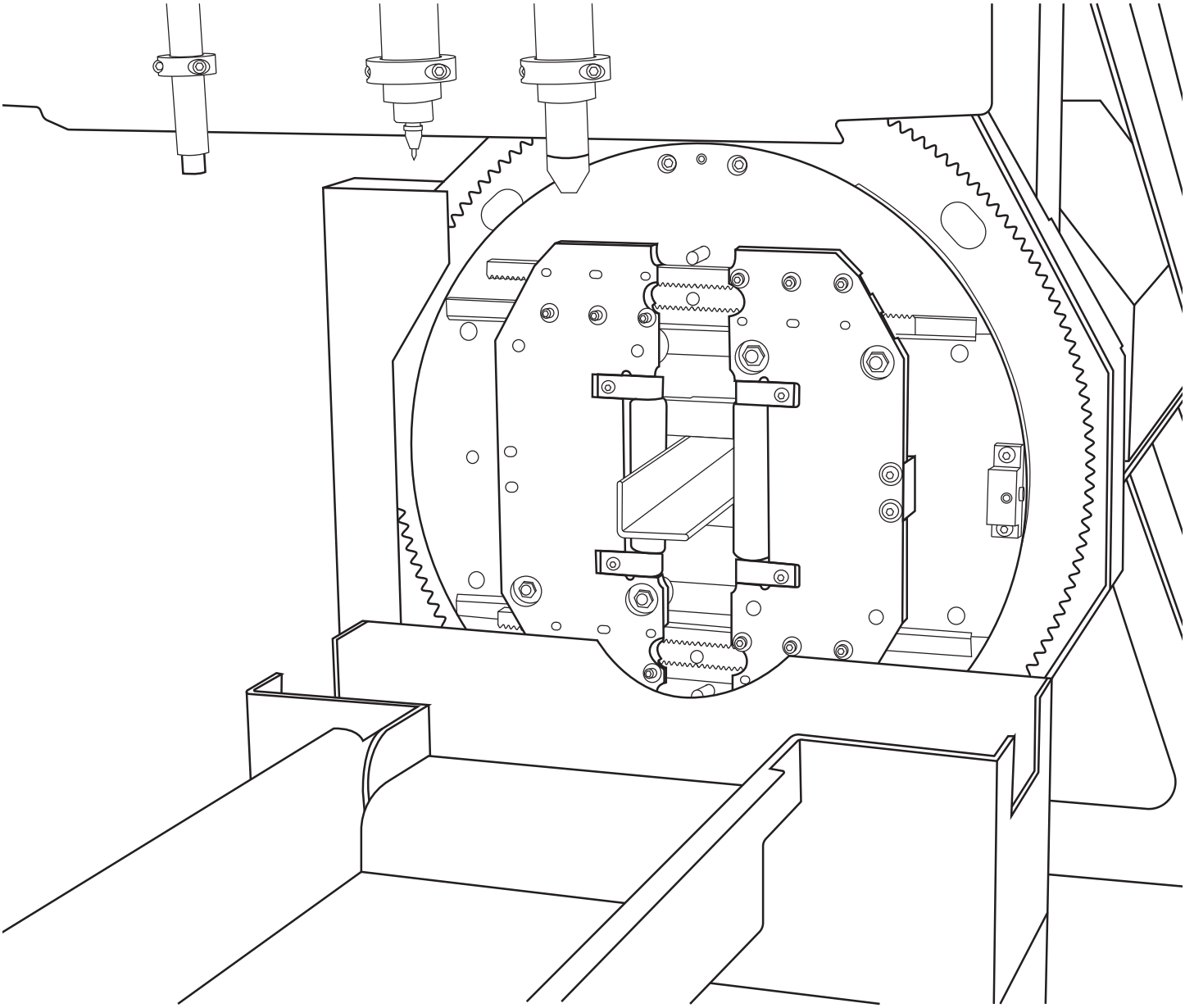
Part 1 of 1

BEND-TECH

DRAGON A400

Powered Gate Retrofit Guide



Revision 3 | English

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Dragon A400

Powered Gate Retrofit Guide
Revision 3

English
Original Instructions

August 2020

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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.

Software

Dragon software is covered by a 2-year maintenance plan from the purchase date of the Dragon A400 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

Any questions or concerns regarding this manual can be directed to Bend-Tech, LLC representatives via the Dragon website, 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

Customer Satisfaction Commitment

Congratulations on your purchase of the world's best CNC plasma tube and pipe cutting machine, the Dragon A400. Bend-Tech, LLC places great pride in customer satisfaction and it is our promise to offer you the best support available for your Dragon A400. We recognize that our support is a key factor in your success.

Contact Us

You can contact Bend-Tech, LLC customer service at 651-257-8715. Our support hours are Monday-Friday, 8:30-5:00 CST. E-mail Bend-Tech, LLC sales at: support@bend-tech.com. Our mailing address is: Bend-Tech LLC, 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 A400 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 A400.

Note

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

Example

Water Cooling system greatly reduces smoke and vapor emitted by the machine. Bend-Tech recommends use of the Water Cooling system whenever possible.

Glossary

A400

Indicates machine with 400-lb weight limit.

Axis

A fixed reference line used by the Dragon A400.

Bend-Tech 7X

Machine design software - CAD.

BOB

Breakout Board.

Material Support Lifter

The Material Support Lifter 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 A400.

Coolant Tray

Cools cut parts as they are produced.

Drive Belt

The X Motor uses the Drive Belt to power the Trolley along the Rail. The Drive Belt is mounted stationary along the length of the machine.

Drive Belt Pulley

Located on the X Motor, it works in conjunction with the Drive Belt to power the Trolley along the Rail.

E-Stop

Emergency stop.

ESS

Ethernet Smooth Stepper (Control Board).

Ethernet

System for connecting multiple computers via a Local Area Network.

Front Gate

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

Gate Lead Screw

Controls operation and adjustment of the Gate.

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.

Rail

The Rail is the main structure of the Dragon A400. The Trolley rides on the Rail.

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, Drive Belt Adjustment Block and E-Stop are located at the Tail of the machine.

Toolhead

Operates the Marker, Engraver and Torch.

Trolley

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

Contents

01 Overview

Powered Gate Overview

The Dragon A400 Powered Gate allows the machine to process angle and channel material in addition to round, square and rectangle material. Bend-Tech has found that to process angle or channel material it is required that the Gate move in coordination with the Chuck. Without a Powered Gate, angle or channel material cannot be held securely in the Gate. Customers who want to process angle or channel material can purchase a new Dragon A400 machine equipped with a Powered Gate, or purchase a Powered Gate Retrofit.

This guide is intended to instruct the Customer regarding the installation of the Dragon A400 Powered Gate Retrofit.

Equipment and Parts Required

- Cordless drill
- 9⁄16 in. wrench
- 9⁄16 in. socket
- Ratchet
- 12 in. socket extension
- 17mm socket
- ¼ in. Allen wrench
- ⅛ in. Allen wrench
- 5⁄32 in. Allen wrench

Powered Gate Retrofit Kit

- C Drive Control Box (1)
- C Drive Motor Cable (1)
- C Drive Homing Sensor Cable (1)
- Stainless Gate Rollers (4)
- Gate Mount Plate (1)
- Gate Ring Gear (1)
- C Axis Motor Mount (1)
- C Axis Motor (1)
- C Axis Drive Gear (1)

- C Axis Homing Sensor (1)
- Gate Ring Gear Safety Guard Right (1)
- Gate Ring Gear Safety Guard Left (1)
- Turn Collar Bushings (2)
- ¾ in. thin wrench

Hardware package

Powered Gate Safety Guard Hardware

- ¼ -20 ¼ in. Allen head cap screws (5)
- ¼ -20 ⅝ in. Allen head cap screws (4)
- ¼ -20 nuts (4)
- washers (4)

C Axis motor hardware

- ¼ -20 1 in. Allen Head Cap Screws (4)
- ¼-20 ¾ in. Allen Head Cap Screws (4)
- ¼ -20 nuts (4)
- washers (4)

02 Installation Guide

Before Beginning

Before beginning the installation of the Powered Gate Retrofit, ensure the Dragon A400 machine is powered down. Turn the Main Power Switch on the Control Box off. The Main Power Switch is off when the O side of the switch is depressed.

Control Box

Tools Needed

- 9⁄16 in. wrench
- 9⁄16 in. socket
- Ratchet and extension
- Large flat blade screwdriver

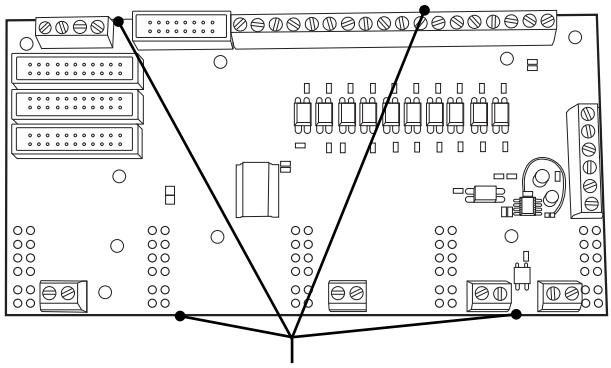
Parts Required

- New Control Box
- Powered Gate Driver Box

1. Breakout Board

Locate the Control Box mounted on the rear of the third Rail Support Leg. Locate the Control Box Door Latch on the right hand side of the Control Box Door. Using a large flat blade screwdriver, turn the latch counterclockwise to open the Control Box.

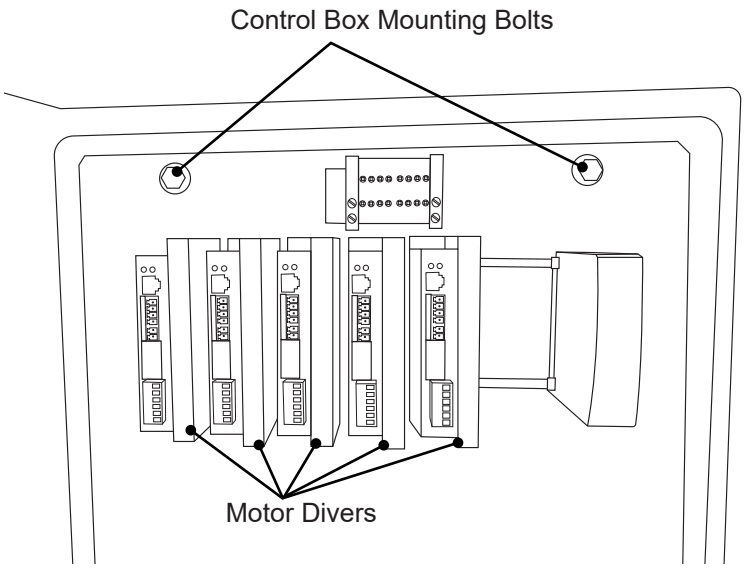
Locate the red Breakout Board in the upper left hand side of the Control Box. The Breakout Board will have a flat flex cable leading to it. Carefully pull the Breakout Board off the Motor Drivers. This will give access to the left hand Control Box Mounting Bolt. The Breakout Board should remain connected to the Control Box via its flat flex cable.



Hold the Breakout Board on the sides and gently pull it off the motor drivers.

2.Control Box Mounting Bolts

Control Box Mounting Bolt heads are located inside the Control Box, in the upper right and left hand corners of the Control Box. Use a ratchet with a 9⁄16 in. socket and extension on the bolt heads inside the Control Box. Place a 9⁄16 in. wrench on the nut located on the backside of the Control Box. Hold the nut with the wrench and turn the ratchet counterclockwise to remove the Mounting Bolt. Repeat this process for the right side Mounting Bolt. Once the mounting bolts are removed, position the old Control box out of the way so the new Control Box can be mounted. Leave all connections on the old Control Box. Connections will be transferred to the new Control Box later in the process.



The new Control Box will have a separate Powered Gate Driver Box attached to it. This Powered Gate Driver Box contains the motor driver for the Powered Gate. The Powered Gate Driver Box is placed on top of the main Control Box once it is mounted to the third Rail Support Leg.

3. Mount New Control Box

Before mounting the new Control Box, the Installer will need to remove the red Breakout Board located in the upper left hand corner of the new Control Box. Carefully pull the Breakout Board out of its mount on the motor drivers. Leave the Breakout Board connected to the door of the Control Box via its flat flex cable.

Using the Mounting Bolts and nuts from the old Control Box, position the new Control Box so the Mounting Bolts can be fed through the mounting holes in the Control Box and the Rail Support Leg. Once in position with a Mounting Bolt fed through both parts, thread a nut onto the Mounting Bolt and tighten finger tight. Repeat this process for the other Control Box Mounting Bolt. Place the 9⁄16 in. wrench on the nut and use the ratchet, extension and 9⁄16 in. socket placed on the bolt head inside the Control Box to tighten the Mounting Bolts securely.

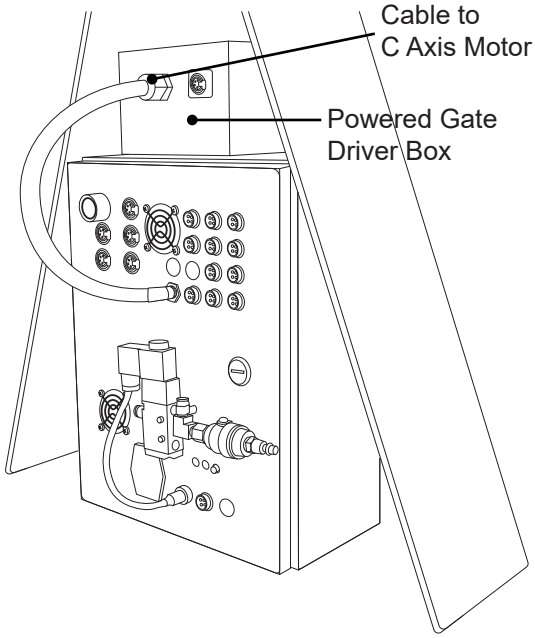
4. Reinstall the Breakout Board

After mounting the Control Box, reinstall the Breakout Board. Position the Breakout Board over the motor drivers and carefully press the Breakout Board into its sockets on the motor drivers. Ensure the Breakout Board is fully seated on the motor drivers. Take care not to alter any of the white dip switch settings as these are preset at the Bend-Tech manufacturing facility for optimum performance.

If the Breakout Board is not fully-seated on the motor drivers it will affect operation of the Dragon machine. Ensure the Breakout Board is pressed firmly into place.

5. Place Powered Gate Driver Box

The Powered Gate Driver Box should be placed on top of the main Control Box. The Powered Gate Driver Box is secured with pre-installed Velcro.



6. Control Box Connections

Transfer all cable, wiring and compressed air connections from the old Control Box to the new Control Box. Bend-Tech recommends starting at either the top or bottom of the old Control Box and transfer each connection individually. Using this method will avoid misconnections.

! Warning !

Do not power on the new Control Box at this time.

Gate Modification

The Powered Gate Retrofit process requires removing the non-power Gate assembly from the Dragon A400 machine and modifying it to work as a Powered Gate. Bend-Tech recommends the Installer enlist help when removing and installing the Gate assembly.

! Warning !

The Gate assembly is heavy and could cause injury to personnel if mishandled or dropped.

Tools Needed

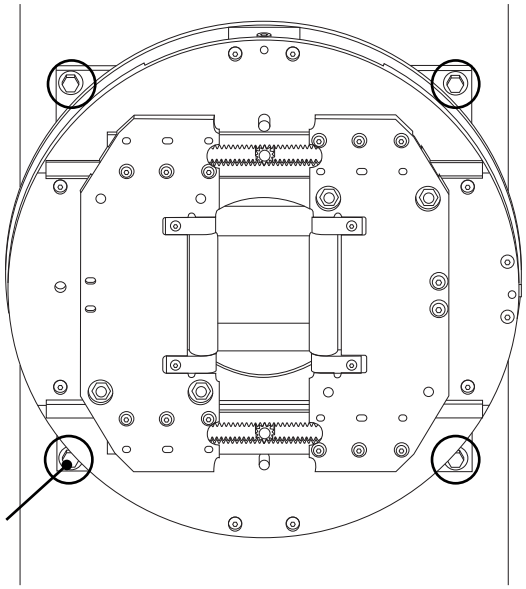
- 17mm Socket and ratchet
- ¾ in. thin wrench
- 9⁄16 in. socket, ratchet and extension
- ¼ in. Allen wrench
- ⅛ in. Allen wrench
- 5⁄32 in. Allen wrench

Parts Required

- Powered Gate Mount Plate (1)
- Powered Gate Ring Gear (1)
- Stainless Steel Gate Rollers (4)
- Loctite Blue 242

1. Gate Mount

Locate the four Gate mounting bolts at each corner of the Gate Mounting Plate. Enlist a helper to hold the Gate assembly in position while the Gate mounting bolts are being removed. Using a 9⁄16 in. socket and extension, remove the four bolts by turning them counterclockwise. Set the bolts aside, they will be re-used to mount the Powered Gate assembly.



2. Removing the Gate

The Gate Assembly is located on the machine with two mounting pins. The Installer should place a hand at the 3 o'clock and 9 o'clock positions on each side of the Gate and gently pull on the Gate assembly, alternating force on the Gate with the right and left hand if necessary. With the Parts Catcher installed, the Gate will need to be removed at the side of the machine. Enlist a helper for this action.

! Caution !

While the Gate is typically tightly fit to the machine via the Gate mounting pins, the Gate can come free unpredictably. The Installer should use caution when removing the Gate assembly.

With the Gate assembly free of the machine, place it on a clean, stable workbench.

Modifying the Gate

Converting the Gate to a Powered Gate configuration requires installing the Gate Ring Gear, Powered Gate Mount Plate and new stainless steel Gate Rollers. In its powered configuration, the Gate will see more force applied to the rollers than in its non-powered configuration. The stainless steel rollers are more durable and able to handle larger forces better than the black steel rollers.

The Gate Bearing Plate is replaced by the Powered Gate Ring Gear. The Powered Gate Ring Gear is driven by the C Axis Motor. When coordinated with the Chuck, this powered rotation allows the machine to process angle and channel material.

The Powered Gate Retrofit is supplied with a new Gate Mount Plate with recessed Gate Mounting Bolt face. The non-power Gate Mount Plate does not have the recessed Gate Mounting Bolt face and does not allow clearance for the C Axis Homing Sensor Bolt. All other parts of the Gate assembly will be re-used on the modified Power Gate.

For the Gate modification process it is recommended the Installer locate a clean, uncluttered work area that is secure and stable, such as a sturdy workbench.

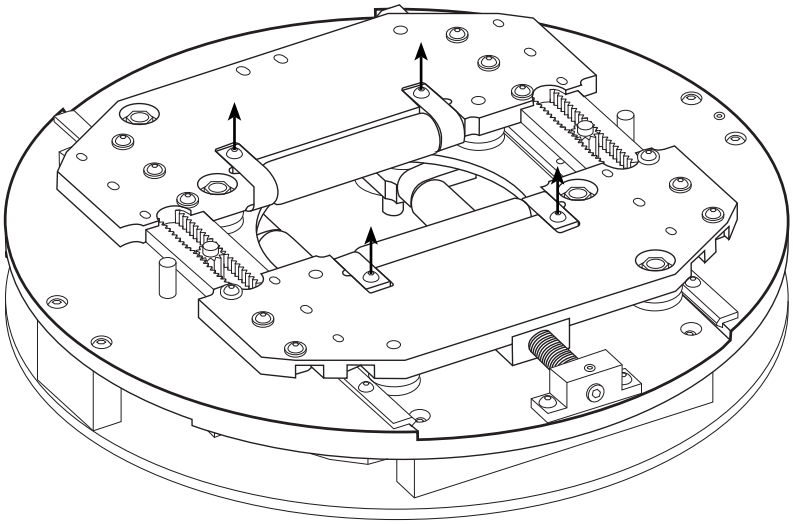
Replacing Gate Rollers

There are four Gate Rollers in the Dragon A400 Gate assembly. Two Gate Rollers are located on the horizontal adjustable Gate and two on the vertical adjustable Gate. Each Gate Roller is attached to an adjustable Gate assembly by two pillow block bearings and two Allen head screws.

1. Horizontal Gate Rollers

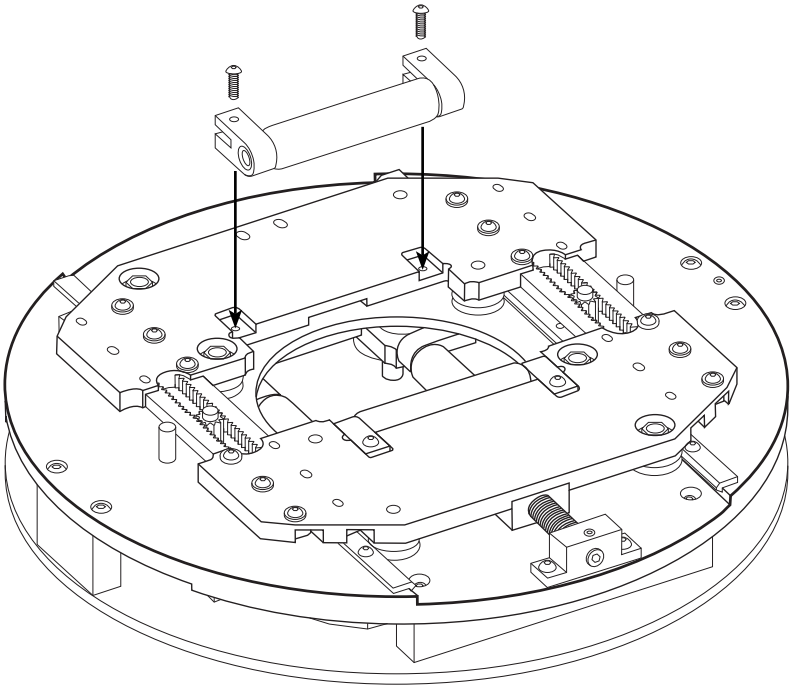
Using a ¼ in. Allen wrench on the 3 o'clock Gate Lead Screw, open the horizontal Gate wide enough to allow enough room to remove the Gate Rollers, about 3-4 in.

Using a ⅛ in. Allen wrench, remove the four screws that attach the Gate Rollers to the Gate.



Remove the pillow block and needle bearing assemblies from the old roller and install on the new stainless steel rollers.

Position the pillow blocks so the thicker side is seated on the mounting surface. Using the ⅛ in. Allen wrench, tighten the Allen head screws hand tight.

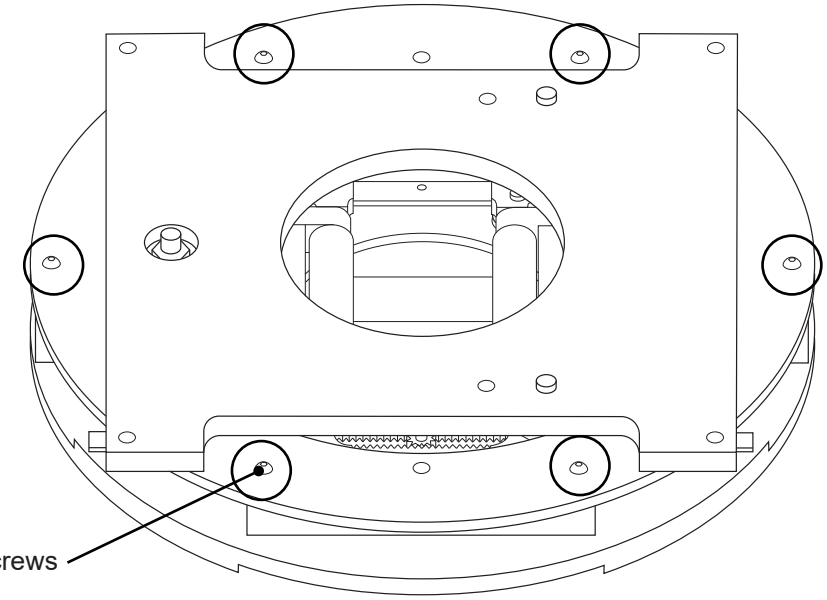


The Gate Roller pillow blocks should sit flush with the surface of the adjustable Gate jaws. If they are not flush they are installed incorrectly.

When finished replacing the Horizontal Gate Rollers it is recommended the Installer close the Gate using the Horizontal Gate Lead Screw. This aids in handling of the Gate during the installation process.

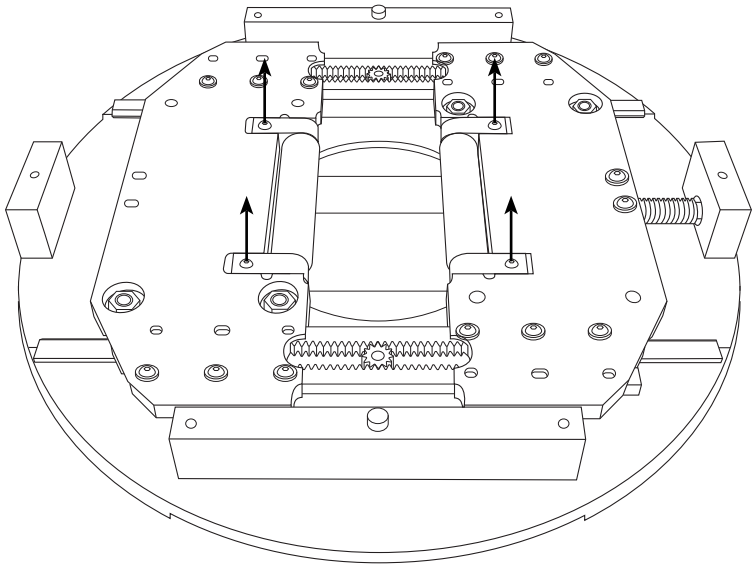
2. Gate Mount Removal

Turn the Gate over so the Gate assembly is face down on the work surface. Using a 5⁄32 in. Allen wrench, begin removing the six Allen head screws that fasten the Gate Bearing Rotation Plate to the Gate assembly. With the six Gate Bearing Rotating Plate screws removed, lift the Gate Bearing Rotation Plate and Gate Bearing Mount Plate off the Gate assembly and set aside.



The Installer will need to rotate the Gate Bearing Mount Plate to access all six mounting screws.

3. Vertical Gate Rollers



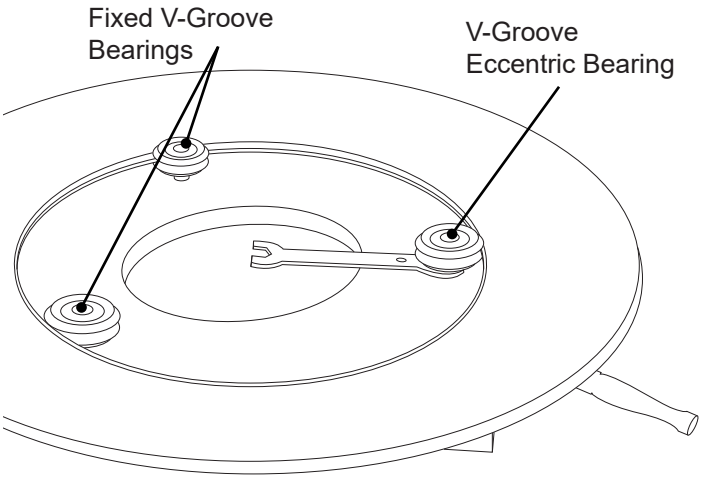
Using a ¼ in. Allen wrench on the 12 o'clock Gate Lead Screw, open the vertical Gate wide enough to allow enough room to remove the Gate Rollers, about 3-4 in.

Using a ⅛ in. Allen wrench, remove the four screws that attach the Gate Rollers to the Gate. Remove the pillow block and needle bearing assemblies from the old roller and install on the new stainless steel rollers. Position the pillow blocks so the thicker side is seated on the mounting surface. Using the ⅛ in. Allen wrench, tighten the Allen head screws hand tight.

The Gate Roller pillow blocks should sit flush with the surface of the adjustable Gate jaws. If they are not flush they are installed incorrectly.

When finished replacing the Vertical Gate Rollers it is recommended the Installer close the Gate using the Vertical Gate Lead Screw. This aids in handling of the Gate during the installation process.

4. Gate Bearing Rotation Plate



At the rear of the Gate Mount assembly, place a 17mm socket and ratchet on the v-groove eccentric bearing nut. Using the thin wrench supplied with the Powered Gate Retrofit, place the ¾ in. end on the back of the v-groove eccentric bearing. Using the ¾ in. wrench to prevent the v-groove eccentric bearing from rotating, use a ratchet and 17mm socket to remove the mounting nut for the v-groove eccentric bearing.

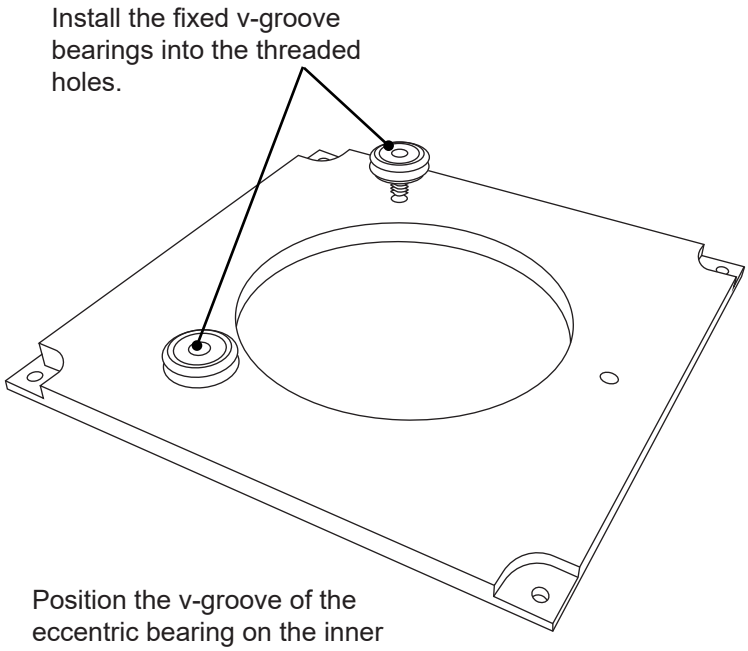
Lifting the Gate Bearing Rotation Plate and v-groove eccentric bearing at the same time, remove these parts and set aside. Using the ¾ in. thin wrench, remove the fixed v-groove bearings from the Gate Mount Plate and set aside with the v-groove eccentric bearing. The Installer will be re-using the v-groove bearings. The Installer will not be re-using the Gate Mount Plate or the Gate Bearing Rotation Plate.

The v-groove eccentric bearing and fixed v-groove bearings are secured with Loctite and can be difficult to break loose. The Installer may need to enlist help to hold the Gate assembly while removing the v-groove eccentric and fixed v-groove bearings.

5. Bearing Installation

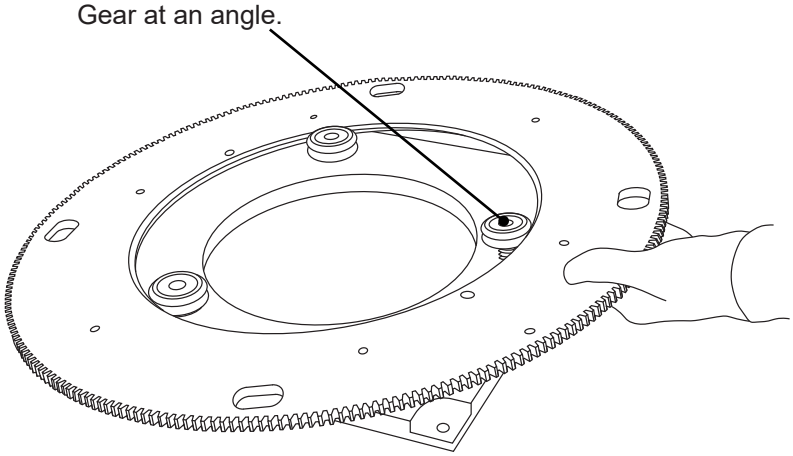
Locate the new Powered Gate Mount Plate. Place the Powered Gate Mount Plate so the mounting pins are facing down and the two threaded holes for the fixed v-groove bearings are farthest away from the Installer. Locate the fixed v-groove bearings that were removed in Step 4.

Apply Loctite Blue 242 to the threads of the fixed v-groove bearings and install them on the new Gate Mount Plate. Using the provided ¾ in. thin wrench, tighten the bearings securely by hand.



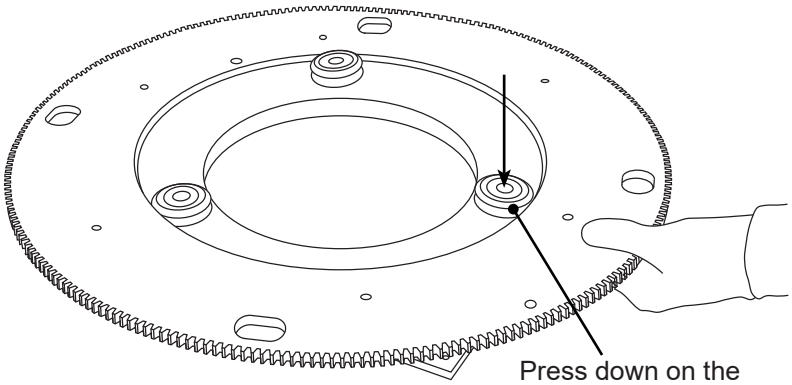
6. Gate Ring Gear

Locate the new Gate Ring Gear. Ensuring the C Axis Homing Sensor bolt head is down, place the Gate Ring Gear over the new Gate Mounting Plate and position it so the v-shaped inner bearing surface is bottomed out in the v-groove of the two fixed v-groove bearings.



With one hand, pull the Gate Ring Gear tight against the two fixed v-groove bearings. With a free hand, position the v-groove eccentric bearing so it is over its mounting hole, then place the v-groove eccentric bearing so its v-groove is seated on the v-shaped inner bearing surface of the Gate Ring Gear.

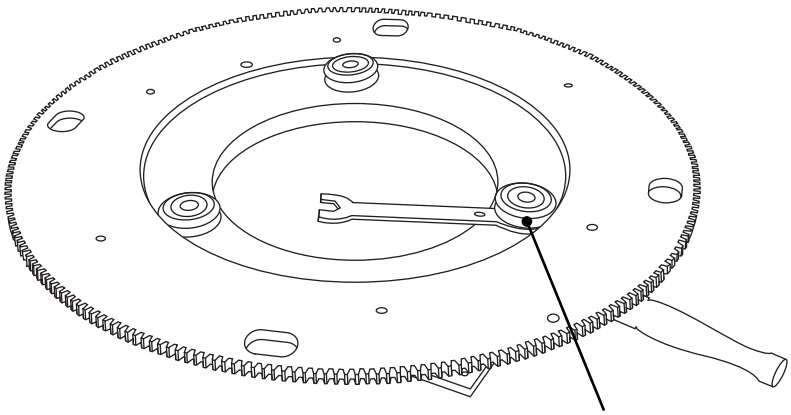
Holding the v-groove eccentric bearing in place, lower the Gate Ring Gear and v-groove eccentric bearing together, inserting the v-groove eccentric bearing mount stud in its mounting hole. Ensure the v-groove eccentric bearing is fully seated in its mounting hole. If necessary, turn the bearing by hand to get it seated in its mounting hole.



Press down on the bearing to seat it in the hole

7. Adjusting the Eccentric Bearing

Thread the mounting nut onto the v-groove eccentric bearing mounting stud. Snug down lightly, but do not tighten. Ensure the bearing is loose enough that it can be rotated for adjustment. Place the supplied ¾ in. thin wrench on the v-groove eccentric bearing adjustment hex between the Gate Mount Plate and the Gate Ring Gear. Turn the adjustment hex until the Gate Ring Gear bearing surface is fully seated in the eccentric bearing v-groove. When properly adjusted, the Gate Ring Gear should spin freely with no side play. Tighten the v-groove eccentric bearing nut securely, assuring the bearing stays in adjustment.

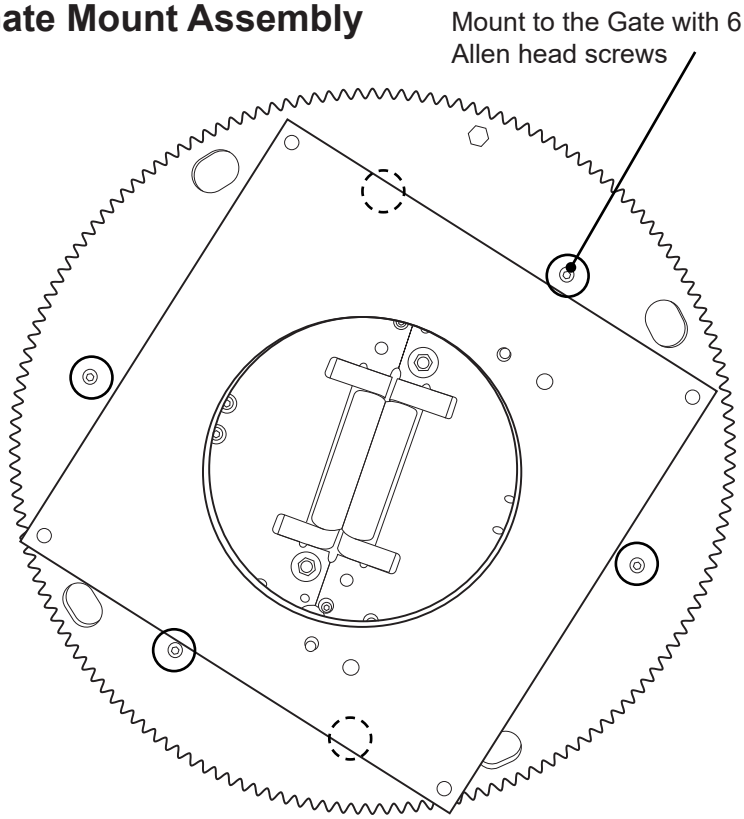


Once the Ring Gear is moving smoothly hold the v-groove eccentric bearing in place and tighten the nut.

Adjusting the Gate Ring Gear on the Gate Mount Plate takes time. Ensure the Gate Ring Gear spins freely. This process may require multiple re-adjustments.

The Gate Ring Gear should ride smoothly and spin freely with no side play.

8. Installing the Gate Ring Gear and Gate Mount Assembly



Place the Gate face down on the work surface. Position the Gate so the 12 o'clock Gate Lead Screw hex is at the top, with the screw perpendicular to the Installer. When in this position, the 3 o'clock Gate Lead Screw should be to the Installer's left.

Locate the C Axis Homing Bolt near the outer ring of the Gate Ring Gear. When the Gate Ring Gear and Gate Mount assembly are installed on the Gate, the C Axis Homing Bolt should be opposite the 3 o'clock Gate Lead Screw, or to the Installer's right with the bolt head facing down. Place the Gate Ring Gear and Gate Mount assembly onto the Gate, aligning it on the two mounting pins located at the 3 o'clock and 9 o'clock positions.

Ensure the C Axis Homing Bolt is opposite the 3 o'clock Gate Lead Screw. Install the six Gate Ring Gear mounting screws. Tighten by hand using a 5⁄32 in. Allen wrench.

When tightening the Gate Ring Gear mounting screws, use an alternating sequence, working around the Gate until all six are secure.

Powered Gate Installation

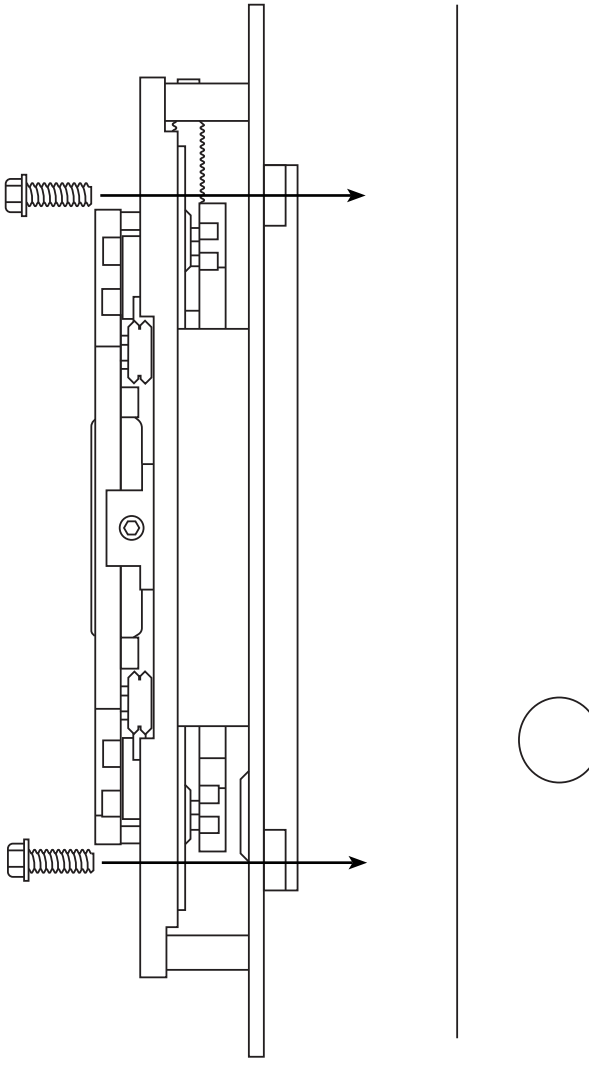
The Powered Gate assembly is heavy and can rotate unexpectedly while handling. Bend-Tech recommends the Installer enlist a helper when installing the Powered Gate.

Tools Required

- 9⁄16 in. socket, ratchet and extension

1. Placing the Gate

Before placing the Powered Gate assembly on the machine, the Installer should align the Powered Gate on the workbench so it is laying flat on the bench with the Gate face up and the v-groove eccentric bearing closest to the Installer. The Gate Mount Plate will be placed on the machine with the v-groove eccentric bearing at the bottom, or in the 6 o'clock position. Lift the Powered Gate Assembly off the workbench ensuring the v-groove eccentric bearing is in the 6 o'clock position.



2. Attaching the Gate

While enlisting a helper, the Installer should place the Gate on the front of the machine, aligning it on the mounting pins. Position the Gate from the side of the machine if the Parts Catcher is installed. There are four access holes in the Gate Ring Gear to allow installation of the Gate Mount Bolts. While holding the Powered Gate assembly firmly on the mounting pins, gently turn the Gate Ring Gear to align the access holes for the Gate Mount Bolts. Locate the four Gate Mount Bolts and install using a 9⁄16 in. socket, ratchet and extension. Tighten securely.

The Powered Gate is now mounted on the Dragon A400.

Installing the C Axis Drive Motor

The Powered Gate is driven by the C Axis Drive Motor. Installing this motor involves drilling holes in the side of the Head of the Dragon A400 machine. It is recommended the Installer have experience using a drill and required tooling for this operation. The C Axis Drive Motor is installed on the right side, or Marker side, of the Head of the machine.

Tools Required

- Drill template
- ¼ in. Drill bit
- Power drill
- 3⁄16 in. Allen wrench
- 9⁄16 in. wrench or socket

If tapping the mount holes

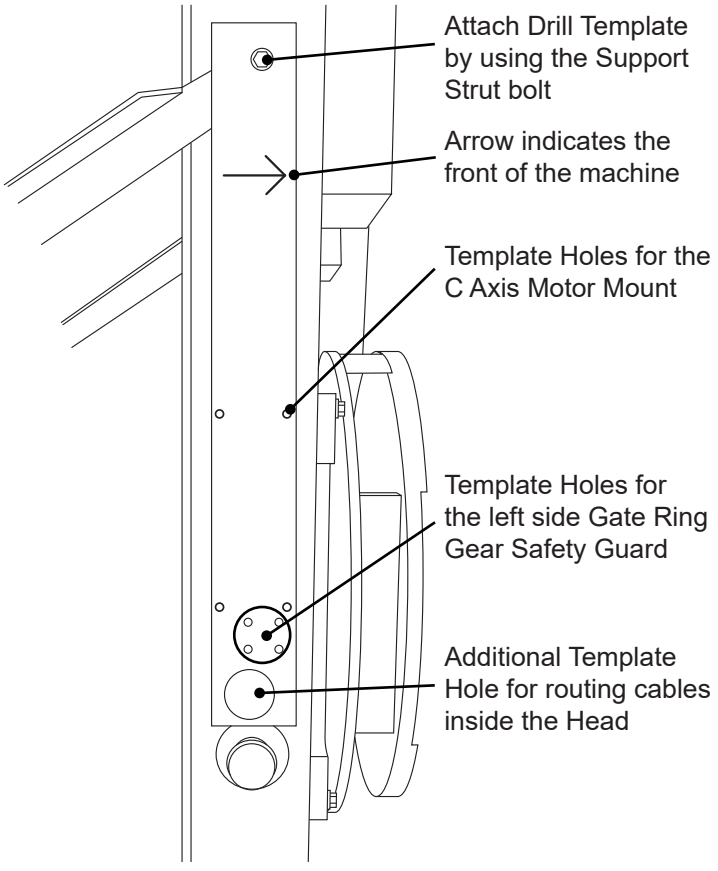
- ¼ -20NC Tap
- 13⁄64 in. drill bit

Parts Required

- C Axis Drive Motor
- C Axis Motor Gear
- C Axis Motor Mount Bracket
- ¼ -20 ¾ in. motor mounting bolts (4)
- ¼ -20 1 in. motor mount to Head bolts (4)
- ¼ -20 Nyloc nuts (4)
- ¼ in. washers (4)

1. Drill Template

Locate the Drill Template from the Powered Gate Retrofit parts kit. The Drill Template will mount to the Head on the right side of the machine using the Support Strut bolt near the top of the Head. Use a 9⁄16 in. wrench or socket to remove the Support Strut bolt near the top of the Head. Use the Support Strut bolt to attach the Drill Template.



Note: Bend-Tech recommends using a level to ensure the Drill Template is vertical before drilling any holes.

2. Drill Mounting Holes

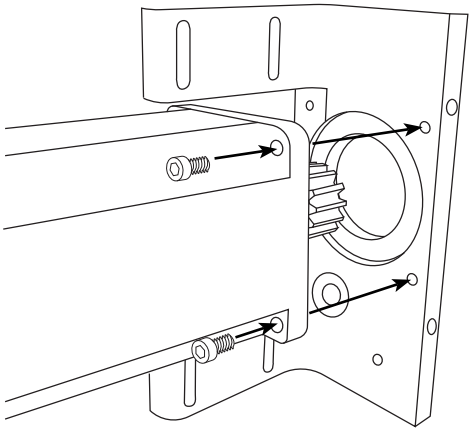
With the Drill Template hung and aligned on the Head of the machine, drill the four ¼ in. holes for the C Axis Drive Motor mount. When complete, remove the Drill Template. Reinstall the Support Strut bolt. If tapping the holes to ¼ -20 thread size, drill the holes out to 13⁄64 in. Tap using ¼ -20 tap.

3. C Axis Drive Motor Gear

Locate the C Axis Drive Motor and the C Axis Drive Motor Gear. The C Axis Drive Motor Gear is secured to the C Axis Drive Motor shaft with two set screws. Install the C Axis Drive Motor Gear and snug the set screws down. Do not apply Loctite or tighten set screws at this time. The Installer may need to adjust the position of the C Axis Drive Motor Gear.

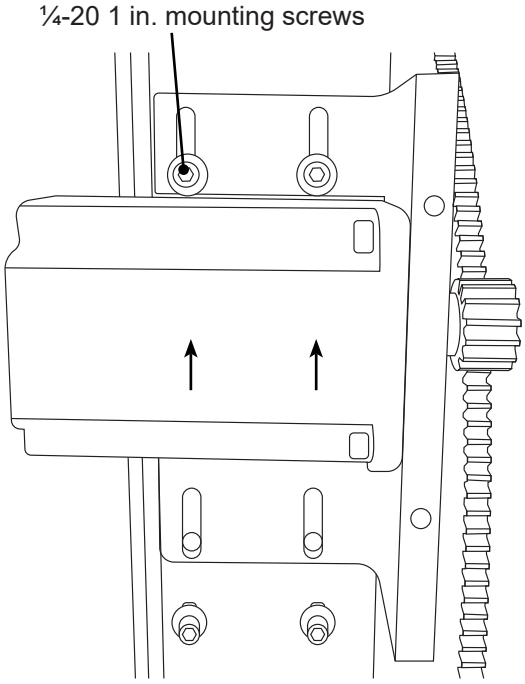
4. C Axis Drive Motor Assembly

Locate the C Axis Drive Motor Mount Bracket, the C Axis Drive Motor and the four ¼ -20 ¾ in. Allen head motor mounting screws and nuts from the Powered Gate Retrofit parts kit. Place the C Axis Drive Motor on the C Axis Drive Motor Mount Bracket so the drive gear feeds through the face of the mount. Install the four motor mount screws and tighten securely using a 3⁄16 in. Allen wrench.



5. Mounting the C Axis Drive Motor

Locate the four C Axis Drive Motor Mount Bracket ¼ -20 1 in. Allen head mounting screws, washers and nuts from the Powered Gate Retrofit parts kit. If the Installer tapped threads in the C Axis Drive Motor Mount Bracket mounting holes, position the C Axis Drive Motor Mount Bracket on the Head of the machine, lining up the mounting holes. Thread the four ¼ -20 mounting screws into place. Do not tighten



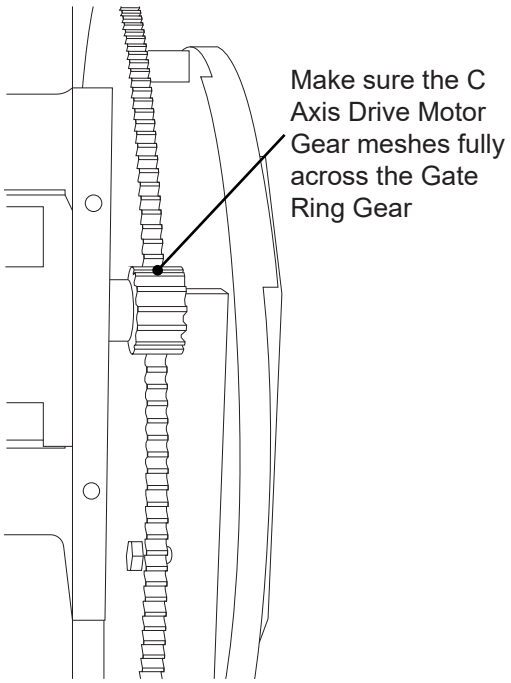
If the Installer did not tap threads in the mounting holes, it will be necessary to reach inside the Head of the machine to install the four ¼ -20 Nyloc nuts and washers onto the C Axis Drive Motor Bracket mounting screws.

Place the C Axis Drive Motor Mount Bracket assembly in position on the side the Head of the machine. Align the mounting holes drilled in the Head with the holes on the mount bracket. Feed a ¼ -20 Allen head mounting screw through one of the mounting holes.

While holding the C Axis Drive Motor Mount Bracket assembly and ¼ -20 Allen head screw in place with one hand, reach into the Head of the machine, place a washer, and thread the ¼ -20 nut onto the ¼ -20 Allen head mounting screw. Tighten the nut finger tight. Repeat this process for the remaining three ¼ -20 Allen head mounting screws.

Setting Backlash for the C Axis

Before tightening down the C Axis Drive Motor Bracket it is necessary to set the backlash between the C Axis Drive Motor and the Gate Ring Gear. If backlash is not correct it may result in imprecise cutting or damage to the Powered Gate.



1. Position Drive Gear

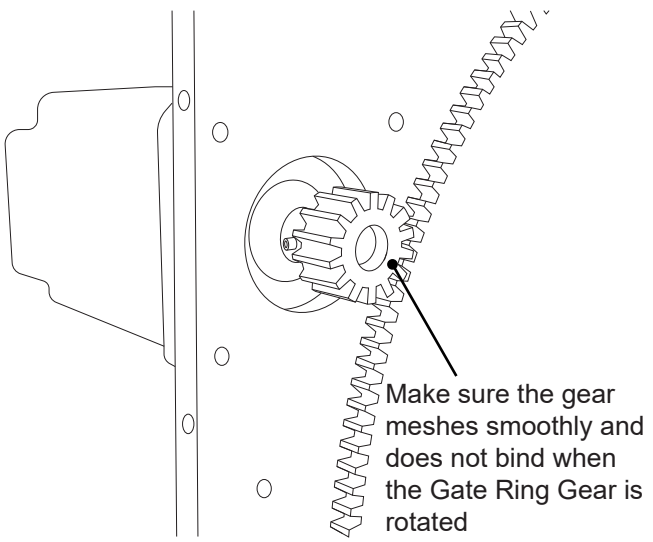
Before setting backlash, the Installer should set the position of the C Axis Drive Gear so the Gate Ring Gear fully meshes at the center of the C Axis Drive Gear. Once the gears are positioned so the Gate Ring Gear meshes at the center of the C Axis Drive Gear, remove each set screw and apply a drop of Loctite Blue 242. Re-install each set screw and tighten securely.

2. Backlash Procedure

To begin setting backlash, mesh the C Axis Drive Motor gear and the Gate Ring Gear by positioning the C Axis Drive Motor by hand. Ensure the C Axis Drive Motor Bracket is snug to the machine. With the drive gear meshed to the Gate Ring Gear, begin turning the Powered Gate by hand while holding the C Axis Drive Motor steady.

Bend-Tech has found there will be a tight spot in one position on the Gate Ring Gear. Locate this position and ensure the C Axis Drive Motor Gear is firmly meshed here. Ensure the C Axis Drive Motor Gear does not bind in this position. With the C Axis Drive Motor Gear meshed in this position, tighten the C Axis Drive Motor Bracket securely by hand.

Rotate the Powered Gate 360-degrees by hand 2-3 times ensuring the gear is meshed properly the entire circumference of the Gate Ring Gear. There should be no play and no overly tight spots. Once this is achieved the backlash is set.

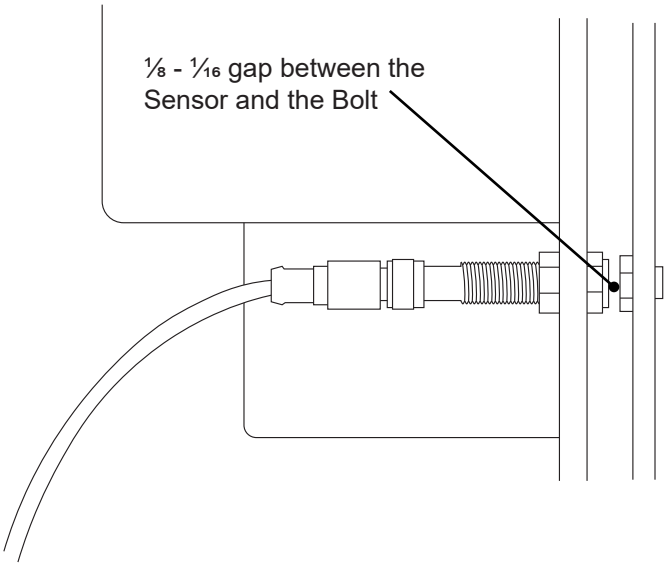


Installing and Setting the Homing Sensor

1. C Axis Homing Sensor

Carefully spin the Powered Gate assembly by hand until the Homing Sensor bolt is in position just under the C Axis Drive Motor Gear. Locate the C Axis Homing Sensor. Remove the outer adjusting nut from the sensor assembly.

Feed the sensor through the C Axis Homing Sensor hole located in the C Axis Drive Motor Mount just below the C Axis Drive Motor. Thread the outer adjusting nut back on the C Axis Homing Sensor.



Carefully align the Homing Sensor bolt so it is positioned directly in front of the C Axis Homing Sensor. Using a feeler gauge and, positioning the adjusting nuts appropriately, position the C Axis Homing Sensor so there is 1⁄16 - ⅛ in. of clearance between the sensor and the bolt. This may require repositioning the adjustment nuts. Once the sensor is in position, tighten the C Axis Homing Sensor adjusting nuts. After the sensor is secured, ensure the clearance is 1⁄16 - ⅛ in. If the Sensor has moved during the tightening procedure, loosen the adjustment nuts and reposition the sensor.

Cable Connections

To connect the C Axis Drive Motor to the Control Box, the Installer will need to route the motor cable from the Powered Gate Driver Box to the C Axis Drive Motor. Route the C Axis Homing Sensor cable to the Control Box. Connect to the socket labeled “Gate” located just under the cooling fan at the top of the Control Box.

Bend-Tech recommends using cable ties, or zip ties, to route the Powered Gate cables along the existing cables leading to the Head of the machine. Connect the cables and tighten the ferrules securely by hand.

! Caution !

Do not use tools to tighten cable connections.

! Caution !

Ensure the machine is powered down when connecting or disconnecting motor cables.

Safety Guards

Tools Required

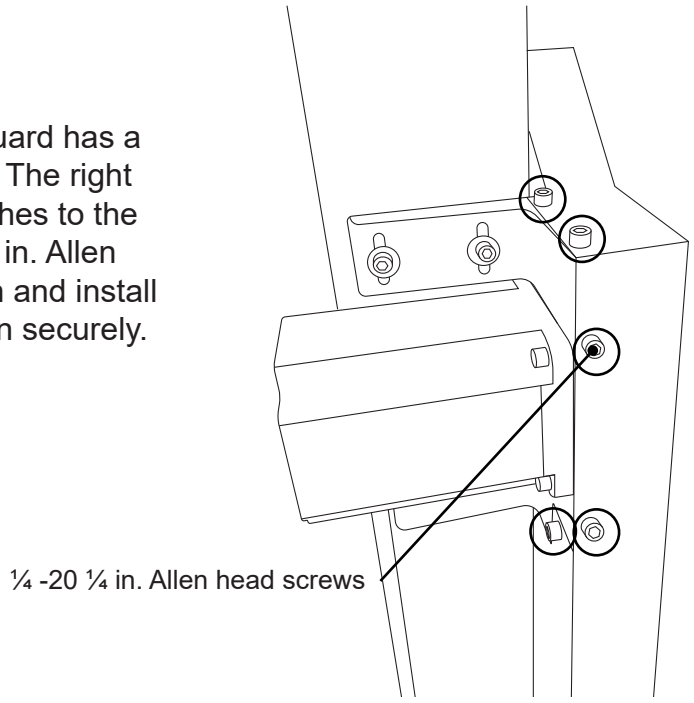
- 3⁄16 in. Allen wrench
- ½ in. wrench

Parts Required

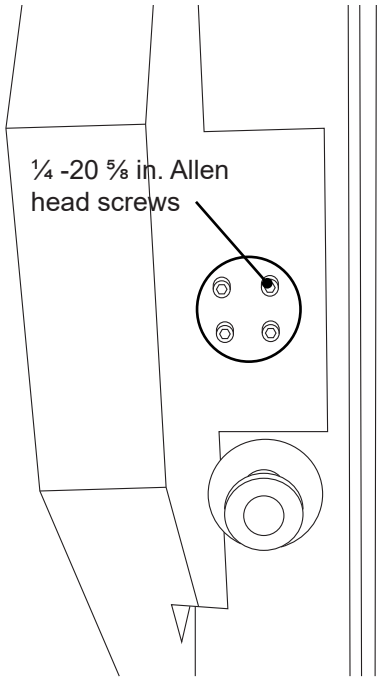
- Gate Ring Gear Safety Guard (R)
- Gate Ring Gear Safety Guard (L)
- ¼ -20 ¼ in. Allen head Gate Ring Gear Safety Guard attachment screws (5)
- ¼ -20 ⅝ in. Allen head Gate Ring Gear Safety Guard attachment screws (4)
- ¼ -20 Nyloc nuts (4)
- Washers (4)

Locate the Gate Ring Gear Safety Guards in the Powered Gate Retrofit parts kit. Locate the nine ¼ -20 Allen head Gate Ring Gear Safety Guard attachment screws, four ¼ -20 nuts and four washers.

The right side Gate Ring Gear Safety Guard has a cutout for the C Axis Drive Motor Mount. The right side Gate Ring Gear Safety Guard attaches to the C Drive Motor Mount using five ¼ -20 ¼ in. Allen head screws. Place the guard in position and install the five ¼ -20 Allen head screws. Tighten securely.



The left side Gate Ring Gear Safety Guard attaches to the Head of the machine using the four Gate Clamp fastener holes. If the Gate Clamp is still installed on the Head of the machine, remove it at this time. Place the guard in position and install the four ¼ -20 ⅝ in. Allen head screws. Reaching inside the Head of the machine, place the 4 washers and thread the four ¼ -20 Nyloc nuts onto the Allen head screws. Place a ½ in. wrench on the nut and tighten the screws using a 3⁄16 in. Allen wrench.



The Powered Gate does not require the use of the Gate Clamp.

On some machines there may not be holes in place for the Gate Clamp. If this is the case, the Installer will need to drill holes in order to mount the left Gate Ring Gear Safety Guard. Use the Drill Template provided with the Powered Gate Retrofit Kit. Attach the template to the Head of the machine using the strut mount bolt. Ensure the arrow on the Drill Template is pointed toward the front of the machine. Drill the four holes using a ¼ in. drill bit.

03 Software Settings

Setting Up The Powered Gate In Dragon Software

With the Powered Gate installed on the Dragon Machine, the Operator will be required to set up the software so the machine recognizes the C Drive and operates it correctly.

1. In the Bend-Tech Dragon Launcher, choose Machine Library from the menu on the right, or from the Tools dropdown at the top of the interface.
2. Choose the machine from the Machine List.
3. At the bottom right of the interface, check the box next to Has Rotation Homing Switch. Also check the box next to Has Powered Gate.

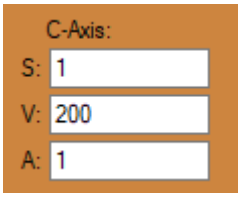
4. Choose Save.
5. At the top of the Machine Library interface, choose the Factory icon. Choose “Click here to show these settings.”
6. In the Mach Axes Settings box, under C-Axis, the Operator will be required to change the values for S: and A:. The default values will typically read:

S: 888.888

V: 200

A: 15

7. Change the C-Axis values to:



S: 1

V: 200

A: 1

8. Choose Save.

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