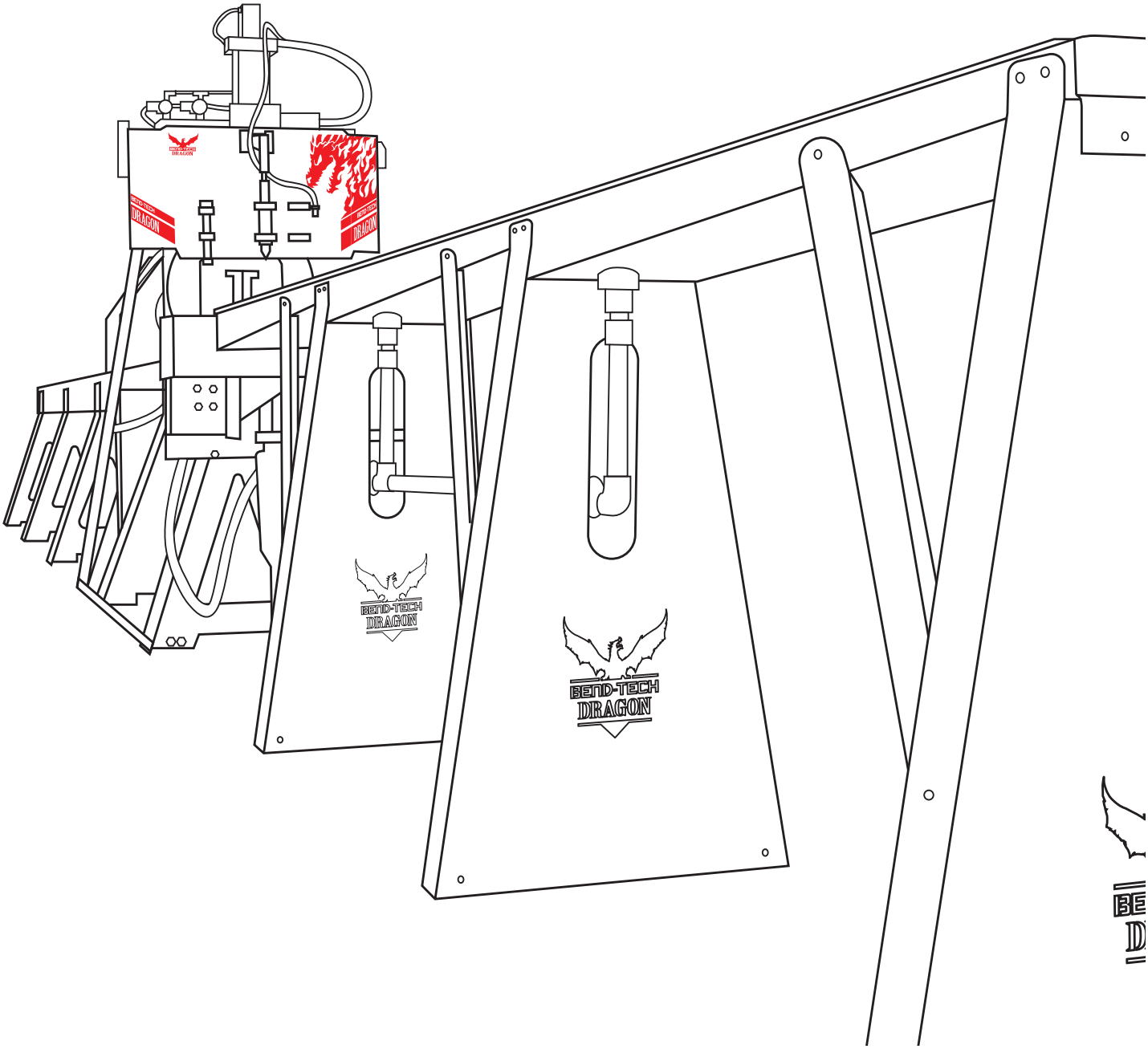
Part 1 of 1

BEND-TECH

DRAGON MACHINES

Material Coolant System
Assembly Manual



Revision 09.5 | English

Dragon Machines

Material Coolant System
Assembly Manual

Revision 09.5

English
Original Instructions

November 2022

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Contents

Limited Warranty

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

The standard 2-year software maintenance plan is included with the purchase of a Dragon. Before the 2-year maintenance plan has expired, the customer may purchase an extended maintenance plan. The maintenance plan and extended maintenance plans 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 Satisfaction Commitment

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 am - 5:00 pm 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
Support team: support@bend-tech.com

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

Customer Service

Comments, questions, or concerns regarding the Dragon Machine, this manual, or the Bend-Tech Software can be directed to Bend-Tech sales and service representatives at the above contact information. Check out the following links for more information regarding Dragon Machines and Bend-Tech Software.

Website, Socials, and Online Resources

- http://www.bend-tech.com
- https://www.facebook.com/2020ssi
- https://www.instagram.com/bend_tech
- https://www.youtube.com/bendtech2020
- http://www.bend-tech.com/wiki7

01 Parts and Equipment

1.1 Parts List

Cooling System

- Plug Kit
- Aluminum Trays (3)
- Aluminum Support Legs (3)
- Parts Catcher
- Reservoir
- Hose (installed in the Cable Track)
- Control Box Shield (2)

Cooling System Hardware

(shipped inside water reservoir)

- Hardware Bag
- Trolley Hose
- Material Rollers (3)
- Clear Silicone (1)
- PVC Cement (1)
- Cushion Clamps (6)
- Leveling Feet (6)
- Disposable Mesh Bags (2)
- 8 in. zip ties (8)

Fastener Bag

- Nuts (54)
- Washers (54)
- ¾ in. Button Head Hex Screws (40)
- 1 in. Button Head Hex Screws (14)

PVC Components

- Coupling (5)
- Union (3)
- Bung (4)
- Tee (2)
- Elbow (2)
- Pipe (11)

1.2 Tools and Equipment

Cooling System Tools List

- 3⁄16 in. Allen wrench
- Rubber Mallet
- 3⁄8 in. Ratchet
- 7⁄16 in. socket
- 9⁄16 in. socket
- Cordless drill or driver with 3⁄8 in. drive or adapter
- 9⁄16 in. wrench
- ½ in. wrench
- Flat head screwdriver

02 Material Coolant System Assembly

2.1 Overview

The Dragon Material Coolant System enables the machine to achieve cleaner cuts with less dross or slag. The material coolant system also reduces plasma dust and toxic gas during the cutting process. While the material coolant system will help the Dragon machine achieve cleaner cuts on any material, it is especially effective when cutting aluminum and stainless steel.

2.1.1 Cooling System Assembly Tools

Before assembling the material coolant system, ensure the required tools are available. The following tools are required to assemble the material coolant system:

Tools Needed

- 3⁄16 in. Allen wrench
- 9⁄16 in. Wrench
- 3⁄8 in. Ratchet
- 7⁄16 in. socket
- 9⁄16 in. socket
- Impact driver with 9⁄16 in. socket
- ½ in. Wrench
- Slotted or Flat blade screwdriver
- Punch or small Phillips screwdriver
- Utility knife
- Rubber mallet or plastic dead blow hammer
- Large channel lock pliers

2.2 Coolant Tray Components

The coolant trays are placed at the Head of the machine. The coolant trays serve as both parts catcher and coolant drainback system for the coolant system. Before beginning assembly, ensure that all components for the coolant trays are present. The coolant Trays consists of:

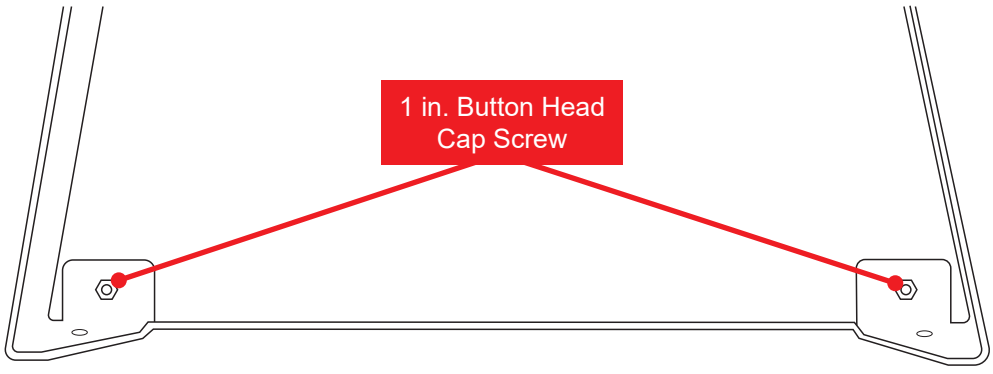
- Aluminum Trays (3)
- Aluminum Support Legs (3)
- Parts Catcher (1)
- Support Leg Braces (6)
- Parts Rollers (3)
- Leveling Feet (6)
- C Bracket (1)

2.2.1 Parts Catcher and Support Leg Removal

It will be necessary to remove the parts catcher, parts tray, and support leg from the Beak of the machine, prior to assembling the material coolant system. Use a 3⁄16 Allen wrench to remove the four screws that hold the parts catcher at the front and back end of the Beak. Remove the eight screws that hold the parts tray where the Beak mounts to the Head of the machine. Use a 3⁄16 in. Allen wrench to remove the four Support Leg screws and spacers.

2.2.2 Support Leg Gusset

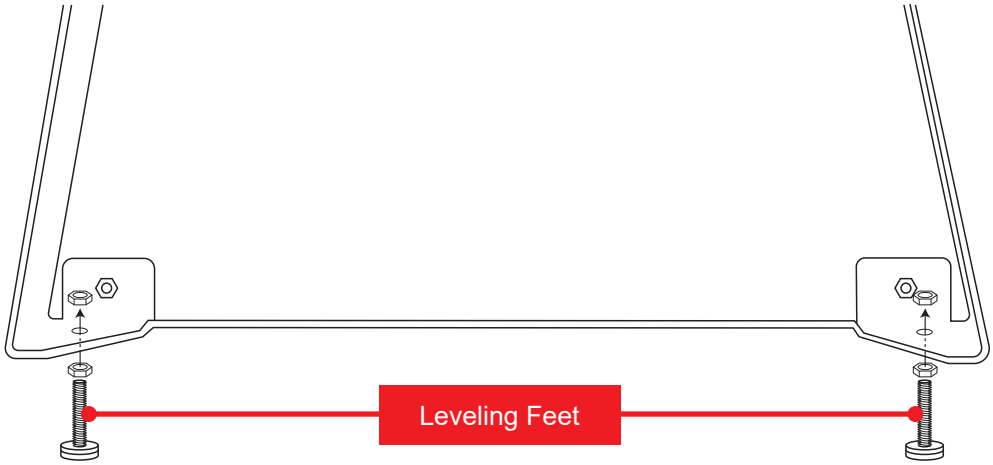
The bottom of each support leg is constructed with an integrated gusset design. In each corner, secure the gusset using a 1 in. Button Head Hex Screw, washers and nut. Place a washer on the 1 in. Button Head Cap Screw and insert into the hole in the Support Leg and gusset. Place a washer on the inside and thread a nut onto the Button Head Cap Screw. Use a 3⁄16 in. Allen wrench and 7⁄16 in. socket and ratchet to tighten the nut, securing the gusset.



2.2.3 Leveling Feet

Locate the Leveling Feet in the hardware bag. Thread a nut onto each leveling foot, leaving about an inch between the base of the foot and the nut. Insert a Leveling Foot into the hole at the bottom of each Aluminum Support Leg.

Thread a second nut onto the Leveling Foot after inserting it in the mounting hole on the bottom of the Aluminum Support Leg. Do not tighten. Leave space for adjustment of the support legs.

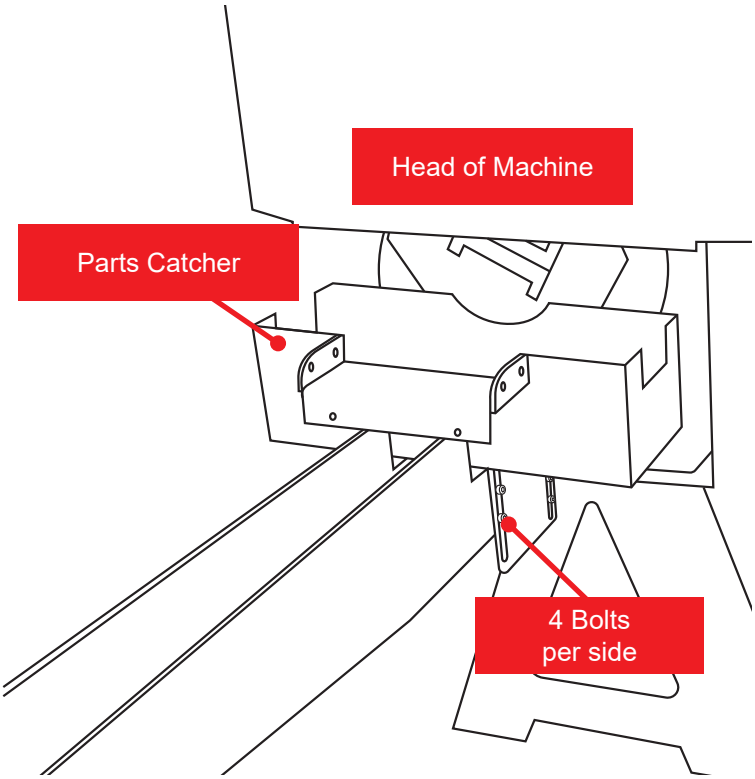


2.2.4 Parts Catcher

Place the parts catcher on the Beak at the Head of the machine, just in front of and under the Gate opening.

Locate eight ¾ in. button head screws, nuts and washers from the hardware bag. Insert the eight fasteners through the slotted opening in the Parts Catcher, aligning them with the holes in the Beak.

Ensure the screw heads are on the outside of the assembly and the nuts and washers are on the inside. Thread the nuts on and snug them down. Do not tighten the nuts at this time.

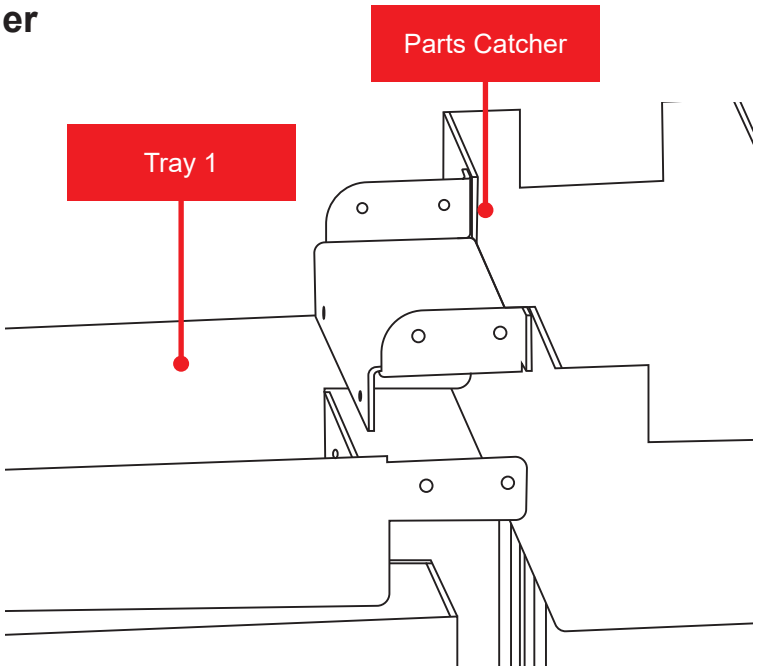


Important

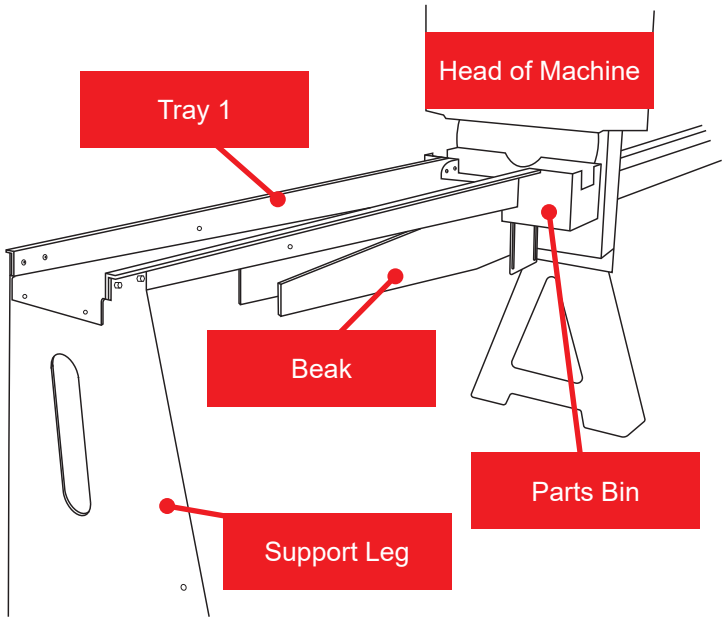
Bend-Tech recommends enlisting a helper when assembling the Water Tray System.

2.2.5 Attach Water Tray to Parts Catcher

When assembling the coolant trays, the face of the tray is placed behind the flange of the previous coolant tray. The first coolant tray will connect to the parts catcher in the same fashion. Position the first tray behind the lip of the parts catcher.



Use one of the support legs to support the free end of the Water Tray. Use four ¾ in. button head screws, nuts and washers to attach the side tabs on the coolant tray to the parts catcher. Feed the screws through the side of the coolant tray so the head of the screw is inside the coolant tray and the nut and washer are on the outside.

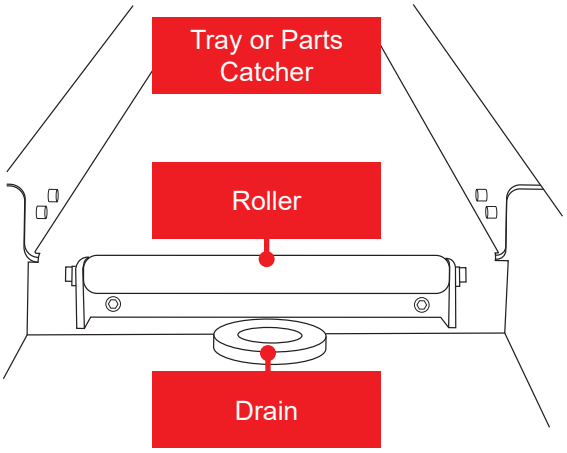


Tip

Use a punch or small Phillips head screwdriver to help align the mounting holes in the Water Tray system.

Locate one of the rollers from the parts bag. Using two 1 in. button head screws, nuts and washers, attach the roller on the inside face of the coolant tray where it connects to the parts catcher. Feed the button head screw through the roller and through the mounting holes in the Water Tray and the parts catcher. Ensure the roller is placed as far up as possible.

Tighten all fasteners finger tight.



Important

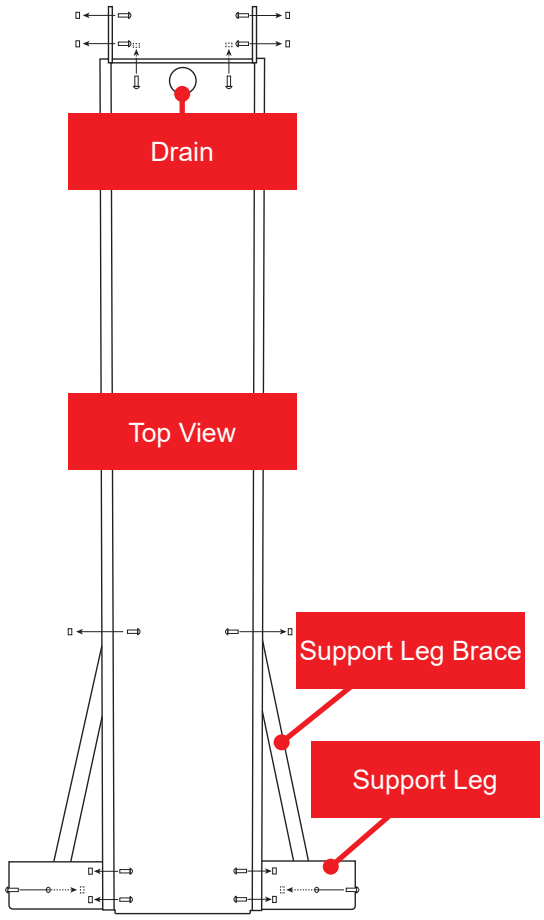
Do not fully tighten any fasteners on the coolant tray assembly until all of the components are connected.

2.2.6 Water Tray System Assembly

Position the second coolant tray behind the lip of the first coolant tray. Use a second support leg to support the free end of the second coolant tray.

Position the first support leg so the mounting surface is on the outside of both water trays. Align the four mounting holes in the support leg with the holes on the sides of the first coolant tray and the side tabs on the second coolant tray.

Fasten the sides of the coolant trays and support leg together using four 1 in. button head screws, nuts and washers. Ensure the heads of the screws are on the inside of the water tray and the nuts and washers are on the outside. Do not tighten.

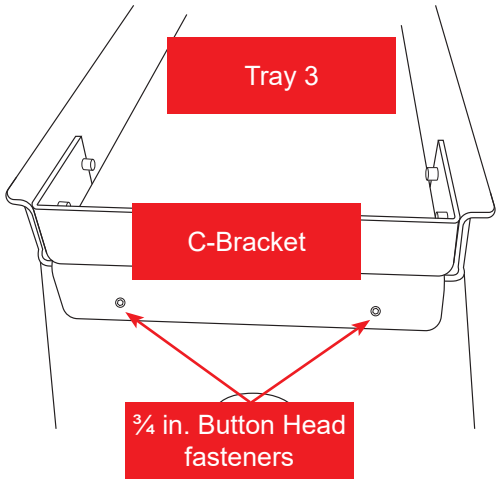


Using ¾ in. button head screws, attach a Parts Roller at the front of the coolant tray, feeding the button head screw through the roller, the flange of the first coolant tray and front of the second coolant tray. Place a washer and nut on each button head screw and tighten finger tight.

Repeat this process with the third coolant tray.

2.2.7 C-Bracket

Place the C-Bracket at the front end of Aluminum Tray No. 3. Align the mounting holes of the third support leg with the holes in the Water Tray and C-Bracket.



Insert four ¾ in. button head fasteners with the heads on the inside of the Water Tray and the nuts and washers on the outside of the support leg.

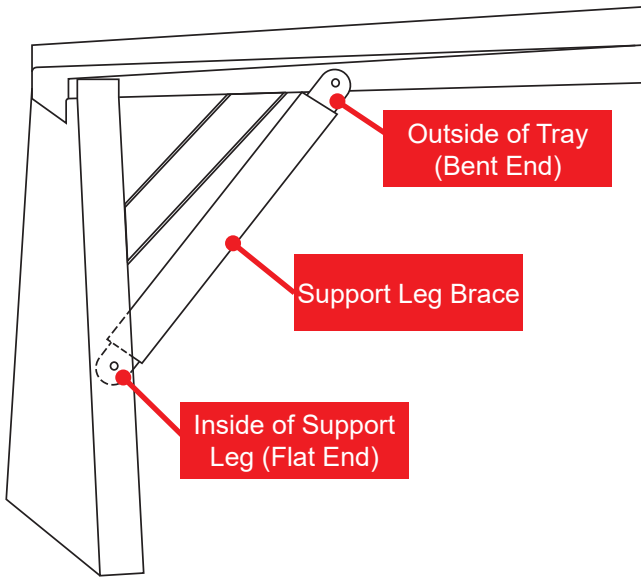
Below the C-Bracket, insert two ¾ in. button head fasteners, with the heads on the outside of the tray flange and support leg and the nuts on the inside, to secure the third tray flange to the third support leg.

2.2.8 Support Leg Braces

Starting at the front of the system, use (12) ¾ in. button head screws, washers and nuts to attach the support leg braces to the support legs and the coolant trays.

Attach the flat section of the support leg brace to the inside the of the support leg, inserting the button head screws so the head is on the outside of the support leg and nut and washer are on the inside.

Attach the bent end of the support leg brace to the outside of the coolant tray, feeding the button head screw from the inside of the coolant tray and the nut and washer are on the outside.



2.2.9 Finishing the Coolant Tray Assembly

Finish the coolant tray assembly by first positioning the parts catcher in the desired position on the Head of the machine and tightening securely. Working front to back, use a 3⁄16 in. Allen wrench and 7⁄16 in. wrench to tighten all fasteners on the coolant trays and the support leg braces. Tighten securely. Take care to position the rollers so they sit above the surface of the coolant trays, adjusted as high as possible.

Tip

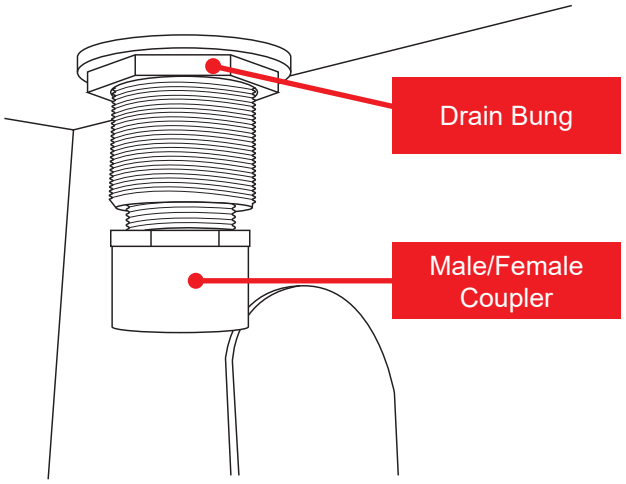
When in use, the rollers should keep parts from resting on the bottom of the coolant trays.

2.3 Water Tray Drain System

The material coolant system's drain system collects water from the coolant trays, holds it in the coolant system reservoir and recirculates it back through the material.

2.3.1 Bung Installation

Locate the four drain bungs in the PVC parts bag. Remove the coupling nuts from each drain bung. Insert a bung into the drain hole in each coolant tray and in the parts catcher. Thread the nuts back onto each bung underneath the coolant tray and tighten securely using a large channel lock pliers. Locate the male/female couplers in the PVC parts bag. Thread one PVC male/female coupler into each drain bung.



Also thread one PVC coupler into the bung inside the parts catcher. This will allow the parts catcher to hold water to help cool parts.

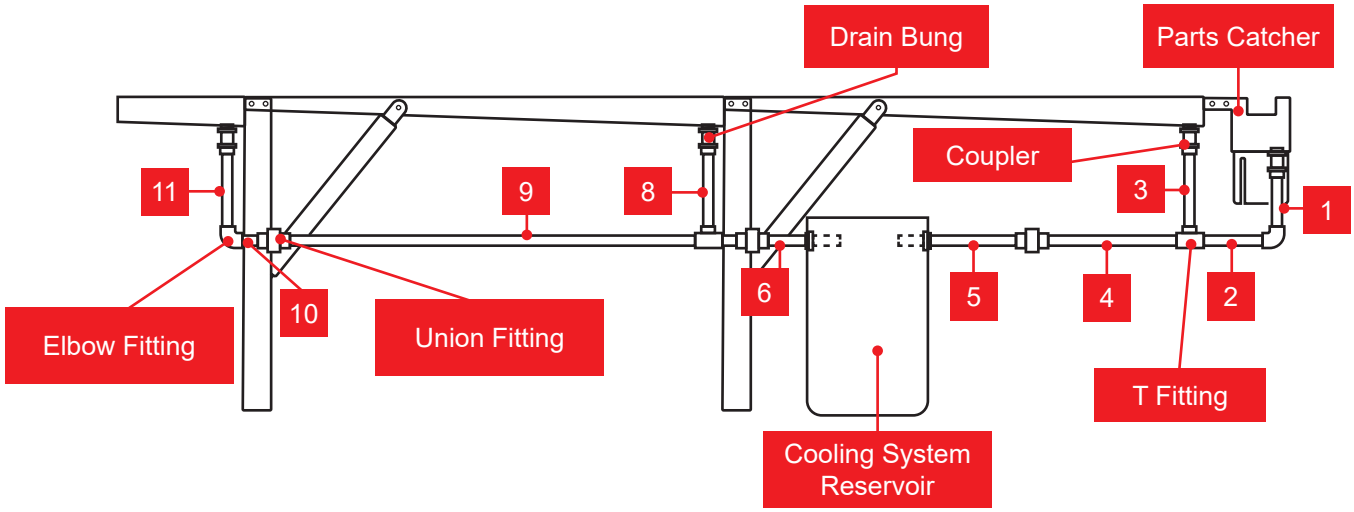
Tip

Teflon tape or plumber's tape will help seal the male/female coupler in the drain bung.

2.3.2 PVC Drain Installation

The PVC drain system is installed beginning at the parts catcher and then working to the end of the trays. The PVC parts are numbered in order of installation. During this process the Installer will also place and connect the coolant reservoir. Using PVC cement, install the parts per diagram 2.3.3.

2.3.3 Tray System Drain Diagram



2.3.4 Placing the Cooling System Reservoir

Place the coolant reservoir according the diagram in section 2.3.3. Install the screens on the drains feeding into the coolant reservoir. Secure using zip ties.

Fit the No. 5 and No. 6 PVC pieces through the grommets in the reservoir.

2.4 Water Pump

The material coolant system requires a water pump to be operational. Because customer needs can vary, Bend-Tech does not supply a water pump with the coolant system. The Customer will be required to supply a water pump to complete the coolant system. Refer to section 2.4.1 for water pump specifications.

Important

Depending on the size of the the water pump used, the pump may need to be placed into the reservoir prior to connecting the reservoir to the rest of the PVC drain system.

2.4.1 Water Pump Requirements

The water pump must be submersible and able to fit inside the coolant reservoir. The pump must have the capacity to adapt to ¾ in. GHT (garden hose) fittings.

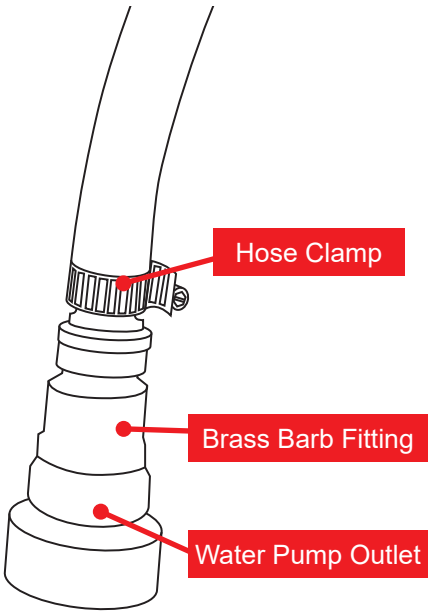
2.4.2 Recommended Water Pump Specifications

Voltage	120VAC
Running Amps	3.84
Horsepower	.5
Volume	2500GPH

2.5 Connect and Install the Pump

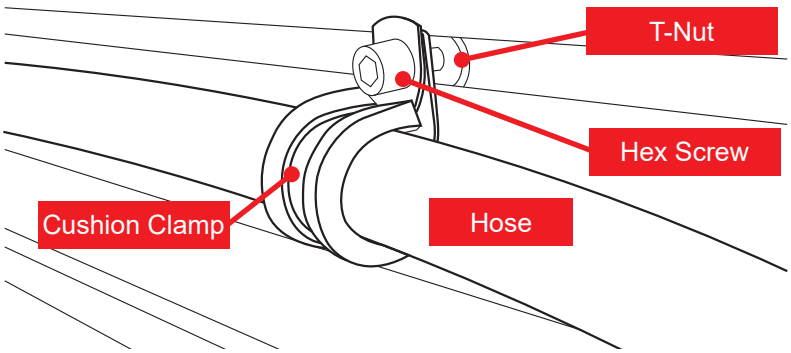
Locate the brass ¾ in. FGHT to ¾ in. barb fitting and attach to the water pump. Using a hose clamp from the hose attachment bag, place the clamp over the end of the long hose and slip the hose onto the barbed fitting. Tighten the hose clamps securely.

With the hose attached to the pump, set the pump inside the coolant reservoir. Install the cover on the coolant reservoir, routing the water pump power cord and hose through the opening in the cover. Attach the wireless remote-control outlet to the water pump power cord, and then the yellow GFCI power cable to the remote-control outlet.



2.6 Securing the Hose

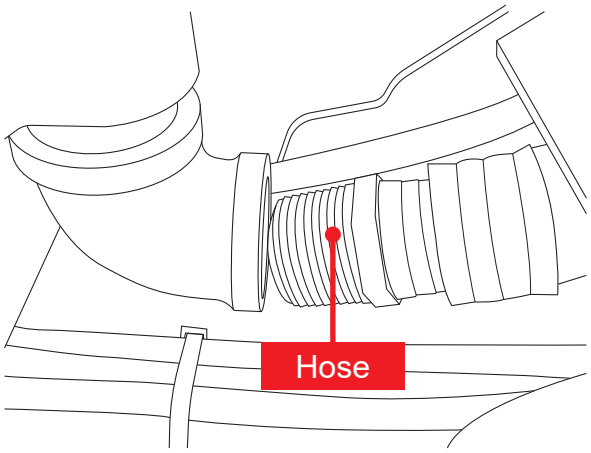
The hose will come routed through the cable track, but the remainder of it will need to be secured to the machine. Use the provided cushion clamps to ensure the length of hose from the coolant reservoir to the cable track is secured to the rail beam.

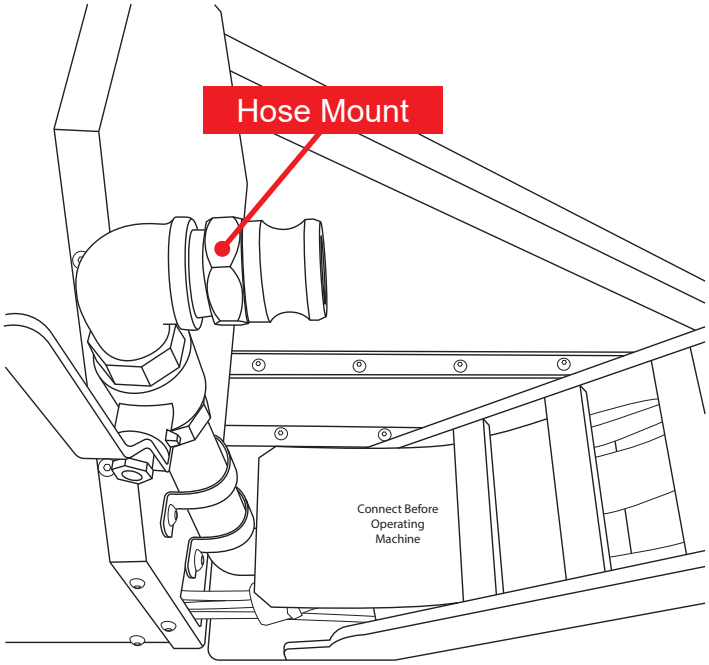


Locate the T-nuts and ½ in. hex screws from the hardware bag, along with the cushion clamps. Loop the cushion clamps around the hose, spacing evenly at intervals along the beam. Attach the cushion clamps to the beam using the T-nuts and hex screws.

2.7 Connect the Hose

The Hose Mount is fastened to the back of the trolley. The Hose will need to be connected prior to operating the machine. Use a 1-1/8” Wrench to tighten the hose fitting.





2.8 Connect the Trolley Hose

The Material Coolant System comes with short trolley hose that has a cam lock on each end. Connect one end to the Hose Mount. The other end will connect to the Round, Square, and Rectangle Coolant Plugs or the Trolley Coolant Plug. More information regarding the Coolant Plug types can be found in Chapter 3.

2.13 Leveling the Coolant Trays

To ensure even water flow in the coolant trays, it is important the coolant trays are level side-to-side and front to back. Use a bubble level placed on the edges of the coolant trays to determine if the system is level. Adjust the system using the Leveling Feet. Use a 7⁄16 in. wrench to turn the bottom nut on each leveling foot to adjust. Once level, tighten the top nut on the leveling foot.

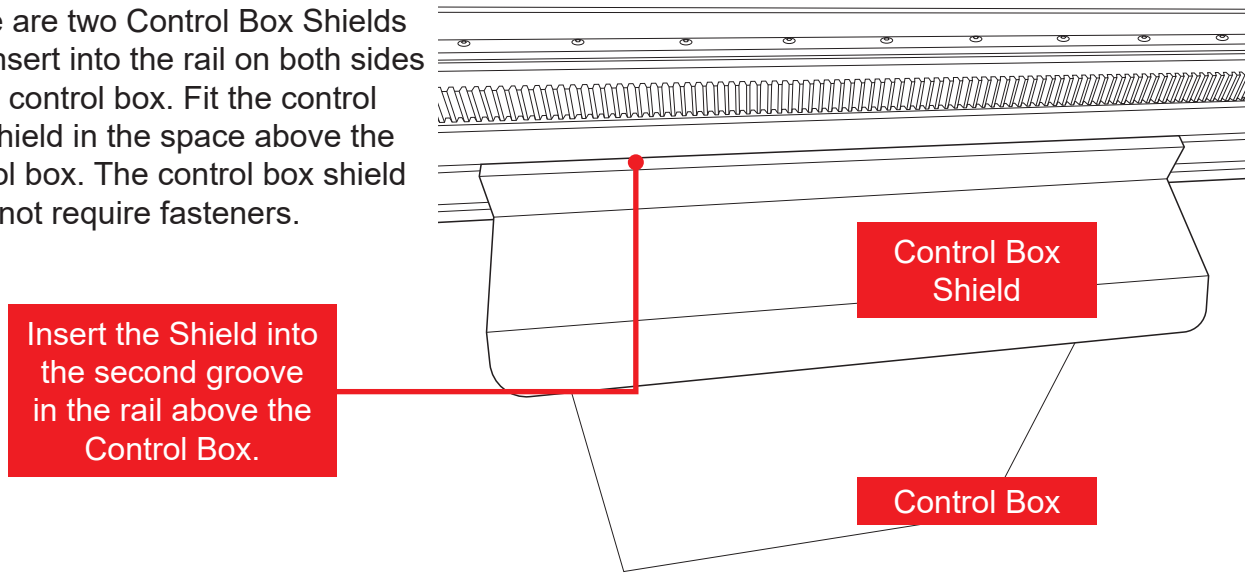
2.9 Sealing the Coolant Trays and Beam

Using the silicone sealant, place a bead of silicone around all gaps and seams in the coolant trays. Use a finger to spread the silicone evenly along the gaps and seams. Allow to cure before using the coolant system.

Apply silicone where the beam sections join above the control box.

2.10 Control Box Shield

There are two Control Box Shields that insert into the rail on both sides of the control box. Fit the control box shield in the space above the control box. The control box shield does not require fasteners.



2.11 Fill the Reservoir

Fill the reservoir to within six inches of the top with clean coolant. Plug in the water pump. Coolant can be water, anti-rust solutions, or other non-flammable coolants.

03 Coolant Plugs

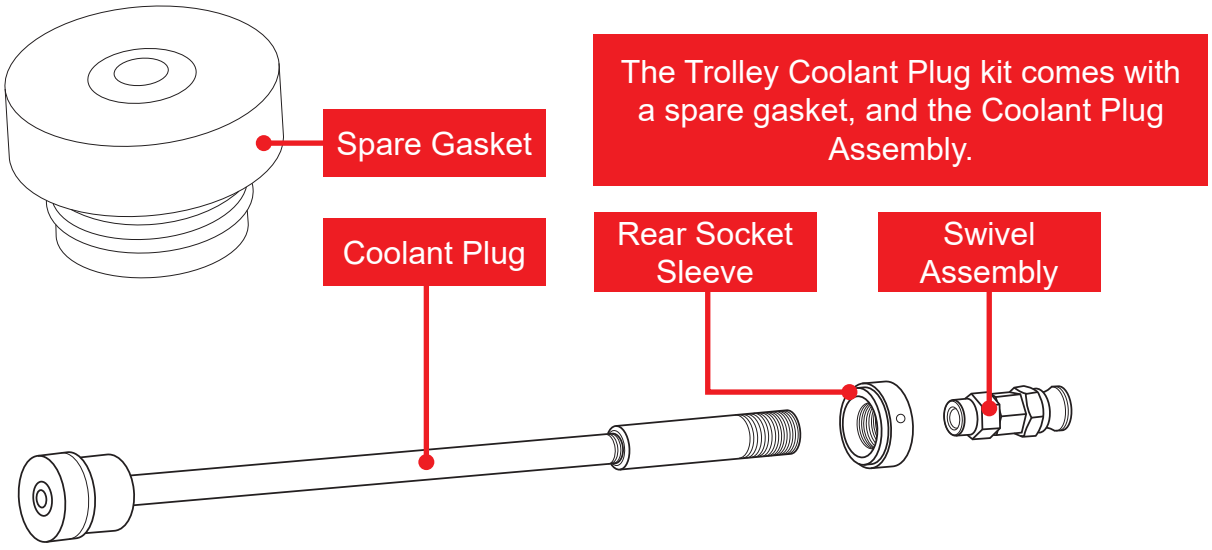
3.1 Overview

With the material coolant system complete, choose the appropriate plug adapter for the size material being processed in the machine. The Plug Kit comes with a variety of round plugs plus a trolley plug for use with material smaller then a 2.5” hypotenuse. Square and rectangle plugs can be purchased as an add-on by talking to a Bend-Tech Sales representative.

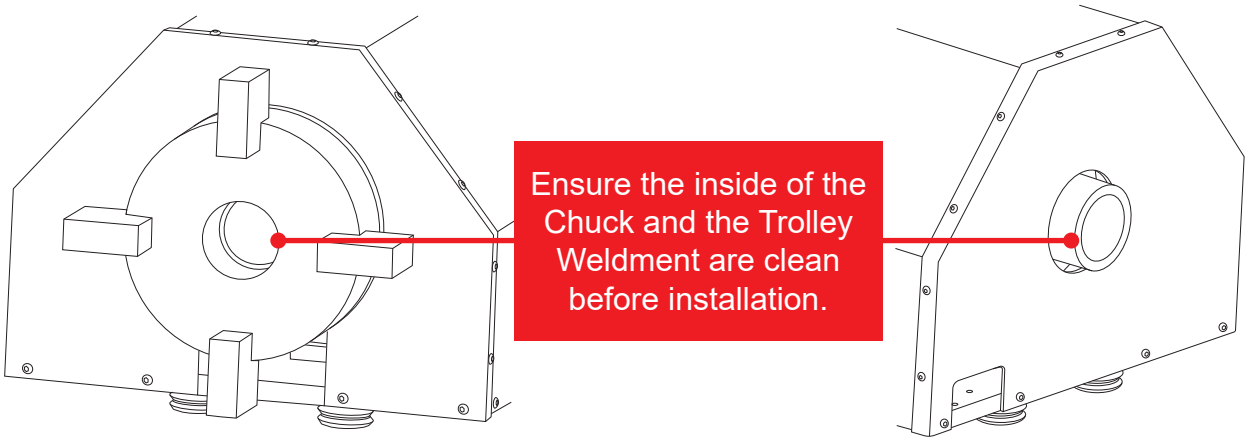
3.2 Trolley Coolant Plug Installation

3.2.1 Preparing the Trolley Coolant Plug

A 1 1/4” flat wrench is required for this installation. Remove the trolley coolant plug and all loose part from its packaging.

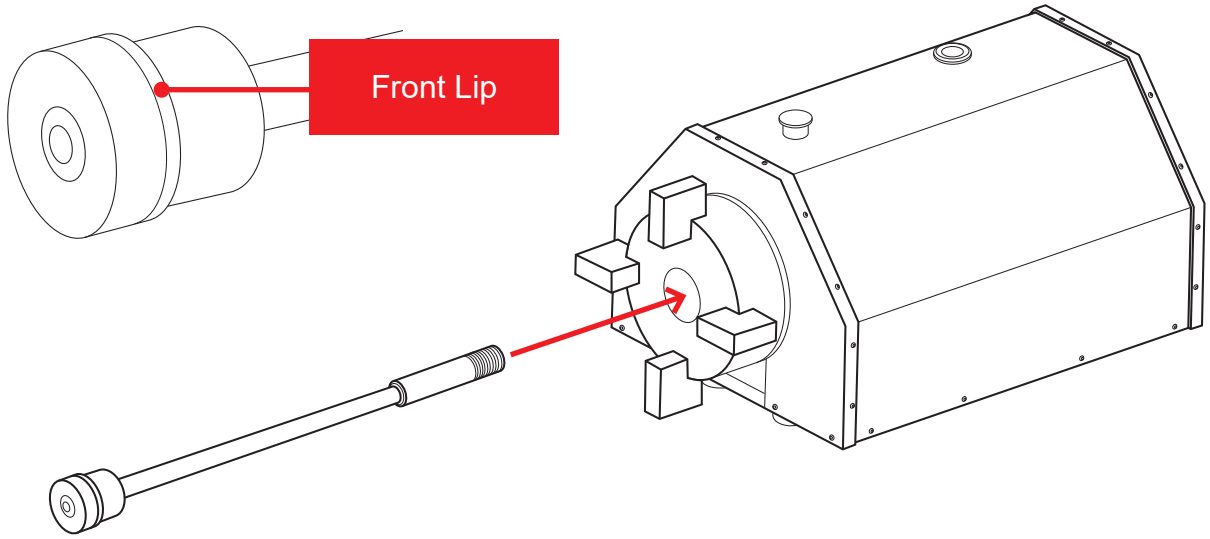


Use a non-scratch scrub sponge to clean the inside of the chuck and the rear of the trolley weldment.



3.2.2 Installing the Trolley Coolant Plug

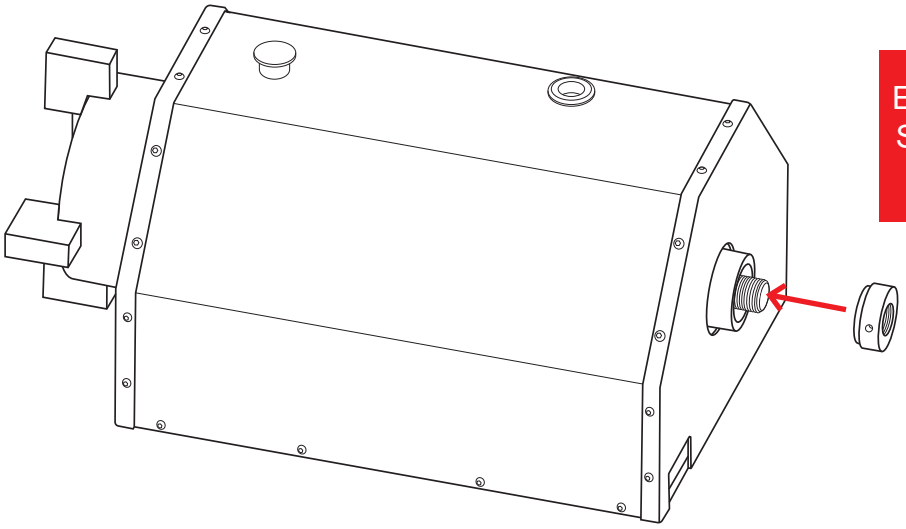
Install the coolant plug assembly into the trolley until the front lip is fully seated. Leave the assembly slightly loose until the next step.



Note

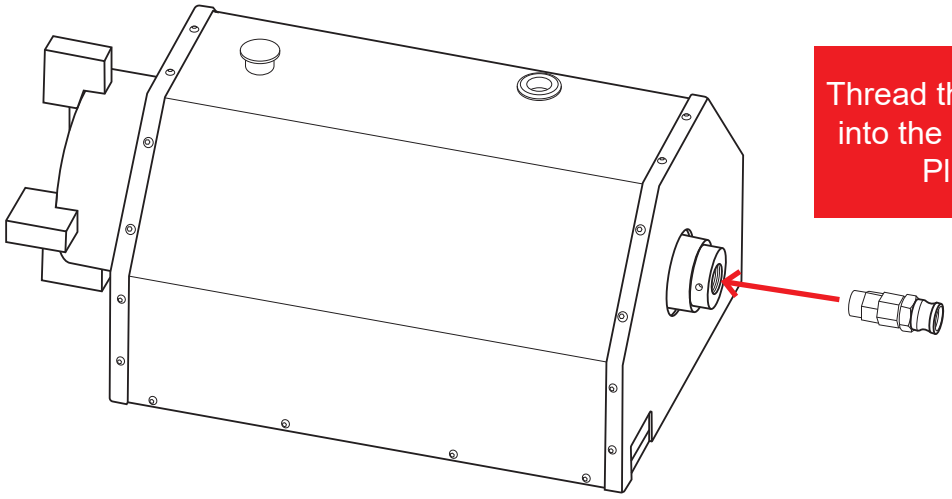
Use caution when installing the coolant plug.

Thread the rear socket sleeve onto the back of the trolley until the assembly is snug within the trolley.



Ensure the Rear Socket Sleeve is fully sealed in the Trolley.

Thread the rear swivel assembly into place, do not over tighten.

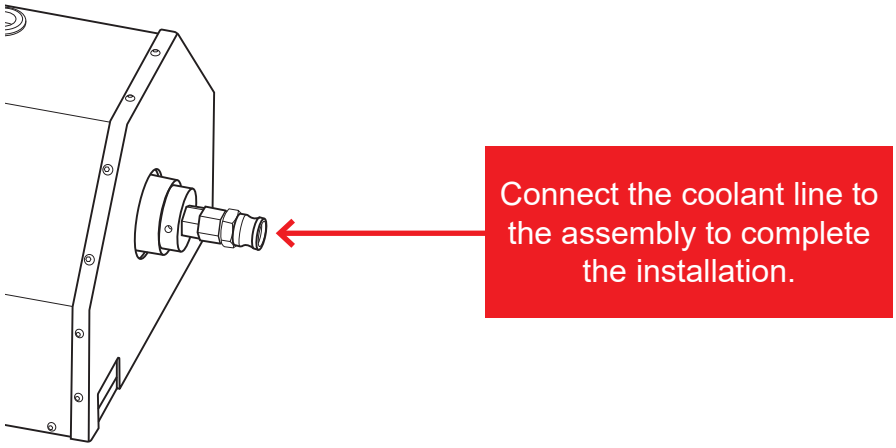


Thread the Swivel Assembly into the rear of the Coolant Plug Assembly

Important

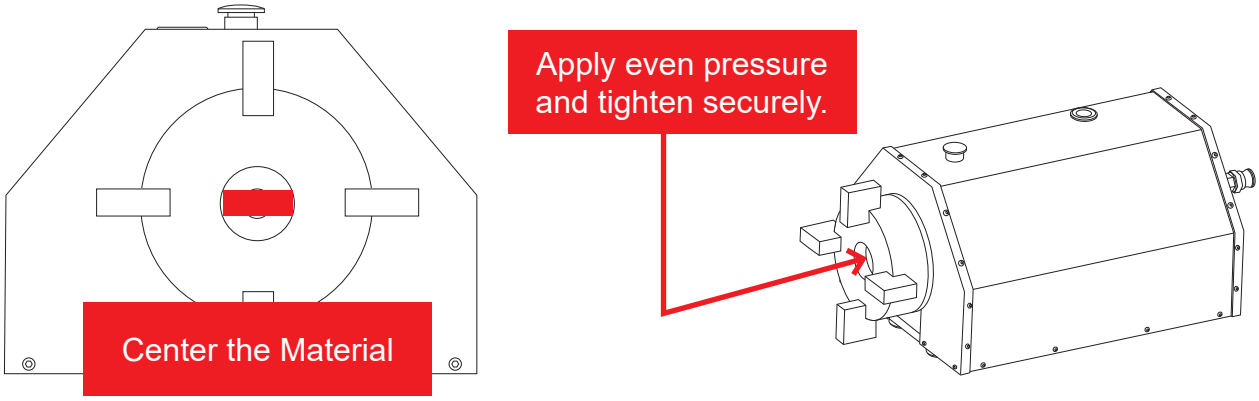
Do not over tighten the swivel assembly.

Connect the coolant line to the assembly.



3.2.3 How to use the Trolley Coolant Plug

Slide the material into the chuck. Ensure even pressure is applied against the coolant gasket as you tighten the chuck. The Trolley Coolant Plug can be used with any round, square, or rectangle material under 2.5” hypotenuse.

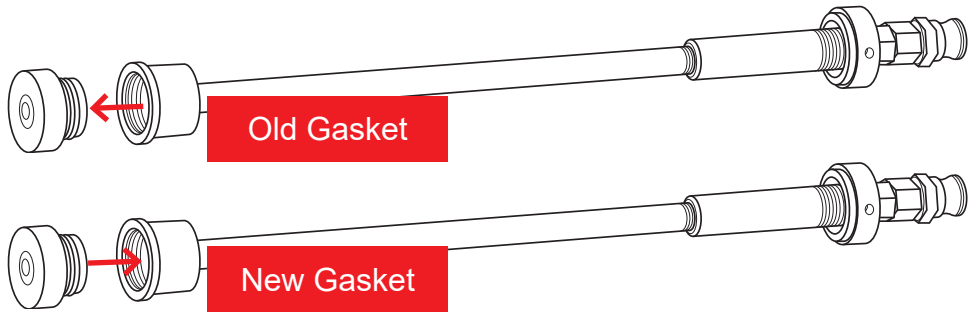


Note

For maximum gasket life, always position the chuck teeth closest to the size of the material before applying pressure into the gasket.

3.2.4 Gasket Replacement

Remove the trolley coolant plug by reversing steps in 3.3.2. Pull out the old gasket. Ensure the new gasket is slight wet. Install the gasket with a twisting motion while applying constant pressure into the plug assembly.



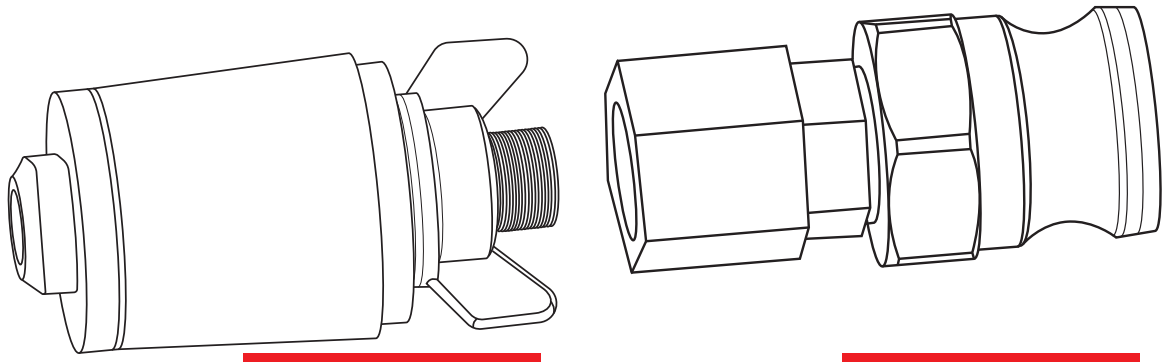
Important

The Trolley Coolant Gasket is a consumable, part number: 050-0055.

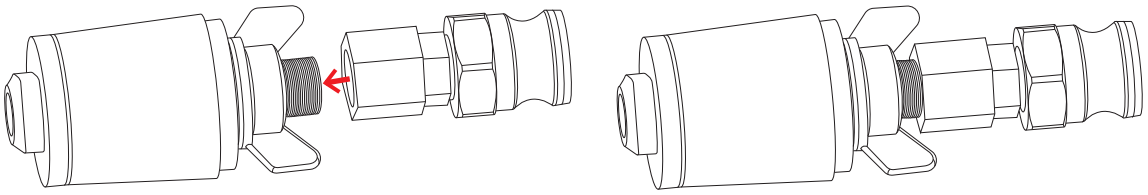
3.3 Coolant Plug Installation

3.3.1 Preparing the Coolant Plug

A 1 1/16-inch Flat Wrench is required for the Coolant Plug Installation. Remove all loose parts from their packaging.



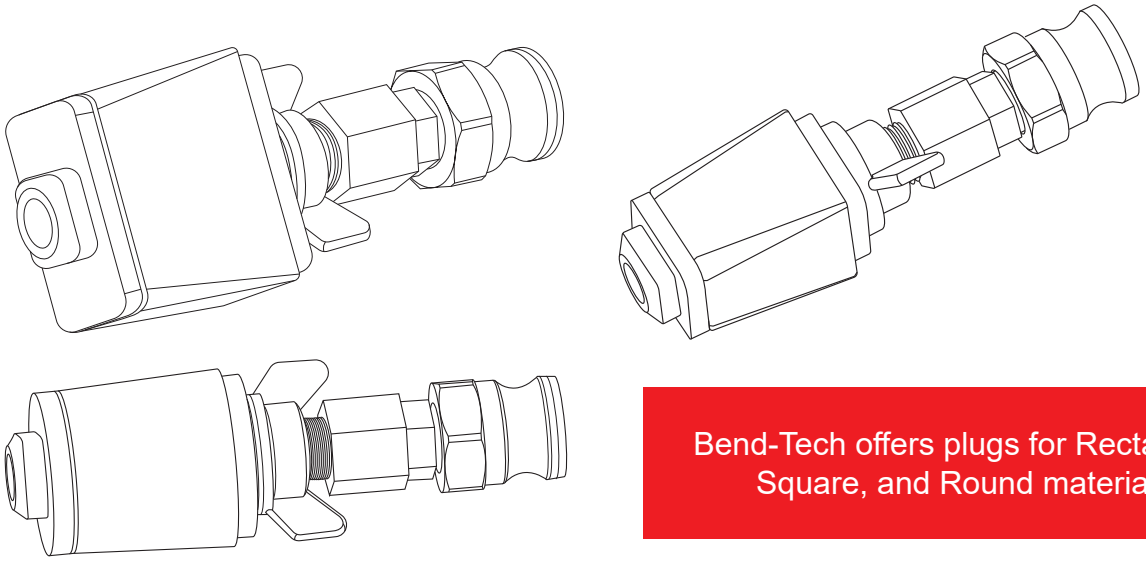
Screw the Swivel Assembly onto the Plug Assembly until a slight resistance is encountered.



Use a 1 1/16-inch Flat Wrench to tighten the Swivel Assembly 1/4 turn.

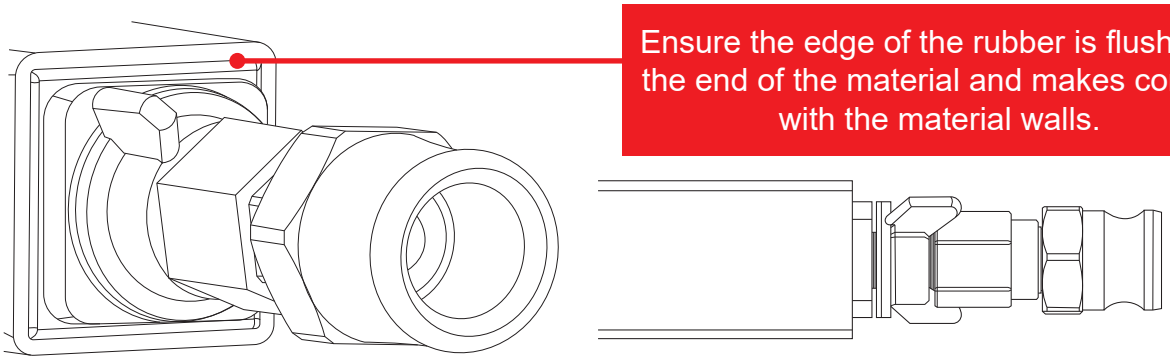
3.3.2 How to use the Coolant Plugs

Select the appropriate plug for the material. As a reminder, square and rectangle plugs do not come with the Material Coolant System. They can be purchased as an add-on by talking to a Bend-Tech Sales representative.



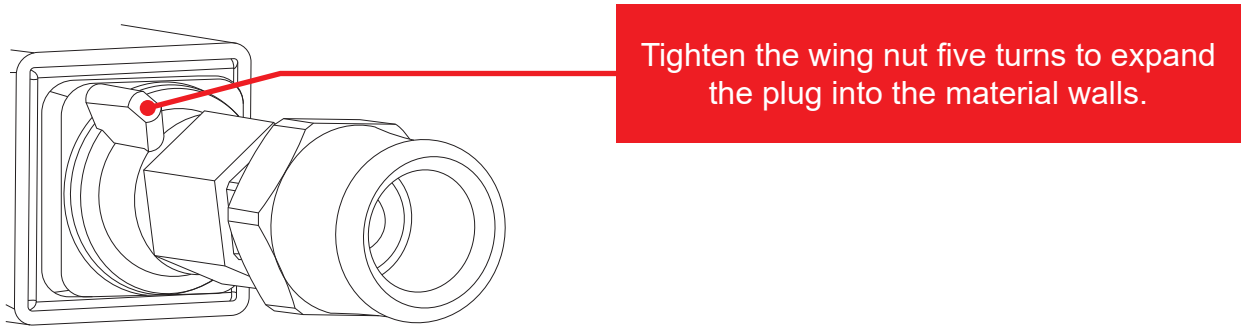
Bend-Tech offers plugs for Rectangle, Square, and Round material.

Insert the plug into the end of the material until the edge of the rubber is flush with the end of the material.



Ensure the edge of the rubber is flush with the end of the material and makes contact with the material walls.

Tighten the Wing Nut until the plug is making contact on every side of the material walls. Seat the plug by tightening the Wing Nut five full turns to expand the plug into the material walls.



Verify the plug is seated fully by slightly pulling on the end of the plug. If it remains secure, it is installed correctly.

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