

# **Bend-Tech Dragon Assembly Manual**

**IMPORTANT:** Please read before unpacking. Place shipping container in a wide open area where you will have room to work and assemble this product.

## **Shipping**

- The Dragon Machine comes in two separate shipping containers: One for the primary parts and one for the rail extension.
- The primary container's dimensions are 60x48x72 in.
- The secondary container's dimensions are 292x12x12 for the shorter machine. (Length varies by the length of machine purchased)







## **Inspection**


- Please make sure that your Dragon Machine product is properly inspected to make sure there was no damage to the machine during shipping and check to make sure that all the parts are intact and present in the containers.
- Read the list of parts included on p.2-3.

## Parts Included

	1/2 inch bolt: 3/4 inch socket	<u>Dragon</u> 12 foot      21 foot x4              x7
	1/2 inch washer	<u>Dragon</u> 12 foot      21 foot x4              x7
	3/4 inch hex nut	<u>Dragon</u> 12 foot      21 foot x4              x7
	2 inch 9/16 coupling nut	x2
	5v Power Source (for operator panel box)	x1
	Machine Power Cord	x1

	Operator Panel Box	x1
	Parallel Cord (For operator panel box. Located on part catcher)	x1
	Zip Ties	Generous Amount
	Fastener Screws	x2

### Tools Required

	3/8 to 1/2 inch Drive Ratchet
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8 inch Socket Extension



1/2 inch Socket  
(For shipping bolts and part catcher)



9/16 inch Socket






3/4 inch Socket



3/8 inch socket



Power Drill w/Phillips Head Bit  
(For opening shipping container)

	<p>Wire Cutters (For zip ties)</p>
	<p>5/16 inch Hex Wrench, 1/8 inch Hex Wrench &amp; 3/16 inch Hex Wrench.</p>
	<p>Hand Truck (Dolly) (Recommended)</p>

## Unloading the Machine



**Step 1:** Using your **power drill** and **phillips head bit**, remove the screws and disassemble the primary shipping crate and remove the top of the secondary crate. Place wooden pieces aside and out of the way.



**Step 2:** Also using your **power drill** and **5/16 inch hex wrench**, remove any additional shipping screws and bolts from the base of the machine, beak



and part catcher. Move the beak and part catcher aside to easily access the bulk of the machine with the **hand truck**.



**Step 3:** Use either the **hand truck** or the help of two additional people to remove the machine from the shipping crate and place it in the general area where it will be assembled.

### **Dismantling the Support Leg**

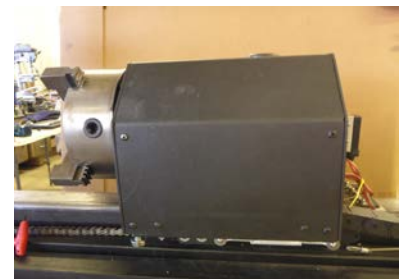


**Step 1:** Using the **ratchet** and **3/4 inch socket** attachment, remove the bottom **3/4 inch bolt** underneath the end of the rail where it is secured to the support leg. (**Save this bolt along with the nut for Assembling the New Rail: Step 1.**)



**Step 2:** Switch to the **9/16 inch socket** and remove the top two remaining **9/16 inch bolts**.

Now, remove the support leg and **retrieve the new rail from the shipping crate at this point.**

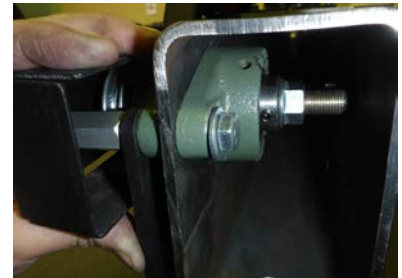




## Assembling the New Rail



**Step 1:** With the help of a friend, and some sturdy supports to prop up the new rail, line the tail end of the supported rail up to the end leg from the previous step and affix the rail, support leg and pulley system together with the **3/4 inch nut and bolt** for the pulley center, **9/16 inch bolts, washers and coupler nuts** provided.



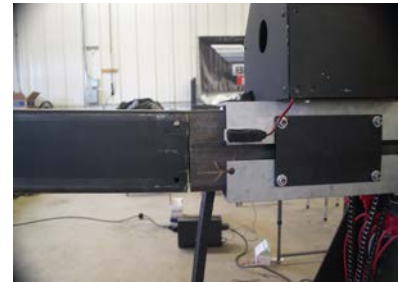
**Be sure to remember the 3/4 inch bolt and corresponding nut from Step 1 of Dismantling the Support Leg that will be secured to the bottom.**



**NOTE:** The supports used to prop up the bulk of the new rail (Not Included) should raise the bottom edge up roughly 29 - 29 1/4 inches off the ground to match the height of the stock rail.



**Step 2:** Line up the bare end of the new rail with the 3 foot stock rail in preparation to transfer the chuck to the new rail.



## **Transferring the Chuck**



**Step 1:** Use the **chuck key** located in the slot on the top of the chuck to loosen the chuck from the gate. Turn the key clockwise to draw the teeth of the chuck inward and release it from the gate.



**TIP:** Using the **5/16 inch hex wrench** and loosening the bottom 2 bolts on the front plate directly below the chuck may make the chuck transfer process much easier.



**Step 2:** As a recommendation, we urge you to degrease the rail and wipe it down with a rag to remove any unnecessary shipping grease before sliding the chuck on. This will make the transfer process easier and keep your machine running as smooth as possible.





**Step 3:** With the help of another person, slowly slide the chuck onto the new rail making sure to support the new rail from the tail end. The tail should not wobble or raise up off the ground during this step.



**Step 4:** If you have loosened the bottom plate on the chuck as mentioned in the previous tip, use the **5/16 inch hex wrench** to tighten the bottom bolts now.

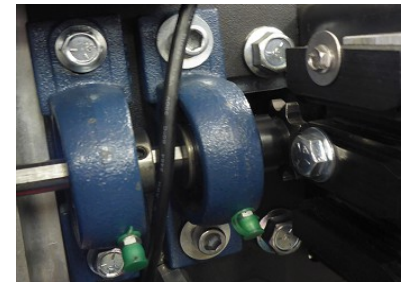


**Step 5:** Using the **ratchet, 8 inch socket extension** and **3/4 inch socket**, remove the bolts on both sides of the machine where the stock rail meets the inside of the face plate. Do this to prepare it for removal and replacement. You may also need a **3/4 inch wrench** to secure the nuts from inside the rail as you remove the bolts. Be sure to support the stock rail as it will become loose.



## Assembling the Machine

**Step 1:** With the machine in multiple sections, remove the stock rail (set aside) and install the new **plastic chain guide block**. Loosely affix the guide block to the rail end nearest the front of the machine using the nuts and bolts provided. **NOTE: You will have to reach a wrench inside the rail to achieve this.**



**Step 2:** Align the center of the guide block with the inner chain gear then tighten the 2 bolts of the block.



**Step 3:** Now, use the **hand truck** (or the help of another person) to move the head of the machine toward the new rail. Then, insert the bare end into the rail slot on the head.



There should be a small gap between the chain guide block (from the previous step) and the sprocket in front of it (attached to the machine head).





Using the **ratchet**, **8 inch extension** and **3/4 inch socket**, fasten the rail to the front end of the machine. This will take all four **3/4 inch bolts** that were removed in step 5 of the dismantling process. **You may now remove the supports propping up the length of the rail.**



**The rail should now be completely attached and secured to the rest of the machine.**



**Step 4:** Working on the front of the machine now, take the beak and attach it to the front face using the **ratchet** and **3/4 inch bolts** provided.

(The part catcher must be removed from the beak in order to place the beak inside of the beak slot on the head of the machine. Place the **1/2 inch**



**bolts** aside until step 5.)



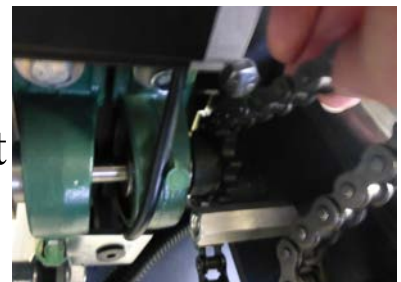
**Step 5:** Use the **ratchet** and the **1/2 inch socket** to lightly secure the part catcher to the beak. This will require the two **1/2 inch bolts** that were removed from the part catcher in step 4.



**Step 6:** Using the **wire cutters**, cut the zip tie holding the chuck chain together and unwind it in preparation to extend it out and connect it to the base of the machine's gear system.



**Step 7:** Guide the end of the chain and steel cord through the chain guide block and around the machine's sprocket. Pull it tight to allow the teeth of the sprocket to settle within the links of the chain.



**Step 8:** Lead the cord (on the end of the chain) through the one inch square tube located along the side of the rail. Then, guide the end of the cord under the first bolt and around the pulley so that it rests in the groove on the top edge of the pulley.



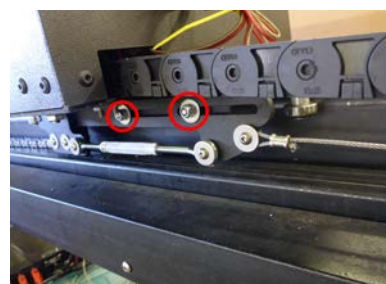


Next, attach the loop on the end of the cord to the bolt on the very rear end of the chuck trolley.

**Step 9:** Adjust and tighten the **nut and bolt** with a pliers and a **1/8 inch hex wrench**.



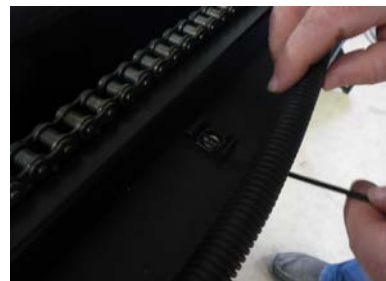
**Step 10:** The **turnbuckle** and the **two hex bolts** above it on the support plate will adjust so that it doesn't rest on the square tube below it by tightening up the slack on the chain and cable.



**Step 11:** The track with the connector wires inside of it should rest on top of the square tube. Using the **1/8 inch hex wrench**, screw in the **two fastener screws** into the pilot holes where the track meets the cable wrap. This is located on the rail nearest the back leg.



**Step 12:** Using the **zip ties** provided in the shipping box, affix the cable wrap to the rail on the **three** separate, plastic connector locations.







**Step 13:** Attach the pulley guard to the pulley on the tail of the rail using the **5/16 hex wrench** and corresponding **5/16 inch bolts**.



**The chain, cord wrap and pulley guard should now be securely attached to the rail.**



**Step 14:** Be sure to walk around the machine and cut off **all** zip ties that will inhibit the machine's movement.

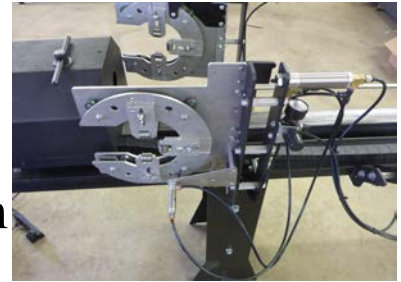


**Step 15:** Use the **3/8 inch socket** and **phillips head screwdriver** to remove the L-bracket located on the top of the tool changer head.



## Attaching the Center Support Gate – For 21' Dragon

**Step 1: For Square** - Position the center gate horizontally underneath the center location of the rail and lift up on the gate structure to stand it upright and align it with the bolt holes.



**Step 1: For Round** – Position the center gate in line with the bolt holes in the center location of the rail. **Tip:** The lip underneath the rail may prevent you from butting the gate up to the rail entirely, so you may have to lift up on the rear of the machine to be able to slide the gate into position.



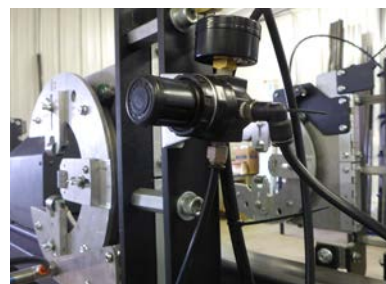
**Step 2:** Using the **ratchet** and **3/4 inch socket**, connect the gate to the rail with **2 of the 3/4 inch nuts and bolts**.



**Step 3:** Also using the **ratchet** and **3/4 inch socket**, connect the pressure switch to the rail with the last **3/4 inch nut and bolt**.



**Step 4:** Push the air line into the bottom of the air pressure regulator to connect it.



**Tip:** Adjusting the bolts connected to the gate's swinging arm to allow for clearance may be a necessary step.

### **Electronic Connections**



**Step 1:** Use your fingers or the ratchet and 3/8 inch socket to remove the 3/8 inch nuts securing the bottom electronics guard plate underneath the back side of the gate. Remove the guard plate itself to reveal the electronics core.



**Note:** If you are using 230v instead of the standard 115v, you will have to change the voltage settings. Please see the Voltage Settings page at the end of this manual for further details on how to change this.



**Step 2:** Connect the **parallel cord** to both the back of the machine's electrical core and the **operator panel box**. Make sure to secure them both by tightening the set screws on each end of the cord.



**Step 3:** Connect the **5v power source** to the back of the **operator panel box** and connect the other side to a wall outlet.



**Step 4:** Connect an Ethernet cable from your operator panel box to your computer.



**Step 5:** Return the electronics guard plate and use the **ratchet** with the **3/8 inch socket** to secure the four **3/8 inch nuts**.



**Step 6:** Connect the **machine power cord** to the machine underneath the electronics guard plate and connect the other side to a wall outlet.



**Step 7:** Attach the alligator clamp from your torch power source to the ground wire underneath the machine's electronics core.



**Step 8:** Attach the torch trigger connection from the machine's electronics core (with the red and black wires) to the back of your torch power source.



**Step 9:** Attach your air hose to both the back of the torch power source and to the back of the machine located on the electronics guard plate.



**Step 10:** Flip the switch on the back of the operator panel box. The red light will turn on to indicate that it is running. Make sure to flip this switch first.



**Step 11:** Flip the switch on the electronics core panel. The machine motors will turn on and begin humming to indicate that the machine is running.





# Modifying and Installing your Hypertherm Torch

**For Hypertherm: 45 Amp** If your Hypertherm 45 torch is brand new or unaltered, there are a few adjustments that must be made to the torch itself in order to install it onto the Dragon machine's tool head.

**Step 1:** Remove the brass teeth from the torch itself by using a **phillips head screwdriver**. There are **2** screws that must be removed in this step.

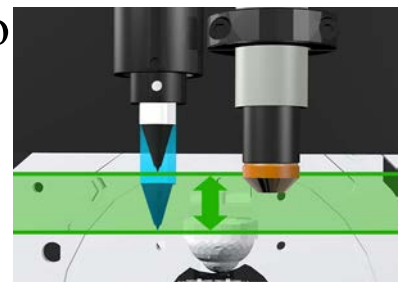


**Step 2:** Set aside the **remote on/off pendant** as we will be using the Dragon software to control the machine.



**Step 3:** Install the torch head into the adjustable mounting brackets on the face of the tool head plate.

**Note:** The height of the torch tip should lie within the stroke of the engraver tip next to it. This is to ensure that the torch will not crash into large diameter tubing while the engraver is in use. The mounting brackets will then be tightened with a **3/16 inch hex wrench**.



**For Hypertherm: 65 Amp** Installing and modifying your 65 amp torch is slightly different than with the 45 amp. Follow the steps below in order to install the 65 amp torch onto your Dragon machine.

**Step 1:** Remove the red rubber cap at the head (if attached) and use a **phillips head screwdriver** to remove the 3 screws accessible from the head of the torch.



**Step 2:** Now, loosen the connection at the rear of the torch by unscrewing the clasp attached to the air hose. (As seen in picture.)



**Step 3:** Then, loosen the section of the ceramic torch nearest the head, remove it and set it aside. **Note: The bulk of the torch will turn; not the section nearest the head.**



**Step 4:** Finally, loosen the next ceramic section all the way and maneuver it to one side in order to slide the brass teeth out from its slot on the torch.



**Step 5:** Reassemble the torch in the order it was taken apart (minus the brass teeth), and make sure to line up the pin inside of the torch with the first ceramic section that was removed.



**Step 6:** Tighten up all of the parts by screwing on the rear clasp last, then return the **3 phillips head screws** to their original positions at the head of the torch.



**Step 7:** Set aside the **remote on/off pendant** as we will be using the Dragon software to control the machine.



**Step 8:** Install the torch head into the adjustable mounting brackets on the face of the tool head plate. **Note: The height of the torch tip should lie within the stroke of the engraver tip next to it. This is to ensure that the torch will not crash into large diameter tubing while the engraver is in use.** The mounting brackets will then be tightened with a **3/16 inch hex wrench**.



**Thank you for following this assembly guide.**

**The next step is to set up your Bend-Tech Dragon software and follow through our Calibration wizard.**

**Support Concerns or Questions:**

**Michael**

**Support Team**

**2020 Software Solutions, Inc.**



**Contact Info**

Phone: [651-257-8715](tel:651-257-8715)

Email: [michael@bend-tech.com](mailto:michael@bend-tech.com); [support@bend-tech.com](mailto:support@bend-tech.com)

Website: [www.Bend-Tech.com](http://www.Bend-Tech.com)

Address: 33510 Lincoln Rd, Lindstrom, MN 55045

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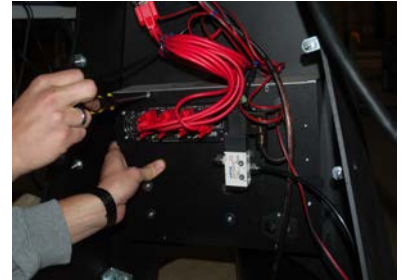
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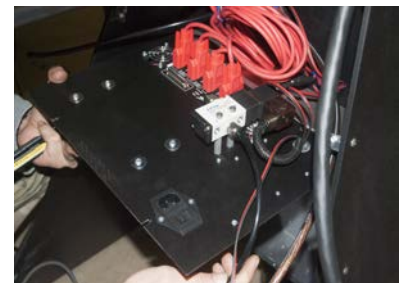
# Voltage Settings

## For voltage other than 115v.

**Step 1:** With the electronics guard plate removed, use a **phillips head screwdriver** to remove the four screws securing the electronics core.



**Step 2:** Lifting up from the bottom and making sure not to free any wires from their positions, tilt the bottom of the electronics core toward you to reveal the red switch on the underside.



**Step 3:** Flip the red switch so that it reads 230v.



**Step 4:** Return the electronics core to its original position and secure the panel with the four screws using the **phillips head screwdriver**. Then, make sure to secure the electronics guard plate with the four **3/8 nuts**.

