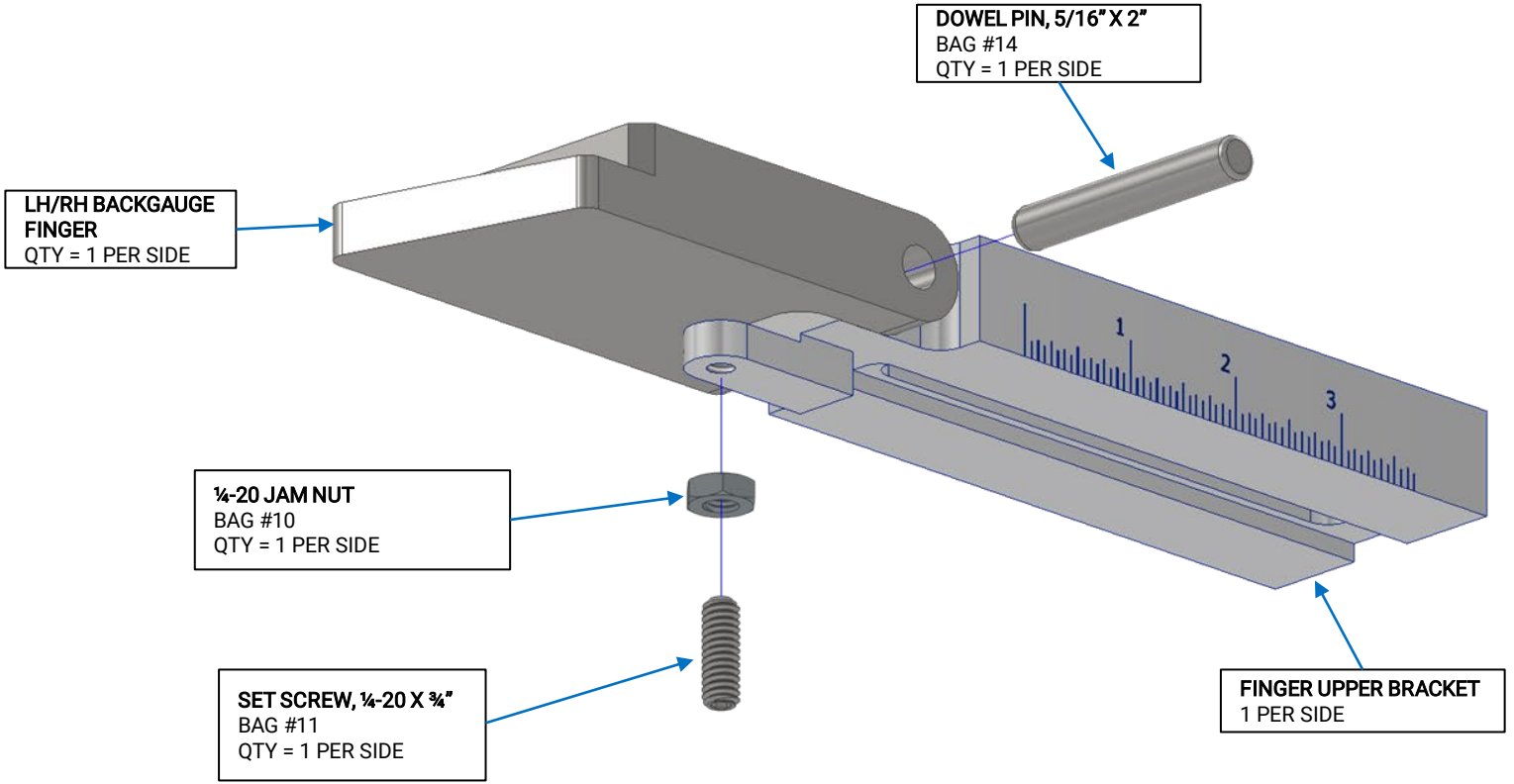
Instructions

C1. Remove one grease plug from each **Linear Rail Bearing Block**, on the face that will sit coincident with the **Linear Rail Hand Brake**.

C2. Slide the **Linear Rail Hand Brakes** onto the linear rail until they are coincident with the sides of the Linear Rail Bearing Blocks.

C3. Install the **Finger Lower Brackets**, **Brake Mount Brackets**, and **Scale Pointers** on to the linear bearing blocks and brakes using the fasteners as shown.

RIGHT HAND ASSEMBLY SHOWN



Materials

Parts

- (2) Finger Upper Bracket
- (1) Left Hand Backgauge Finger
- (1) Right Hand Backgauge Finger

Hardware

- (2) SET SCREW, ¼-20 X ¾”
- (2) ¼-20 JAM NUT
- (2) DOWEL PIN, 5/16” X 2”

Tools

- 7/16” Wrench
- ⅛” Hex Key

Instructions

D1. Thread the jam nut on to the set screw.

D2. Thread the set screw into the **Finger Upper Bracket** as shown.

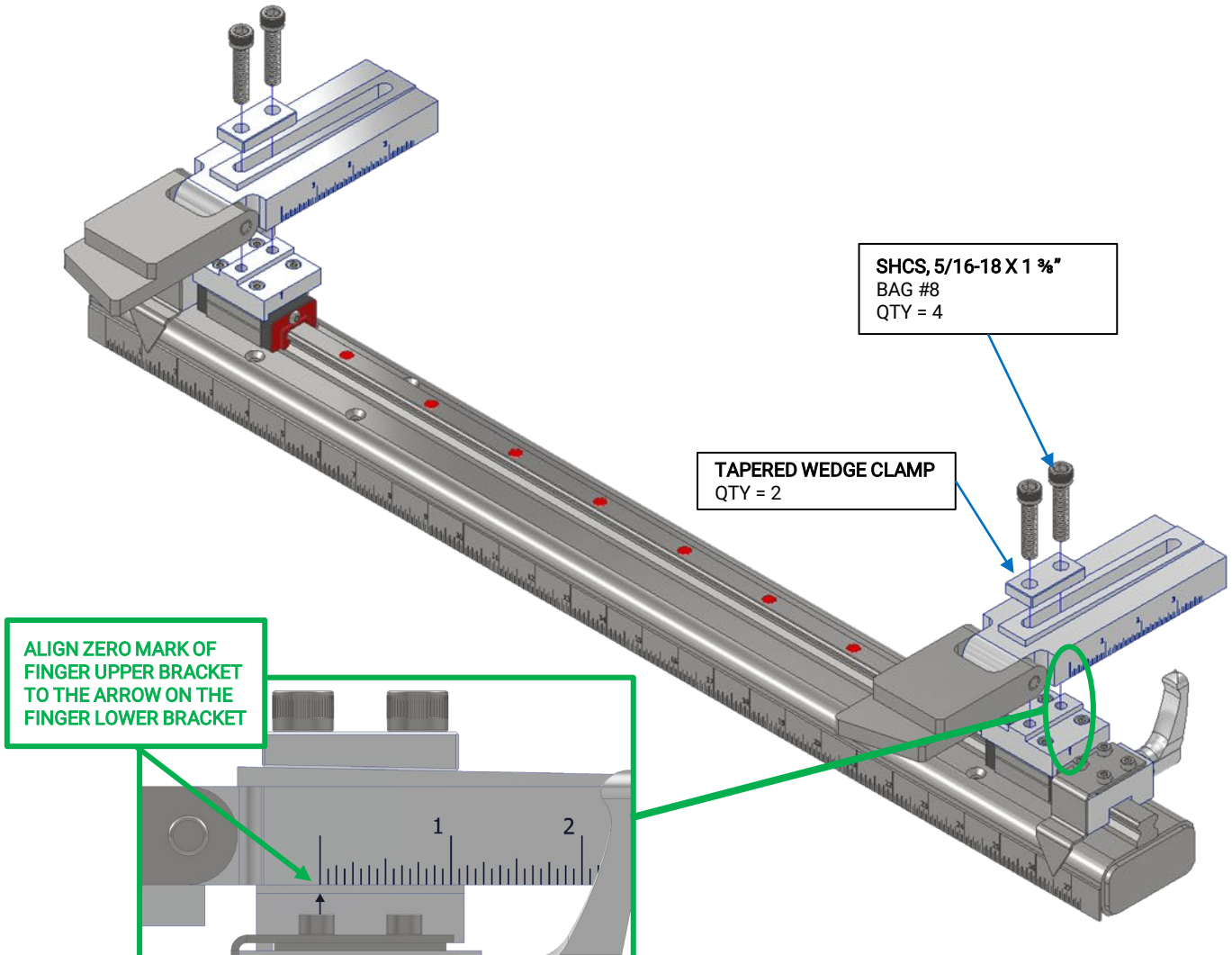
D3. Line up the mounting hole on the **Finger Upper Bracket** and the **Right Hand Backgauge Finger** as shown.

D4. Insert the dowel pin in to the **Finger Upper Bracket** and **Backgauge Finger** mounting holes, as shown, to attach the **Backgauge Finger** to the **Finger Upper Bracket**.

D5. Adjust the set screw such that the **Backgauge Finger** is level with the **Backgauge Finger Upper Bracket**.

D6. Tighten the jam nut to lock the set screw into position.

D7. Repeat steps 1-6 for the **Left Hand Finger Assembly**


SHCS, 5/16-18 X 1 ⅜"
BAG #8
QTY = 4
TAPERED WEDGE CLAMP
QTY = 2
ALIGN ZERO MARK OF FINGER UPPER BRACKET TO THE ARROW ON THE FINGER LOWER BRACKET
1
2

Materials

Parts
- (2) Tapered Wedge Clamp

Hardware
- (4) SOCKET HEAD CAP SCREW, 5/16-18 X 1 ⅜” (2 per side)

Tools
- ¼” Hex Key

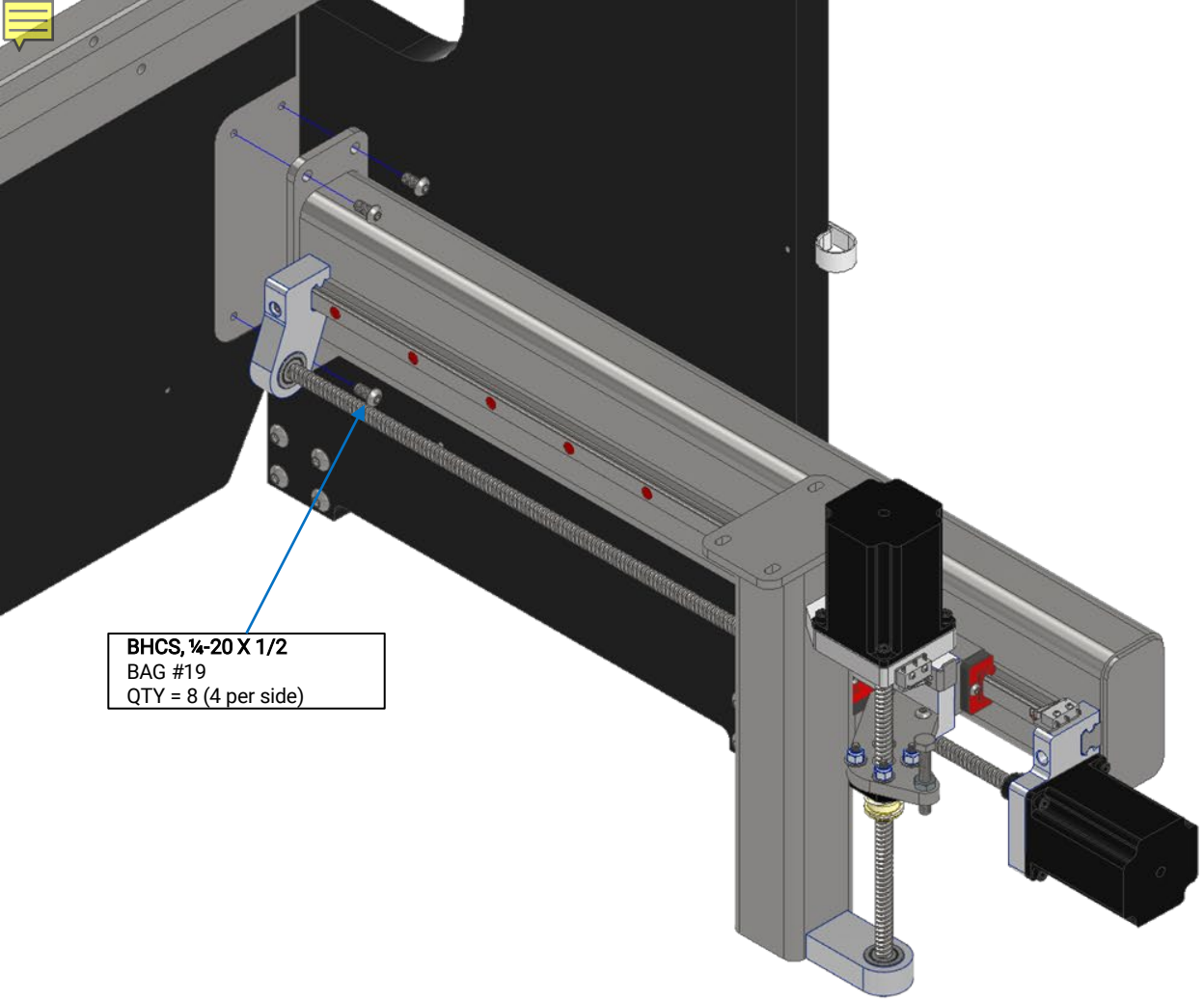
Instructions

E1. Attach the Backgauge Finger Assemblies to the **Finger Lower Brackets** using the fasteners and **Tapered Wedge Clamps** as shown. Ensure the slanted face of the **Tapered Wedge Clamps** are oriented such that they are coincident with the corresponding slanted face on the **Finger Upper Brackets**.

E2. Adjust to position of the **Finger Upper Brackets** such that the arrows on the **Finger Lower Brackets** points to the zero marks on the Upper Brackets.

5: Backgauge Installation and Wire Management

The next step in the assembly process is to attach the Backgauge to the TITAN 25T and install the wire management.



DUE TO THE WEIGHT OF THE X AND R AXIS ASSEMBLIES, A HELPER, OR SOMETHING TO HOLD THE BACKGAUGE IN PLACE IS RECOMMENDED FOR THIS STEP.

Materials

Parts

- (1) Backgauge X-axis R-axis and Gantry Assemblies (Previously Assembled)

Hardware

- (8) BUTTON HEAD CAP SCREW, ¼-20 X ½” (4 per side)

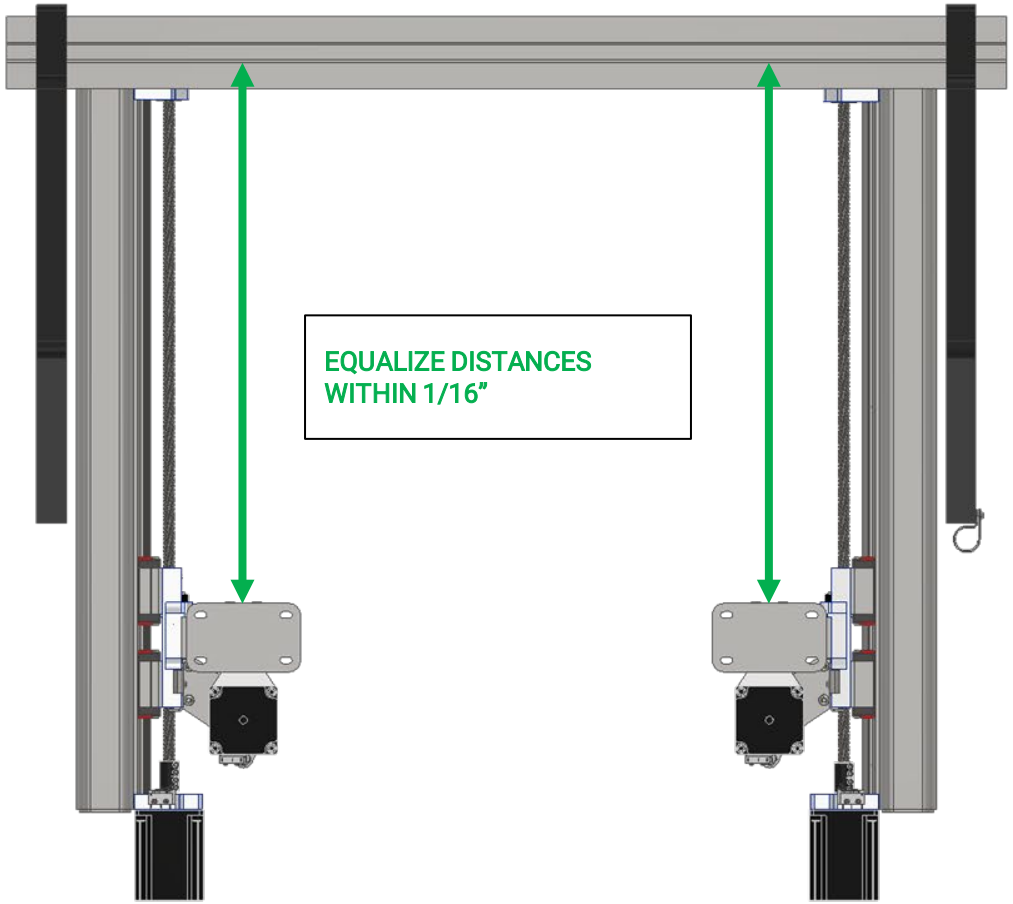
Tools

- 5/32 Hex Key

Instructions

A1. Attach the **Left Hand X and R-axis Assemblies** to the **Press Brake** with the fasteners as shown, l**eaving the cap screws ¼ turn from tight.**

A2. Repeat step 1 for the **Right Hand X and R-Axis Assemblies.**


EQUALIZE DISTANCES
WITHIN 1/16”

Materials

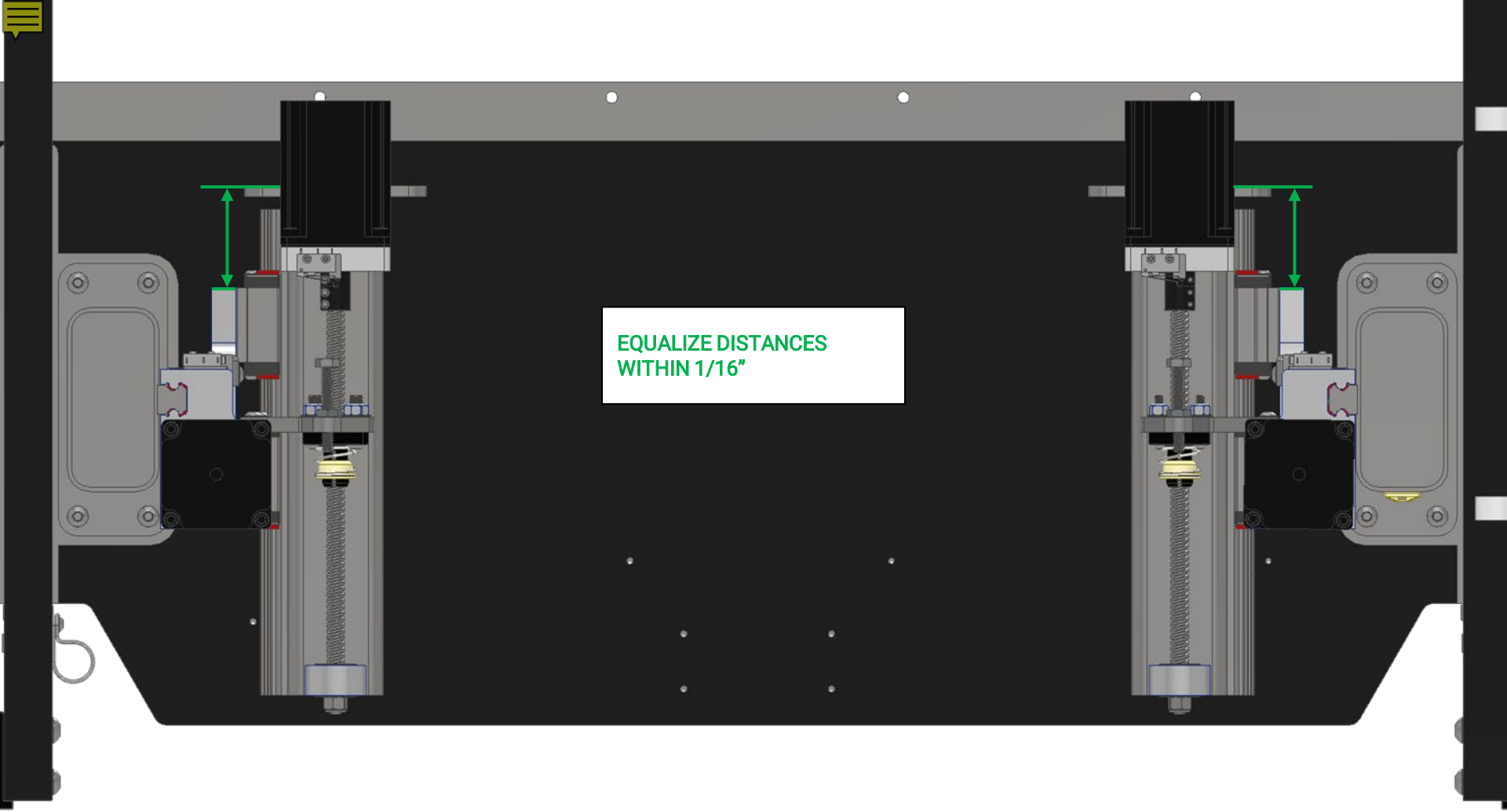
Parts
- N/A

Hardware
- N/A

Tools
- Tape Measurer
- 7/16” Wrench

Instructions

B1. Equalize the distance from the front edge of each **R-Axis Plates** to the rear edge of the table slot within 1/16” by rotating the ¼-20 lock nut on the **X-Axis Lead Screws**.


EQUALIZE DISTANCES
WITHIN 1/16”

Materials

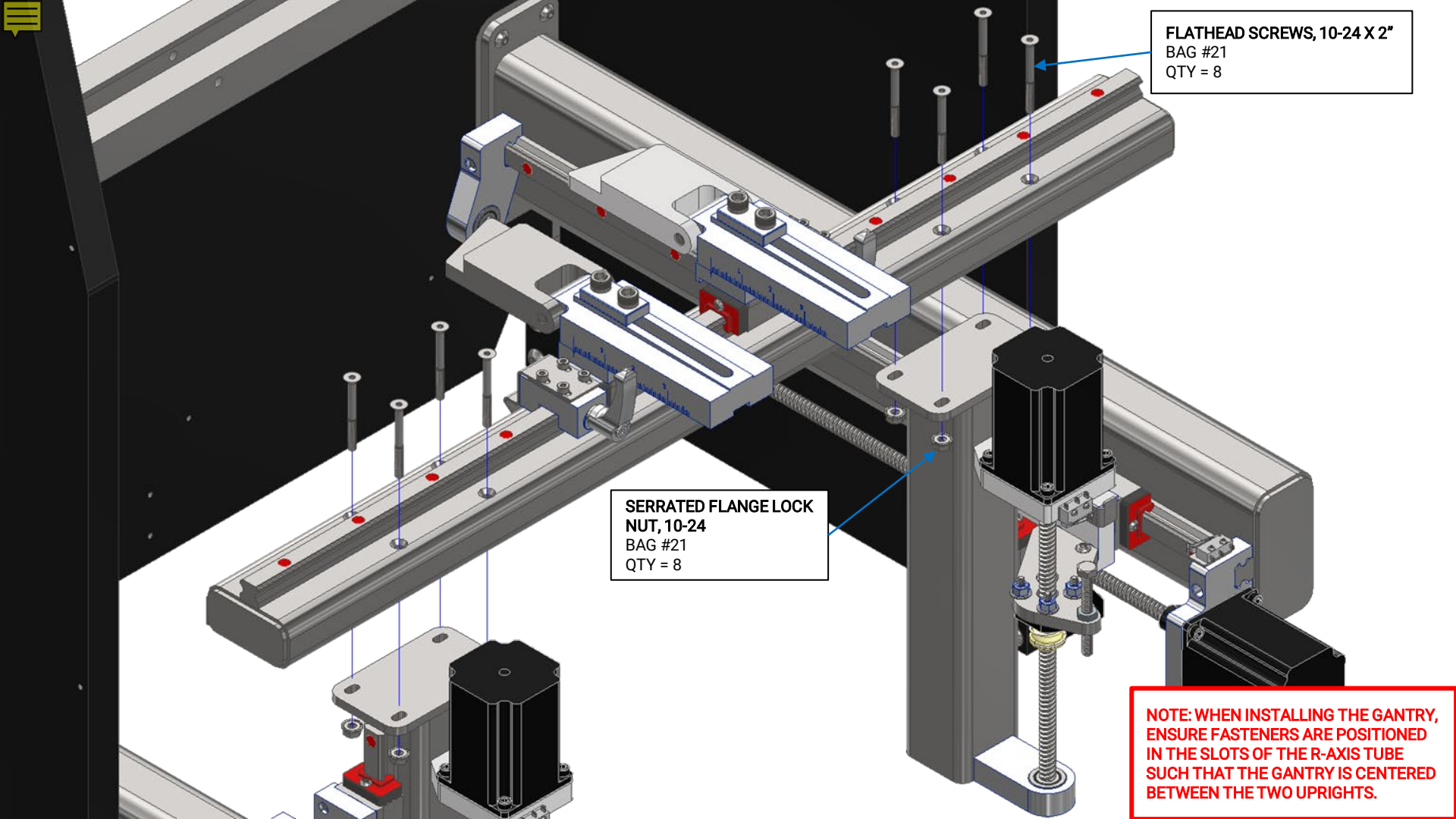
Parts
- N/A

Hardware
- N/A

Tools
- Tape Measurer
- 7/16” Wrench

Instructions

C1. Equalize the distance from the top face of each **R-Axis Plates** to the top face of the **X-Axis Carriage Plate** slot within 1/16” by rotating the ¼-20 lock nut on the **R-Axis Lead Screws**.


FLATHEAD SCREWS, 10-24 X 2"
BAG #21
QTY = 8
SERRATED FLANGE LOCK NUT, 10-24
BAG #21
QTY = 8
NOTE: WHEN INSTALLING THE GANTRY, ENSURE FASTENERS ARE POSITIONED IN THE SLOTS OF THE R-AXIS TUBE SUCH THAT THE GANTRY IS CENTERED BETWEEN THE TWO UPRIGHTS.

Materials

Parts
- (1) Gantry Tube Assembly (Previously Assembled)

Hardware
- (8)FLATHEAD SCREW, 10-24 X 2.25”
- (8)10-24 SERRATED FLANGE NUT

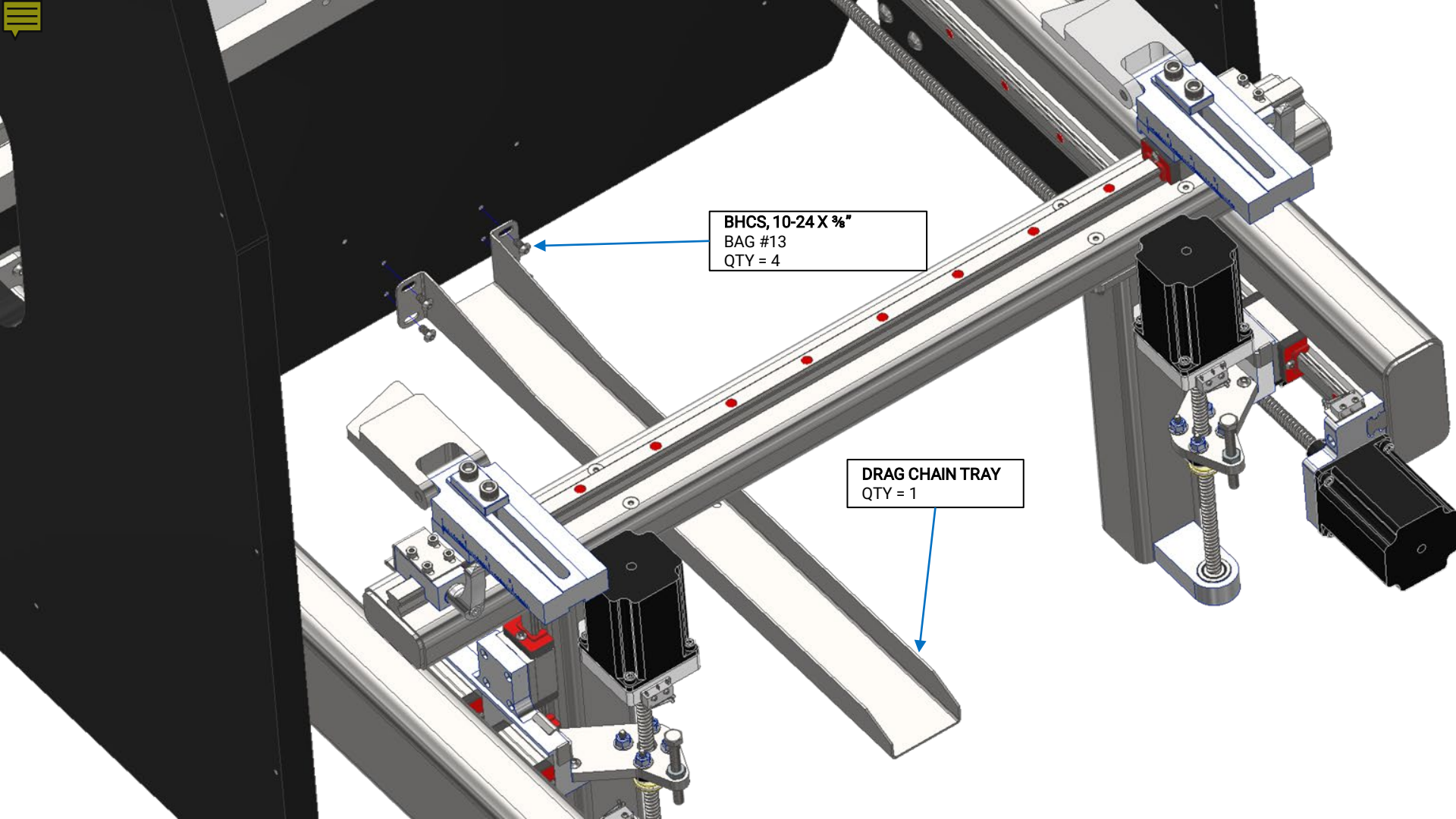
Tools
- 1/8” Hex Key

Instructions

D1.Install **Gantry Tube** onto **R-Axis Tube** as shown. Ensure the **Adhesive Backed Gantry Scale** is oriented such that the fingers point towards the table and the scale will be visible when operating the machine.

D2. Tighten the 8, 10-24 socket head screws securing the **X-Axis Tubes** to the table of TITAN.

D3. Only after completing D2, break loose the flathead screws that were previously tightened in D1.


BHCS, 10-24 X ⅜"
BAG #13
QTY = 4
DRAG CHAIN TRAY
QTY = 1

Materials

Parts

- (1) Drag Chain Tray

Hardware

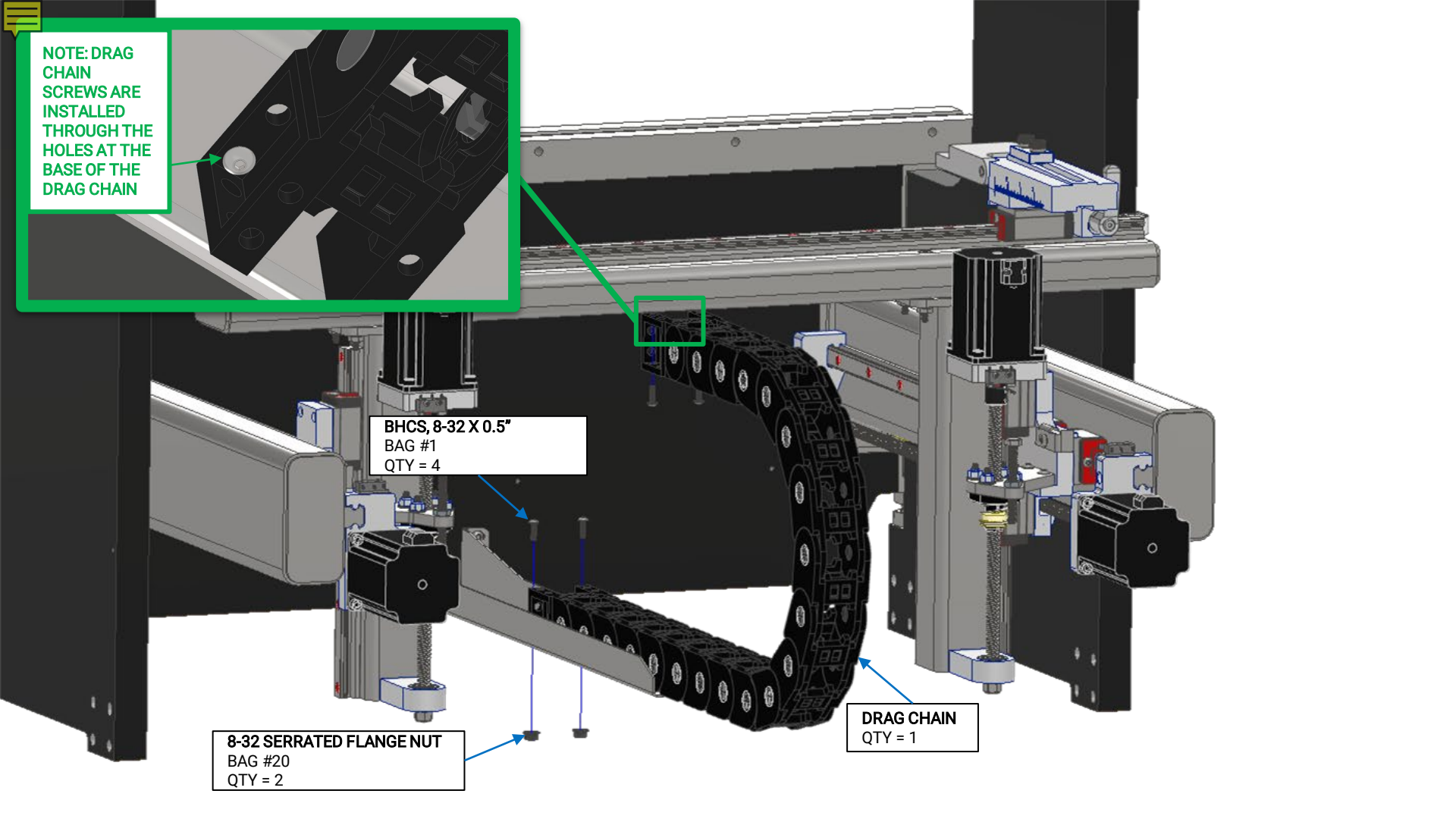
- (4) BUTTON HEAD CAP SCREW, 10-24 X ⅜”

Tools

- 1/8 Hex Key

Instructions

E1. Attach the **Drag Chain Tray** to the **Press Brake** with the fasteners as shown.


NOTE: DRAG CHAIN SCREWS ARE INSTALLED THROUGH THE HOLES AT THE BASE OF THE DRAG CHAIN
BHCS, 8-32 X 0.5"
BAG #1
QTY = 4
8-32 SERRATED FLANGE NUT
BAG #20
QTY = 2
DRAG CHAIN
QTY = 1

Materials

Parts
- (1) Drag Chain

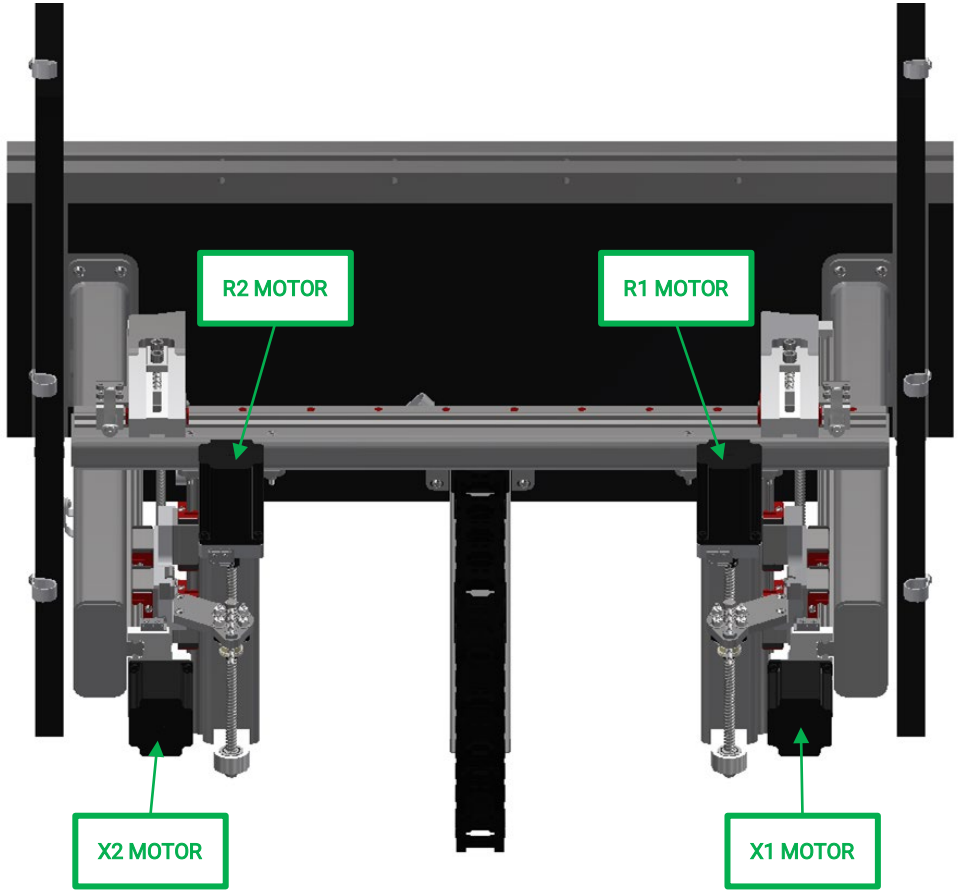
Hardware
- (4) BUTTON HEAD CAP SCREW, 8-32 X 0.5”
- (2) 8-32 SERRATED FLANGE NUT

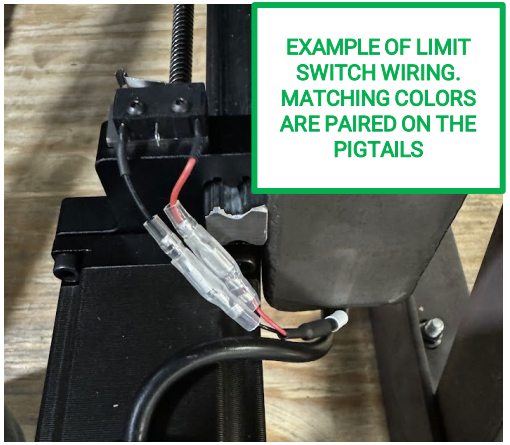
Tools
- 9/64 Hex Key

Instructions

F1. Run all wires from the Backgauge R-axis motors and R-axis limit switches, through the Drag Chain and out into the Drag Chain Tray

F2. Attach the **Drag Chain** to the **Press Brake** and **Backgauge** with the fasteners as shown.





Motor Part Numbers

LS-PBRK-1616-3	X1 MOTOR
LS-PBRK-1616-4	X2 MOTOR
LS-PBRK-1616-2	R2 MOTOR
LS-PBRK-1616-1	R1 MOTOR

Materials

Parts

- (4) Motor Cables - 4 Pin Connector End
- (2) Limit Switch Cables - 3 Pin Connector End

Hardware

Tools

Instructions

G1. Locate the 4 motor wires (connector/plug end) that install into the back of the Titan 25T Electronics Enclosure.

G2. Each of the four motors are labeled with a unique part number. Similarly, this part number is applied to a label adjacent to the plug at the end of the cable. Use the ‘Motor Part Numbers’ table to determine which ports on the back of the electronics enclosure these motor cables must be connected to. For example, a cable with part number LS-PBRK-1616-2 belongs to the R2 motor and therefore should be plugged into the R2 Motor Port.

NOTE: The plugs are directional and have a built in keyway to determine the orientation of the connector.

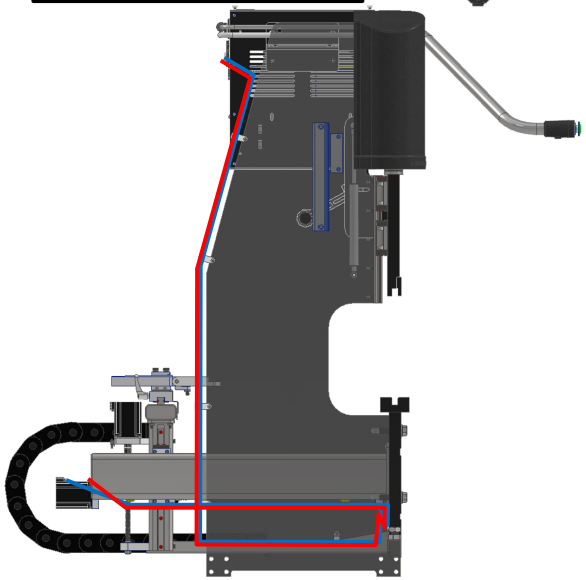
G3. Locate the X-Axis limit switch cable and insert the connector end into the electronics enclosure plug.

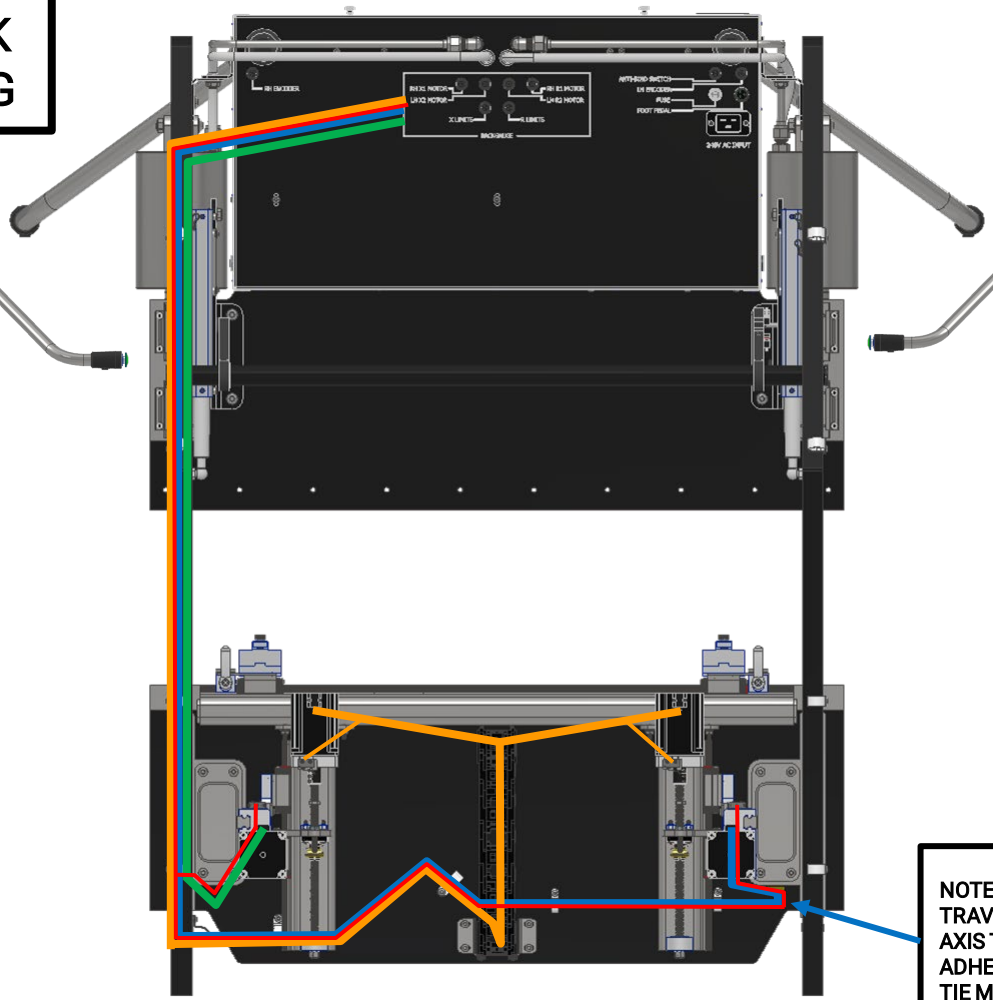
G4. Repeat step G3 for the R-axis Limit Switch cable.

G5. Ensure the wiring is installed correctly to the electronics enclosure and that the limit switch pigtails are matched by colors (Red to Red & Black to Black) when installing them onto the end of the cable.

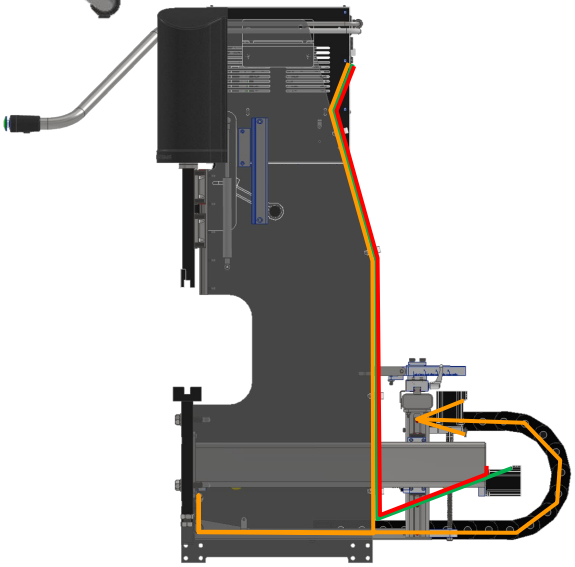
RECOMMENDED BACK GAUGE WIRE ROUTING

SIDE VIEW FOR X2
MOTOR+LIMIT SWITCH

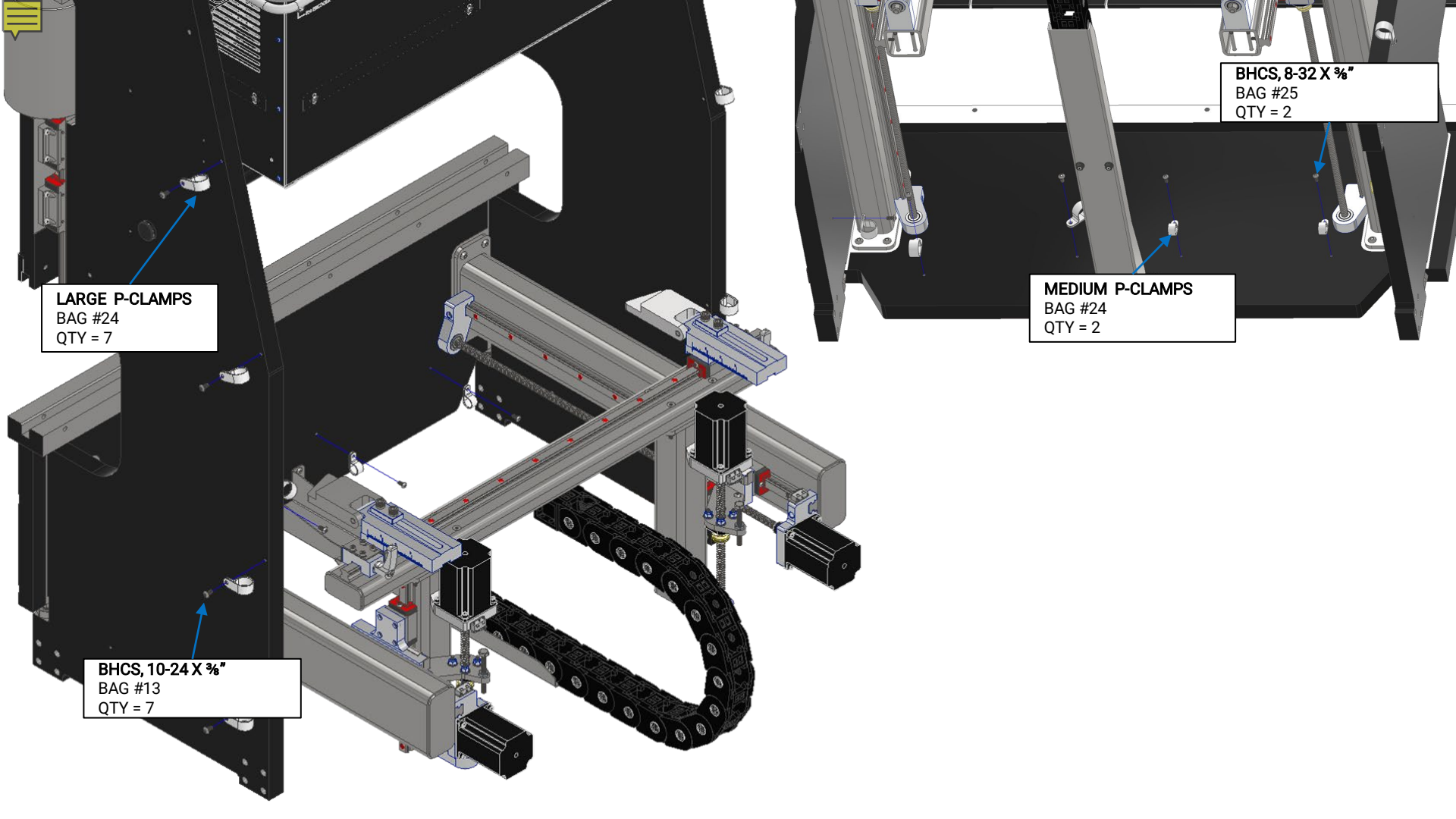




SIDE VIEW FOR X1
MOTOR+LIMIT SWITCH AND R
MOTORS+LIMIT SWITCHES



NOTE: THESE CABLES TRAVELS DOWN THE LH X-AXIS TUBE VIA THE ADHESIVE BACKED CABLE TIE MOUNTS


LARGE P-CLAMPS
BAG #24
QTY = 7
BHCS, 10-24 X ⅜"
BAG #13
QTY = 7
BHCS, 8-32 X ⅜"
BAG #25
QTY = 2
MEDIUM P-CLAMPS
BAG #24
QTY = 2

Materials

Parts

- (7) Large P-Clamps
- (2) Medium P-Clamps

Hardware

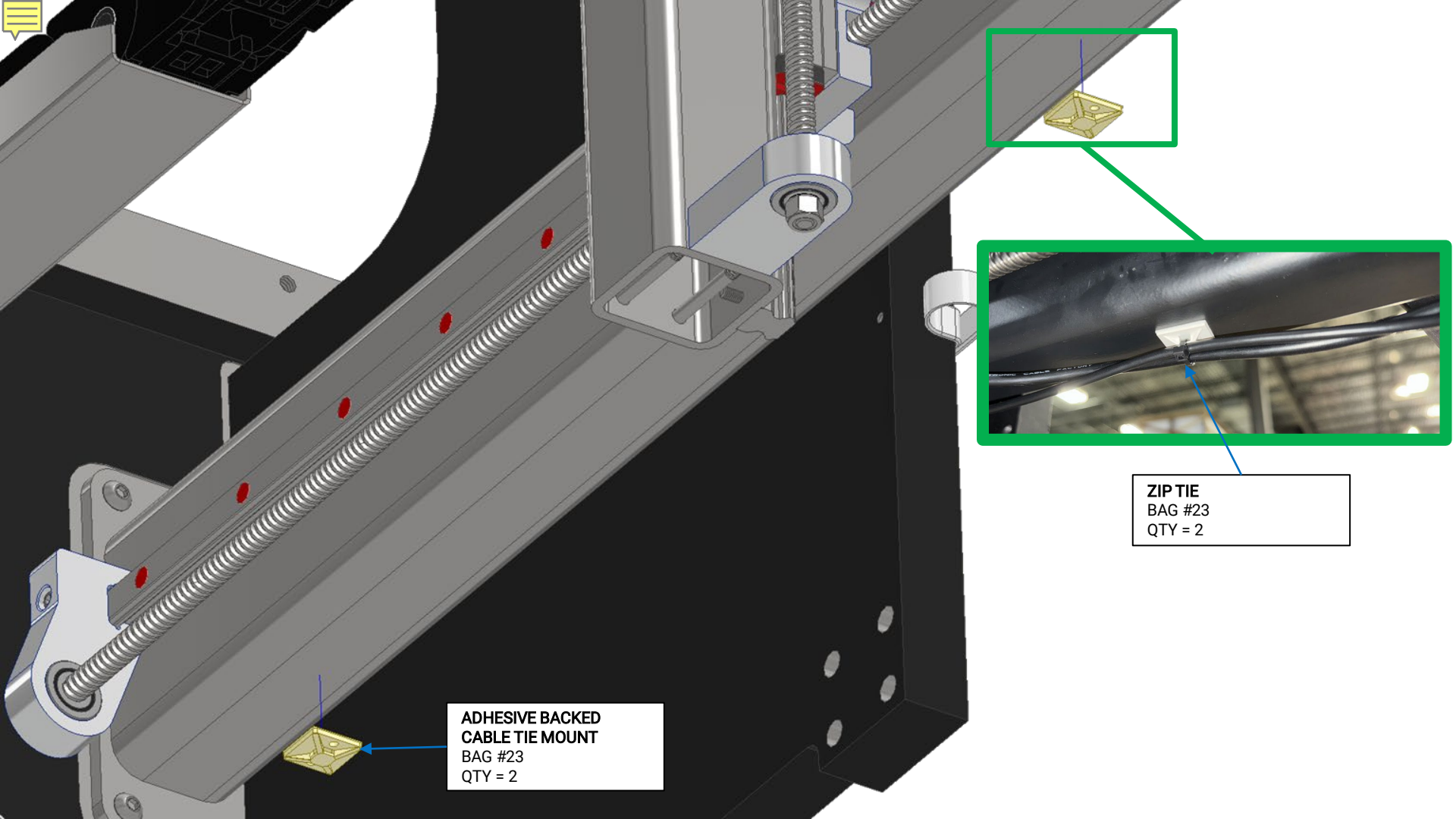
- (7) BUTTON HEAD CAP SCREW, 10-24 X 3/8”
- (2) BUTTON HEAD CAP SCREW, 8-32 X ⅜”

Tools

- ⅛ Hex Key
- 3/32 Hex Key

Instructions

H1. Insert the Backgauge wires into the **P-Clamps** and install using the fasteners as shown.


ADHESIVE BACKED
CABLE TIE MOUNT
BAG #23
QTY = 2
ZIP TIE
BAG #23
QTY = 2

Materials

Parts
- (2) Adhesive Backed Cable Tie Mount

Hardware
- (2) ZIP TIES

Tools
- Scissors or wire cutters
- Towel or paper towel
- Rubbing alcohol

Instructions

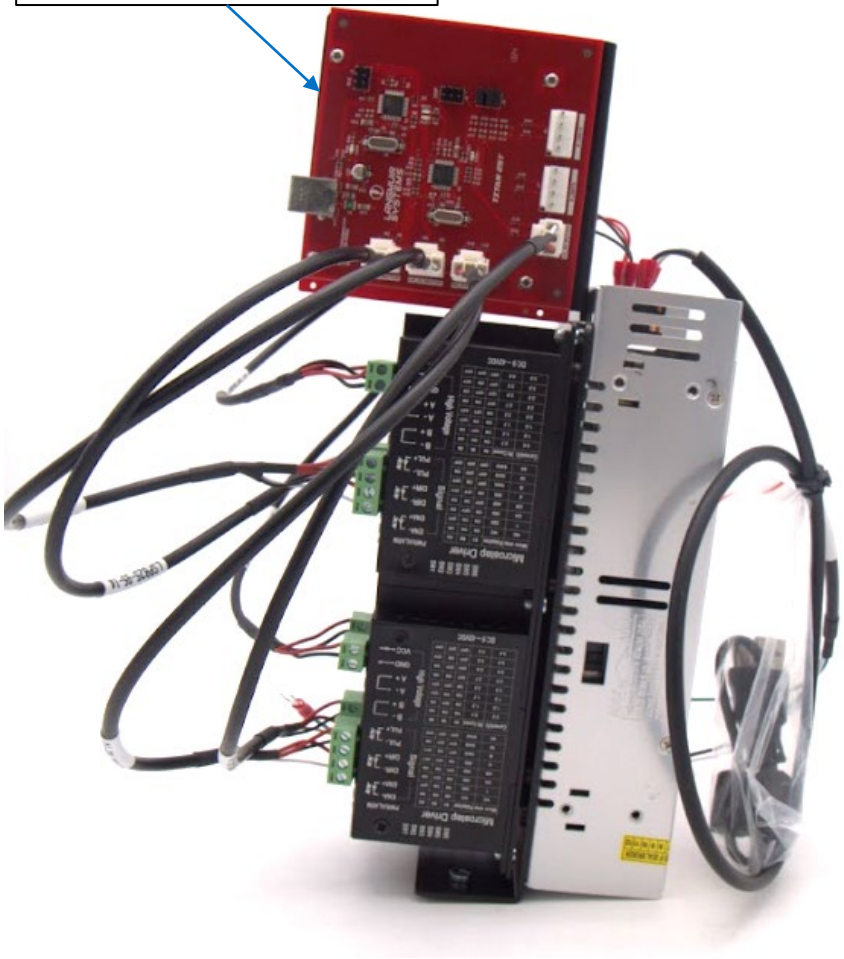
I1. Wipe down the bottom surface of the **Left Hand X-Axis Gantry Tube** with rubbing alcohol.

I2. Remove the protective backing from the **Adhesive Backed Cable Tie Mounts**.

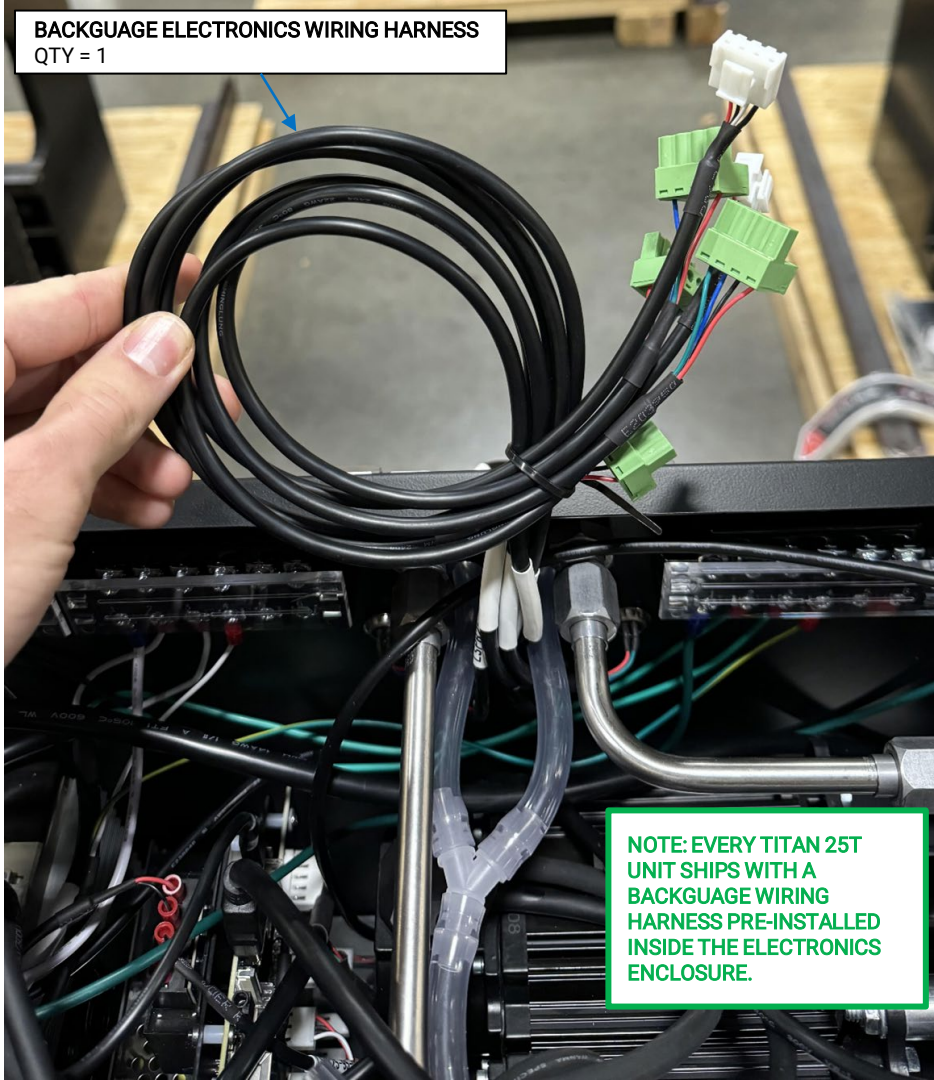
I3. Apply one **Adhesive Backed Cable Tie Mount** to each end of the bottom surface of the **Left Hand X-Axis Gantry Tube**. Exact placement of these mounts is not important as long as there is sufficient space between the mounts.

I4. Gather all wires that travel down the Left Hand X-Axis Tube to the P-Clamps and secure them to the Cable Tie Mounts with zip ties, as shown.

BACKGUAGE ELECTRONICS ASSEMBLY
QTY = 1



BACKGUAGE ELECTRONICS WIRING HARNESS
QTY = 1



NOTE: EVERY TITAN 25T UNIT SHIPS WITH A BACKGUAGE WIRING HARNESS PRE-INSTALLED INSIDE THE ELECTRONICS ENCLOSURE.

Materials

Parts

- (1) Backguage Electronics Assembly
- (Pre-Installed) Backguage Electronics Wiring Harness

Hardware

Tools

Instructions

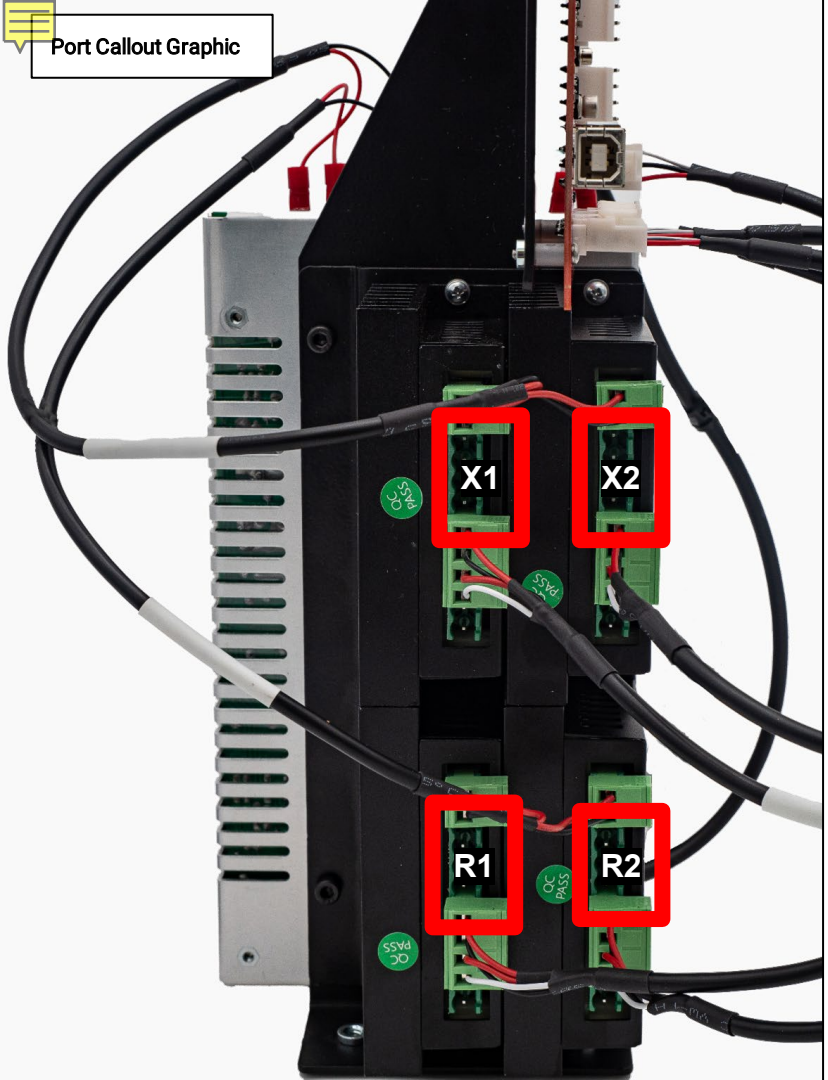
[WARNING SYMBOL] ELECTRIC SHOCK

IMPORTANT: The Titan 25T should be powered off with the power cable completely disconnected prior to beginning this step. Failure to remove power from the Titan 25T while working in the electronics enclosure can result in electric shock that may cause serious injury or death.

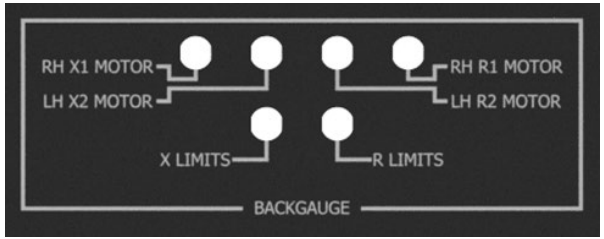
J1. Locate the **Backgauge Electronics Assembly** and remove the Zip tie securing the USB A to USB B cable to the unit. Set the bagged cable aside for later installation.

J2. Remove the lid from Titan's Electronic enclosure by removing the 4 thumb screws located on top of the enclosure.

J3. Locate the **Backgauge Electronics Wiring Harness** that was pre-installed with your unit. Remove the zip tie that is securing the harness to itself.



Back Panel Graphic



NOTE: REFERENCING THE WIRING DECAL ON THE BACK OF THE ELECTRONICS ENCLOSURE IS HELPFUL TO ENSURE CORRECT WIRING INSTALLATION.

Wiring Diagram

X1 PORT	LSPB25-95-15	X1 MOTOR
X2 PORT	LSPB25-95-15	X2 MOTOR
R2 PORT	LSPB25-95-16	R2 MOTOR
R1 PORT	LSPB25-95-16	R1 MOTOR

Materials

Parts

- (1) Backguage Electronics Assembly
- (Pre-Installed) Backguage Electronics Wiring Harness

Hardware

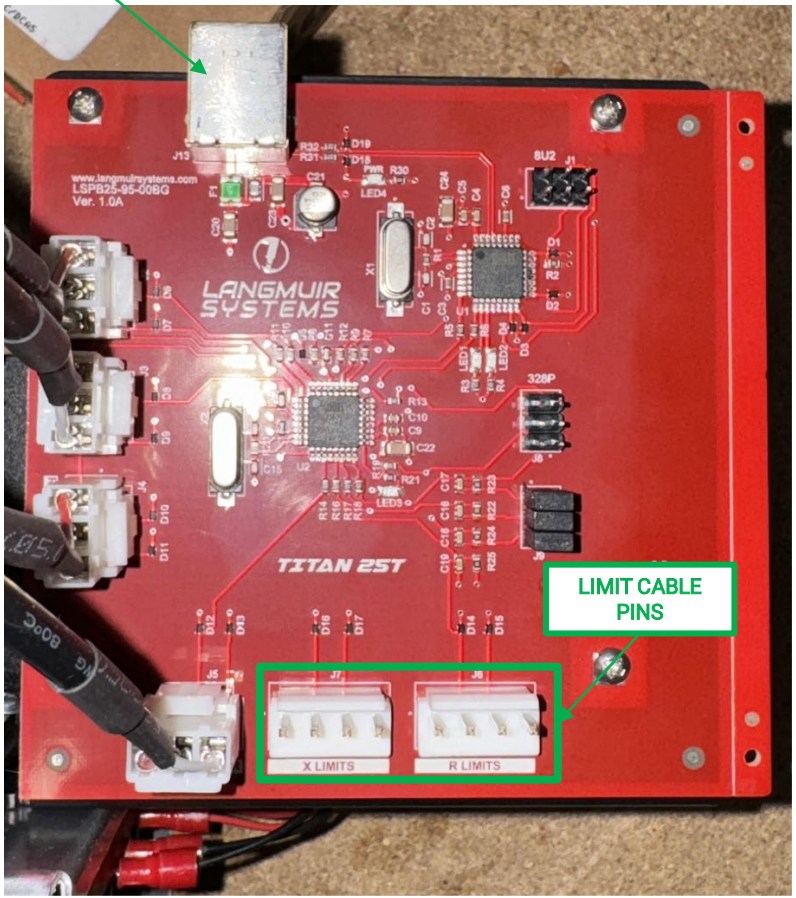
Tools

Instructions

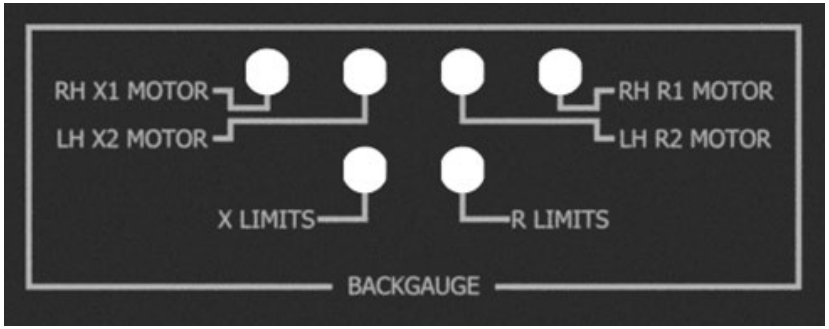
K1. Locate wires LSPB25-95-15 (2x) and LSPB25-95-16 (2x) from the Backguage Electronics Wiring Harness.

K2. Using the provided wiring diagram and port callout graphic, insert the green plug connectors into their respective ports on the Backguage Electronics Assembly.

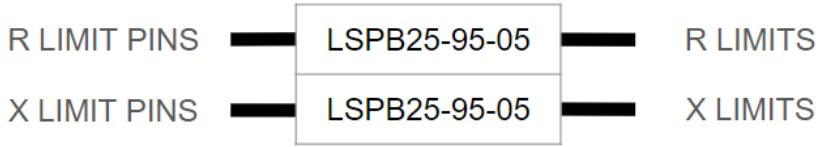
NOTE: The graphic located on the back panel of the Titan 25T Electronics Enclosure is especially helpful to reference during this step to ensure that the correct motor corresponds to the correct port on the Backguage Electronics.



Back Panel Graphic



Wiring Diagram



Materials

Parts

- (1) Backguage Electronics Assembly
- (Pre-Installed) Backguage Electronics Wiring Harness

Hardware

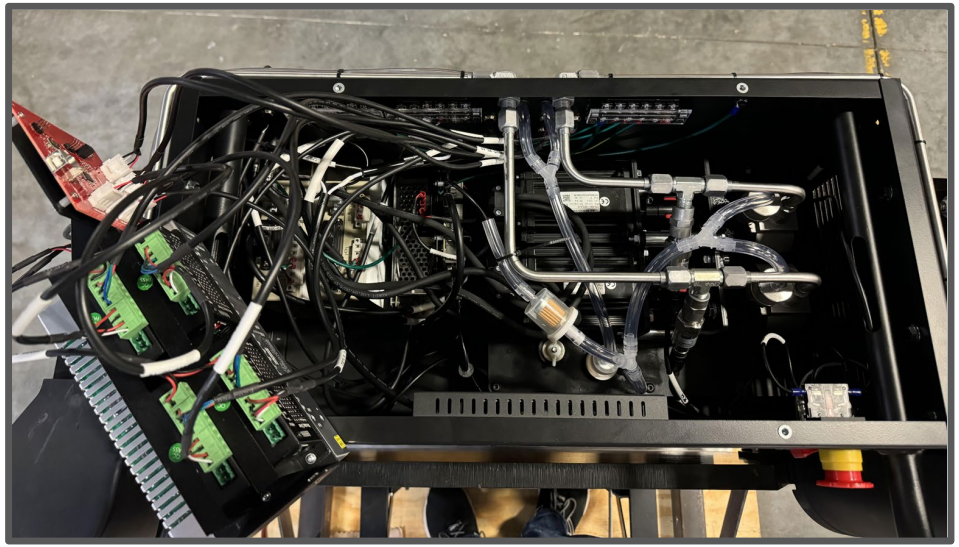
Tools

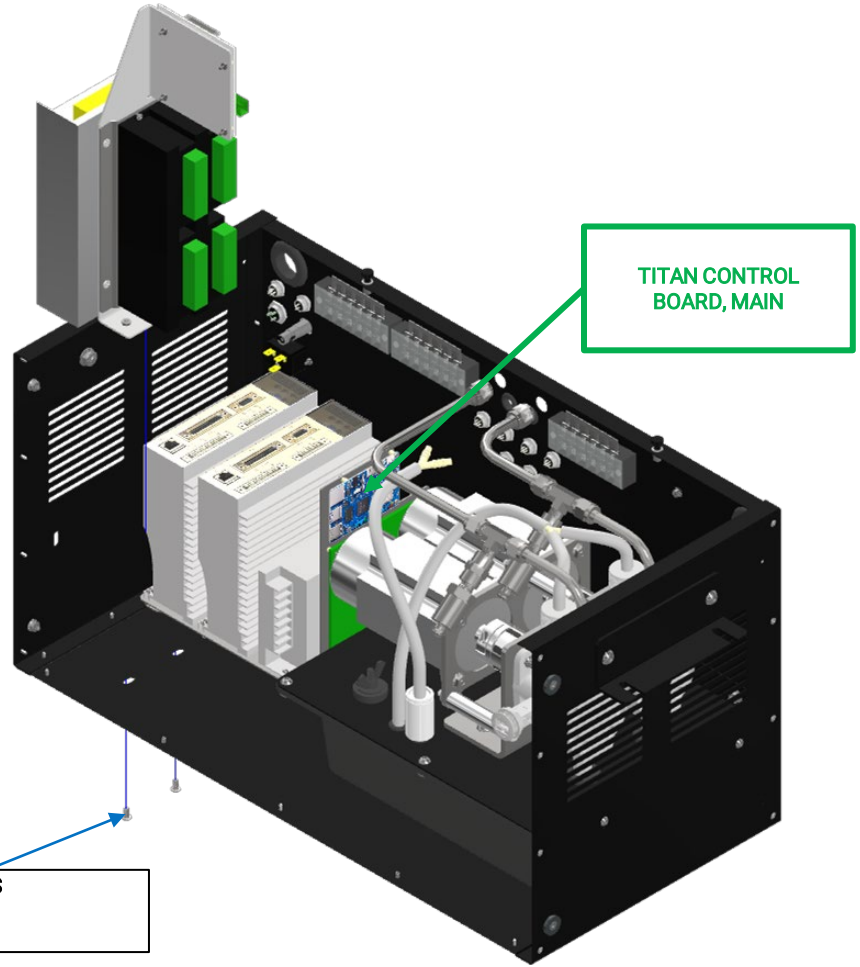
Instructions

L1. Locate the two LSPB25-95-05 (2x) wires from the Backguage Electronics Wiring Harness.

L2. Using the provided wiring diagram, install the white cable connectors onto the respective labeled pins located on the Backguage Electronics Assembly's control board.

NOTE: The graphic located on the back panel of the Titan 25T Electronics Enclosure is especially helpful to reference during this step to ensure that the correct limit switches correspond to the correct pins on the Backguage Electronics.




TITAN CONTROL
BOARD, MAIN
10-24 X ⅜ BHCS
BAG #13
QTY = 2

Parts

- (1) Backguage Electronics Assembly

Hardware

- (2) 10-24 x ⅜ Button Head Cap Screws

Tools

- ⅛ Hex Key

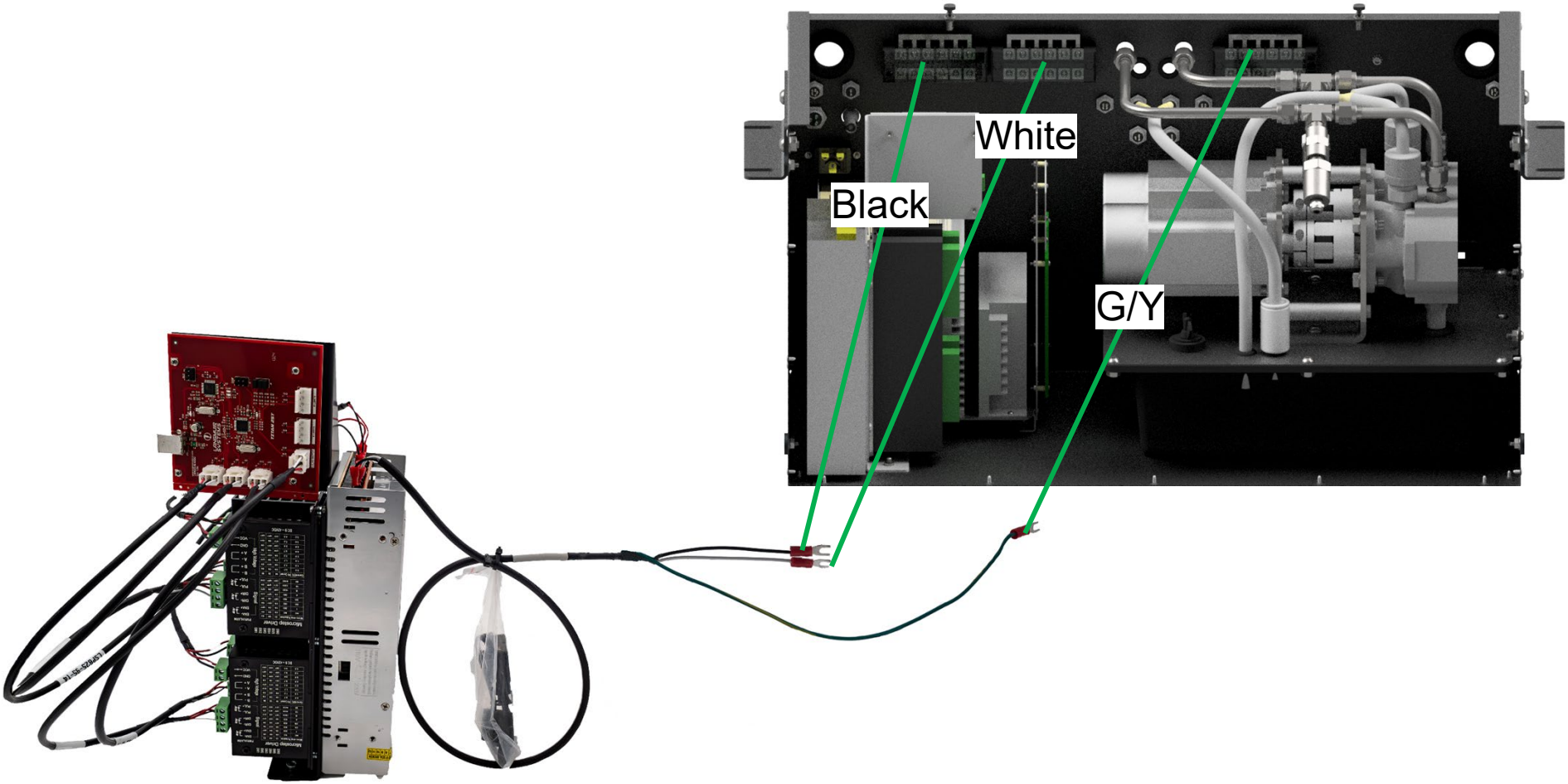
Instructions

M1. Orient the Backguage Electronics Assembly vertically such that the metal mounting flange aligns with the mounting slot features located on the underside of the Titan 25T electronics enclosure as shown.

M2. Slowly lower the wired Backguage Electronics Assembly into the electronics enclosure and secure in place using the provided 10-24 x ⅜ BHCS.

M3. At this time, locate the USB-A to USB-B cable that came with the Backguage Electronics Assembly. Inside the Titan 25T electronics enclosure, locate the main Titan control board and identify the remaining available USB-A port located on the board.

M4. Install the USB-A to USB-B cable that came with your backguage electronics assembly into the USB-A port located on the main Titan control board and into the USB-B port located on the Backguage Electronics Assembly Board such that the two boards are connected via the cable.


White
Black
G/Y

Materials

Parts

- (1) Backguage Electronics Assembly

Hardware

Tools

- Phillips Head Screwdriver

Instructions

N1. Locate the LSPB25-95-12 cable on the Backgauge Electronics Assembly.

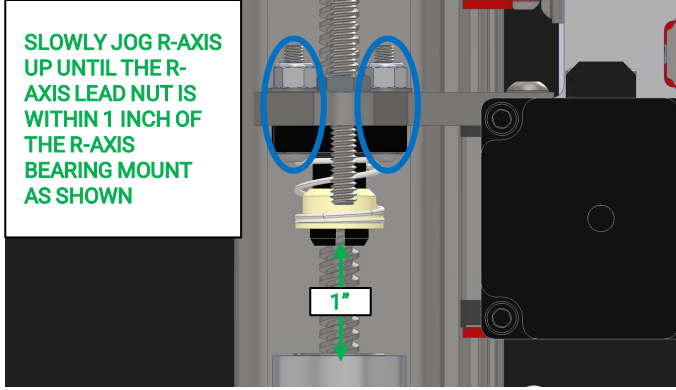
N2. Remove the clear plastic covers located on the three terminal blocks at the back of the electronics enclosure.

N3. On each of the exposed terminal blocks, locate an unused terminal and back out the screw until the spade fork from the **Backguage Electronics Assembly** can fit into the terminal.

N4. Install each of the spade forks into their respective terminals as shown and tighten the down the terminal. If done correctly, all other wires in the terminal blocks will be the same color as the wire installed into each respective terminal block.

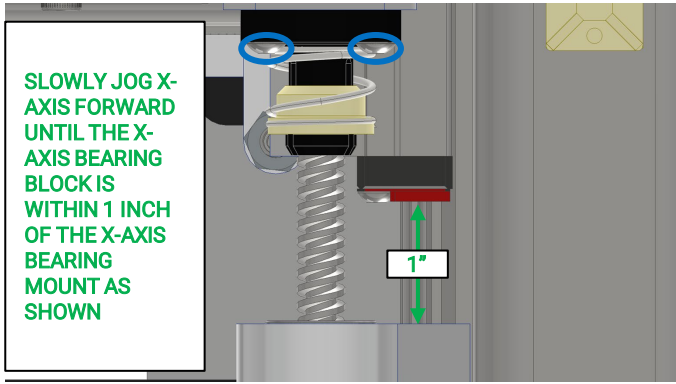
N5. Reinstall the clear plastic covers onto the terminal blocks.

SLOWLY JOG R-AXIS UP UNTIL THE R-AXIS LEAD NUT IS WITHIN 1 INCH OF THE R-AXIS BEARING MOUNT AS SHOWN



ALL LEAD NUT FASTENERS PREVIOUSLY LEFT LOOSE MUST BE TIGHTENED AFTER JOGGING THE BACKGAUGE INTO THE POSITION SHOWN.

SLOWLY JOG X-AXIS FORWARD UNTIL THE X-AXIS BEARING BLOCK IS WITHIN 1 INCH OF THE X-AXIS BEARING MOUNT AS SHOWN



Materials

Parts
- N/A

Hardware
- N/A

Tools
- Tape Measurer(optional)
- 7/16” Wrench
- 3/32” Hex Key

Instructions

O1. Ensure Backgauge Wiring is complete and the machine can be jogged as detailed in the TITAN Quickstart guide.

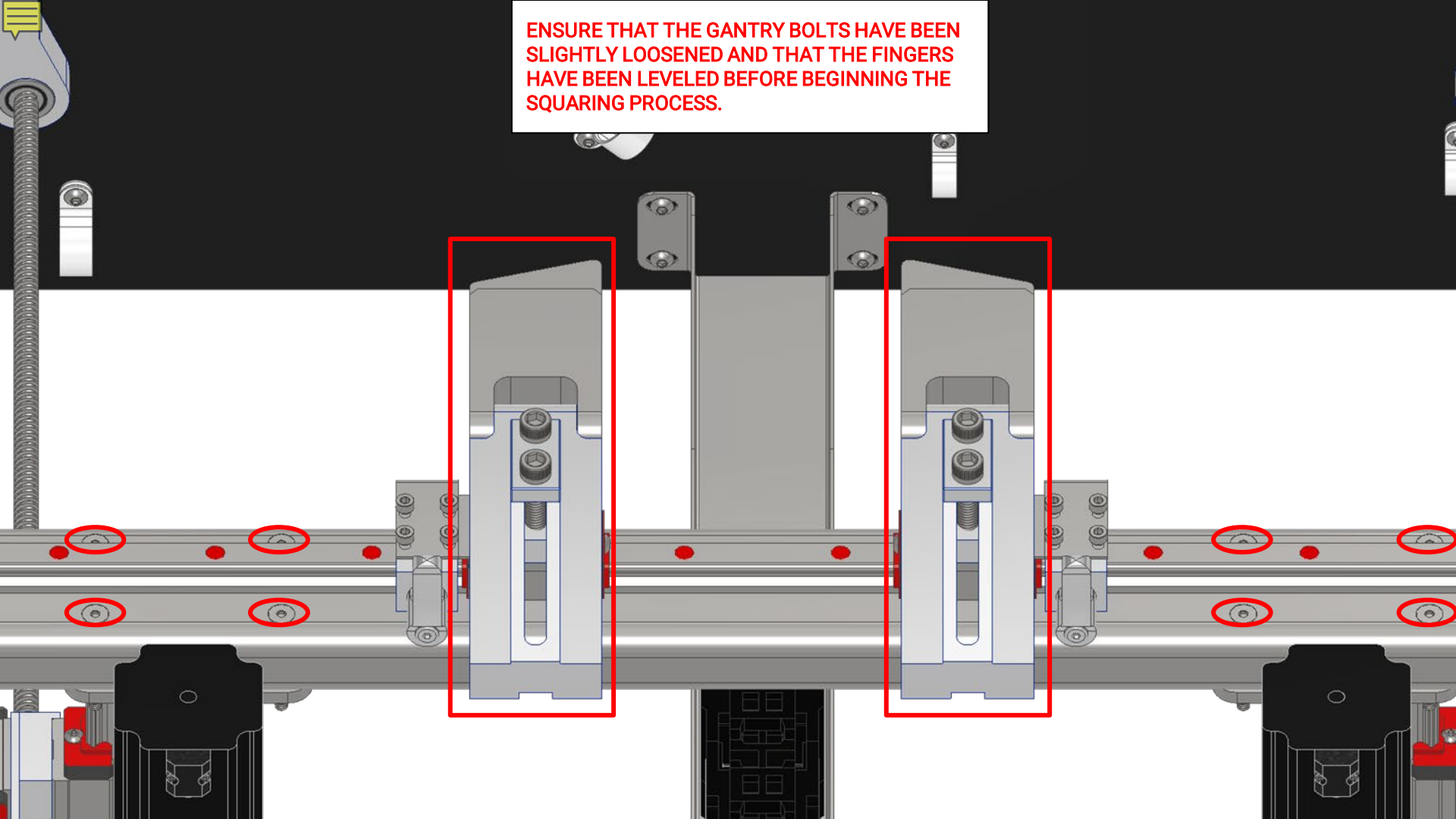
O2. Jog the Backgauge forward and up, until the **R-Axis Lead Nut** is within 1” of the **R-Axis Bearing Mount** and the **X-Axis Bearing Block** is within 1” of the **X-Axis Bearing Mount**.

O3. Tighten the fasteners securing the **R and X-Axis Lead Nuts**, which were previously left ¼ turn from tight.

O4. Jog the Backgauge in both X and R directions through full length of travels to ensure that it jogs properly without issue.

6: Backgauge Squaring

The final step is to complete the backgauge squaring process


ENSURE THAT THE GANTRY BOLTS HAVE BEEN SLIGHTLY LOOSENED AND THAT THE FINGERS HAVE BEEN LEVELED BEFORE BEGINNING THE SQUARING PROCESS.

Materials

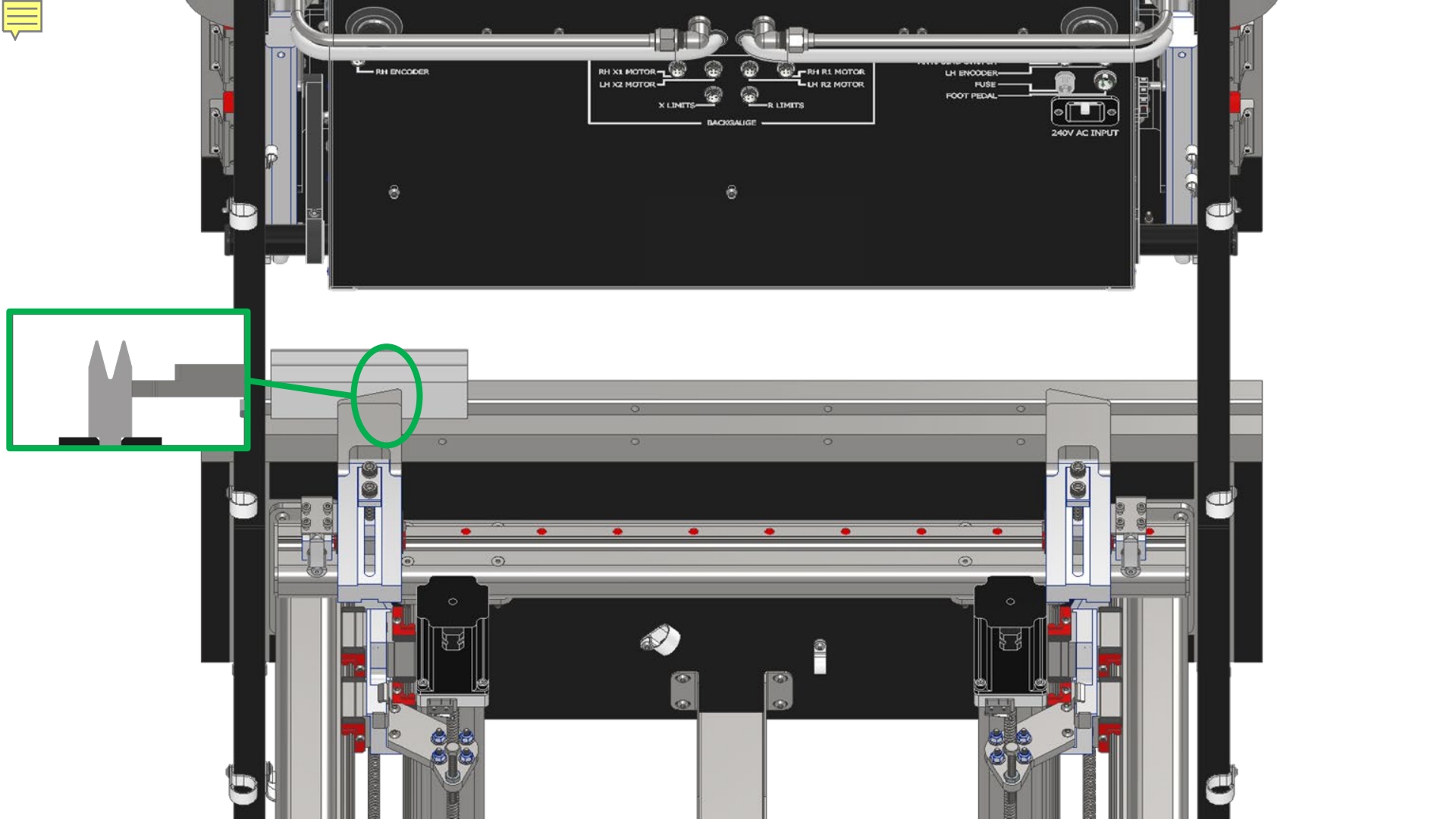
Parts
- N/A

Hardware
- N/A

Tools
- ⅛” Hex Key
- 7/16” Wrench

Instructions

A1. Prior to beginning the Backgauge squaring process, ensure that the gantry bolts have been loosened (¼ turn from tight) and that the fingers have been leveled. These steps will have already been completed in the Backgauge assembly process, but if you are re-squaring your machine, are required to complete the squaring process.


RH ENCODER
RH X1 MOTOR
LH X2 MOTOR
X LIMITS
RH R1 MOTOR
LH R2 MOTOR
R LIMITS
BACKGAUGE
LH ENCODER
FUSE
FOOT PEDAL
240V AC INPUT

Materials

Parts
- N/A

Hardware
- N/A

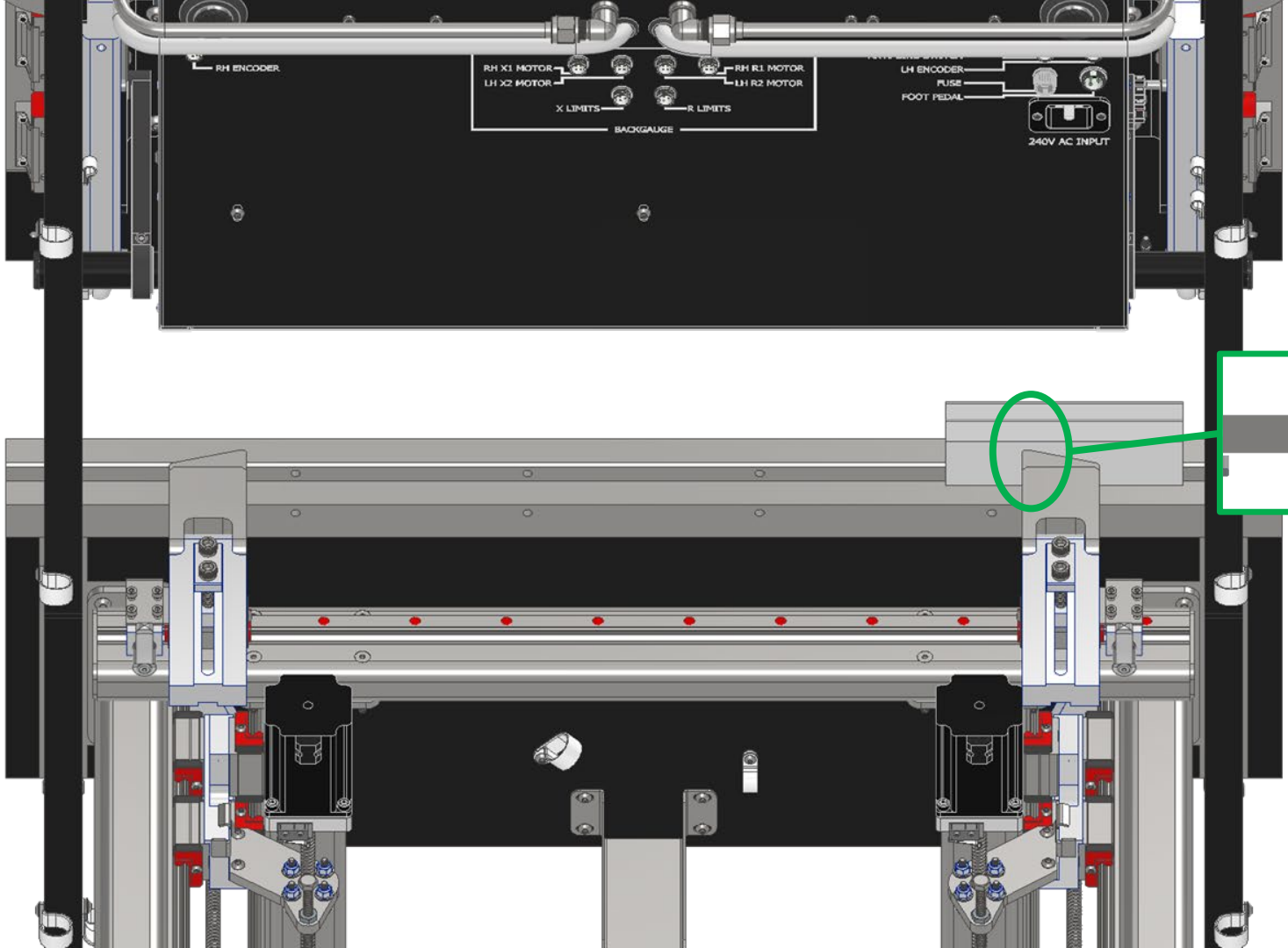
Tools
- American Standard Die
- 7/16” Wrench
- ⅛” Hex Key

Instructions

B1. Ensure that the Backgauge is fully set up and powered on before beginning the final squaring process.

B2. Place an American Standard Die in the die slot and slide it all the way to the right side of the Press Break.

B3. Slowly jog the Backgauge and adjust the position of the **Backgauge Fingers** until the right finger is barely touching the back side of the die, as shown.


RH ENCODER
RH X1 MOTOR
LH X2 MOTOR
X LIMITS
RH R1 MOTOR
LH R2 MOTOR
R LIMITS
BACKGAUGE
LH ENCODER
FUSE
FOOT PEDAL
240V AC INPUT

Materials

Parts
- N/A

Hardware
- N/A

Tools
- American Standard Die
- 7/16” Wrench
- ⅛” Hex Key

Instructions

B4. Slide the die to the far left side of the table.

B5. Unplug the left hand **X-Axis Motor** on the Backgauge and rotate the **X-Axis Lead Screw** by hand, or by turning the ¼-20 locknut, until the left finger is barely touching the side of the die.

B6. Plug back in the left hand **X-Axis Motor** on the Backgauge.

B7. Tighten the 8, 10-24 Flat Head Screws securing the Gantry.

CLOSING RAM AND DIE

You are exposed to moving machine parts that can crush, dismember, and cause death. Never place your hands or any parts of your body in this machine

NEVER

- Operate this machine unless you have been fully trained and have received and understand all operating instruction
- Pleace any part of your body in the die area
- Pleace any part of your body where it can be struck or crushed by part movementt
- Operate this machine without the use of a point-of-operation safeguard that will protect you from injury
- Work on this machine unless power is off the flywheel ins at rest safety blocks are used between the dies, and all energy (electrical, air, hydraulic, etc.) is in a zero state

ALWAYS

- Use nabd tools for feeding and retrieving material from the point of operattion or any other hazardous part of the machine

COVER THIS WARNING!

LANGMUIR SYSTEMS

Materials

Parts
- N/A

Hardware
- N/A

Tools
- 7/16” Wrench

Instructions

C1. Jog the Backgauge so both **Backgauge Fingers** are above the top of the table.

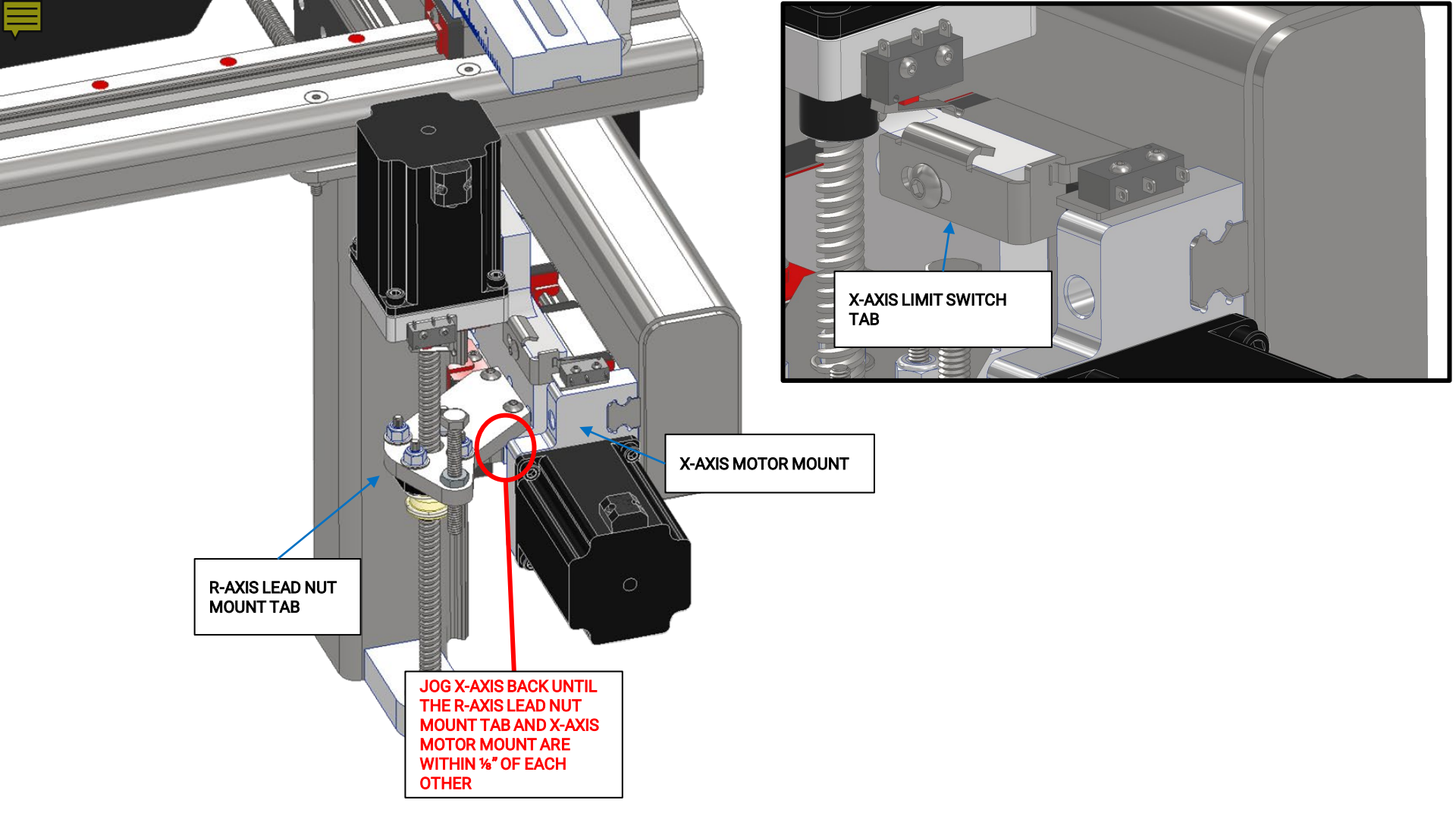
C2. Using the Hand Brakes, adjust the **Backgauge Fingers** to their furthest left and right positions.

C3. Jog the Backgauge forward until both fingers sit above the die table.

C4. Slowly step the Backgauge down until at least one finger makes light contact with the die table.

C5. If only one finger made contact with the die table. Unplug the **R-Axis Motor** nearest to the finger that is not contacting the die table and rotate the **R-Axis Lead Screw** by hand, or by turing the ¼-20 locknut, until it is lightly contacting the table.

C6. Plug the **R-Axis Motor** cable back in.


X-AXIS LIMIT SWITCH TAB
X-AXIS MOTOR MOUNT
R-AXIS LEAD NUT MOUNT TAB
JOG X-AXIS BACK UNTIL THE R-AXIS LEAD NUT MOUNT TAB AND X-AXIS MOTOR MOUNT ARE WITHIN ⅛" OF EACH OTHER

Materials

Parts
- N/A

Hardware
- N/A

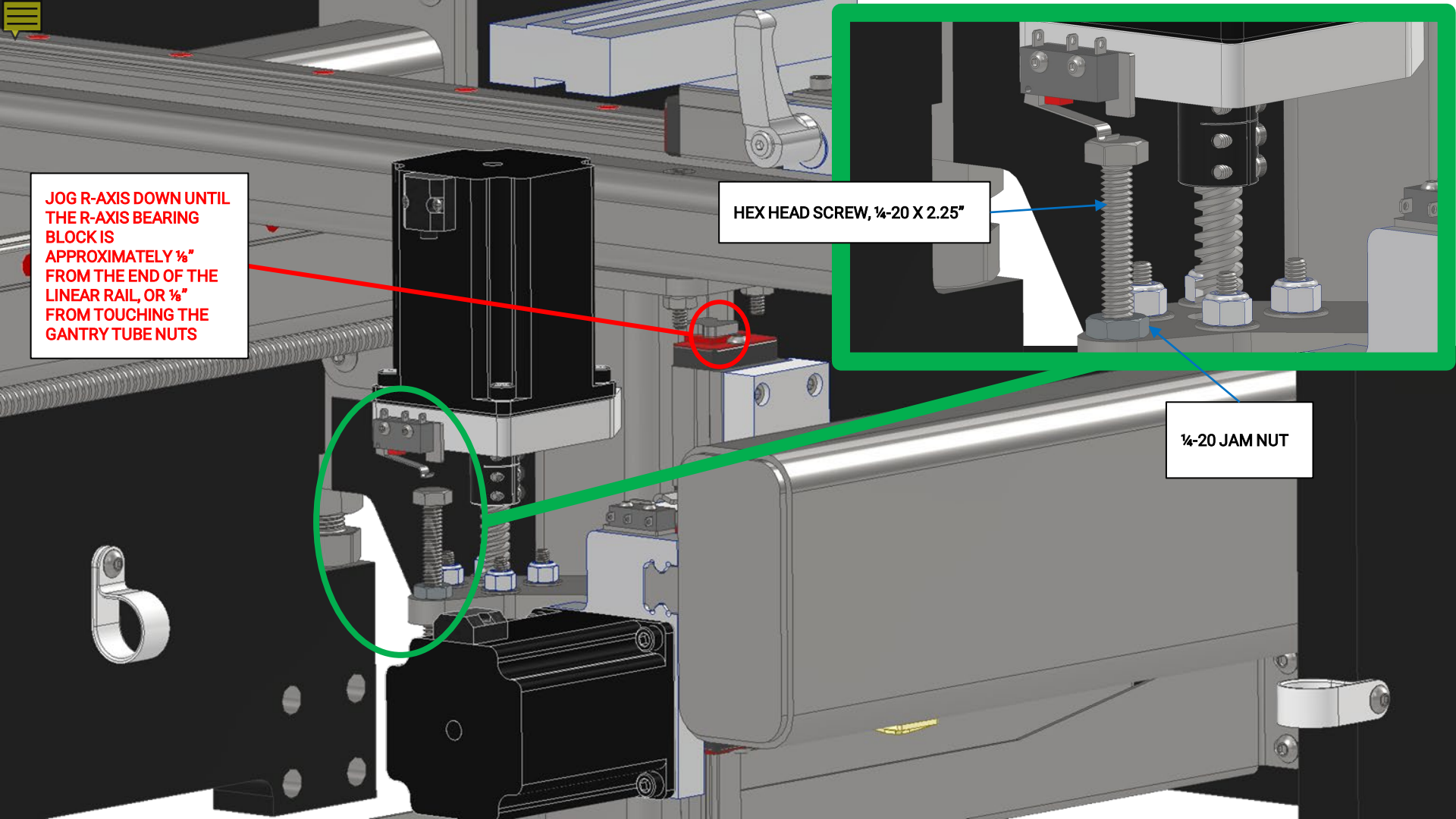
Tools
- ⅛” Hex Key

Instructions

D1. Jog the Backgauge back until the **R-Axis Lead Nut Mount Tabs** are within ⅛” of the **X-Axis Motor mounts**

D2. Loosen the fasteners securing the **X-Axis Limit Switch Tabs** and slide them forward, until both **X-Axis Limit Switches** are *just barely* triggered on both sides. At the trigger point on the limit switches, there should be an audible click. Tighten the fasteners securing the X-Axis Limit Switch Tabs. Note: It is very important that the **X-Axis Limit Switch Tabs** are secured in the exact location that triggers the limit switch. If this is not done accurately, it will reduce the positioning accuracy of the back gauge.

D3. Jog the Backgauge forward such that both X-Axis Limit Switches are no longer triggered.


JOG R-AXIS DOWN UNTIL THE R-AXIS BEARING BLOCK IS APPROXIMATELY ⅛" FROM THE END OF THE LINEAR RAIL, OR ⅛" FROM TOUCHING THE GANTRY TUBE NUTS
HEX HEAD SCREW, ¼-20 X 2.25"
¼-20 JAM NUT

Materials

Parts
- N/A

Hardware
- N/A

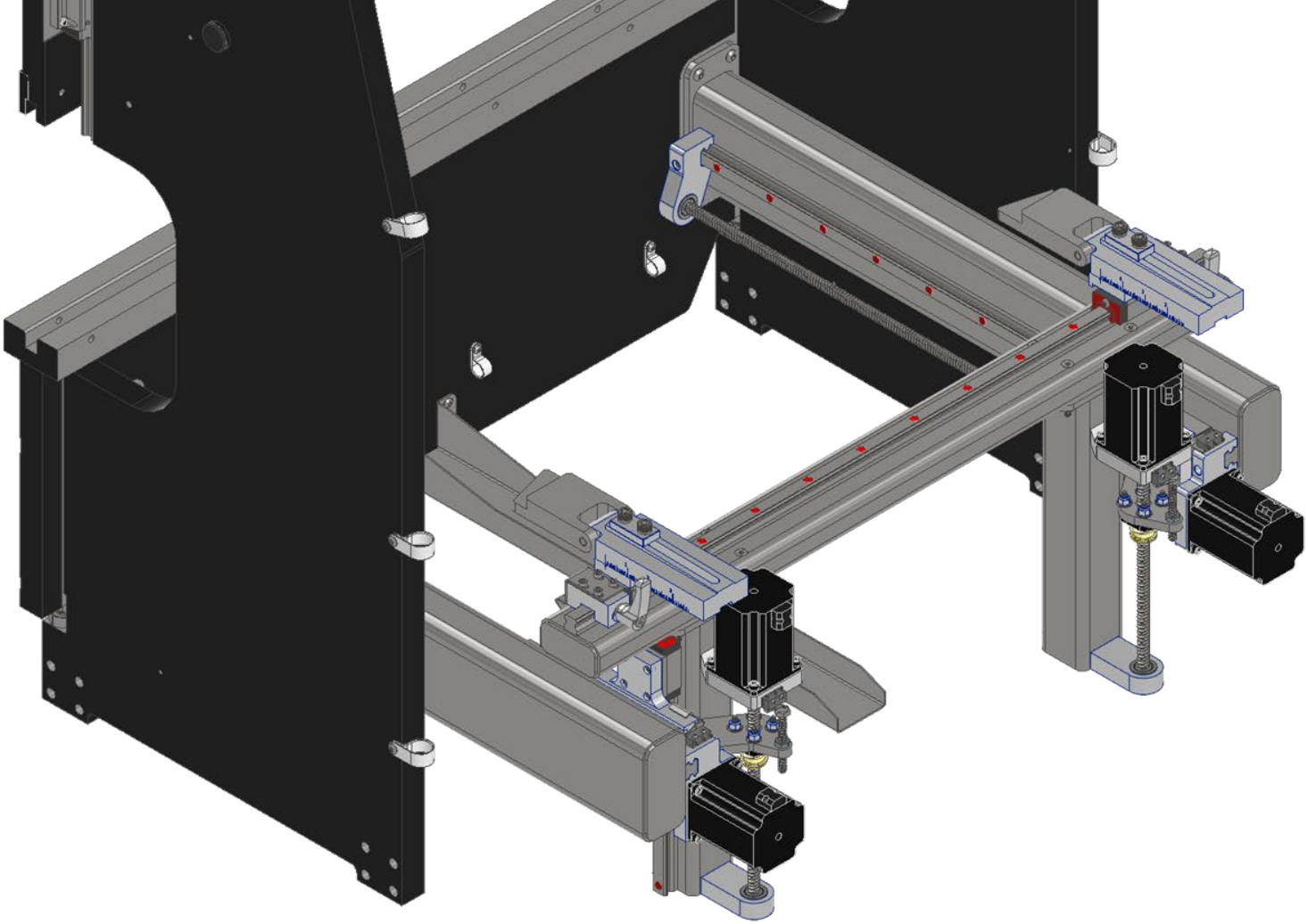
Tools
- 7/16” Wrench

Instructions

E1. Jog the Backgauge down until the **R-Axis Linear Bearing Blocks** are within ⅛” of the Gantry Tube nuts or the end of the linear rail.

E2. Loosen the jam nuts securing the R-Axis Limit Switch screws and thread them up until both **R-Axis Limit Switches** are *just barely* triggered on both sides. At the trigger point on the limit switches, there should be an audible click. Tighten the jam nuts to secure the R-Axis Limit Switch screws. Note: It is very important that the screws are secured in the exact location that triggers the limit switch. If this is not done accurately, it will reduce the positioning accuracy of the back gauge.

E3. Jog the Backgauge up such that both R-Axis Limit Switches are no longer triggered.



Materials

Parts

- N/A

Hardware

- N/A

Tools

- N/A

Instructions

F1. Home the Backgauge as detailed in the TITAN Quick Start Operation Manual . Ensure both limit switches on the X and R-Axis trigger during homing. If both limit switches do not trigger during homing, repeat steps D1-E3.