

Torque Bar Activated Autofacer
Operating Instructions

STEINER

Thank you for investing in a Steiner Autofacer

If this is your first experience with an Autofacer, you'll discover this is a truly ingenious tool that allows you to reach through a hole and machine a circular feature on the back side of a workpiece automatically; circular features such as a spotface, counterbore, countersink, chamfer, spherical radius, or some combination thereof.

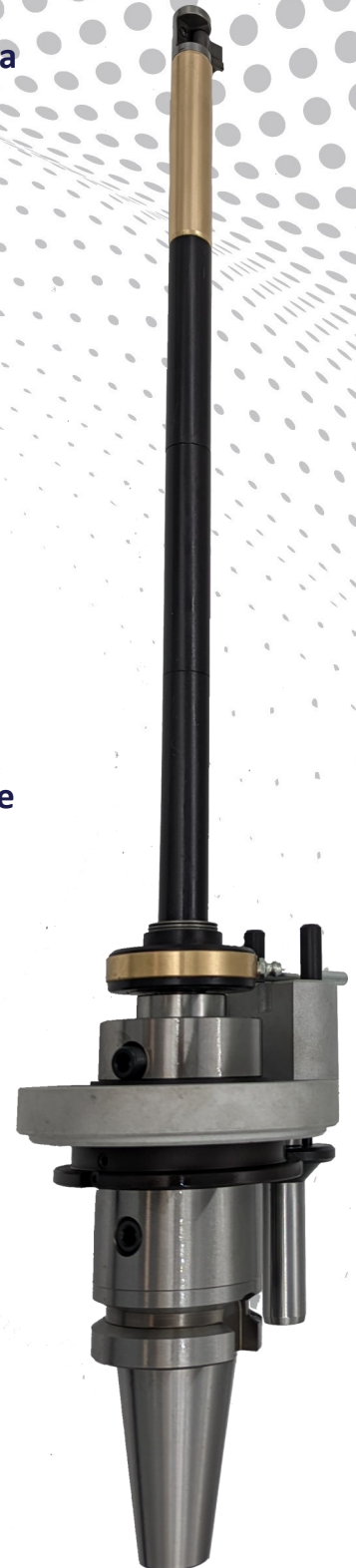
This is accomplished by mechanically folding the cutting blade into the body of the Autofacer allowing the tool to pass through the workpiece. Once the tool has passed through the workpiece the cutting blade is mechanically opened and reverse machining may begin.

The key design features of the Autofacer are:

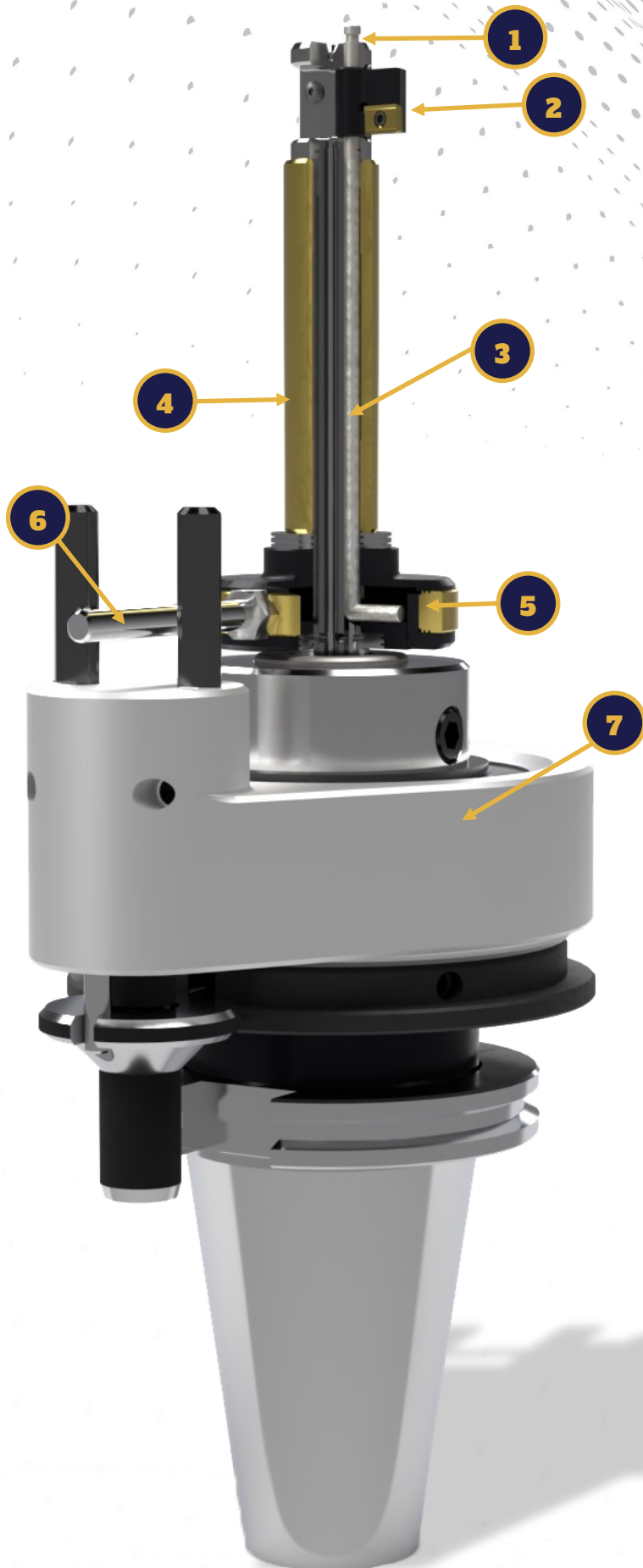
1. Friction clutch that mechanically opens and closes the cutting blade ensuring high reliability of part processing.
2. Cutting blades that are mechanically held open while cutting allows the Autofacer to perform heavy interrupted cuts.
3. Autofacer Cutter Body or Rotary Pilot utilizes the workpiece hole to support the tool while cutting. This enables the operator to run the Autofacer at high speeds and feeds even at long length-to-diameter ratios.

Autofacer cutting blades are available in many different configurations depending upon customers' applications. Having a full service grind department at our manufacturing facility in the New York allows us to offer custom geometries on our indexable inserts and brazed carbide Cutter Blades. This means we can combine multiple operations into a single blade, thus maximizing time savings.

The Application Engineers at Steiner will select the appropriate activation method to ensure optimum performance. Backed by more than 50 years experience, we are here to serve your most demanding needs.



Get to know your Autofacer



1. **Pivot Pin** - Locking Pin which connects cutter blade or master holder to Activating rod.
2. **Cutting Blade** - Available in many configurations including indexable inserts and brazed carbide.
3. **Activating Rod** - Transfers rotational forces from the clutch to the cutting blade.
4. **Pilot** - Custom manufactured to suit individual applications. Allows the tool to run at carbide speeds and feeds, and in long length-to-diameter applications.
5. **Activator** - Internal clutch mechanism which actuates the cutter blade assembly open and closed.
6. **Torque Rod** - Transfers rotational force between clutch assembly and Torque Bar Driver.
7. **Torque Bar Driver** - Captures Torque Rod and actuates clutch assembly with rotation of machine spindle.

Things to check before operating:

1. Manually open and close the Autofacer. Check for smooth activation with no obvious signs of bindings
2. Is the cutting blade locked securely onto the flat of the Pivot Pin?

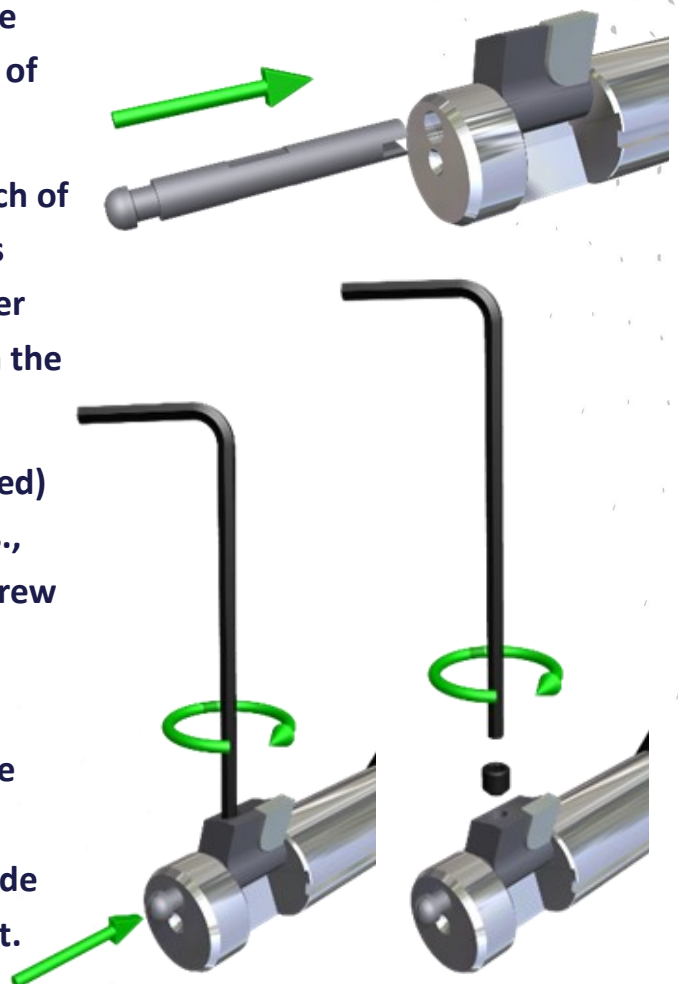
Programming and Operating Hints

1. Turn ON the spindle through coolant after blade has opened.
2. Turn OFF the spindle through coolant before blade has closed.
3. Autofacers utilizing a Shear Pin must clear the work piece by a minimum of 3 inches before traversing. This will allow the shank to completely pull off the Cutter Body in case the Shear Pin breaks.

Cutter Installation Instructions:

1. Insert the pivot pin into the cutter body and thru the blade. Rotate the pivot pin until it engages the tang of the activating rod.
2. With the blade in the open position, rotate the clutch of the tool until the alignment mark on the pivot pin is parallel to the hex wrench and set screw in the cutter blade. This will ensure the set screw is aligned with the flat on the pivot pin.
3. Apply a small amount of serviceable Loctite (provided) to threads of screw. Tighten set screw to 6-10 in/lbs., being careful not to overtighten and ensuring set screw is on flat of pivot pin. If second follow up screw is provided, install and tighten to 6 in/lbs.

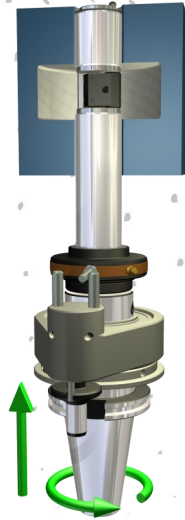
TIP: To verify the set screw is located on the flat of the pivot pin, loosen set screw slightly and attempt to pull pivot pin out of tool. The pin should only be able to slide until the set screw stops on the end of the pivot pin flat.



Torque Bar Activated Autofacer Sequence

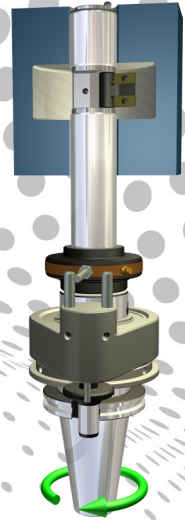
1.

With through coolant **OFF** and flood coolant **ON**, enter workpiece hole in clockwise rotation of 100 rpm.



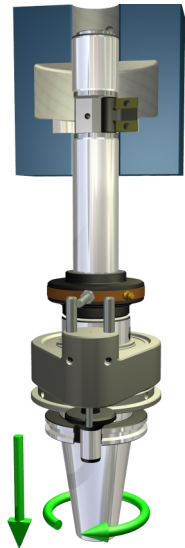
2.

Reverse spindle rotation to counter-clockwise at 100 rpm. Blade will open. After a 1-3 revolution dwell, increase rpm to proper cutting speed. Turn through coolant **ON**.



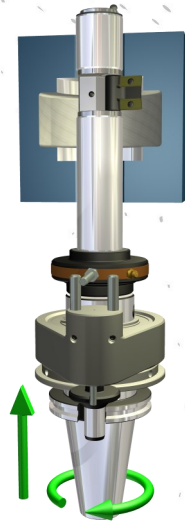
3.

Back feed to counterbore depth. Dwell for 1-3 revolutions to clean up cut.



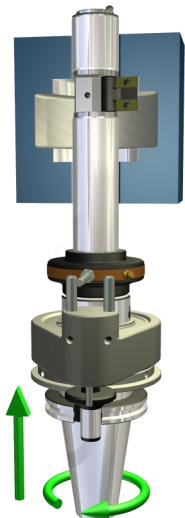
4.

If front cutting, fast feed forward to approach front face, feed to depth and dwell for 1-3 revolutions.



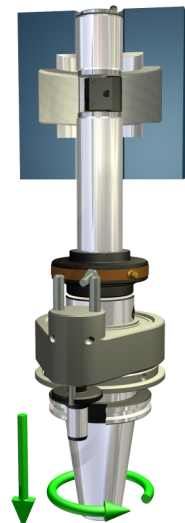
5.

Feed to clear area to clear part. Turn through coolant **OFF**. Leave flood coolant **ON**.



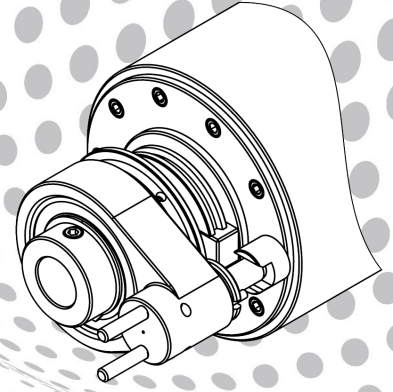
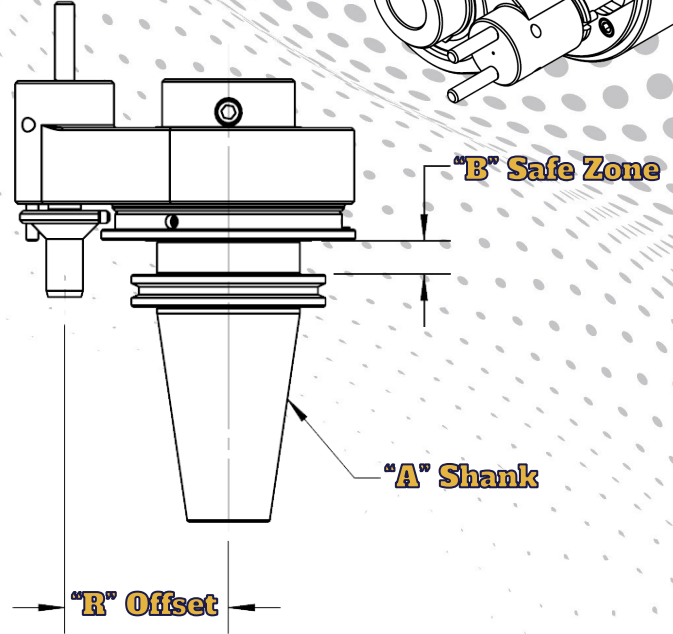
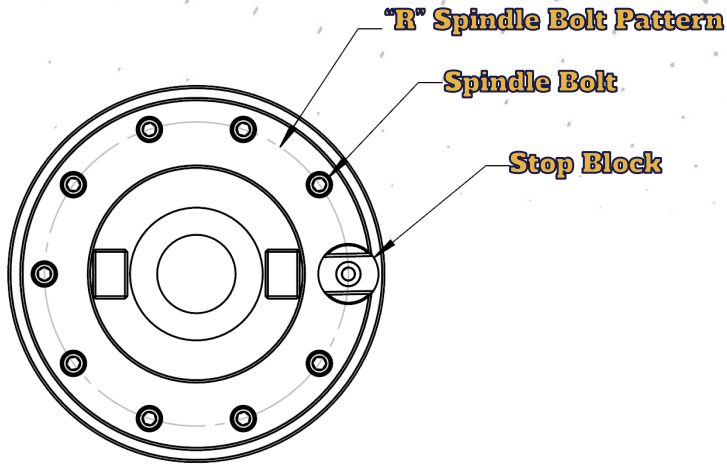
6.

Set spindle to 100 rpm and reverse to clockwise. Blade will close. Dwell 1-3 revolutions. Fast-feed out to complete machining cycle.



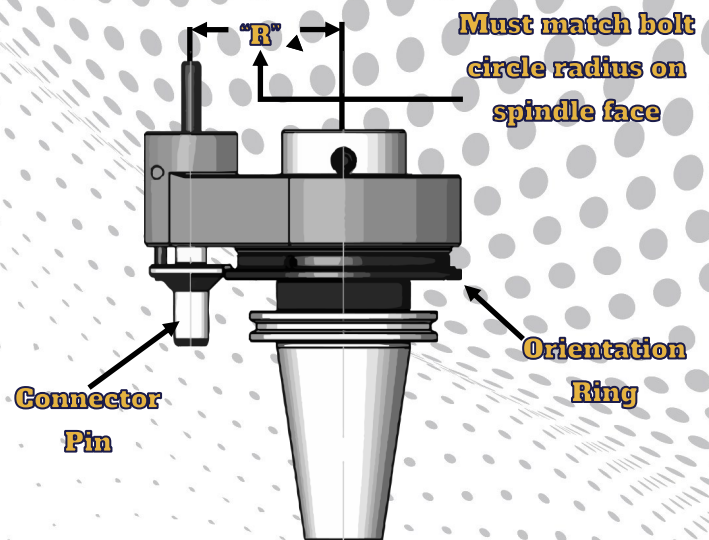
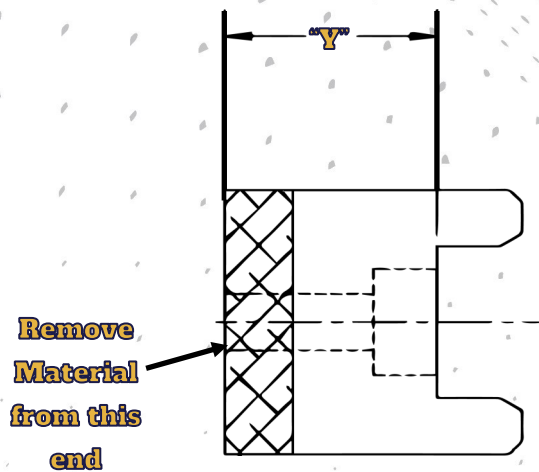
Torque Bar Driver Reference Sheet

1. VERIFY "A", "B", AND "R" DIMENSIONS
2. "B" SAFE ZONE MUST BE ADEQUATE TO CLEAR TOOL CHANGE ARM
3. OFFSET "R" MUST MATCH SPINDLE FACE BOLT PATTERN



Driver	"A" Shank	"B" Safe Zone (mm)	"R" Offset (mm)
TBC50S06	CAT50	16.5	80
TBC50S06-100MM	CAT50	16.5	100
TBC50S06-110MM	CAT50	16.5	110
TBC50L06	CAT50	46.5	80
TBC50L06-100MM	CAT50	46.5	100
TBC50L06-110MM	CAT50	46.5	110
TBD50S06	DIN50	16.5	80
TBD50S06-100MM	DIN50	16.5	100
TBD50S06-110MM	DIN50	16.5	110
TBB50S06	BT50	19	80
TBB50S06-100MM	BT50	19	100
TBB50S06-110MM	BT50	19	110
TBH100S06	HSK 100	15.8	80
TBH100S06-100MM	HSK 100	15.8	100
TBH100S06-110MM	HSK 100	15.8	110
TBC40S06	CAT40	16	65
TBB40S06	BT40	34	65
TBH63S06	HSK63	15.8	80

Torque Bar Driver Installation Instructions



1. Verify correct Torque Bar Driver being used with Torque Bar Driver Reference Sheet

2. Mount Stop Block to machine spindle face

- A.** Length of Stop Block as well as bolt hole size may need to be altered before installation due to variations in spindle configurations.
- B.** Remove the spindle nose bolt where the Stop Block will be installed. Make sure to choose a bolt location where the Stop Block will not interfere with tool changer arm.
- C.** Remove retention knob from Torque Bar Driver.
- D.** Insert Torque Bar Driver into machine spindle.
- E.** Measure the distance from the machine spindle face where the Stop Block will be mounted to the face of the Connector Pin on the Torque Bar Driver. This will be distance "X".
- F.** Add .175" to distance "X". The result is what you must make distance "Y" shown at right.
- G.** Machine Stop Block to proper "Y" length.
- H.** Install Stop Block to spindle face using existing screw. Make sure slot in Stop Block is parallel to the radius of the spindle. Bolt hole in Stop Block may need to be opened up. Longer than original screw may need to be used.

3. Install Torque Bar Driver

- A.** Verify that the Connector Pin offset distance ("R") shown at right matches the bolt circle radius on the machine spindle face.
- B.** Remove retention knob from shank.
- C.** Loosen the three set screws that lock the Orientation Ring in place so that the complete housing and Connector Pin can rotate freely.
- D.** Insert Torque Bar Driver into machine spindle and rotate the housing assembly until the Connector Pin meets up with the Stop Block.
- E.** Tighten the three Orientation Ring set screws.
- F.** Verify that the Connector Pin is being compressed by the Stop Block and that it is fully disengaged. The shank and spindle should be able to rotate freely.
- G.** Verify that the Connector Pin is not being over compressed as there is a limited amount of travel.
- H.** Install retention knob back into shank and install Autofacer into Torque Bar Driver.
- I.** Make sure Torque Rod coming off Autofacer goes in between the two Driver Rods on Torque Bar Driver.

Autofacer Maintenance Information

Lubrication:

If through spindle coolant is being used, lubrication is not necessary for the operation of the tool.

If through spindle coolant is not being used, the clutch components of the Autofacer should be lubricated after every 10 hours of use.

Lubricate by disassembling the tool and applying lubricant to flywheel clutch and pilot assemblies.

If the tool has not been in use for an extended period of time, lubricate before using with marine grease.

If the tool will not be in use for an extended period of time, make sure to clean and lubricate thoroughly with rust inhibitor and seal within an airtight bag before putting away.

Inspection & Maintenance:

The Autofacer should be inspected for wear and tear monthly or sooner depending on usage.

It is a good idea to activate the tool by hand periodically to check for a smooth action and no noticeable binding.

Periodically inspect the Cutter Body pocket for chips that may prevent to the tool from closing fully.

After use, disassemble the Autofacer and inspect the components of the clutch mechanism for any signs of damage or wear. Replace as necessary.



Troubleshooting

The Shear Pin is breaking during machining:

- This is caused when cutting pressure is too high due to too high of a feed rate or a dull Cutter Blade or Insert. First, check the cutting edge to see if it needs sharpening or replacing. If not, decrease the feed rate by 10-20%.

The Shear Pin is breaking when exiting the part:

- This is caused when the blade has not closed. First check that the Cutter is properly attached to the Pivot Pin. Next disassemble the tool and check the activating rod for wear or damage.

The chip is not breaking:

- This is usually caused by too low of a feed rate. Autofacers are designed to be fed at high feed rates. Increase the feed rate by 10-20%.
- Program periodic dwells into the feed to thin the chip out.

The Cutter is coming loose from the Pivot Pin:

- Apply a small drop of serviceable Loctite (provided with purchase of an Autofacer) to the thread of the secondary lock screw.
- The blade may not be locked onto the flat of the Pivot Pin.
Please see "Cutter Installation Instructions."

The Cutter is not opening or closing all the way:

- The blade may not be locked onto the flat of the Pivot Pin.
Please see "Cutter Installation Instructions."
- The tool may be jammed up by chips. Make sure there are no chips in the Cutter Body pocket where the blade folds into. Also, disassemble the Autofacer and check for chips or damage to the internal components of the clutch mechanism.

The tool is chattering:

- This is usually caused by too low of a feed rate. Autofacers are designed to be fed at high feed rates. Increase the feed rate by .001-.003 IPR (.03-.08 MMPR).
- The clearance between the Pilot and the work hole may be too great. The diameters should differ no more than .010" (.25mm) but no less than .002" (.05mm).