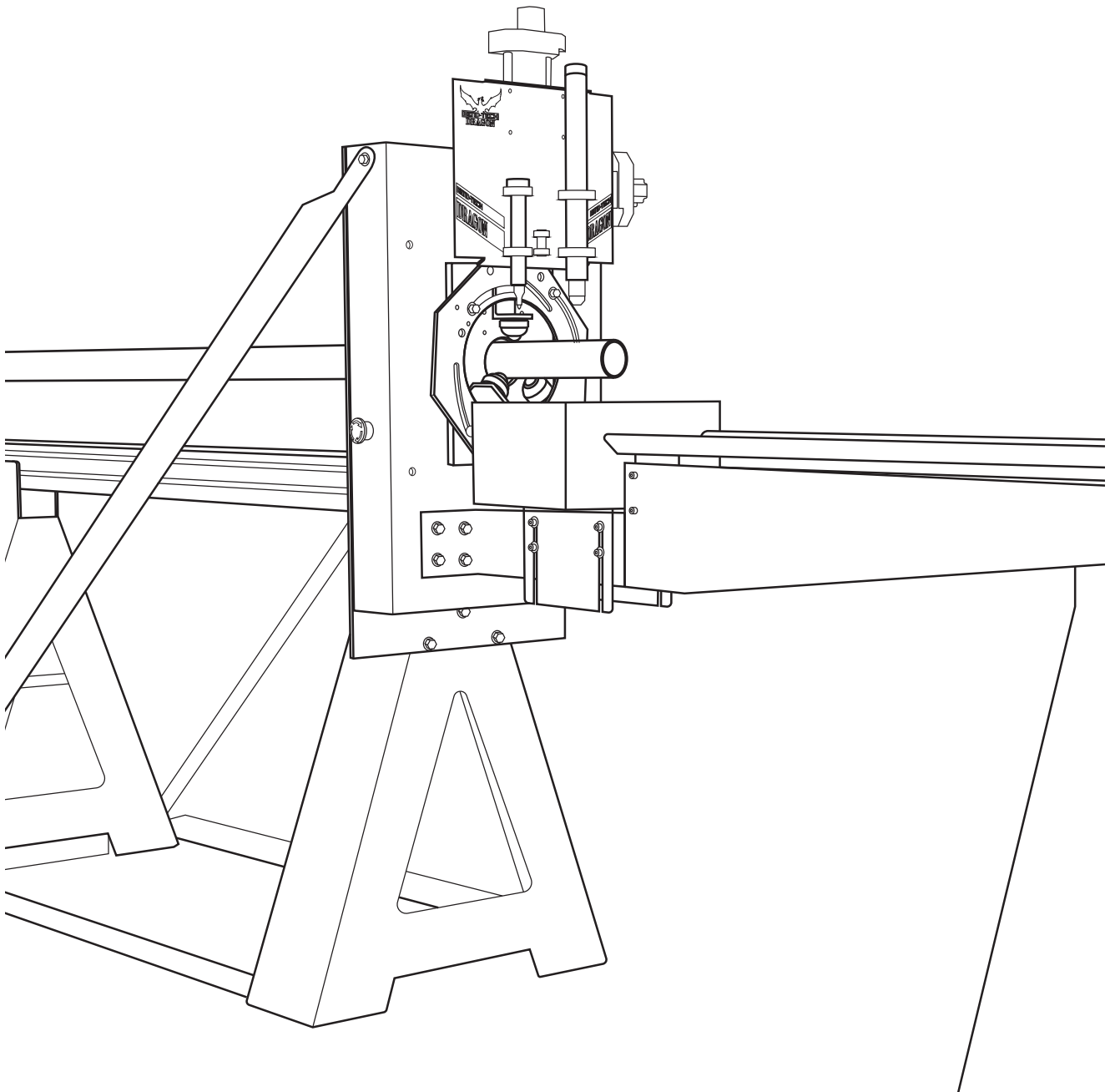


Part 1 of 1

# BEND-TECH DRAGON A250

## Assembly Manual



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# **Dragon A250**

## **Assembly Manual** Revision 1

English  
Original Instructions

December 2020

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# ***Limited Warranty***

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## **Covering Bend-Tech Dragon**

Bend-Tech, LLC provides a limited warranty on all new Dragon machines that are manufactured directly or under license by Bend-Tech, LLC, and sold by Bend-Tech, LLC or its approved distributors.

## **Warranty Coverage**

Each Bend-Tech Dragon machine is warrantied by the manufacturer against defects in material workmanship for 12-months. The warranty period commences upon delivery of the Dragon machine to the customer's facility.

## **Repair or Replacement Only**

The Manufacturer's sole liability, and the Customer's exclusive remedy under this warranty shall be limited to repairing or replacing the defective part. Repair or replacement of parts is at the sole discretion of the manufacturer. The Customer is responsible for warranty parts installation. Bend-Tech does not provide warranty service labor.

## **Limits**

This warranty does not cover components subject to wear due to normal use of the machine such as belts, lights, tooling etc. This warranty is void if Bend-Tech, LLC has determined any failure is the result of mishandling, abuse, misuse, improper installation, improper storage, improper maintenance or unauthorized modification of the machine. The warranty does not cover damage due to natural disasters, fire, flood or other external factors. The warranty may become void or limited in the event that hardware changes or adaptations are made to the machine.

## **Software**

Dragon software is covered by a 2-year maintenance plan from the purchase date of the Dragon machine. After the 2-year maintenance plan is expired, the Customer can purchase a maintenance plan. A maintenance plan will ensure the customer always has the newest version of Dragon software. The maintenance plan is critical to keeping Dragon software updated with the newest capabilities possible, and is critical to the servicing of the machine. Bend-Tech, LLC will contact the Customer regarding updates to the maintenance plan within 1-month of expiration. Contact Bend-Tech Support to ensure software is up to date: support@bend-tech.com.

# Customer Service

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Any questions or concerns regarding this manual can be directed to Bend-Tech, LLC representatives via the Dragon website, [www.bend-tech.com](http://www.bend-tech.com). Click Contact in the menu bar for communication options and send your comments to the Dragon Customer Service department.

## Online Resources

- <https://www.youtube.com/user/bendtech2020>
- <http://www.bend-tech.com/wiki7>
- <http://www.bend-tech.com>
- <https://www.facebook.com/2020ssi>
- [https://www.instagram.com/bend\\_tech](https://www.instagram.com/bend_tech)

# Customer Satisfaction Commitment

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Congratulations on your purchase of the world's best CNC plasma tube and pipe cutting machine, the Bend-Tech Dragon. Bend-Tech, LLC places great pride in customer satisfaction and it is our promise to offer you the best support available for your Dragon. We recognize that our support is a key factor in your success.

## Contact Us

Bend-Tech's hours of operation are Monday - Friday, 8:00 - 5:00 EST. The Bend-Tech support team and sales team are always available during our hours of operation.

**Phone:** 651-257-8715

**Email:** Sales team: [sales@bend-tech.com](mailto:sales@bend-tech.com)  
Support team: [support@bend-tech.com](mailto:support@bend-tech.com)

**Address:** Bend-Tech, 729 Prospect Ave., Osceola, WI 54020, U.S.A..

# Warnings

---

This manual contains important statements that are called out from the regular text with an associated signal word: “Danger,” “Warning,” “Caution,” or “Note.” Each of these signal words is accompanied by its own icon. These signal words and icons indicate the severity of the condition and the warning. The machine operator should familiarize themselves with these warnings and read the statements before operating the machine.

## Definitions & Examples

### **Danger**

Danger indicates a serious condition that could cause severe injury or death to the operator or bystanders if the instructions are not followed.

#### *Example*

### **! Danger !**



Exceeding the material weight limit of the Dragon A250 can result in serious injury to the operator and/or bystanders.

### **Warning**

A Warning indicates there is a possibility for minor injury if the instructions are not followed correctly.

#### *Example*

### **! Warning !**



Due to the extreme temperatures that result from the plasma cutting process, parts cooled in water in the parts catcher can still be extremely hot. Always use caution when handling newly-cut parts.

## Caution

Caution warns the Operator that minor injury or machine damage could occur if instructions are not followed. It could also mean that not following directions could affect the overall procedure being performed.

### Example

## ! Caution !



Exceeding the material weight limit can affect performance and possibly damage the Dragon A250.

## Note

A Note gives clarification or focuses on information that is critical or unique to an operation.

### Example



*The material cooling system greatly reduces smoke and vapor emitted by the machine. Bend-Tech recommends use of the material cooling system whenever possible.*

# Glossary

---

## Axis

A fixed reference line used by the Dragon A250.

## Bend-Tech 7x

Machine design software - CAD.

## BOB

Breakout Board.

## Material Support Lift

The Material Support Lift supports material to reduce sag.

## Chuck

Located on the Trolley, the Chuck holds the material so it can be moved forward, backward and rotated.

## Control Box

Connects Dragon Software Suite to the Dragon A250.

## Coolant Tray

Cools cut parts as they are produced.

## E-Stop

Emergency stop.

## ESS

Ethernet Smooth Stepper (Control Board).

## Ethernet

System for connecting multiple computers via a Local Area Network.

## Gate

The Gate supports the material at the front of the machine. It consists of two sets of self-centering roller jaws.

## Interface

Any particular screen display generated by Bend-Tech software.

## Mach3

Machine driver software.

## Parts Catcher

The parts catcher is placed at the front of the machine to catch parts as they are cut.

## Rack & Pinion

The rack and pinion gear assembly is the method that drives the horizontal movement of the Trolley.

## Rail & Beam

The Beam is the main structure of the Dragon A250, the rails are attached to the beam and guides the Trolley.

## Tail

The Tail is located at the opposite end of the Head of the machine. The Tail arrives pre-assembled. The X-Axis homing sensor, rear E-Stop are located at the Tail of the machine.

## Toolhead

Operates the Marker, Laser Light, and Torch.

## Trolley

The Trolley rides on the Rail, and carries the Chuck forward and backward along the length of the Support Beam.



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# 01

## Safety

### 1.1 Introduction

Before assembling the Dragon A250, read this manual and ensure that all personnel involved in assembling the machine are properly trained in lifting procedures and tool operation. Ensure all personnel are aware of the dangers and hazards involved in assembling the machine.



*Assembling the Dragon A250 requires a moderate level of mechanical skill and experience. Assembly should not be undertaken by personnel without experience in assembling machinery or experience in industrial or machine maintenance.*

### 1.2 Assembly Safety

## ! Danger !



Certain Dragon A250 parts are heavy. Handling them incorrectly could result in severe injury or possibly death. Always use caution and follow safety procedures for moving heavy equipment when assembling the Dragon A250.

### **Safety Precautions**

- Do not attempt to assemble the Dragon without reading this manual first.
- Have the correct tools listed in the Tool List on hand.
- Enlist help of 1-3 additional personnel trained to install industrial machinery.
- Follow the methods and procedures outlined in this manual.
- Do not attempt to lift heavy materials without assistance.
- Before beginning, ensure the workspace is clean and of appropriate size for Dragon A250 assembly.

## **! Warning !**



Altering the installation methods and procedures outlined in this manual could result in improper installation, machine damage, or personal injury.

### **1.2.1 Safety Equipment**

Bend-Tech recommends using the proper safety equipment when installing the Dragon A250. Safety equipment standards for each shop should be outlined in Occupational Safety and Health Administration (OSHA) standards. Also, individual shops may have their own standards. Always consult safety regulations before beginning work. Basic safety equipment may include:



Safety Glasses



Safety Shoes



Work Gloves



Hearing Protection

# 02

## ***Tools and Equipment***

### **2.1 Tools**

---

The Installer(s) should ensure the proper complement of tools are on hand to assemble the Dragon A250. Bend-Tech does not recommend attempting to assemble the machine without the tools listed in this chapter.

#### **2.1.1 Tool List**

The following are the recommended tools needed to uncrate the Dragon A250 and perform the complete assembly procedure.

- Forklift
- Cordless drill/driver
- T25 bit
- Side cutters
- Tin snips
- Utility knife
- $\frac{3}{16}$  in. Allen wrench
- $\frac{1}{8}$  in. Allen wrench
- $\frac{5}{16}$  in. Allen wrench
- $\frac{7}{32}$  in. Allen wrench
- Level (laser, digital or bubble)
- Ratchet
- $\frac{9}{16}$  in. socket
- $\frac{9}{16}$  in. wrench
- $\frac{3}{4}$  in. socket
- $\frac{3}{4}$  in. wrench
- $\frac{3}{4}$  in. deep well socket
- $\frac{1}{2}$  in. socket
- $\frac{1}{2}$  in. wrench
- $1\frac{1}{16}$  in. wrench
- Rubber mallet or Dead Blow plastic hammer
- Tape measure
- Zip ties
- $\frac{3}{8}$  in. x 3 in. Concrete Sleeve Anchors
- $\frac{7}{16}$  in. Concrete drill bit

## 2.2 Crate Parts List

---

### Dragon A250 Assembly

- Machine Head
- Machine Tail
- Rail & Beam Section (3)
- Support Leg (2)
- Rack (3)
- Beak
- Cable Track Tray (3)
- Trolley Housing
- Chuck
- Computer
- Monitor

### Miscellaneous Box

- Training Packet (1)
- Plasma Cutting Guide (1)
- Cutoff Drop Tank (1)
- Swivel Levelers (14)
- Wrench (1)
- Magnetic Tool (1)
- Belt Tension Tester (1)
- ¼ T-Handle Allen Wrench (1)
- Engraver (1)
- Ethernet Cable (1)
- Power Cable (1)
- Torch Cable (1)
- Coiled Wire Harness Tubing (1)
- String
- Hardware Bags (6)
- Bridge Rack

## 2.3 Optional Parts

---

### Technology Package

- Computer Cabinet
- Battery Backup
  
- ⅛ T-handle Allen wrench (1)
- ⅜ T-handle Allen wrench (1)
- Feeler Gauge Set (1)
- Vernier Caliper (1)
- Torpedo Level (1)
- 26 Piece Radius Gauge Set (1)
- WD40 Gel Lube (1)
- Main Drive Belt 260 XL (1)
- Thomson Sensor (1)

### Hypertherm

# 03

## ***Assembling the Dragon***

### **3.1 Shipping Crate**

---

The Dragon A250 is shipped from the Bend-Tech manufacturing facility in a custom-fabricated shipping crate. This crate features a steel reinforced floor and is fully-enclosed to ensure the protection of the Dragon A250 during shipping. The Dragon A250 machine is completely secured within the crate for shipping purposes. Components may be bolted to the crate, shrink wrapped, or secured with plastic or metal banding. The order in which components are uncrated is important in executing proper assembly of the machine. For best results in assembling the Dragon A250, carefully follow the steps outlined in this Assembly Manual.

#### **3.1.1 Dragon A250 Shop Position**

Before beginning assembly, ensure there is adequate space to accommodate the machine on the shop floor. Plan on reserving a minimum of 28-feet for the full length machine, if the material cooling system is installed more room will be needed.

### **3.2 Crate Disassembly**

---

#### **Tools Needed**

- Cordless Driver
- T25 Bit

# ! Caution !



Enlist the help of additional personnel when uncrating and assembling the machine. A dropped crate component could cause injury to bystanders or could damage the machine. Crate sides are large and heavy and should not be lifted without help.

Disassemble the crate first. Use a cordless driver and T25 bit to remove the screws that fasten the top of the crate to the sides of the crate. Lift the top off and set it aside. Remove the screws fastening one of the two larger crate sides, then remove the two smaller crate ends. Remove the remaining crate side.

## 3.3 Getting Started

---

Uncrating the Dragon A250 components properly, and keeping them in order, is critical to achieving the quickest, most seamless installation possible. As shipped, the components of the machine will be bolted to the floor of the crate, strapped to the floor of the crate, strapped together, or shrink-wrapped together.



*Do not remove any strapping or shrink wrap from the head of the Dragon A250. It is important to keep components secure while the Head is being removed from the crate.*

### 3.3.1 Component Boxes

Remove the various component boxes packed around the Dragon A250 machine. The Component Boxes are labeled for reference during the assembly process.



### 3.3.2 Miscellaneous Box

Locate the Miscellaneous Box, and remove the swivel levelers and hardware bags. These will be used during the assembly process.



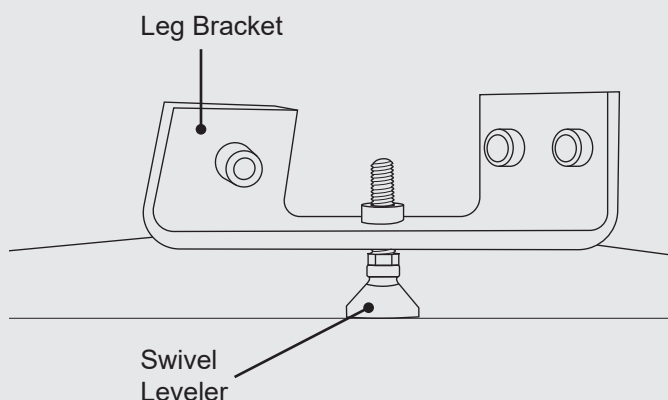
*The Dragon A250 Rail Support Legs are mounted to the floor of the shipping crate using the Floor Brackets. When assembling the machine, the Floor Brackets should be left in place. The Installer will use the Swivel Levelers to true the machine then bolt it to the floor using the Floor Brackets.*

## Installing Swivel Levelers

### Tools Needed

- ½ in. wrench
- 1¼ in. wrench

The Installer will be required to install two Swivel Levelers in each Support Leg. Each base of the Support Leg will have a bracket with a threaded hole. Prepare the Swivel Leveler for installation by positioning the jam nut approximately one inch above the adjustment hex at the bottom of the Swivel Leveler.



Thread the Swivel Leveler into the threaded hole in the base of the support leg until it bottoms out on the adjustment nut. This method will place all of the Swivel Levelers at approximately the same distance, providing a baseline for levelling the machine.

Install Swivel Levelers on each support leg as the installation progresses. An 1¼ in. wrench may be needed to thread the Swivel Levelers into the bottom of the Support Legs.



*Installing the Swivel Levelers may require help.*

## 3.4 Unpacking the Crate

When unpacking the crate, take care to keep components of the machine organized so they can be located easily. Remove all of the boxes and machine components from the crate except for the head of the machine. This will need to be removed last using a forklift. Use a ½ in. socket and ratchet to remove the major components of the machine. Tin snips will be required to remove the beams. Two of the racks are secured to the floor of the crate with screws. The third is secured to the right side (sensor side) of the tail of the machine, use a ⅜ in. Allen wrench to remove this rack; only loosen the rack enough to slide it out. Take care not to damage the racks when moving them.

### Tools Needed

- ½ in. socket and ratchet
- Tin Snips
- ⅜ Allen Wrench
- Forklift
- Wood Blocks

## 3.5 Moving the Head into Position

The head of the machine is extremely heavy. As shipped, the head of the machines contains all the working mechanics of the machine as well as the control box. Great care should be taken not to damage any components on the head of the machine during moving and installation.

### Remember

Remove all other contents of the crate before attempting to move the head of the machine.

### ! Danger !



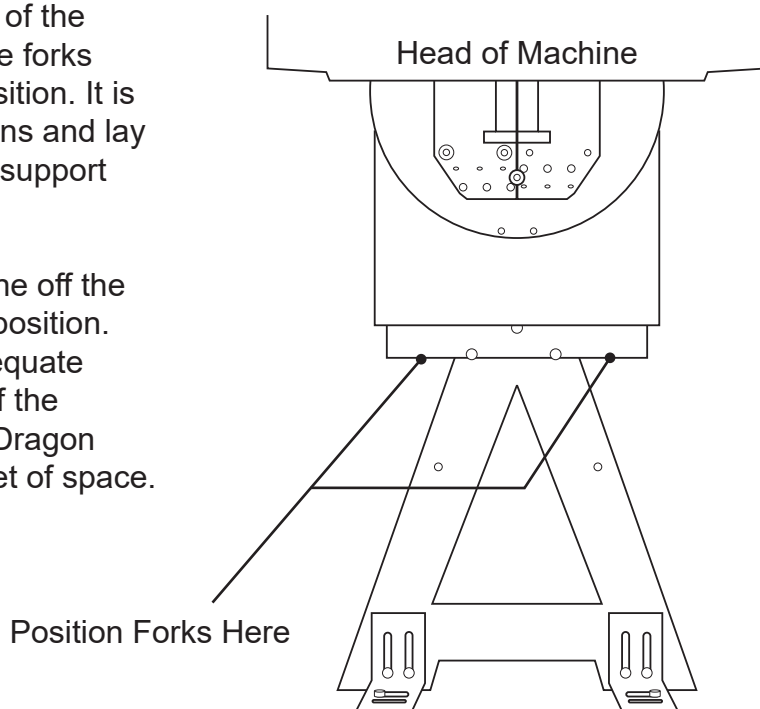
The Head of the machine is heavy. If the Head falls or tips over it could cause severe injury or death.

### 3.5.1 Place the Head using a Forklift

Use a ½ in. socket and ratchet to remove the lag bolts securing the head of the machine to the floor of the crate.

Using a forklift, approach the head of the machine from the front. Position the forks under the head in the indicated position. It is recommended to use fork extensions and lay blocks of wood across the forks to support the beam of the machine.

Carefully lift the head of the machine off the crate floor and slowly move it into position. Before placing the head, leave adequate space for the remaining sections of the machine to be put into place. The Dragon A250 requires a minimum of 28-feet of space.

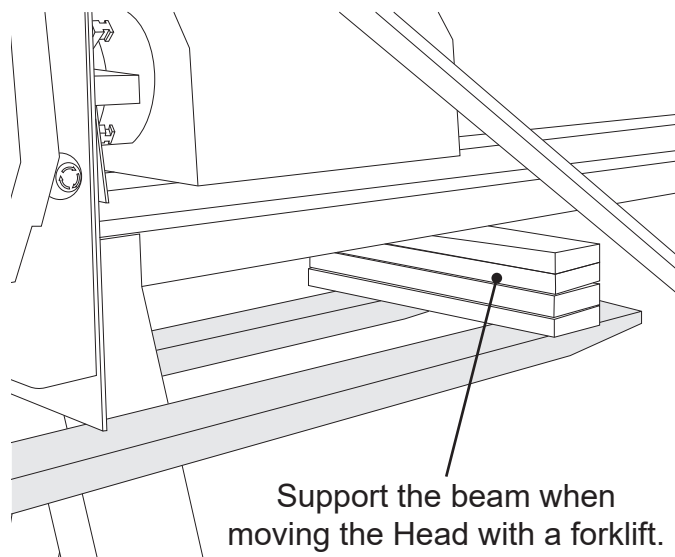


## Important

Due to its size and weight, Bend-Tech does not recommend placing the head of the machine manually.

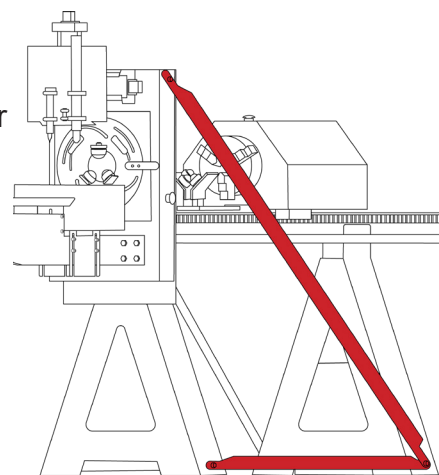


*Before placing the machine, ensure the Swivel Levelers are installed in each of the Support Legs as outlined in Section 3.3.2.*



### 3.5.2 Install the Head Supports

The left side (cable track side) head supports are shrink wrapped to the supports on the right side of the machine. After positioning the head, install the left side supports as shown; use a  $\frac{9}{16}$  in. wrench to tighten the bolts.



## 3.6 Installing the Beams

### Tools Needed

- Dead blow plastic hammer or rubber mallet
- $\frac{3}{16}$  in. Allen wrench
- Magnet tool

### 3.6.1 Install the First Beam

#### Installing the Underside Bolts

##### Tools Needed

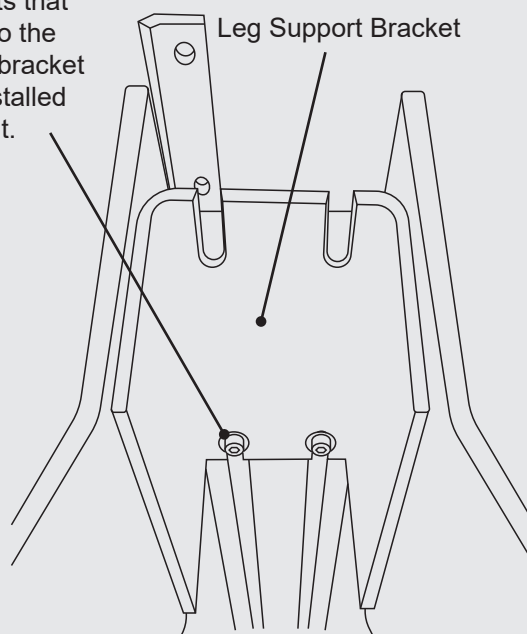
- $\frac{3}{16}$  in. Allen wrench

Before installing the beams, take the  $\frac{1}{4}$ -20 x  $\frac{5}{8}$ " bolts, and washers from Hardware Bag no. 6 and 12 T-Nuts from Hardware Bag no. 1. These will be used to attach the beams to the leg support brackets. There are four bolts per joint.

The easiest way to install these bolts is to screw the bolts with the washer, partially into the T-Nuts, and slide them into the space on the underside of the beams, prior to installing each of the beams.

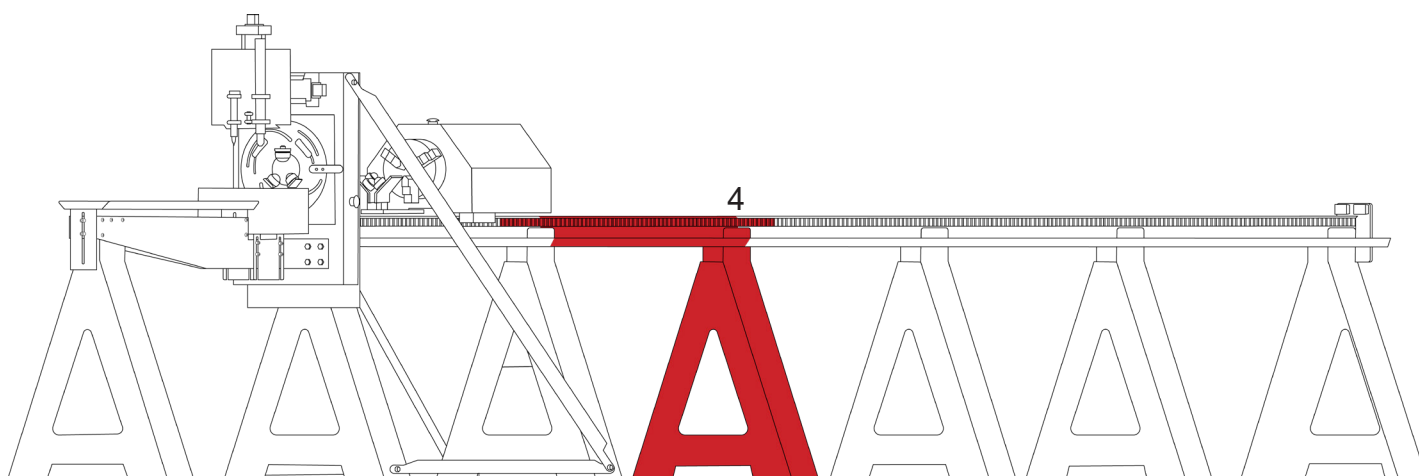
When fastening the support legs to the beams, slide these bolts into position as pictured, before tightening them.

There are four bolts that secure the beam to the leg support bracket that need to be installed on each beam joint.



After the head is placed into position, locate the first beam. The first beam will be labeled 3 at one end and 4 at the other. Use the stainless steel locating pins on the beam to align the beam when installing it.

Install the first beam so that the end labeled 3 is the end being attached to the head of the machine. If necessary, use a rubber mallet or dead blow plastic hammer to seat the beam sections together.



## Important

Do not assemble the Dragon machine alone. Get help for moving and supporting the machine components during assembly.

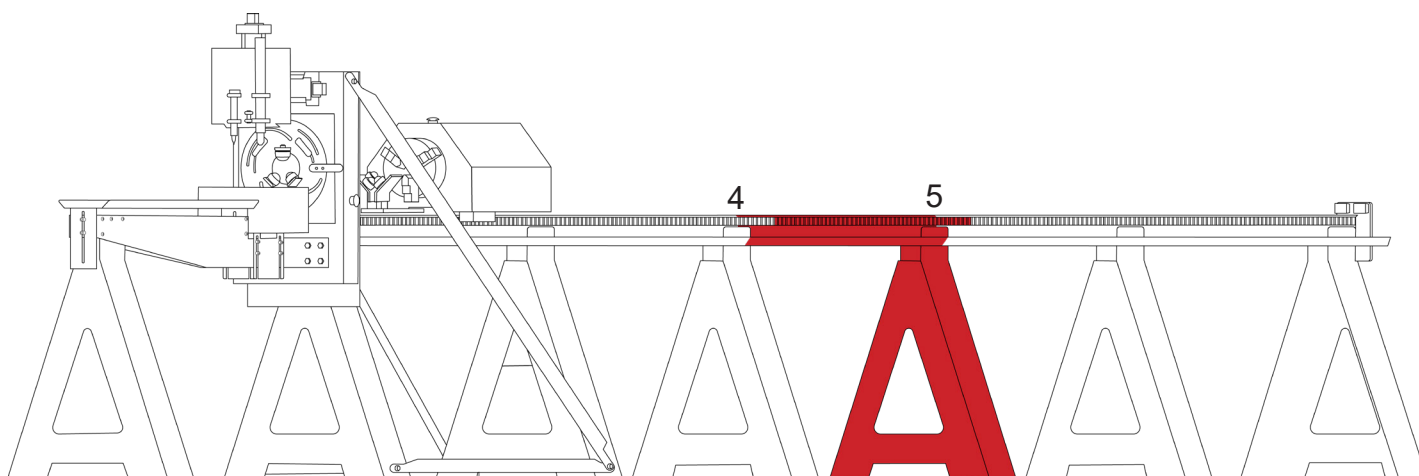
### 3.6.2 Slide Support Leg #4 into Position

Locate support leg #4 and slide it into position at the end of the first beam which is labeled 4. Ensure the swivel levelers are installed onto support leg #4 before proceeding with the assembly.

### 3.6.3 Install the Second Beam

Locate the second beam, which will be labeled 4 at one end and 5 at the other end. Again, use the stainless steel locating pins on the beam to align the beam when installing it.

Install the second beam so that the end labeled 4 is attached to the first beam and support leg 4. If necessary, use a rubber mallet or dead blow plastic hammer to seat the beam sections together.



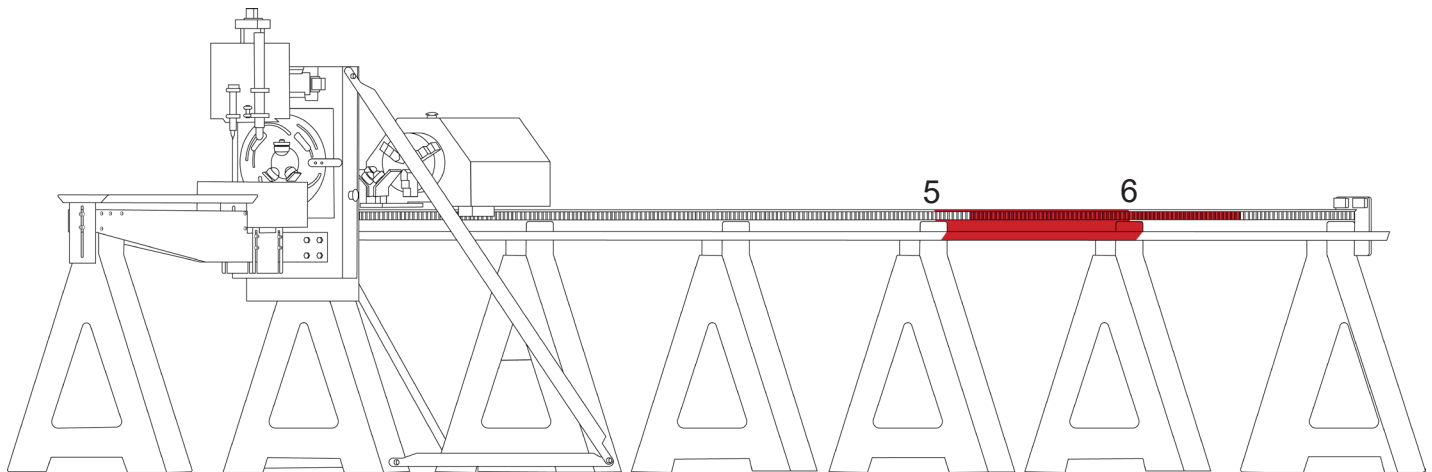
### 3.6.4 Slide Support Leg #5 into Position

Locate support leg #5 and slide it into position at the end of the first beam which is labeled 5. Ensure the swivel levelers are installed onto support leg #5 before proceeding with the assembly.

### 3.6.5 Install the Third Beam

Locate the third beam, which will be labeled 5 at one end and 6 at the other end. Again, use the stainless steel locating pins on the beam to align the beam when installing it.

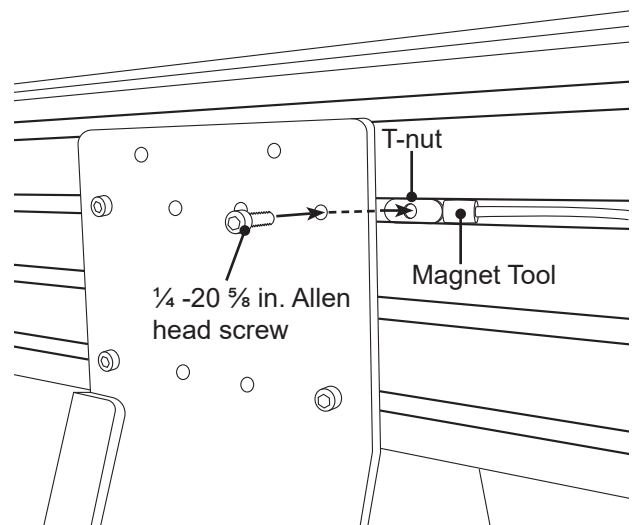
Install the second beam so that the end labeled 5 is attached to the second beam and support leg 5. If necessary, use a rubber mallet or dead blow plastic hammer to seat the beam sections together. The end labeled 6 will need to be supported until the tail of the machine is installed.



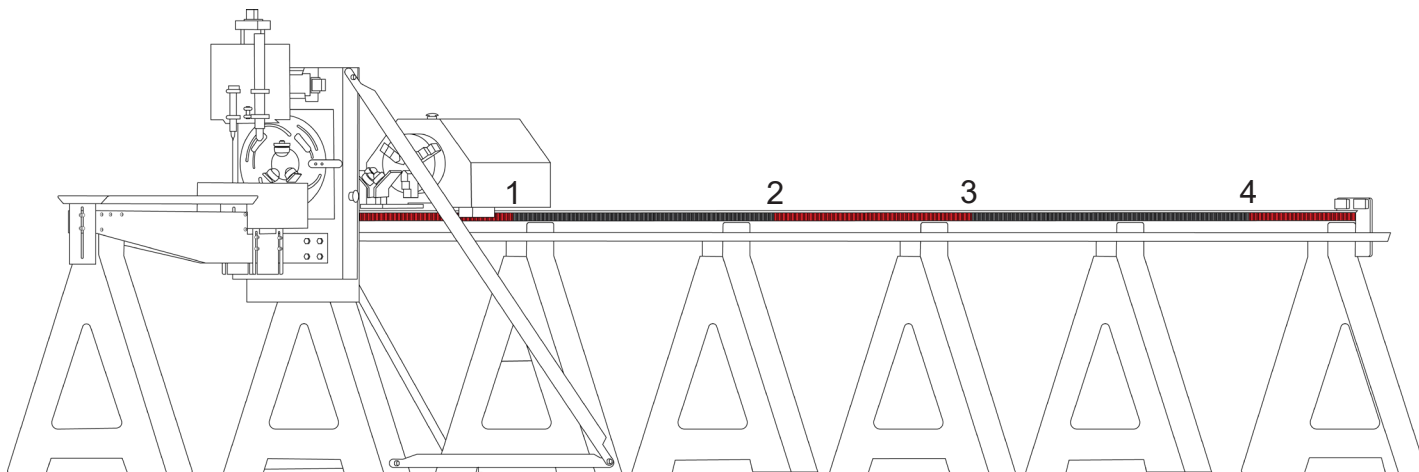
### 3.6.6 Fasten the Support Legs to the Beams

Before installing the tail of the machine, secure the support legs to the beams using  $\frac{3}{16}$  in. Allen head screws and T-nuts. These can be found in hardware Bag No. 1.

Using the magnetic tool provided, slide the T-nut behind the support leg brace until it aligns with the mounting hole in the support leg. Insert the Allen head screw and thread it into the T-nut. Repeat this process for all four fasteners on each side of the support legs. Do not fully tighten these yet.



### 3.6.7 Slide the Racks into Position



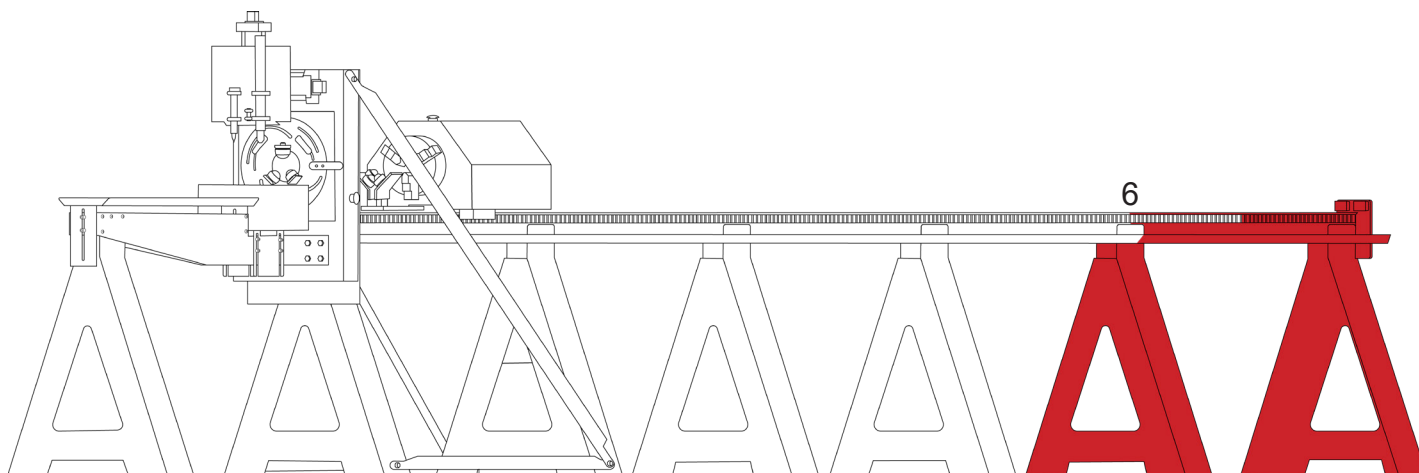
Locate the three middle racks that were set aside after uncrating the machine components. Each rack is labeled on each end 1 through 4. There are five racks total, two 72 inch racks, two 48 inch racks, and one 35 ½ inch rack.

The first rack is pre-installed on the head of the machine and serves as the base for aligning and setting the rest of the racks. Slide the second rack, which is labeled 1 at one end and 2 at the other end, onto the beam. Align the rack so that the end labeled 1 butts up against the rack installed on the head of the machine.

Locate the third rack, which is labeled 2 at one end and 3 at the other end. Slide the rack onto the beam so that the end labeled 2 butts against the second rack. Repeat this process for the fourth rack. Slide the rack onto the beam so that the end labeled 3 butts against the third rack.

The fifth rack is installed to the tail of the machine. When the tail of the machine is installed, the fifth rack will need to be adjusted along with the rest using the bridge rack spacer to set the spacing between the racks. This will ensure the racks are spaced correctly.

## 3.7 Placing the Tail



### 3.7.1 Place and Install the Tail

The tail section of the machine comes pre-assembled. Remember to install swivel levelers on the bottom of the two support legs before placing and installing the tail.

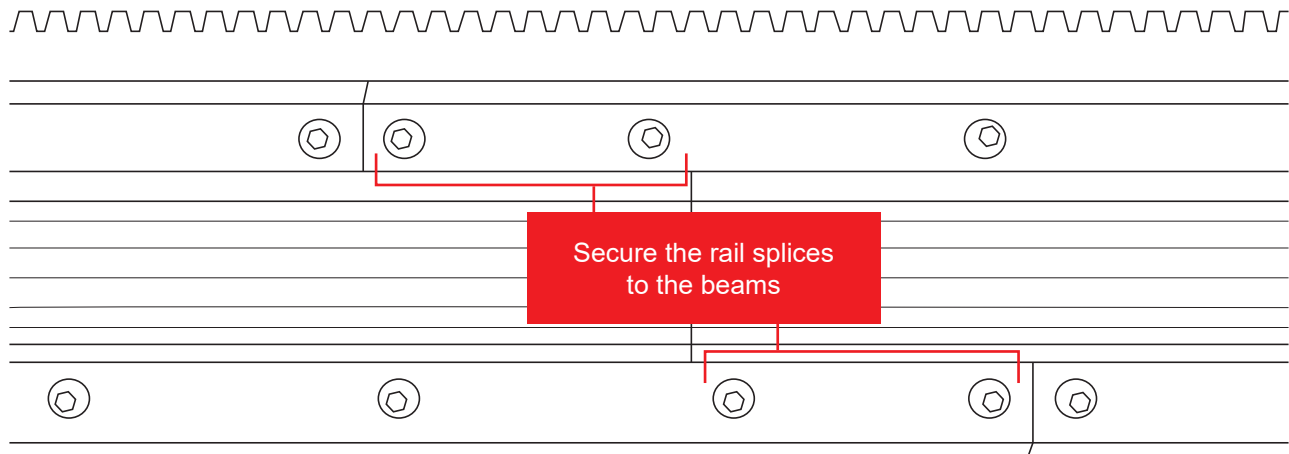
Use the stainless steel locator pins to align the tail of the machine with the end of the beam, which should be labeled 5. Ensure that there are no gaps between the beam and rail sections.

### 3.7.2 Secure the Tail Support Leg to the Second Beam

Secure the tail support leg to the beam the same way the previous support legs were fastened to the beam, using the magnet tool and a  $\frac{3}{16}$  in. Allen wrench.

## 3.8 Securing the Rail Sections

The rail splices should be secured to the beams using the  $\frac{1}{8}$  in. Allen fasteners from Hardware Bag No. 3. They only need to be secured at the rail joints. There are four screws needed for each joint. Once the rail sections are secure and tight, tighten all the fasteners securing the support legs.



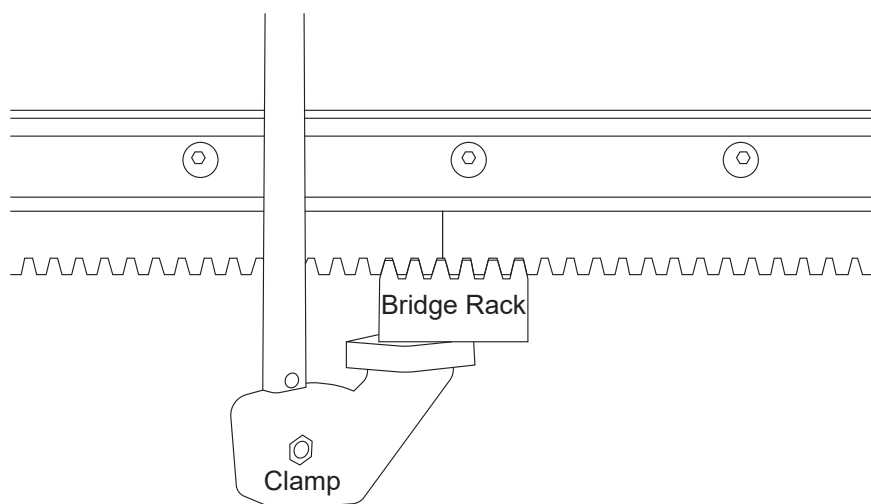
## Remember

After securing the rail sections, remember to tighten all the fasteners securing the support legs to the beams, including those located on the underside of the beams that secure the beams to the support leg brackets.



## 3.9 Installing the Racks

Use the bridge rack, which is located in the miscellaneous box, to set the spacing between the racks. Hold the bridge rack with a clamp to ensure proper spacing between racks while tightening the  $\frac{3}{16}$  in. Allen bolts.



## 3.10 Installing the Cable Track Tray

### Tools Needed

- $\frac{7}{32}$  in. Allen wrench

### Hardware Needed

- Hardware Bag No. 3

The cable track trays are numbered to coincide with the beam sections. Align the cable track trays so that the numbers line up with the coinciding numbers on the beam.

One cable track tray has a hole for the wires to feed through, this tray should be positioned so the hole is towards the tail of the machine.



*The tail of the machine and head of the machine are pre-assembled at the Bend-Tech manufacturing facility and will arrive with the cable track tray pre-installed.*

## 3.11 Installing the Beak

The beak of the machine serves as a parts catcher. The beak prevents parts that have been cut by the machine from falling to the ground and possibly being damaged or causing injury.

### 3.11.1 Installing the Beak

#### Tools Needed

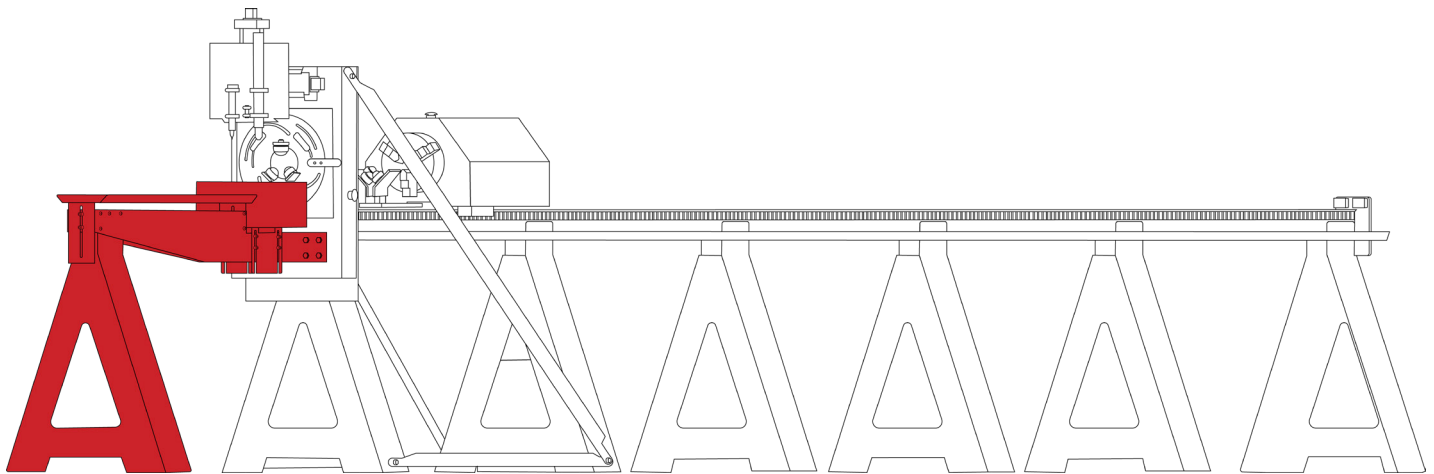
- $\frac{9}{16}$  in. wrench or  $\frac{9}{16}$  in. socket and ratchet
- $\frac{5}{16}$  in. Allen wrench

#### Hardware Needed

- Hardware Bag No. 2

The beak is placed on end inside the crate. The beak should have been removed from the crate prior to moving the head of the machine. Before installing the beak, ensure the remaining support leg is fitted with swivel levelers and is ready to be placed under the beak.

Place the beak at the front of the machine and attach it to the head using the  $\frac{3}{8}$  -16  $\frac{5}{8}$  in. bolts from Hardware Bag No. 2 from the Miscellaneous box. Once secured to the head, slide the support leg under the other end of the Beak. Attach the beak to the support leg using  $\frac{5}{16}$  in. Allen head screws and spacers from Hardware Bag No. 2. The spacers should be placed between the support leg and the beak.



## Important

Shorter machines will have a different configuration of beams and racks. Use the numbers on the beams, racks, and other components to assemble the machine in the correct order.

# 04

## Leveling and Alignment

### 4.1 Leveling and Alignment Overview

Ensuring the Dragon A250 is straight and level is the most critical part of the installation of the machine. Many operational difficulties can be traced back to improper machine installation, and the majority of installation issues center around the machine not being true.

#### Tools Needed

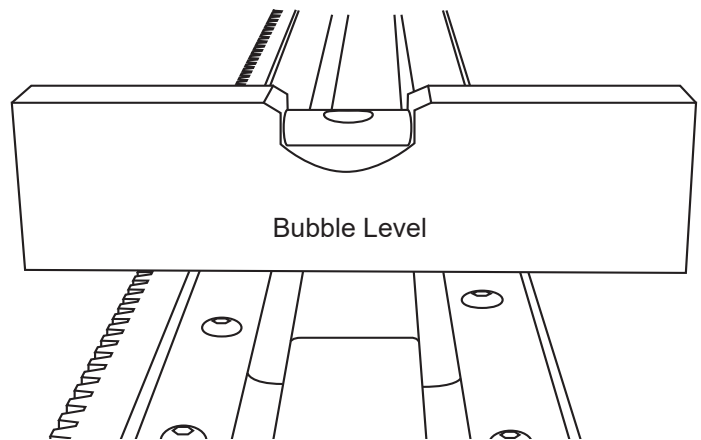
- Level
- $\frac{1}{16}$  in. Wrench



*This process is also covered in the Start-Up and Training Manual Part 2, Chapter 1, sections 1.2.2 through 1.2.3.*

### 4.1.1 Checking Rail Level

Each Rail section should be checked for level side-to-side and lengthwise using a bubble level. If the Rail needs to be adjusted, use the Swivel Levelers provided with the Dragon A250. The Swivel Levelers should be installed upon assembly.



### 4.1.2 Adjusting Swivel Levelers

To adjust the Swivel Levelers, ensure the jam nut is loose and backed off to the base of the Swivel Leveler.

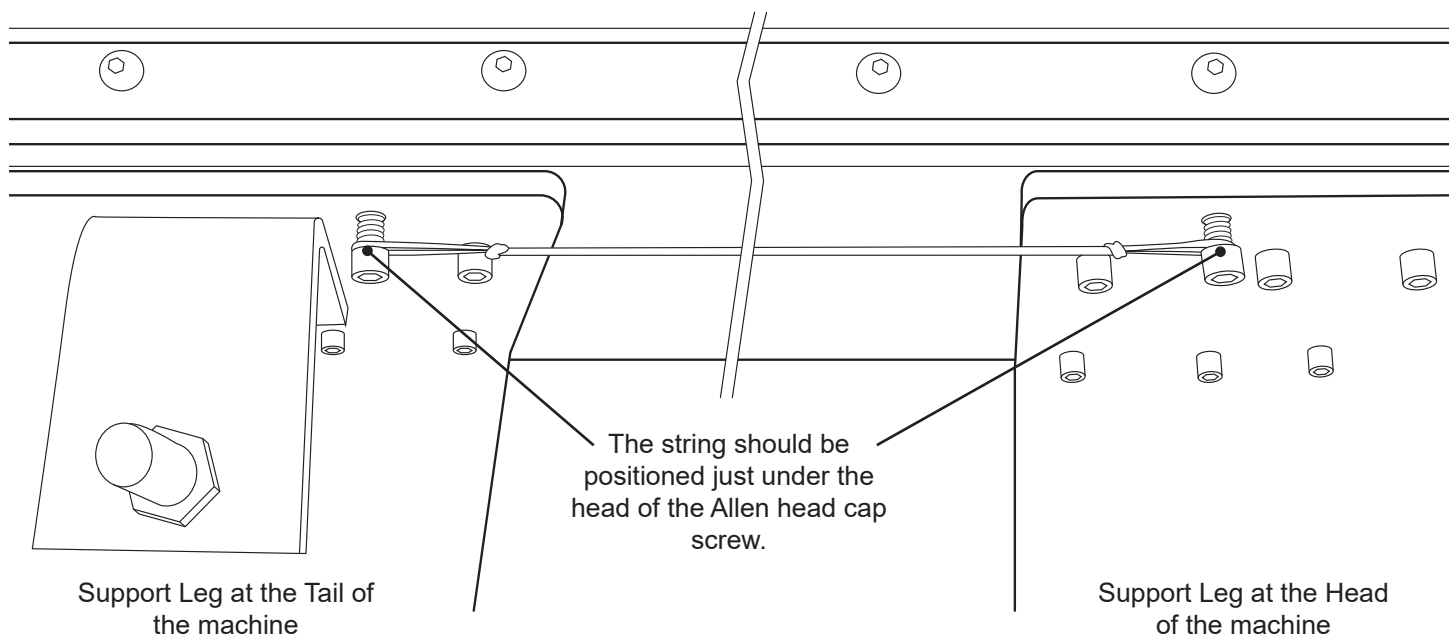
Place an  $1\frac{1}{16}$  in. wrench on the hex adjustment at the base of the Swivel Leveler. When viewing from above, turn clockwise to raise the leg, turn counterclockwise to lower the leg.

## 4.2 Straightening the Dragon A250

Ensuring the Dragon A250 is straight is one of the most important steps in preparing the machine for operation. Bend-Tech has found the simplest and best way to determine if the machine is straight is to use a length of string. The string used during assembly at the Bend-Tech facility has been provided with the machine. Follow the instructions regarding its use in ensuring the machine is straight.

The machine will come with  $\frac{1}{4}$  -20  $\frac{5}{8}$  in. Allen head cap screws pre-installed on the Support Leg at the Head of the machine as well as the rearmost Support Leg.

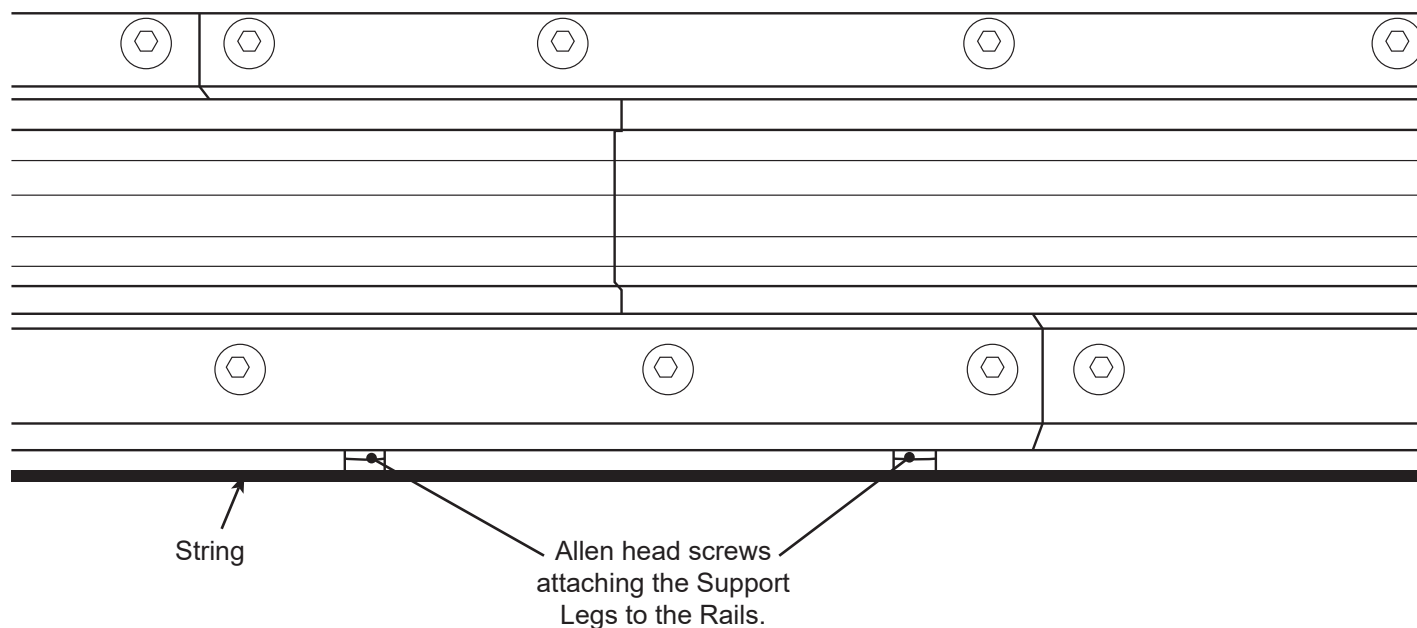
A string has been provided in the Misc. Box.



### 4.2.1 Checking the Straightness

Once the machine is assembled, hook the loops of the string around the  $\frac{1}{4}$  -20  $\frac{5}{8}$  in. Allen head cap screws at the front and rear of the machine. Ensure the string is positioned just under the head of the Allen head cap screw.

With the string installed, ensure it is even with the tops of the Allen head cap screws installed in each of the Support Legs. The string should be flush with the top of each fastener along the length of the machine, as pictured.



### 4.2.2 Rail Splices

Ensure that each Rail splice intersects with the next as seamlessly as possible. Ensure that all of the Rail splices are fastened properly to the Rail.



*Aligning the Rail Splices is one of the most difficult and time-consuming parts of the assembly process. Ensuring Rail Splices are straight and even is critical to the setup of the Dragon A250. Bend-Tech recommends experienced personnel perform the Rail Splice installation.*



# 05

## Mounting to the Floor

### 5.1 Mounting Overview

To maintain long-term precision of the Dragon A250, Bend-Tech recommends the machine to be mounted to the floor of the shop. A machine not securely mounted to the floor can result in inconsistent operation.

#### Tools Needed

- $\frac{7}{16}$  in Concrete Bit
- 3 in. long,  $\frac{3}{8}$  in. concrete anchor sleeves
- Hammer Drill
- Hammer
- $\frac{1}{2}$  in. Socket
- Torque Wrench
- Shop Vac or Compressed Air

### 5.2 Concrete Sleeve Anchors

Bend-Tech requires using  $\frac{3}{8}$  in. diameter, 3 in. long concrete sleeve anchors to mount the Dragon A250. Installing the concrete sleeve anchors will require a  $\frac{7}{16}$  in. concrete drill bit. One concrete sleeve anchor per Floor Bracket is sufficient for anchoring the Dragon A250.



*Installing concrete sleeve anchors requires the use of a hammer drill.*

## 5.3 Preparing the Floor Brackets

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With the machine level and true, loosen the Floor Brackets on the Rail Support Legs so they are snug, but can be lowered to the surface of the floor. Using a marker or pencil, mark the floor where the concrete sleeve anchor will be placed.

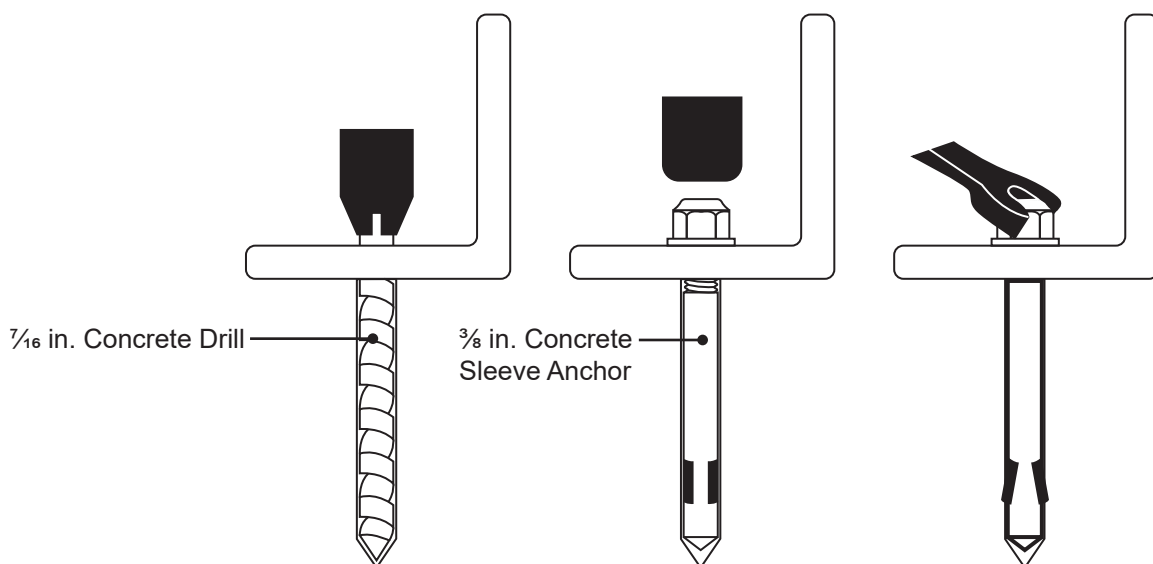
Remove the Floor Brackets from the machine. Removing the Floor Brackets makes it easier to drill the holes for the concrete sleeve anchors.

Drill the holes to the depth specified by the concrete sleeve anchor manufacturer. Once holes are drilled, clean the holes out with a vacuum or compressed air. Re-install the Floor Brackets on the machine. Do not tighten the Floor Brackets onto the Support Legs at this time. Ensure the Floor Brackets are snug to the Support Leg, but that they are still able to be adjusted by the Installer.

## 5.4 Install Concrete Sleeve Anchors

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With the Floor Bracket snug on the Support Legs but still adjustable, line up the hole in the Floor Bracket with the hole drilled in the concrete. Insert a concrete anchor into the hole. Tap the concrete anchor into place lightly with a hammer, ensuring the Floor Bracket is flush with the floor and the concrete sleeve anchor is snug to the Floor Bracket. Tighten the concrete sleeve anchor nut with fingers. Using a  $\frac{1}{2}$  in. socket and torque wrench, torque to manufacturer specs (typically 8 lb ft. for  $\frac{3}{8}$  in. concrete sleeve anchor). Tighten the Floor Bracket to the Rail Beam Support Leg.





# Cables and Control Box

## 6.1 Cable Pre-Installation

The Dragon A250 is delivered with the Cable Track rolled up and shrink wrapped at the front of the machine, just behind the Trolley. The cables are pre-connected to the various components on the Head of the Dragon A250.

The Installer will be required to unroll the Cable Track on the Cable Track Tray and route the ends of the cables to the Control Box.

## 6.2 Installing the Cable Track

### Tools Needed

- Utility Knife
- $\frac{3}{16}$  in. Allen Wrench

### Hardware Needed

- Hardware Bag No. 4

Remove the shrink wrap and unroll the Cable Track into the Cable Track Tray.

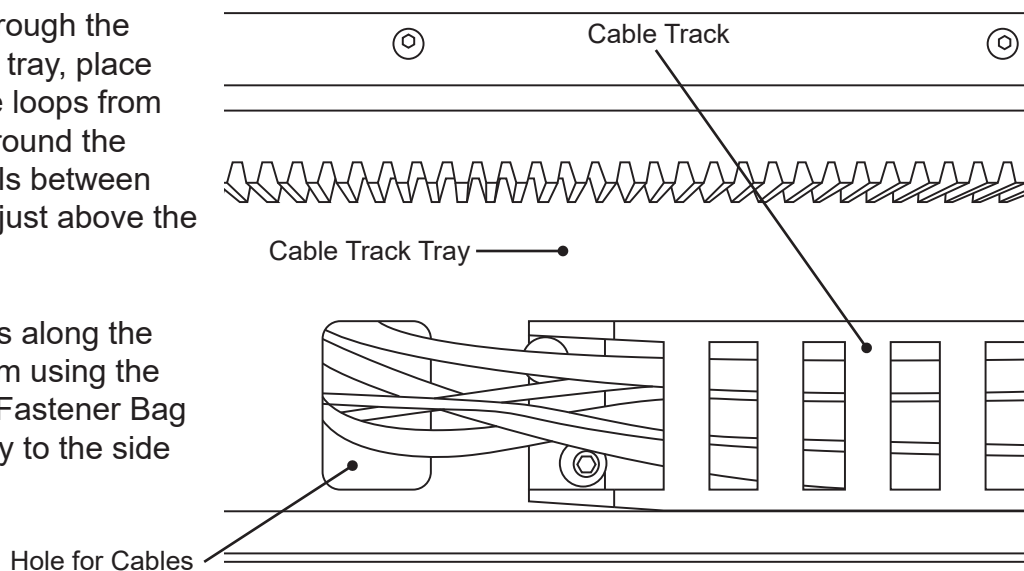
Route the cable ends through the large grommet in the Cable Track Tray.

Once the cables are routed through the hole in the cable track tray, click the end of the Cable Track into the Cable Track Guide mounted on the Cable Track Tray.

## 6.3 Routing Cables

With the cables fed through the hole in the cable track tray, place the three 1 ½ in. cable loops from Fastener Bag No. 4 around the cables at even intervals between the hole and the area just above the control box.

Secure the cable loops along the center of the Rail Beam using the T-Nuts and screws in Fastener Bag No. 4. Tighten securely to the side of the Rail Beam.



## 6.4 Connect to Control Box

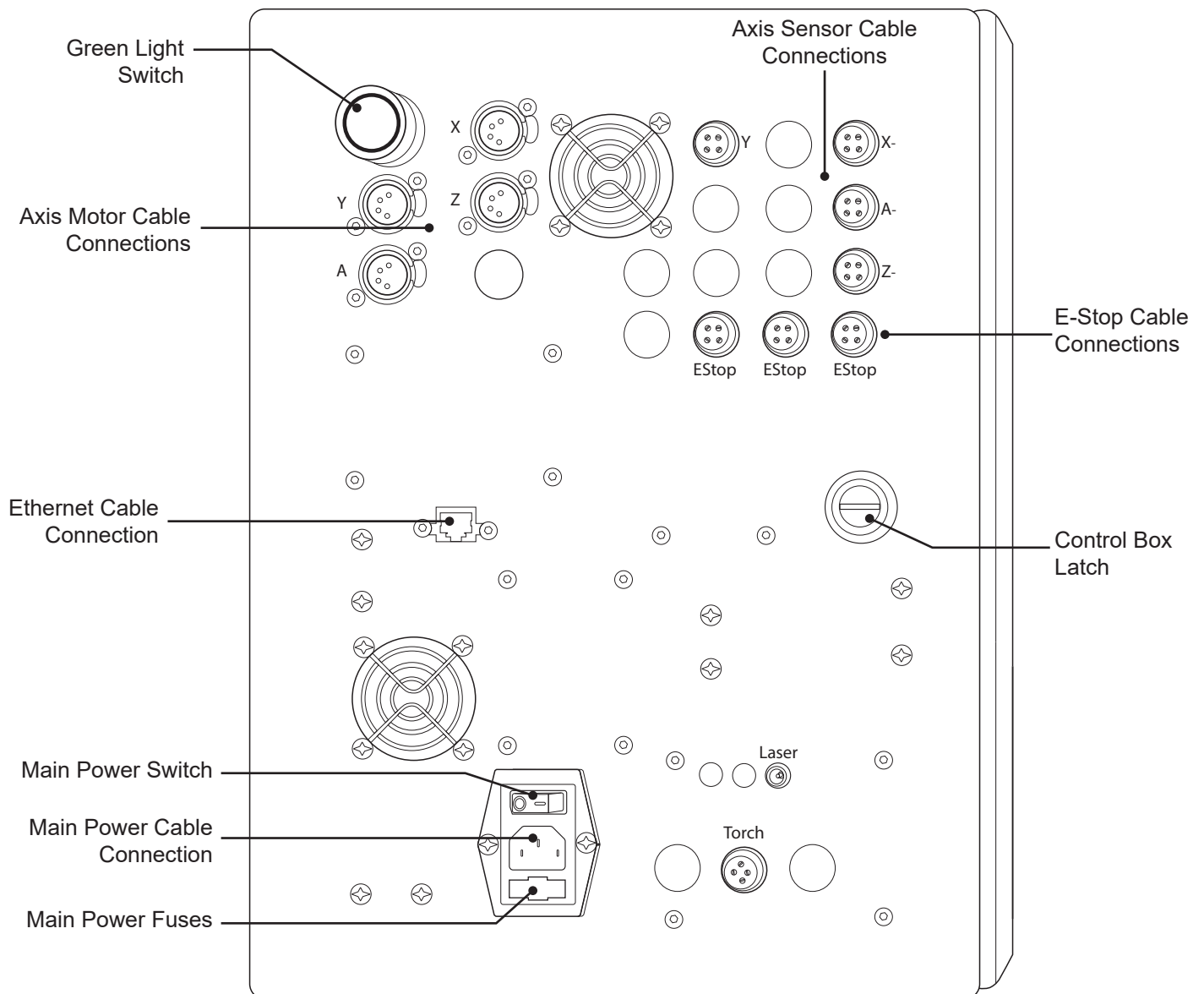
With the cables routed along the Rail Beam, insert the cables in their appropriate connections at the Control Box. Both the cables and the Control Box will be clearly labeled. Tighten securely by hand.

## 6.5 Control Box Connections

Locate the Ethernet cable, Power Cable, and Torch Cable in the Miscellaneous box. Connect the Ethernet cable to the Ethernet port on the middle left hand side of the Control box, ensuring it clicks into place.

Connect the Power Cord to the main power connection at the bottom of the Control Box, ensuring it is seated in the plug.

Connect the Torch Cable to the Torch Cable Connection at the bottom of the Control Box. Tighten the Torch Cable securely by hand.



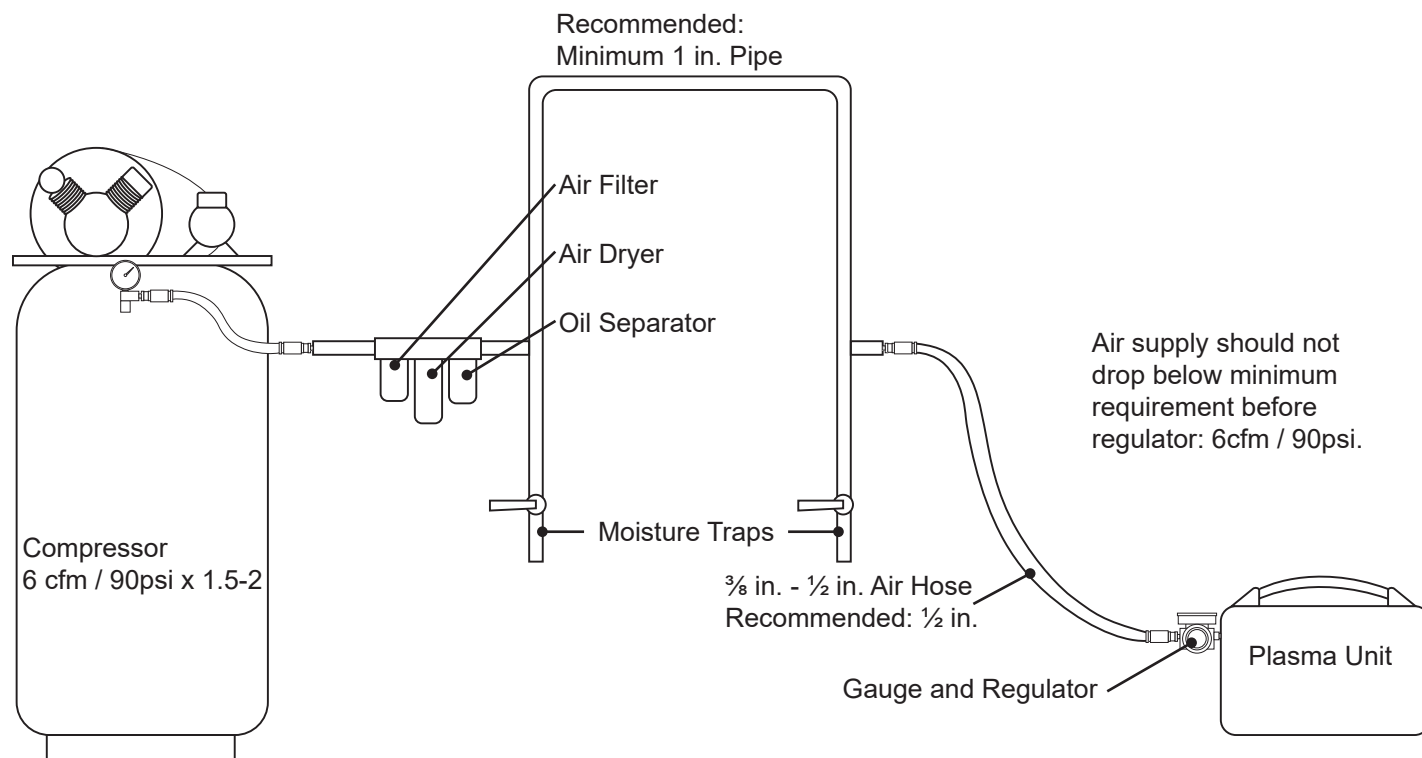


# 07

## Air Line

### 7.1 Air Line Connection Overview

The Dragon A250 requires one air line feed to the Hypertherm. It is recommended that the air supply to the Dragon A250 be equipped with an air water separator and filter.





# 08

## Torch

### 8.1 Torch Cable

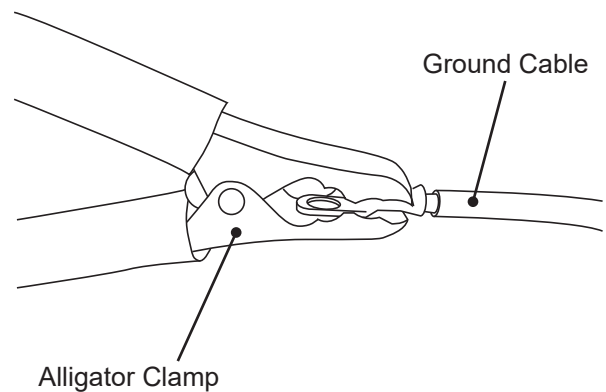
#### Tools Needed

- $\frac{3}{16}$  in. Allen wrench

The Installer should have attached the Torch cable to the Control Box as outlined in Chapter 6. Connect the loose end of the Torch Cable to the power cable connection at the back of the Hypertherm unit.

#### 8.1.1 Torch Ground

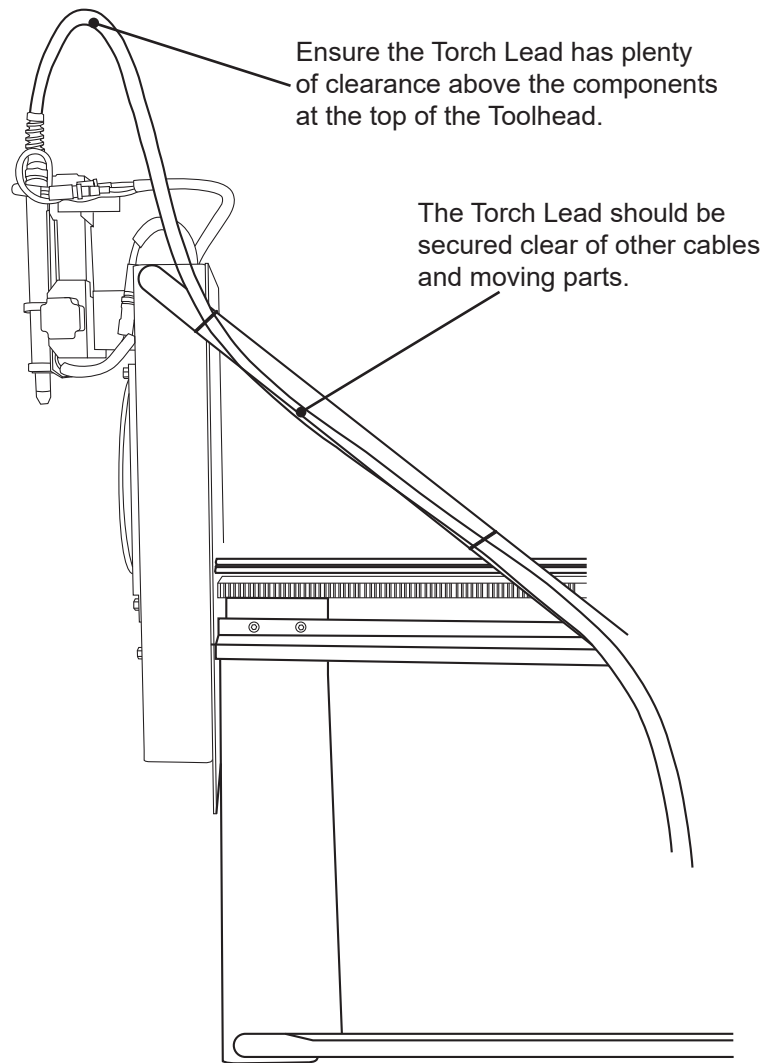
Connect the alligator clamp from the Hypertherm unit to the ground cable on the Dragon A250.



### 8.1.2 Torch Lead

When mounting the Torch wand on the Toolhead, it is up to the Customer to determine best routing for the Torch lead. Refer to diagram for recommended routing.

Bend-Tech recommends securing the Torch lead to the Head Support Strut on the left side of the machine. Ensure the Torch cable is clear of other cables and moving parts. The Torch lead transmits high voltage current which can affect the performance of other electrical components. This can create connectivity issues and possible machine malfunction.



*The Customer should ensure the Torch lead is secured so it is clear of the cables at the top of the Toolhead. It is recommended that the Torch lead be secured so it loops up above the components at the top of the Toolhead.*

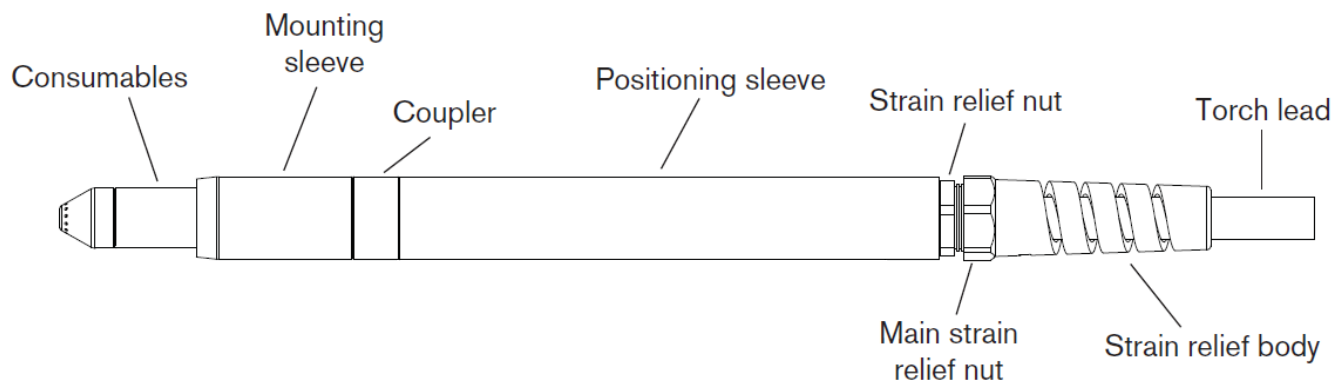
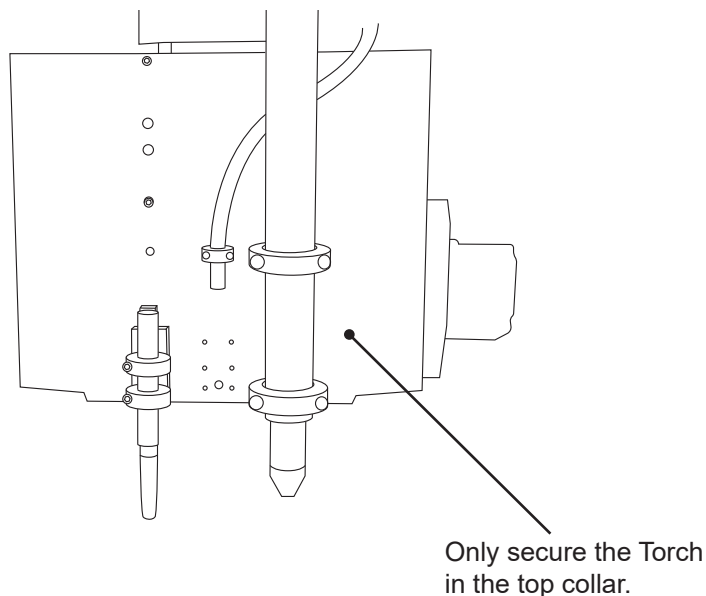


## 8.2 Install the Torch Wand

The Torch is mounted to the Toolhead using two mounting collars. For initial install, the Torch should only be mounted in the top collar.

Loosen the adjustment screws in the top collar using a  $\frac{3}{16}$  in. Allen wrench. Slide the Torch into the collar from above, with the tip of the Torch pointing down.

When the ceramic body of the Torch is nearly touching the bottom collar, hold the Torch in place and tighten the top collar securely by hand. Do not install the Torch in the bottom collar at this time.



### Important

Running the Torch Mount utility is required before the Dragon Machine is ready for operation. This utility is used to set the torch operating height. The Torch Mount procedure is outlined in the Startup and Training Manual Part 3.



## **Attention**

After completing the Dragon A250 assembly, please proceed to Startup and Training Manual Part 1.

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