

Owner's Guide: 770M® Automatic Tool Changer (ATC)

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1.1 PURPOSE

This document gives instructions to install and use an Automatic Tool Changer (ATC) on a 770M®.

You must install the Power Drawbar on your machine before installing the ATC. Do not install the Power Drawbar button (the button's functionality is replaced by the ATC).

1.2 PRODUCT INFORMATION

Product: Automatic Tool Changer (ATC)

The Automatic Tool Changer (ATC) holds up to 10 tools in a single tray. If your program requires more tools, the ATC changes tools automatically for all tools assigned to the tray, and pauses for a manual tool change for all tools not assigned to the tray.

Quantity	Description	PN
1	ATC Assembly	—
3	Fixed Standoff Assembly	37260
10	Plastic Screw	32173
1	Tilt Standoff Assembly	35911

NOTE: If any of these items are missing, we can help.



Email support@tormach.com to contact Tormach Technical Support for guidance on how to proceed.

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2.1 SETTING UP THE AUTOMATIC TOOL CHANGER (ATC)

2.1.1 Required Tools

This procedure requires the following tools. Make sure that you have them available before you begin.

Tools Required for Installation

- 1-1/2 inch adjustable wrench
- Metric hex wrench set
- Phillips screwdriver
- Small, flat-head screwdriver
- Snips
- Socket wrench, and a 13 mm socket

Tools Required for Validation

- Machinist's square
- 8-inch rod for Tormach Tooling System® (TTS®) tool holder
- Tormach Tooling System® (TTS®) tool holder

2.1.2 Air Requirements

You must make sure that the site conforms to the following air supply requirements.

- **Air Pressure.** Between 90 pounds per square inch (psi) and 120 psi (620 kPa - 825 kPa).
If the air supply is more than 120 psi (825 kPa), you must use a regulator.
- **Dry Air.** We recommend using a compressed air dryer, desiccator, or filter between the air compressor and the machine.
- **Lubricated Air.** You must lubricate the air with air tool oil. Use the FRL Filter-Regulator-Lubricator (PN 38829) or similar for this purpose.

2.1.3 Prepare the Machine

1. If there is already a Tormach Tooling System® (TTS®) tool holder in the spindle, remove it.

2. From the PathPilot® interface, reference the mill: click **Ref Z**, **Ref X**, and **Ref Y**.



WARNING! Electrical Shock Hazard: You must power off the machine before making any electrical connections. If you don't, there's a risk of electrocution or shock.

3. Power off the machine and the PathPilot® controller.
 - a. Push in the **Emergency Stop** button on the operator box, which disables movement of the axes and the spindle.
 - b. From the PathPilot® interface, click **Exit**.
 - c. Turn the **Main Disconnect** switch to **Off** on the side of the electrical cabinet.

2.1.4 To Install the Automatic Tool Changer (ATC)

Installing the ATC involves the following steps. Complete them in the order listed:

- **Step 1:** "Disassemble the Power Drawbar Button" (below)
- **Step 2:** "Install the Air Cylinder" (on the next page)
- **Step 3:** "Mount the Automatic Tool Changer (ATC) Bracket" (on the next page)
- **Step 4:** "Install the Main Assembly" (page 5)
- **Step 5:** "Level the Automatic Tool Changer (ATC)" (page 5)
- **Step 6:** "Make Air Connections" (page 7)
- **Step 7:** "Make Electrical Connections" (page 8)
- **Step 8:** "Validate the Installation" (page 8)
- **Step 9:** "Adjust the Power Drawbar" (page 8)

Disassemble the Power Drawbar Button

If you previously installed the Power Drawbar button assembly, you must first disassemble it.

If you're installing an Automatic Tool Changer (ATC) on a new machine, go to "Mount the Automatic Tool Changer (ATC) Bracket" (on the next page).

1. Disconnect shop air supply from the machine, and then disconnect all air lines from the Power Drawbar button.
2. Set aside the shop air line for later installation.
3. Remove four M5 × 0.8 - 10 button head cap screws that secure the Power Drawbar button cover.
4. Remove two M4 × 0.7 - 50 socket head cap screws that

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secure the Power Drawbar button to the spindle head.

5. Remove the Power Drawbar button from the spindle head.

Install the Air Cylinder

1. Insert the air cylinder into the ATC main assembly.

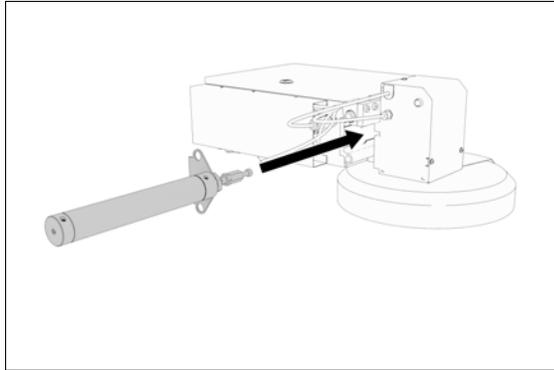


Figure 2-1: Air cylinder aligned with the ATC main assembly.

2. Use a 12 mm hex wrench (provided) to secure the air cylinder to the ATC main assembly with two M14 × 20 mm socket head cap screws.

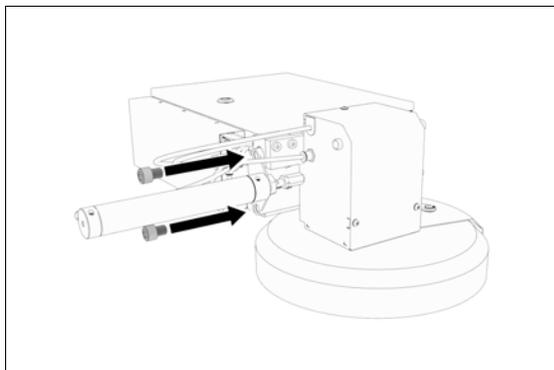


Figure 2-2: Air cylinder hardware aligned with the air cylinder.

3. Connect the airlines from the ATC main assembly to the air cylinder.

Mount the Automatic Tool Changer (ATC) Bracket

1. Identify four provided standoffs, used to mount the ATC to the Z-column:
 - Three fixed standoffs
 - One tilt standoff
2. Remove the flange nut and the washer from each standoff.
3. Set aside all flange nuts and washers.

4. Install the four standoffs on the Z-column in the order shown in the following image.

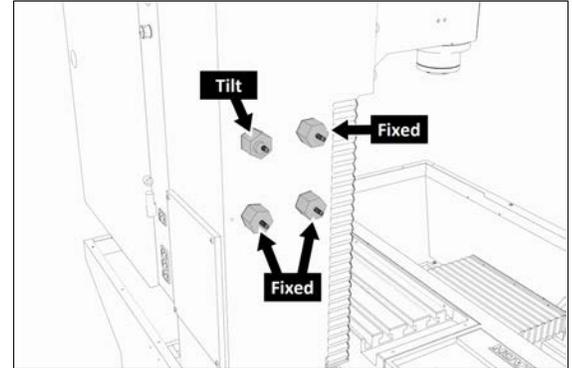


Figure 2-3: Four standoffs installed on the Z-column.

5. Tighten the standoffs securely on the Z-column using an adjustable wrench.
6. Install the ATC mounting bracket on the standoff's threaded studs as shown in the following image.

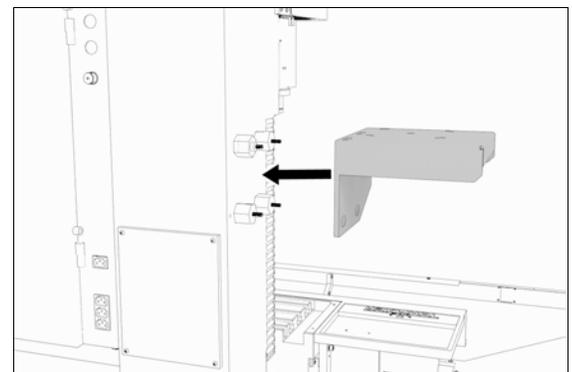


Figure 2-4: ATC mounting bracket installed on the four standoffs.

NOTE: Make sure that the tilt standoff's eccentric cam fits into the large slot on the ATC mounting bracket.

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7. Make sure that the top right standoff is centered within the slot on the ATC mounting bracket.

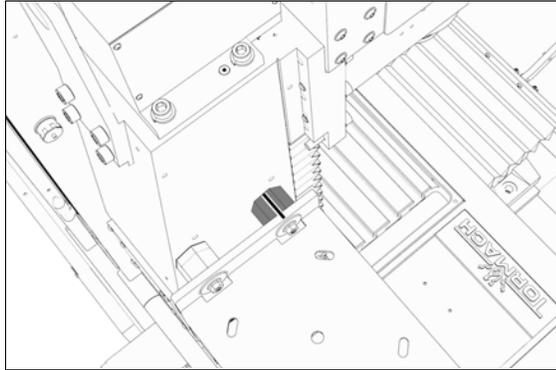


Figure 2-5: Example of the top right standoff centered within the ATC mounting bracket slot.

NOTE: To make sure that the ATC mounting bracket stays in place, you can put a piece of tape on both the top right standoff and the slot on the ATC mounting bracket, and draw a straight line between them. This may help with further adjustments made later in the installation procedure.



8. Loosely reinstall the washers and flange nuts that you removed in Step 3. Only tighten the washers and flange nuts finger-tight.



NOTE: More adjustments are made later in the installation procedure.

Install the Main Assembly

1. Identify the four provided M8 × 1.25 - 16 mm socket head cap screws and washers, and then set them all aside.



CAUTION! Team Lift Required: You must use two people to lift and install the ATC on the Z-column.

2. Lift the ATC main assembly on to the mounting bracket.

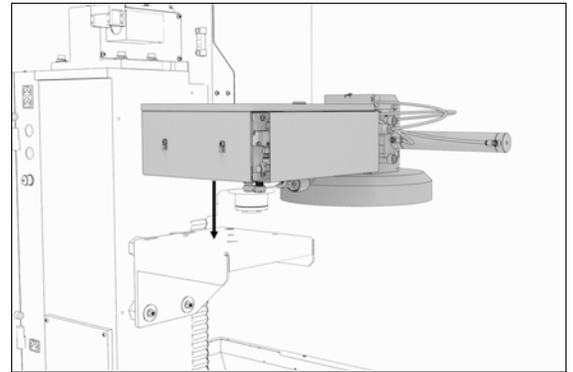


Figure 2-6: ATC main assembly lifted on to the mounting bracket.

3. Align the locating pin on the ATC main assembly with the matching hole in the mounting bracket.
4. Use four M8 × 1.25 - 16 mm socket head cap screws that you set aside in Step 1 to secure the ATC main assembly to the mounting bracket.

Level the Automatic Tool Changer (ATC)

This section gives instructions to roughly align the ATC on the machine by using a long, straight rod. More adjustments are made later in the installation procedure.

NOTICE! After the initial installation, you must level the ATC. If you don't, there's a risk of machine damage.

1. Move the tool tray toward the spindle.

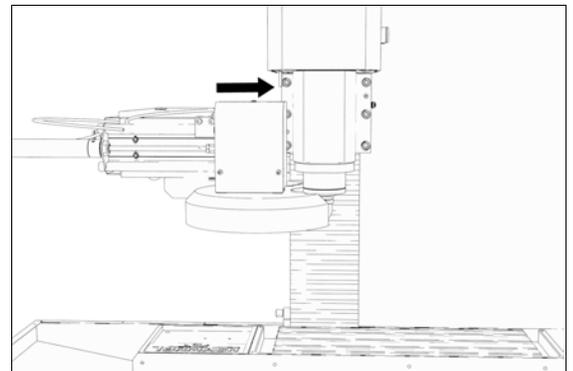


Figure 2-7: Example of the tool tray moved in toward the spindle.

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2. Make sure that the linear bearing on the ATC is flush with the ATC main assembly.

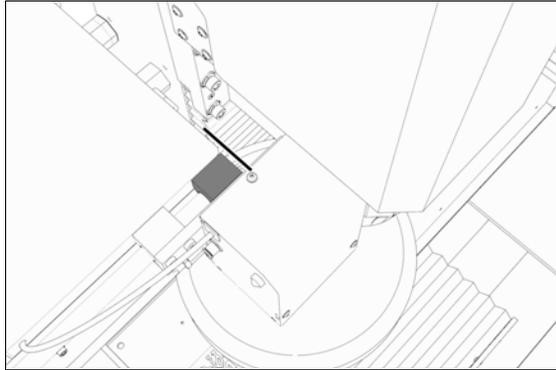


Figure 2-8: Example of the linear bearing flush with the ATC main assembly.

3. Insert a rod — no more than 8 inches long — into a Tormach Tooling System® (TTS®) tool holder.
4. Insert the tool holder into the fork. Make sure that the groove in the tool holder slides along the shoulder on the fork.

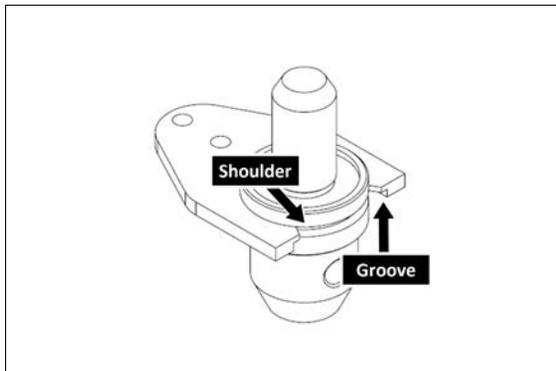


Figure 2-9: Example of the groove on a Tormach Tooling System® (TTS®) aligned with the shoulder of an ATC fork.



NOTE: Do not rest the tool holder on top of the fork.

5. Put a machinist's square on the machine table. Make sure that the rod is perpendicular to the machine table in both the X and the Y directions.

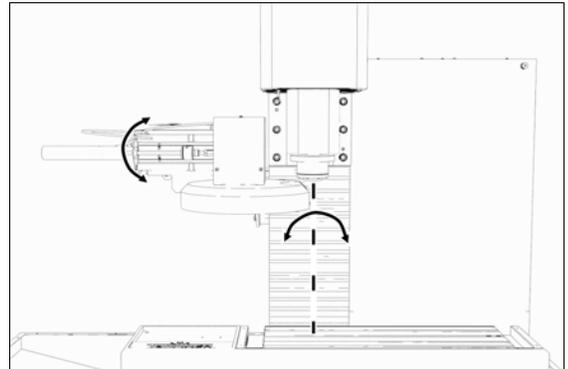


Figure 2-10: Example of the directions to adjust the ATC alignment.

If it isn't, do the following:

- Adjust the alignment of the ATC in the Y direction:
 - a. Loosen the flange nuts on the standoffs.
 - b. Use an adjustable wrench to turn the tilt standoff, and slowly pivot the ATC until the rod is perpendicular to the machine table.

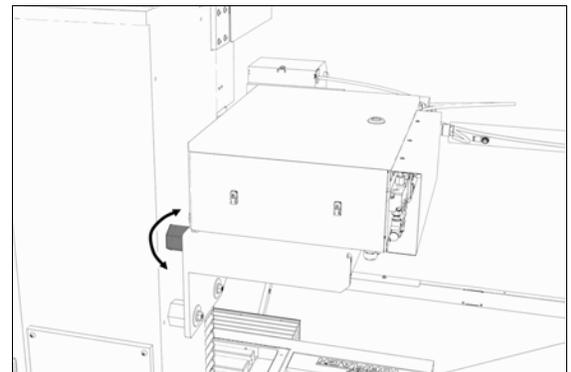


Figure 2-11: Tilt standoff.

- c. Make sure that the top right standoff is centered within the slot on the ATC mounting bracket.
- d. Tighten the flange nuts.
- e. Re-check the alignment of the ATC in the Y direction.

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- Adjust the alignment of the ATC in the **X** direction:
 - a. Loosen the two socket head cap screws on the linear rails.

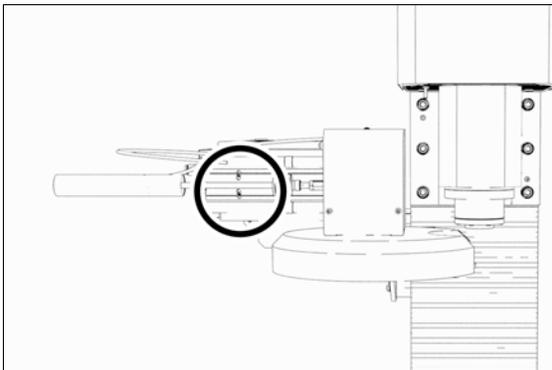


Figure 2-12: Socket head cap screws on the linear rails.

- b. Slowly pivot the ATC until the rod is perpendicular to the machine table.
- c. Tighten the socket head cap screws.
- d. Re-check the alignment of the ATC in the **X** direction.

Repeat this step until the rod is perpendicular to the machine table in both the **Y** and the **X** direction.

6. Remove the tool holder from the fork, and then set it aside.



NOTE: You'll need this tool later in the installation procedure to make further alignments.

7. Move the tool tray away from the spindle.
8. Power on the machine and the PathPilot® controller.
 - a. Turn the **Main Disconnect** switch to on **On** the right side of the electrical cabinet.
 - b. Twist out the **Emergency Stop** button on the operator box, which enables movement to the machine axes and the spindle.
 - c. Press the **Reset** button on the operator box.
 - d. Bring the machine out of reset and reference it.
9. Slowly jog the Z-axis **down (-Z)** 1-1/2 inches.
10. Power off the machine and the PathPilot® controller.
 - a. Push in the **Emergency Stop** button on the operator box, which disables movement of the axes and the spindle.
 - b. From the PathPilot® interface, click **Exit**.
 - c. Turn the **Main Disconnect** switch to **Off** on the side of the electrical cabinet.

11. Move the tool tray toward the spindle.

12. Make sure that the carousel door opening is approximately equal in distance on all sides of the spindle mounting flange.

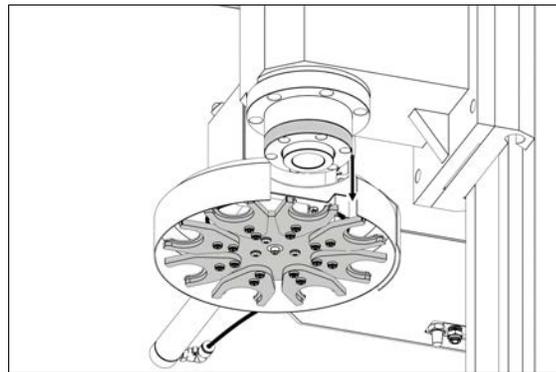


Figure 2-13: Example of examining the distance between the carousel door opening and the spindle mounting flange.

Figure 2-14: If it isn't, do the following:

- a. Loosen the four socket head cap screws that secure the ATC main assembly to the mounting bracket.

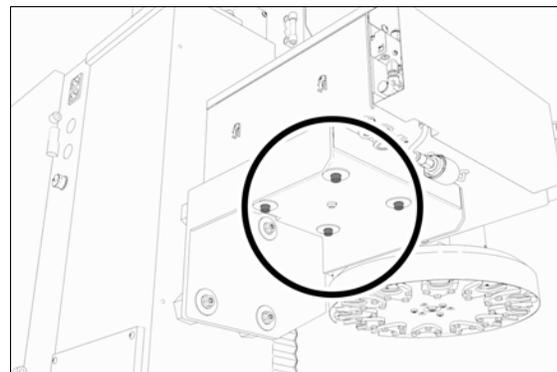


Figure 2-15: Socket head cap screws securing the ATC main assembly to the mounting bracket.

- b. Pivot the ATC about the locating pin in the mounting bracket until the carousel door opening is centered with the spindle mounting flange.
 - c. Tighten the socket head cap screws.
13. Move the tool tray away from the spindle.

Make Air Connections

1. Use snips to cut the zip tie securing the ATC cables and plastic tubes together.
2. Route the loose ends of the two 1/4-inch plastic tubes connected to the ATC main assembly through the energy chain and toward the Power Drawbar.

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3. Connect the loose ends of the 1/4-inch plastic tubes in the following order:
 - a. Connect the **Retract (PDB Bottom)** airline to the bottom push-to-connect elbow on the Power Drawbar.
 - b. Connect the **Advance (PDB Top)** airline to the top push-to-connect elbow on the Power Drawbar.
 - c. Connect your shop's air supply to the **Air In** port in the ATC main assembly.

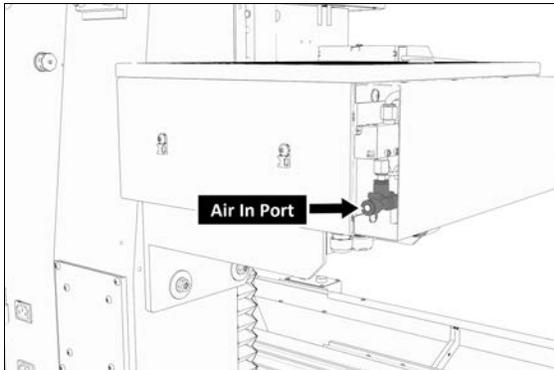


Figure 2-16: Air In port in the ATC main assembly.

Make Electrical Connections

1. Route the ATC power cable and the USB cable toward the back of the machine.
2. Put the USB cable in the access hole in the back of the stand toward the controller.
3. Insert the USB cable into any open USB port on the PathPilot® controller.
4. Connect the ATC power cable to the **ATC Power** connector on the side of the electrical cabinet.

Validate the Installation

1. Power on the machine and the PathPilot® controller.
 - a. Turn the **Main Disconnect** switch to on **On** the right side of the electrical cabinet.
 - b. Twist out the **Emergency Stop** button on the operator box, which enables movement to the machine axes and the spindle.
 - c. Press the **Reset** button on the operator box.
 - d. Bring the machine out of reset and reference it.

2. From the PathPilot® interface, on the **Settings** tab, select the **ATC** radio button.

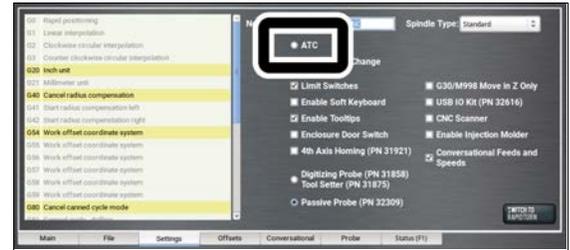


Figure 2-17: ATC radio button on the Settings tab.

The **ATC** tab appears in the PathPilot® interface.

3. From the **Main** tab, reference the machine by clicking **Ref Z**, **Ref X**, and **Ref Y**.
4. Insert a tool into the spindle as follows:
 - a. Push and hold the button on the ATC. The collet opens.
 - b. Insert a tool into the spindle.
 - c. Release the button. The collet closes.
5. From the PathPilot® interface, on the **Main** tab, type **1000** into the **RPM DRO** field.
6. Click **FWD**. The spindle starts.
7. From the **Status** tab, make sure that the **VFD Running** green light comes on.

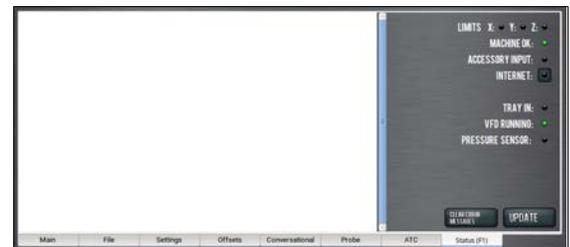


Figure 2-18: VFD Running light on the Status tab.

NOTE: If the VFD Running light did not come on in Step 7, we can help. Email support@tormach.com to contact Tormach Technical Support for guidance on how to proceed.

8. Click **Stop**. The spindle stops.

Adjust the Power Drawbar

If you have not yet done so, you must adjust the Power Drawbar. Complete the following steps in the order listed:

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- **Step 1:** "Adjust the Drawbar Tension" (below)
- **Step 2:** "Adjust the Initial Setup" (below)

Adjust the Drawbar Tension

The purpose of this adjustment is to set the highest possible drawbar tension while still allowing the Power Drawbar cylinder to release the tool. For more information, go to "About Drawbar Tension" (below).

NOTICE! After the initial installation, you must examine the drawbar tension weekly. During periods of heavy use, examine the drawbar tension more frequently. If you don't, there's a risk of tool pull-out.

To adjust the drawbar tension:

1. Install an empty Tormach Tooling System® (TTS®) tool holder in the collet.
2. Use one hand to support the tool holder, and then push the **Release Tool** button. Do one of the following:
 - If the tool holder releases: Use two adjustable wrenches to tighten the Power Drawbar in quarter-turn increments while pushing the **Release Tool** button after each turn. Stop when the tool holder does not release.
 - If the tool holder does not release: Use two adjustable wrenches to loosen the Power Drawbar in quarter-turn increments while pushing the **Release Tool** button. Stop when the tool holder releases.
3. Make a visual reference to help you set or adjust the drawbar tension in the future: Use a paint pen to make a witness mark on both the head of the drawbar and the end of the spindle.

About Drawbar Tension

While machining, the Tormach Tooling System® (TTS®) collet holds a Tormach Tooling System® (TTS®) tool holder in the spindle by applying a clamping force to both the shank and the shoulder of the tool. The tension force that is applied to the drawbar pulls the Tormach Tooling System® (TTS®) collet into the spindle taper, which then applies the clamping force to the Tormach Tooling System® (TTS®) tool.

The force on the drawbar, known as the drawbar tension, is applied differently depending on the tool changing method:

- When you change tools manually, the tension is applied when you tighten the drawbar into the collet using a wrench.
- When you change tools with the Power Drawbar, the tension is applied by the compressed spring washers.

Adjust the Initial Setup

The purpose of this adjustment is to make sure that there is enough clearance between the end of the drawbar and the Power Drawbar cylinder.

NOTICE! If you don't do this adjustment, there's a risk that the drawbar can loosen, or that operations can be louder than normal.

1. Examine the space between the hex head screw on the Power Drawbar cylinder's rod and the top of the drawbar.

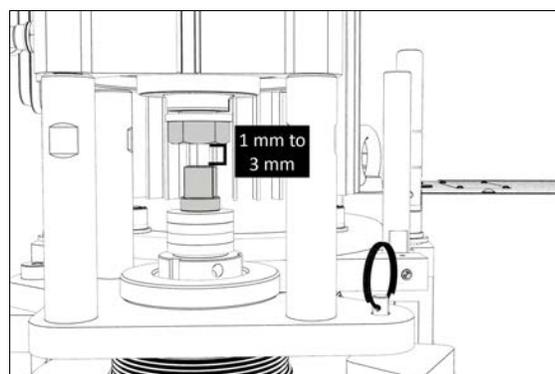


Figure 2-19: Example of a correctly spaced drawbar and Power Drawbar cylinder.

2. Make sure that the gap is between **1 mm** and **3 mm**. Depending on the size of the gap, do one of the following:
 - If the gap is between **1 mm** and **3 mm**, you have completed adjusting the initial setup.
 - If the gap is **less than 1 mm** or **greater than 3 mm**, go to Step 3.
3. Disconnect the shop's air supply from the Power Drawbar button.
4. Pull out the quick-release pin.

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- Pivot the Power Drawbar cylinder assembly to the left so that you can access the Power Drawbar cylinder's rod.

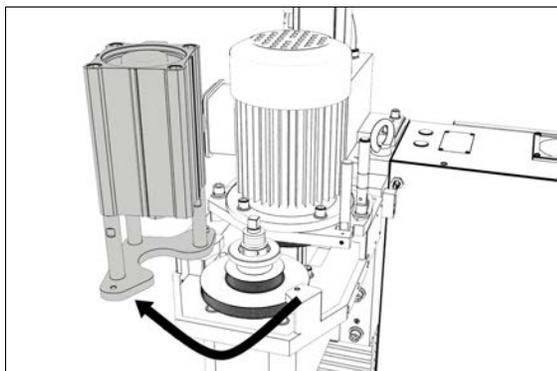


Figure 2-20: Power Drawbar cylinder pivoted to the left.

- Use an adjustable wrench to remove the hex head screw on the Power Drawbar cylinder's rod.

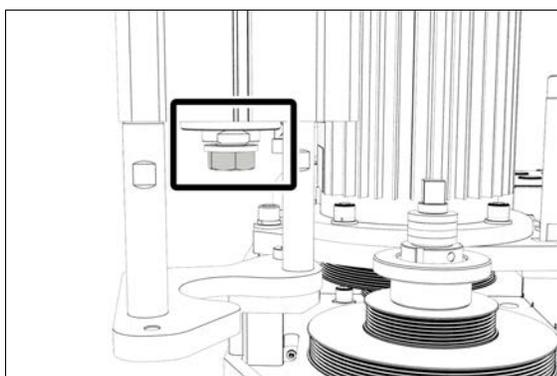


Figure 2-21: Hex head screw on the Power Drawbar cylinder's rod.

- Remove the M16 washer from the Power Drawbar cylinder's rod, and set it aside.

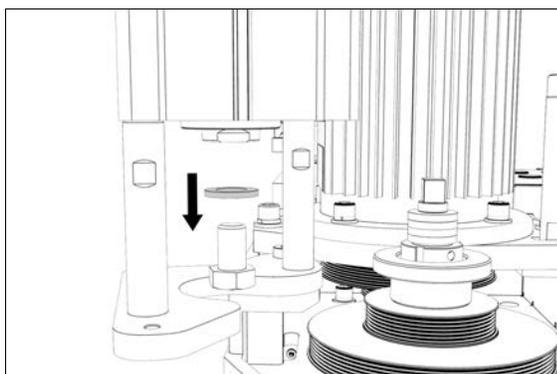


Figure 2-22: M16 washer removed from the Power Drawbar cylinder's rod.

- Use an adjustable wrench to reinstall the hex head screw, and then tighten it completely.
- Pivot the Power Drawbar cylinder to the original location.

- Push in the quick-release pin.
- Reconnect the shop's air supply to the Power Drawbar button.
- Examine the space between the hex head screw on the Power Drawbar cylinder's rod and the top of the drawbar.
- Make sure that the gap is between **1 mm** and **3 mm**. Depending on the size of the gap, do one of the following:
 - If the gap is between **1 mm** and **3 mm**, you have completed adjusting the initial setup.
 - If the gap is **less than 1 mm**, go to Step 14.
- Identify the three extra M16 flat washers provided.
- Put one M16 flat washer under each mounting post on the Power Drawbar cylinder.

2.1.5 To Make the Final Alignments to the Automatic Tool Changer (ATC)

Making the final alignments the ATC involves the following steps. Complete them in the order listed:

- Step 1:** "Adjust the Tool Tray Load Position" (below)
- Step 2:** "Validate the Alignment" (page 12)
- Step 3:** "Set the Tool Change Height" (page 14)
- Step 4:** "Adjust for Rotational Play" (page 12)

Adjust the Tool Tray Load Position

- Make sure that there is no tool in the spindle.
- From the PathPilot® interface, on the **ATC** tab, click **Ref Tool Tray**.

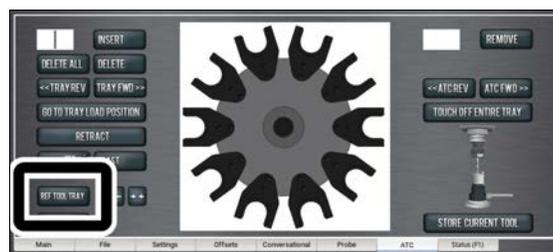


Figure 2-23: Ref Tool Tray button on the ATC tab.

The tool tray spins.

NOTE: You're only required to reference the tool tray once — unlike the mill axes' referencing procedure.

3. Click **Go to Tray Load Position**.

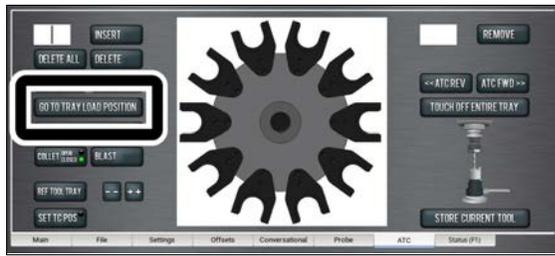


Figure 2-24: Go to Tray Load Position button on the ATC tab.

4. When prompted, click **OK**.
The tool tray moves forward.
5. Insert the tool holder with the rod into the fork.
6. From the PathPilot® interface, slowly jog the Z-axis **down** (-Z) to bring the spindle nose toward the tool in the tool tray.

7. Make sure that the tool's shank is aligned concentrically with the collet in the spindle. If it isn't, do the following:

- Adjust the alignment of the tool in the Y direction (toward or away from the Z column):
 - a. Determine if the tray must move clockwise or counterclockwise.

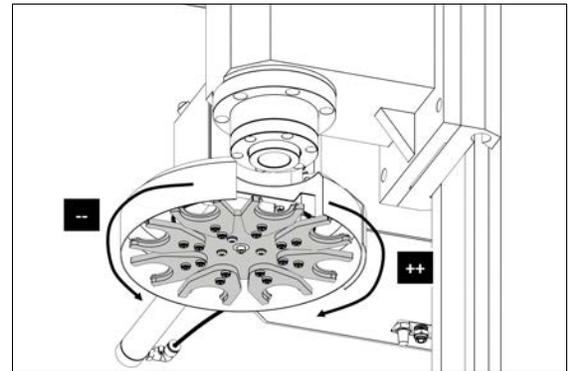


Figure 2-25: Example of the directions to move the tool tray.

- b. From the PathPilot® interface, in the **ATC** tab, do one of the following:
 - Click -- to step the tool tray counterclockwise.
 - Click ++ to step the tool tray clockwise.

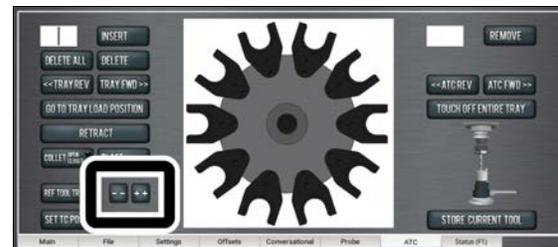


Figure 2-26: Tool tray step buttons on the ATC tab.

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- Adjust the alignment of the tool in the **X** direction (left or right):
 - a. Determine if the tray must move left or right.

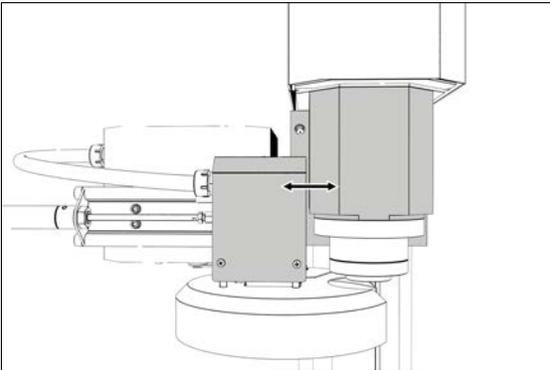


Figure 2-27: Example of the directions to move the tool tray.

- b. Use two wrenches to loosen the jam nut on the end of the cylinder rod. Make sure that you don't spin the rod end when adjusting the jam nut.
- c. Do one of the following:
 - Turn the rod end one-half turn further on to the cylinder rod to move the tool tray to the left.
 - Turn the rod end one-half turn off of the cylinder rod to move the tool tray to the right.
- d. Tighten the jam nut.

Repeat this step until the tool's shank is concentric with the collet in the spindle.

8. From the PathPilot® interface, in the **ATC** tab, click **Retract**.

Validate the Alignment

1. From the PathPilot® interface, click **Go to Tray Load Position**.
2. Slowly jog the Z-axis **down (-Z)** over the tool's shank.
3. Make sure that the tool's shank moves freely into the collet. Then, do one of the following:
 - If it does not move freely in the collet, this indicates that the ATC is misaligned and you must realign it. Go to "Adjust the Tool Tray Load Position" (page 10).
 - If it does move freely in the collet, go to "Set the Tool Change Height" (page 14).

Set the Tool Change Height

1. From the PathPilot® interface, slowly jog the Z-axis **down (-Z)** over the tool. Stop jogging when the spindle nose just

makes contact with the shoulder of the tool holder.

2. On the **ATC** tab, click **Set TC POS**.

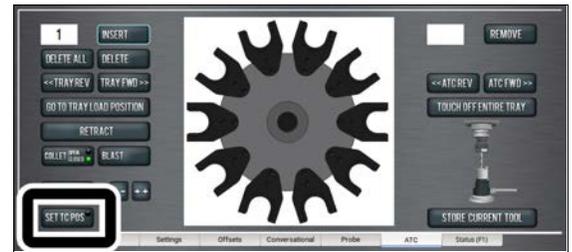


Figure 2-28: Set TC POS button on the ATC tab.

The tool change position is set.

Adjust for Rotational Play

There is a small amount of rotational play built into the Automatic Tool Changer (ATC) carousel. This play allows for some misalignment during tool changes, and must be adjusted for in both directions. The taper on the tool shank also helps align the tool during a tool change.

1. From the PathPilot® interface, on the **ATC** tab, click **Tray FWD** to rotate the tray clockwise (forward) one full tool slot.

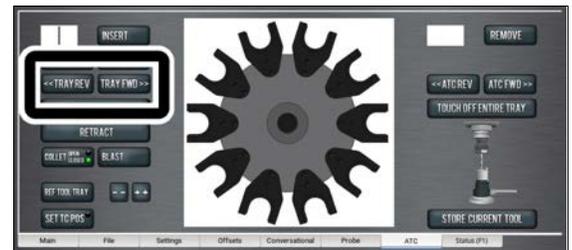


Figure 2-29: Tray FWD and Tray REV buttons on the ATC tab.

2. Click **Tray REV** to rotate the tray counterclockwise (backward) one full tool slot.
3. Make sure that the tool's shank is in line with the collet in the spindle. Then, do one of the following:
 - If it is not in line with the collet, you must readjust the tool tray rotation. Go to "Adjust the Tool Tray Load Position" (page 10).
 - If it is in line with the collet, you have completed the alignment of the ATC.

3.1 OPERATING THE AUTOMATIC TOOL CHANGER (ATC)

NOTE: Make sure that there's always a Tormach Tooling System® (TTS®) tool holder in the collet while the machine is not in use. Retracting the Power Drawbar to the clamped position with no tool holder in the collet will eventually fatigue the collet, and may shorten its service life. For more information, refer to the Power Drawbar documentation.

Read the following sections to understand how to operate the ATC:

- "Assign Tool Numbers" (below)
- "Automatically Load a Tool into the Tool Tray" (below)
- "Automatically Unload a Tool From the Tool Tray" (below)
- "Insert a Tool into the Spindle" (on the next page)
- "Manually Load a Tool into the Tool Tray" (on the next page)
- "Manually Unload a Tool From the Tool Tray" (on the next page)
- "Retrieve a Tool From the Tool Tray" (on the next page)
- "Set the Tool Change Height" (on the next page)
- "Switch to Manual Tool Changes" (page 15)

3.1.1 Assign Tool Numbers

- Use any tool number, from **1-256**, to assign a position in the tool tray.

3.1.2 Automatically Load a Tool into the Tool Tray

1. Load a tool into the spindle.
2. From the PathPilot® interface, on the **ATC** tab, type the tool number in the **Tool DRO** field, and then press **ENTER** on the keyboard.

3. Click **Store Current Tool**.

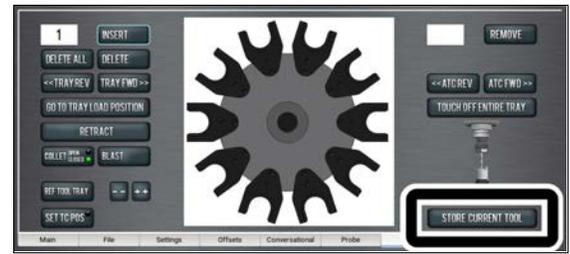


Figure 3-1: Store Current Tool button on the ATC tab.

The tool is assigned to the nearest open slot. The ATC fetches the tool from the spindle, and stores the tool in the tray. The tool number is displayed on the tray image in the center of the screen.

4. Click **Retract**.

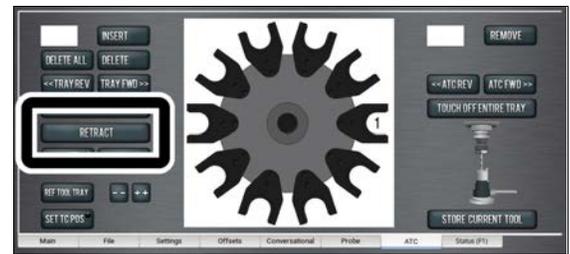


Figure 3-2: Retract button on the ATC tab.

The tray returns to machining position.

3.1.3 Automatically Unload a Tool From the Tool Tray

NOTE: Typing a new tool number in the **Tool DRO** does not remove the tool from its tray assignment.

1. From the PathPilot® interface, on the **ATC** tab, type the tool number in the **Remove DRO** field, and then press **ENTER** on the keyboard.

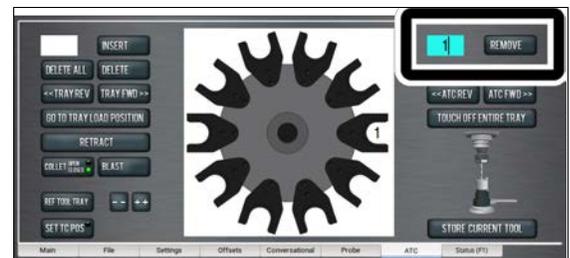


Figure 3-3: Remove DRO field on the ATC tab.

2. Click **Remove**.
The ATC fetches the tool from the tray.
3. Remove the tool from the spindle.

TECHNICAL DOCUMENT

- From the **ATC** tab, click **ATC FWD** or **ATC REV**.

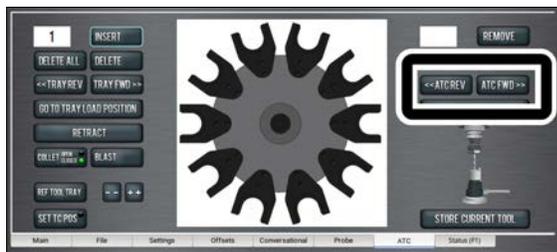


Figure 3-4: ATC REV and ATC FWD buttons on the ATC tab.

The tray advances to the next location and fetches another tool.

- Click **Retract**.

The tray returns to machining position.

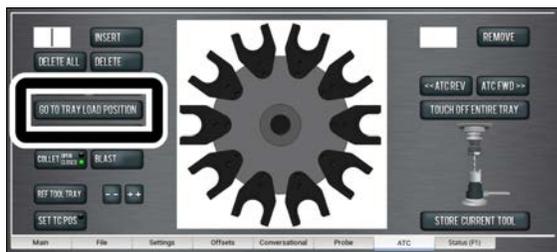
3.1.4 Insert a Tool into the Spindle

Insert a tool into the spindle as follows:

- Push and hold the button on the ATC.
The collet opens.
- Insert a tool into the spindle.
- Release the button.
The collet closes.

3.1.5 Manually Load a Tool into the Tool Tray

- From the PathPilot® interface, on the **ATC** tab, click **Go To Tray Load Position**.



The spindle head moves up and the ATC moves into the door open position.

- Insert a tool into an open fork on the tray.
- From the **ATC** tab, type the tool number into the **Insert** DRO field, and then press **ENTER** on the keyboard.
- Click **Insert**.
The tool is assigned to the exposed tray slot.
- Click **Tray FWD** or **Tray REV**.
The tray advances to the next slot location.
- Click **Retract**.
The tray returns to machining position.

3.1.6 Manually Unload a Tool From the Tool Tray

- From the PathPilot® interface, on the **ATC** tab, type the tool number into the **Insert** DRO field, and then press **ENTER** on the keyboard.
- Click **Go To Tray Load Position**.
The spindle head moves up and the ATC moves into the door open position.
- Click **Delete**.

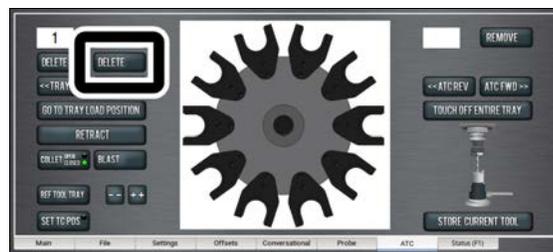


Figure 3-5: Delete button on the ATC tab.

The tool is unassigned from the tray and the tray moves to that tool.

- Click **Tray FWD** or **Tray REV**.
The tray advances to the next slot location.
- Click **Retract**.
The tray returns to machining position.

3.1.7 Retrieve a Tool From the Tool Tray

Depending on your workflow, do one of the following:

- Type **Txx M6** in the **MDI Line** field, with **xx** as the tool number.
- Type the tool number in the **Tool** DRO field, and then press **ENTER** on the keyboard.

3.1.8 Set the Tool Change Height

- From the PathPilot® interface, slowly jog the Z-axis **down** (**-Z**) over the tool. Stop jogging when the spindle nose just makes contact with the shoulder of the tool holder.

TECHNICAL DOCUMENT

2. On the **ATC** tab, click **Set TC POS**.

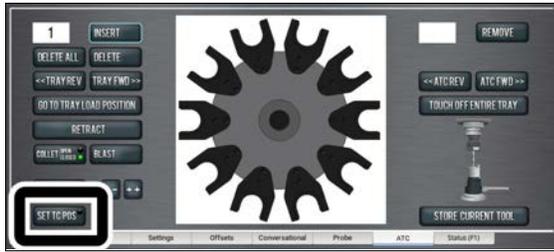


Figure 3-6: Set TC POS button on the ATC tab.

The tool change position is set.

3.1.9 Switch to Manual Tool Changes

- From the PathPilot® interface, on the **Settings** tab, click the **Manual Tool Change** radio button.
The Automatic Tool Changer (ATC) is prevented from making tool changes.

4.1 MAINTAINING THE AUTOMATIC TOOL CHANGER (ATC)

Read the following sections to understand how to maintain the ATC:

- "Lubricate the Linear Rails" (below)
- "Replace the Plastic Screws on a Fork" (below)

4.1.1 Lubricate the Linear Rails

The linear rails are self-lubricating. If, after initial installation, you hear chatter from the linear rails, apply a thin layer of way oil to the linear rails.

4.1.2 Replace the Plastic Screws on a Fork

The plastic screws that hold the fork to the tool tray are designed to fail under greater-than-normal loads: when a tool crashes, the plastic screws snap to prevent damage to the Automatic Tool Changer (ATC).

If the plastic screws that hold the fork to the tool tray break, do the following:

1. Remove the broken screws from the fork.
2. Use two included plastic screws to secure the fork to the tool tray. Make sure the groove on the fork faces the machine table.

NOTICE! Do not use metal screws to replace broken screws on an ATC fork. If you do, it could cause machine damage.

3. Re-adjust the tool tray rotation. Go to "Adjust the Tool Tray Load Position" (page 10).