

OWNER'S GUIDE

AUTOMATIC COLLET CLOSER FOR 8L

PURPOSE

This document gives instructions on installing an Automatic Collet Closer Kit on a 8L Lathe.

PRODUCT INFORMATION

Product: Automatic Collet Closer for 8L (PN 54904)

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

Complete the following steps in the order listed:

Required Tools.....	2
Before You Begin.....	3
Prepare the Pneumatic Cylinder.....	3
Install the Anti-Rotation Bracket.....	3
Install the Pneumatic Cylinder Assembly.....	4
Make Air Connections.....	6
Make Electrical Connections.....	8
Align the Pneumatic Cylinder with the Spindle.....	9

Required Tools

Before you begin, make sure you have the following tools and items:

- 3/16 in. hex wrench
- 9/16 in. box-end wrench
- 11/16 in. box-end wrench
- 2.5 mm hex wrench
- 3 mm hex wrench
- 7 mm wrench
- 8 mm wrench
- 10 mm wrench
- Flat-blade screwdriver, small
- Hammer
- Magnetic dial indicator
- Ratchet with 3/16 in. hex bit
- Round stock
- Safety eyewear that meets ANSI Z87+
- Thread sealant tape

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

Before You Begin

1. Power off the machine and the PathPilot controller.
 - a. Push in the machine's red Emergency Stop button, which removes power to motion control.
 - b. From the PathPilot interface, select **Exit**.
 - c. Turn the Main Disconnect switch to **OFF** on the side of the electrical cabinet.
2. Disconnect the compressed air supply, and wait for any residual air pressure in the system to release.

Prepare the Pneumatic Cylinder

1. Find the two push-to-connect elbow fittings provided. Wrap the threads on the ends of both elbow fittings with thread seal tape.
2. Install two elbow fittings on the pneumatic cylinder with a 9/16 in. wrench.



Figure 1: Elbow fittings installed on the pneumatic cylinder.

3. Set aside the pneumatic cylinder assembly for later installation.

Install the Anti-Rotation Bracket

1. Identify the cover panel inside the lathe's base, as shown in the following image.

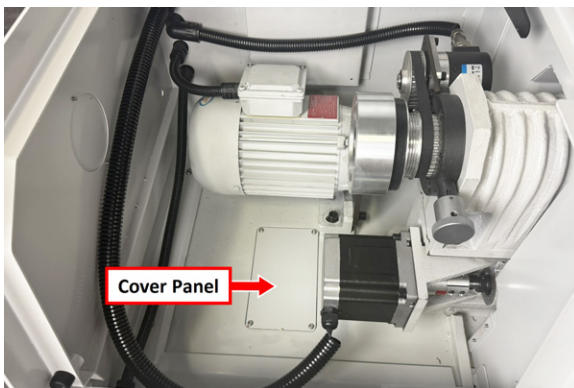


Figure 2: Cover panel on the base of the machine.

2. Remove the cover panel with a 2.5 mm hex wrench. Set aside the four screws and discard the cover plate.

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

3. Install the anti-rotation bracket in place of the panel with the four M4 screws that you set aside in the previous step.

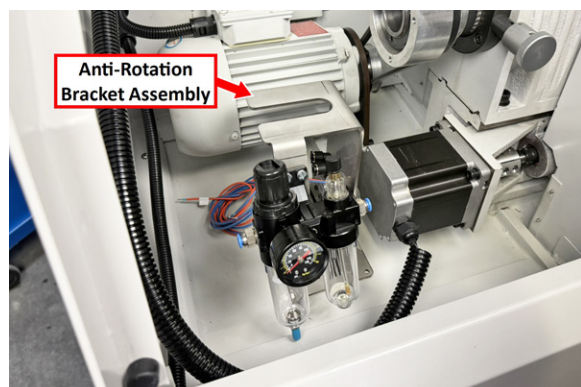


Figure 3: Anti-rotation bracket installed.

Install the Pneumatic Cylinder Assembly

1. Remove the two screws securing the draw tube cover plate, and remove the plate. Set the plate and its screws inside — you'll reinstall them once this assembly is complete.

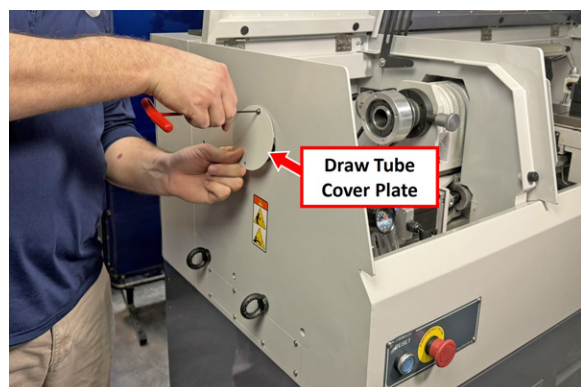


Figure 4: Removing the draw tube cover plate.

2. Mount the cylinder to the pulley with the four bolts provided and a 10 mm wrench. Lightly snug the bolts for now — you'll tighten them down after alignment. Make sure that the cylinder is oriented so that its elbow fittings are in the notch on the anti-rotation bracket as shown in the following image.

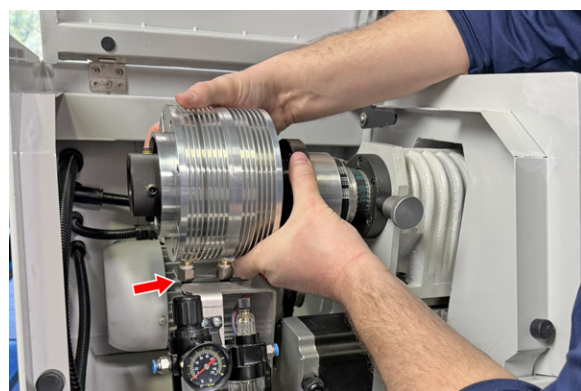


Figure 5: Mounting the pneumatic cylinder.

3. Find the draw tube provided. One end of the draw tube has four holes, which are used to secure the draw tube to the pneumatic cylinder. The other end has threads for a 5C insert on the inside of the tube.

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

4. Insert the threaded end of the draw tube through the access hole on the enclosure and into the pneumatic cylinder.

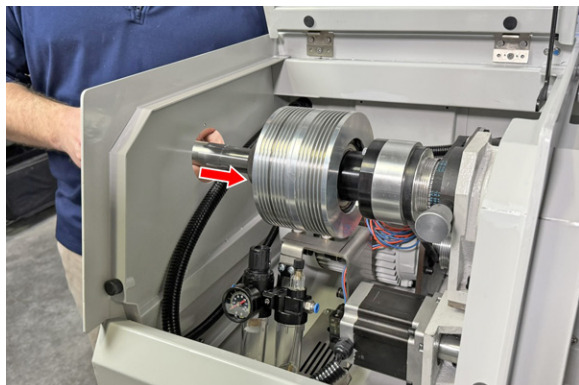


Figure 6: Inserting the draw tube into the pneumatic cylinder.

5. Use a 3/16 in. hex wrench with a ratchet to remove one of the four set screws on the pneumatic cylinder. Set aside the set screw.

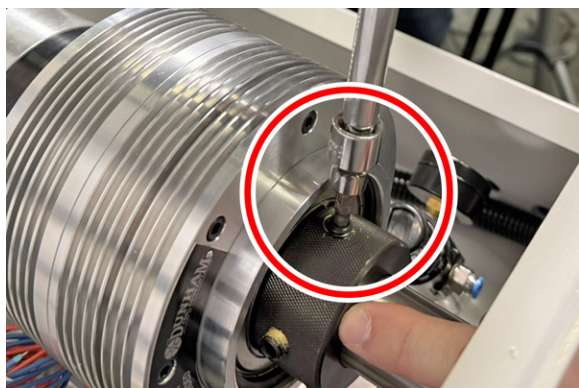


Figure 7: Removing a set screw from the pneumatic cylinder.

6. Rotate the draw tube until one of the holes in the draw tube aligns with the empty set screw hole on the pneumatic cylinder.

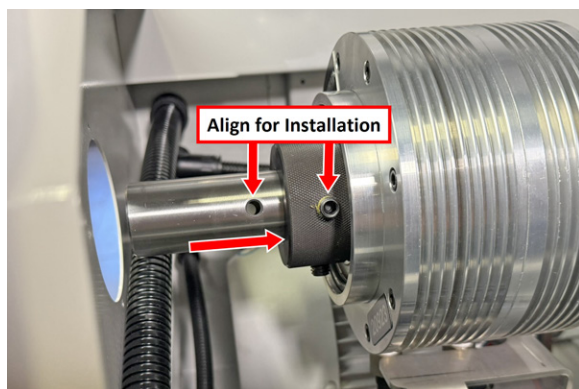


Figure 8: Example of the draw tube hole to align with the set screw.

7. Tighten one of the remaining set screws to hold the draw tube in position. Then, reinstall the set screw that you previously set aside.

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

8. Tighten the remaining set screws evenly until the draw tube no longer rotates inside of the knurled knob.



IMPORTANT! Do not overtighten the set screws. Excessive torque can deform the draw tube, which may cause spindle runout.

9. Loosen the thumb screw on the pneumatic cylinder assembly. Loosening the thumb screw allows the draw tube to rotate separately from the spindle so that you can thread a collet into the draw tube.
10. Install a collet into the spindle. Rotate the collet until its groove aligns with the pin inside the spindle.



Figure 9: Installing a collet into the spindle.

11. Put a piece of stock into the collet.
12. Hold the collet with one hand and then, from the pneumatic cylinder, use your other hand to turn the draw tube handle.
13. Continue to thread the collet on the draw tube until it is completely threaded.
14. Tighten the thumb screw on the pneumatic cylinder assembly.
15. To prevent the draw tube from turning during operation, you must make sure that the thumb screw is engaged in the draw tube: Turn the draw tube handle counterclockwise until the thumb screw clicks into one of four slots on the draw tube.
The draw tube is now locked into place.

Make Air Connections

Use the (provided) **FRL Filter-Regulator-Lubricator (PN 38829)** to supply dry, filtered air to the solenoid.



Note: For an air routing diagram for reference, go to "Pneumatic Schematic" (page 16).

1. Find the four air lines provided with this kit. Identify the two shortest air lines (Hose 1 and Hose 2), which connect the pneumatic cylinder to the solenoid on the anti-rotation bracket.
2. Connect Hose 1 (9 in. or 228 mm) between:
 - The elbow fitting **furthest** from the spindle on the collet closer
 - Port 4 on the solenoid

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

3. Connect the Hose 2 (6 in. or 152 mm) between:
- The elbow fitting **closest** to the spindle on the collet closer
 - Port 2 on the solenoid

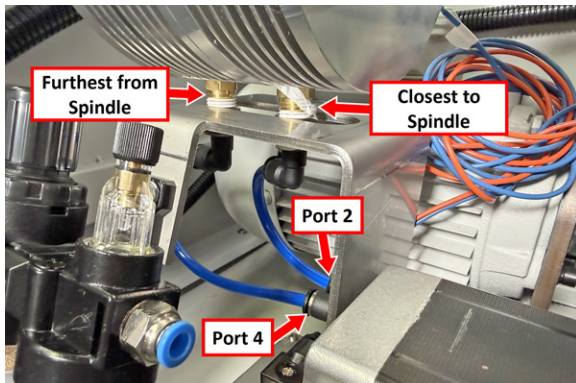


Figure 10: Air connections between the cylinder and the solenoid.

4. Identify Hose 4 (10 in. or 254 mm). Connect it between the push-to-connect fitting on the right side of the FRL and port 1 on the solenoid.

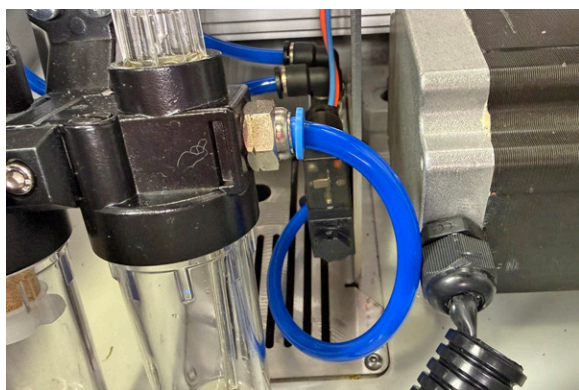


Figure 11: Air connection between the FRL and the solenoid.

5. Identify Hose 3 (72 in. or 1.8 m). Connect one end to the push-to-connect elbow fitting.



Figure 12: Connecting Hose 3 to the PTC elbow fitting.

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

6. Route the loose end of Hose 3 through one of the access holes on the outside of the enclosure, and then connect it to the input port on the FRL.



Figure 13: Routing Hose 3 through the access hole in the enclosure.

7. Fill the FRL reservoir with air tool oil.

Make Electrical Connections

1. From the back of the machine, remove and set aside the back panel with a 3 mm hex wrench.



Figure 14: Removing the back panel from the machine.

2. Route the two solenoid wires through the hole in the back of the enclosure (toward the electrical cabinet).

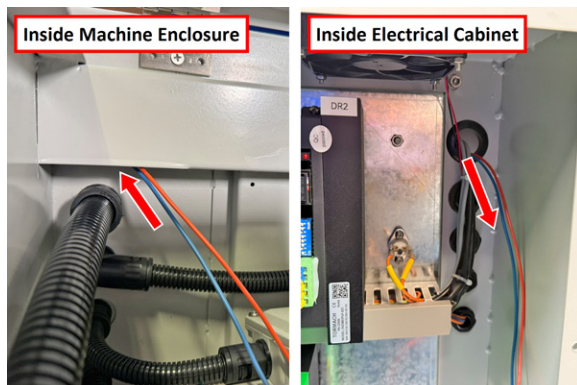


Figure 15: Routing the solenoid wires into the electrical cabinet.

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

3. Route the blue wire (#425) to the power supply, and connect it to V- with a small, flat-blade screwdriver.

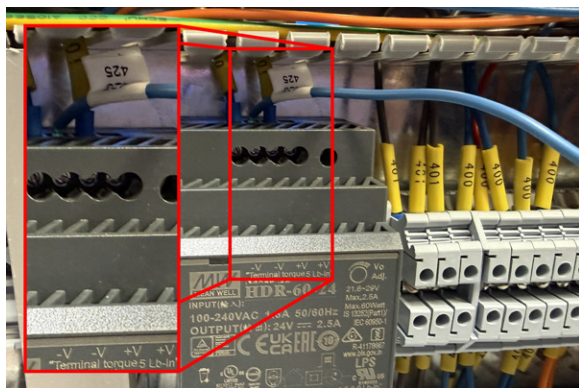


Figure 16: Blue wire #425 connected to the power supply.

4. Route the orange wire (#410) to the machine control board, and connect it to pin 2 on connector J10 with a small, flat-blade screwdriver.

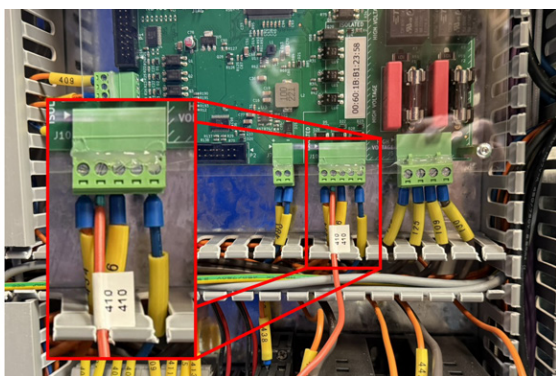


Figure 17: Orange wire #410 connected to the machine control board.

5. Remove the wire tray covers, and route the collet closer wires into the trays. Then, replace the covers.
6. Reinstall the back panel onto the machine.

Align the Pneumatic Cylinder with the Spindle

1. Verify that the bolts securing the cylinder to the pulley are finger-tight (snug), but not yet completely tightened.
2. Connect the quick-connect fitting to the air compressor.



Note: You may hear the collet closer clunk. Connecting the shop air supply moves the cylinder into the clamped (closed) position.

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

3. On the FRL, pull up on the knob and turn it until the dial reads 20 psi.

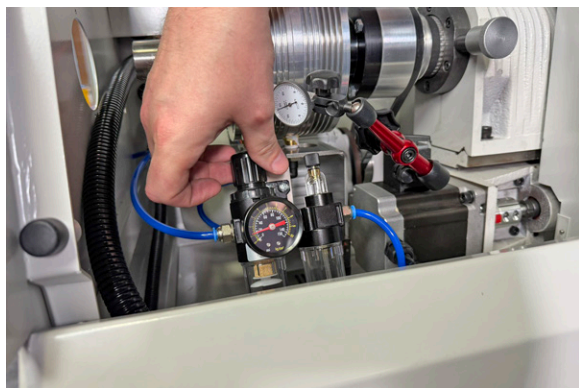


Figure 18: Turning the knob on the FRL.

4. Put the base of a magnetic dial indicator on the motor. Verify that the magnetic dial indicator touches the aluminum of the pneumatic cylinder furthest away from the spindle, as shown in the following image.

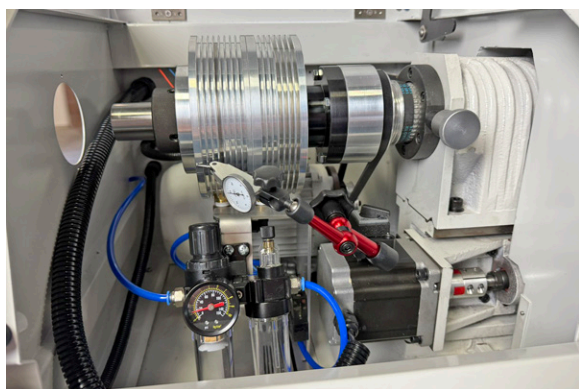


Figure 19: Magnetic dial indicator put on a pneumatic cylinder.



Note: We don't recommend mounting the dial indicator base to the sheet metal of the enclosure. The sheet metal can flex, which impacts the results of the alignment.

5. Manually rotate the spindle clockwise. On the magnetic dial indicator, the needle rises and falls. Continue to rotate the spindle until the needle reaches the highest point on the magnetic dial indicator.
6. Gently tap the mounting flange with a hammer, as shown in the following image.

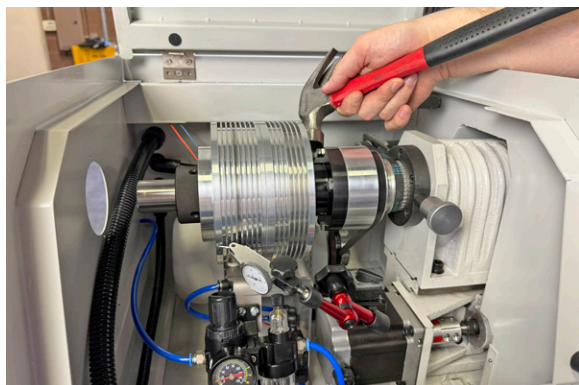


Figure 20: Using a hammer to align an Automatic Collet Closer Kit.

INSTALL THE AUTOMATIC COLLET CLOSER FOR 8L

7. Manually rotate the spindle clockwise until the needle again reaches the highest point on the magnetic dial indicator.
8. Continue adjusting until the runout is less than 0.002 in.



Note: If the reading on the magnetic dial indicator remains the same after you tap the mounting flange with the hammer, slightly loosen the four M6 × 1 - 25 hex head screws, and repeat the alignment steps.

9. Tighten the four M6 × 1 - 25 hex head screws on the mounting flange with a 10 mm wrench.
10. Manually rotate the spindle to verify that the runout is still less than 0.002 in. If it's not, repeat the alignment steps.
11. Power on the machine and the PathPilot controller.
 - a. Turn the Main Disconnect switch to **ON** on the side of the electrical cabinet.
 - b. Twist out the machine's red Emergency Stop button, which enables movement to the machine axes and the spindle.
 - c. Press the machine's Start button (next to the Emergency Stop button).

You have completed installing the Automatic Collet Closer Kit. For operating instructions, go to "Operation" (page 12).

OPERATION

WARNING! Operator Knowledge: You and all other operators must read and understand the 8L operator manual before installing, using, or maintaining the machine.

Enable the Automatic Collet Closer



Note: The Automatic Collet Closer Kit requires PathPilot v2.14.3 or later. If you haven't yet done so, download and install the latest version of PathPilot.

- From the PathPilot interface, on the **Settings** tab, select the **Automatic Collet Closer** checkbox.

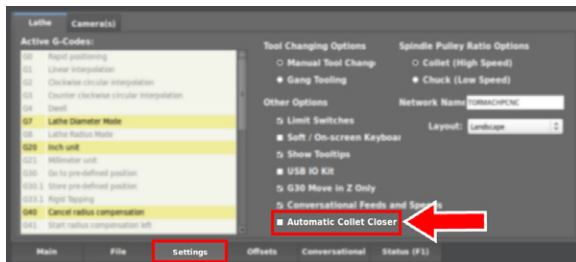


Figure 1: Automatic Collet Closer checkbox.

Selecting the checkbox enables support for automatic or manual operation and limits the spindle to 3500 RPM.

Automatic Operation

- Use M-code to program the collet closer to open and close:
 - M10 opens the collet closer.
 - M11 closes the collet closer.

Manual Operation

- From the PathPilot interface, select **Collet Clamped** to toggle the button's green light on and off. When the **Collet Clamped** button's green light is on, the collet is in the closed (clamped) position. When the **Collet Clamped** button's green light is off, the collet is in the open (unclamped) position.



Figure 2: Collet Clamped button with the light on.

Change the Collet

1. From the PathPilot interface, select **Collet Clamped** to toggle the button's light off.



Figure 3: Collet Clamped button's light off.

The collet closer is now in the open position.

2. Loosen the thumb screw on the pneumatic cylinder assembly. Loosening the thumb screw allows the draw tube to rotate separately from the spindle so that you can thread a collet into the draw tube.
3. Install a collet into the spindle. Rotate the collet until its groove aligns with the pin inside the spindle.



Figure 4: Installing a collet into the spindle.

4. Hold the collet with one hand and then, from the pneumatic cylinder, use your other hand to turn the draw tube handle.
5. Continue to thread the collet on the draw tube until it is completely threaded.
6. Tighten the thumb screw on the pneumatic cylinder assembly.
7. To prevent the draw tube from turning during operation, you must make sure that the thumb screw is engaged in the draw tube: Turn the draw tube handle counterclockwise until the thumb screw clicks into one of four slots on the draw tube.

The draw tube is now locked into place, and the collet is ready for the workpiece.

Adjust the Holding Force

If needed, you can adjust the holding force using the pressure regulator:

- Increase the pressure to increase the holding force.
- Decrease the pressure to decrease the holding force.



Note: Refer to "Specifications" (on the next page) for information on holding force limits.

We recommend you begin with 40 psi, and then gradually increase the pressure until the part is sufficiently held.

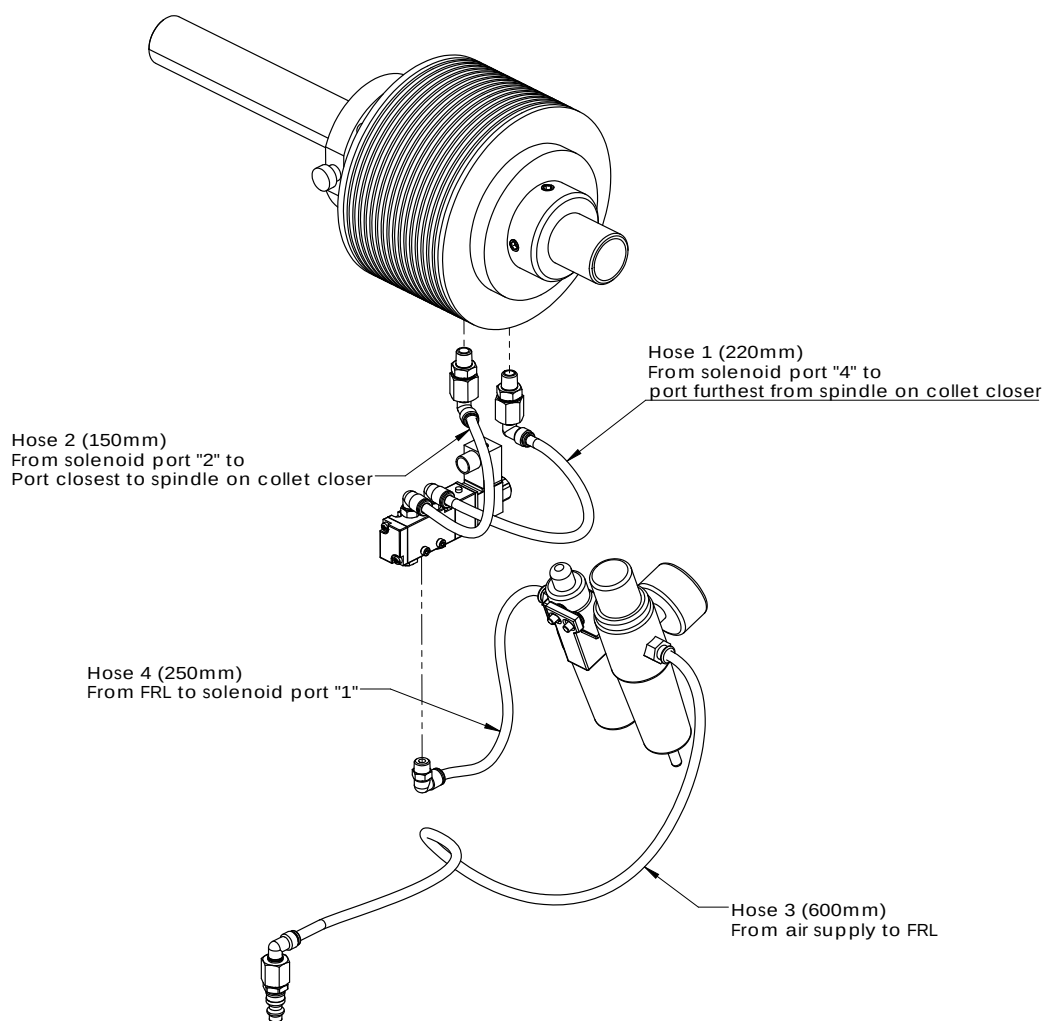
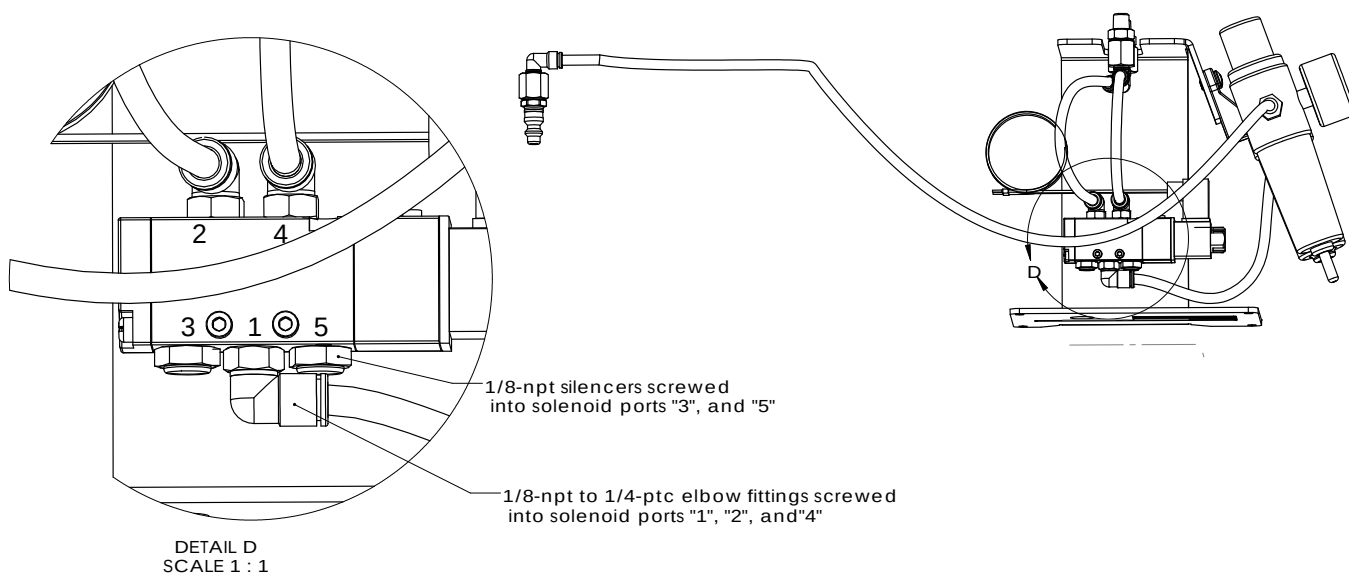
Specifications

Maximum Continuous rpm	3600 rpm
Maximum psi	100 psi
Pull Force	1600 lb at 100 psi
Push Force	600 lb at 100 psi

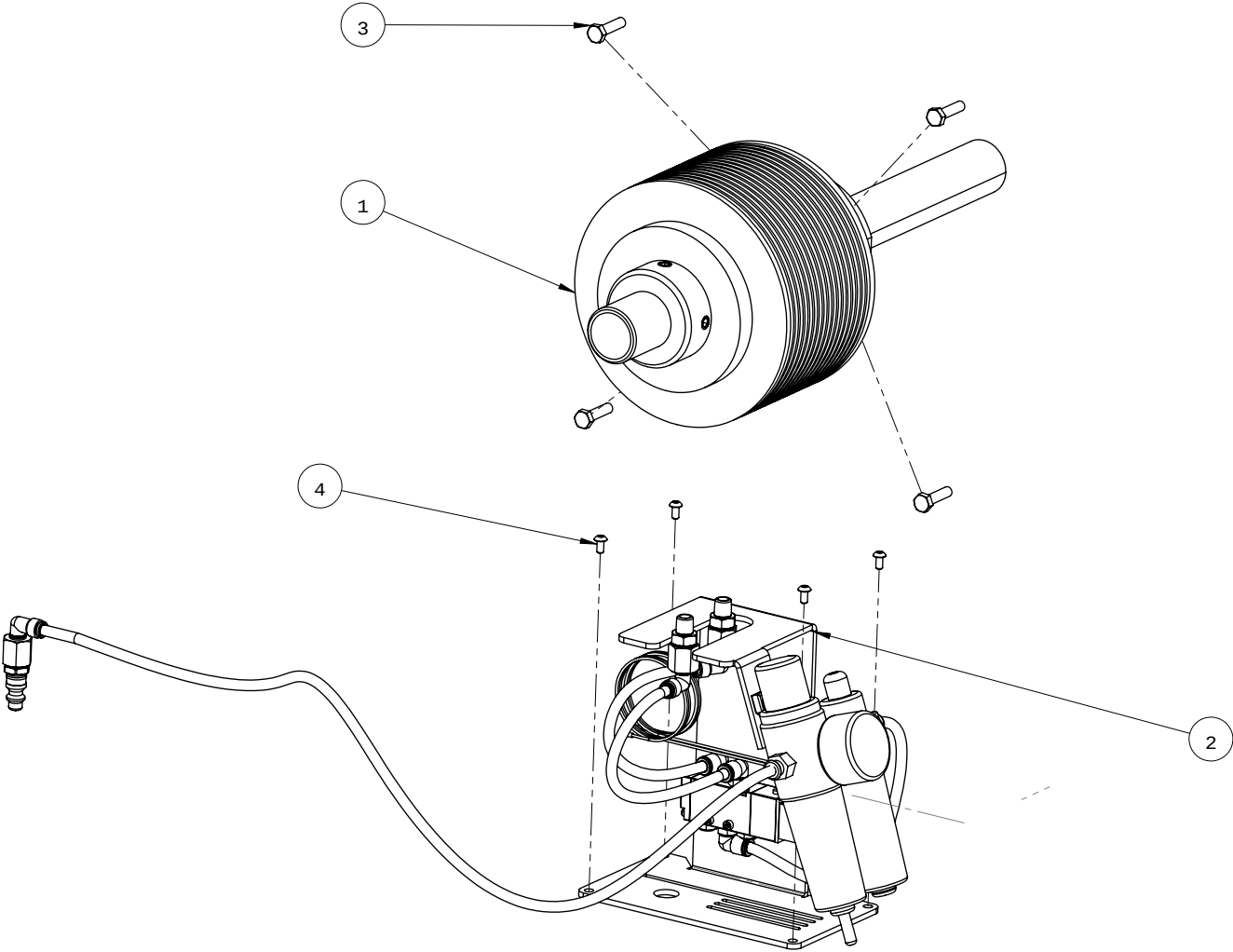
SCHEMATICS, DIAGRAMS, AND PARTS LISTS

Pneumatic Schematic.....	16
Automatic Collet Closer for 8L.....	17

Pneumatic Schematic



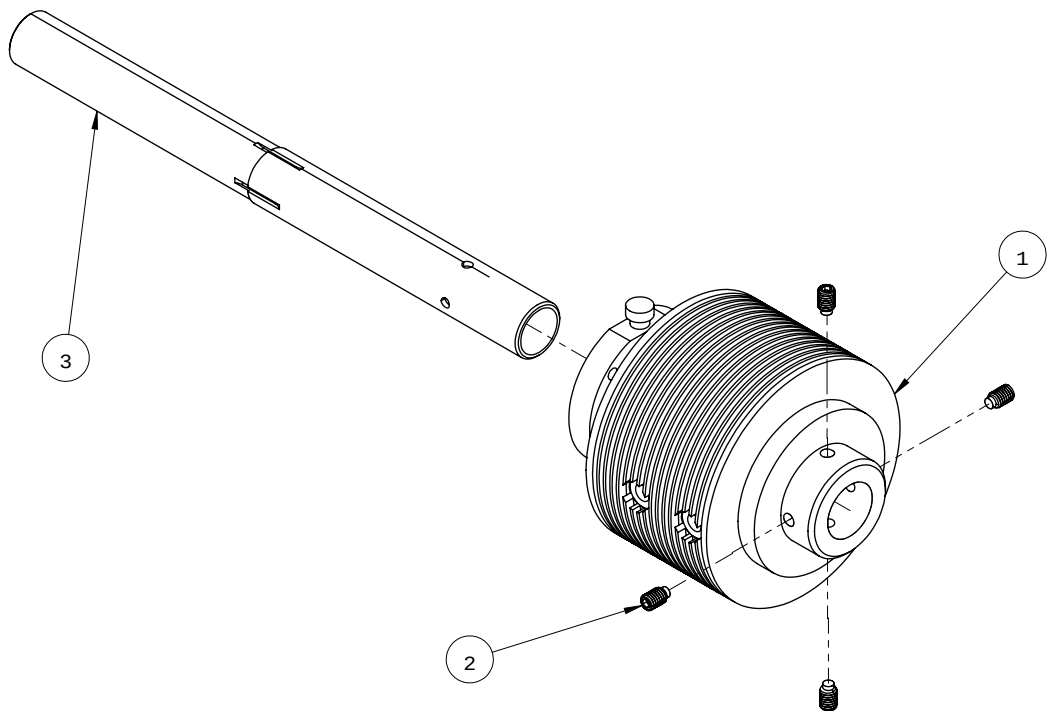
Automatic Collet Closer for 8L



SCHEMATICS, DIAGRAMS, AND PARTS LISTS

ID	Description	Alternative Part Number	Quantity
1	Dunham Collet Closer with Drawtube, 8L (PN 54902)	—	1
2	8L Collet Closer Pneumatics Sub-Assembly (PN 54903)	—	1
3	Screw, Hex Head Cap, M6 × 1 - 25 (PN 32371)	McMaster Carr: 92314A669	4
4	Screw, Button Head Cap, M4 × 0.7 - 8, Stainless Steel (PN 50838)	McMaster-Carr: 92095A189	4

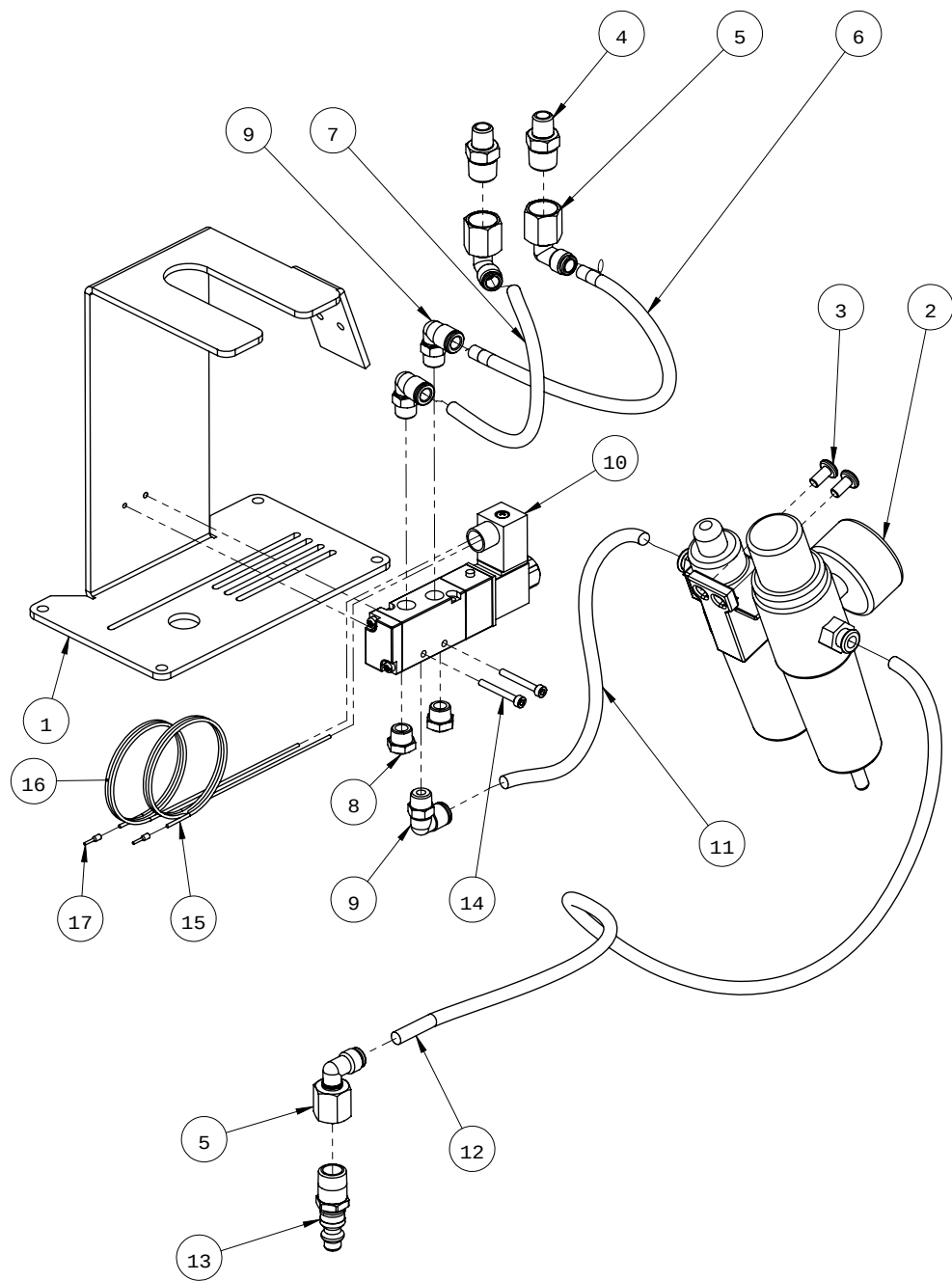
Dunham Collet Closer with Drawtube



SCHEMATICS, DIAGRAMS, AND PARTS LISTS

ID	Description	Alternative Part Number	Quantity
1	Pneumatic Collet Closer Cylinder (PN 38377)	—	1
2	Screw, Hex Head Set, 3/8 in. × 16 - 5/8 in. (PN 38361)	McMaster Carr: 92845A653	4
3	8L Automatic Collet Closer Drawtube (PN 54901)	—	1

Pneumatics Sub-Assembly



SCHEMATICS, DIAGRAMS, AND PARTS LISTS

ID	Description	Alternative Part Number	Quantity
1	Anti-Rotation Bracket, 8L (PN 54900)	—	1
2	<u>FRL Filter-Regulator-Lubricator (PN 38829)</u>	—	1
3	Screw, Pan Head Machine, M5 × 0.8 - 10, Zinc Plated (PN 34166)	McMaster-Carr: 92005A320	2
4	Fitting, 1/4 × 1/8 NPT Male Reducer (PN 38689)	—	2
5	Fitting, Elbow, 1/4 in. Tube - 1/4 in. NPT (Female) (PN 31990)	McMaster-Carr: 5779K635	3
6	Hose, Solenoid to Collet Closer, 9 in. Long, 8L (PN 32685)	—	1
7	Hose, Solenoid to Collet Closer, 6 in. Long, 8L (PN 32685)	—	1
8	Fitting, Muffler (Flat), 1/8 NPT (PN 37297)	—	2
9	Fitting, Elbow, 1/8 in. NPT (Male) - 1/4 in. PTC (PN 34886)	—	3
10	Five Port, Four Way, Two Position, 24 VDC, Single Solenoid Valve, 1/8 in. (Inlet/Outlet), 1/8 in. (Exhaust) (PN 52306)	—	1
11	Hose, FRL to Solenoid, 10 in. Long, 8L (PN 32685)	—	1
12	Hose, Air Supply to FRL, 72 in. Long, 8L (PN 32685)	—	1
13	Fitting, Brass Coupling, 1/4 Male NPT (PN 31989)	McMaster Carr: 1077T17	1
14	Screw, Socket Head Cap, M3 × 0.5 - 25 (PN 50768)	McMaster-Carr: 91290A125	2
15	Wire, 22 AWG, Blue, 72 in. Long (PN 50999)	—	1
16	Wire, 22 AWG Orange, 56 in. Long (PN 51714)	—	1
17	Ferrule, 22 AWG, Turquoise (PN 35607)	—	2