



*The tools of a new generation™*

# USER NOTES AND SETUP GUIDE

**www.airturbinetools.com**

+1.561.994.0500 | ask@airturbinetools.com



**Read Thoroughly Before Use**

## Table of Contents

- 1** Key Points for Successful Operation and Safety
- 2** Initial Installation
- 2** Air Hoses and Fitting Protocol Requirements
- 3** Compressed Air Flow Volume Requirements
- 3** Idle CFM/L/s Rating vs. Working Air Consumption Ratings
- 3** Maintaining your Air Turbine Live Tool®
- 4** Mounting your Air Turbine Live Tool®
- 5** Calculating Your New Feed Rate And Cycle Time
- 5** Operating your Air Turbine Live Tool®
- 5** Operating Air Turbine Live Tools® in a Wet Environment
- 6** Cutting Tool Selection and Opening your ER Collet



**WARNING**

Connection to air supply starts Live Tool rotation.  
Do not connect air to your tool until installation is complete.

## Key Points for Successful Operation

1. Eliminate flow restrictions in your airline. Check if the minimum internal diameter of your hose and fittings meets the requirements for your Air Turbine Live Tool® as specified on **figure 2 on page 2**.
2. Ensure a 0.3 micron air filter/regulator is installed. Set the regulator between 90 psi (6.2 bar) to 100 psi (6.9 bar). Air pressure exceeding 100 psi (7 bar) must not be used.
3. Check for and repair any airleaks and obstructions.
4. Use the air flow meter to check the CFM (L/s) air flow volume to your Air Turbine Live Tool® at the air inlet port to ensure the air flow volume and pressure meets the specifications as stated in **figure 3 on page 3**.
5. If your Air Turbine Live Tool® has underpower performance, check the psi (bar) pressure using the air filter/regulator gauge to see if the pressure drops below 90 PSI (6.2 bar). If the gauge dial indicates that there is less than 90 psi (6.2 bar) pressure:
  - › Check internal diameters of all couplings/connectors/hoses for restrictions on air flow.
  - › Review compressor operation to turn up minimum psi (bar). If your default compressor settings allow psi/bar to drop down to ~80 or 85 psi (5.5 or 5.9 bar), then it is necessary to build up pressure before you turn the compressor on. An extra holding tank may be required.



### WARNING

Your Air Turbine Live Tool® must be run at least 10 minutes every 30 days from manufacture date to maintain optimal performance.

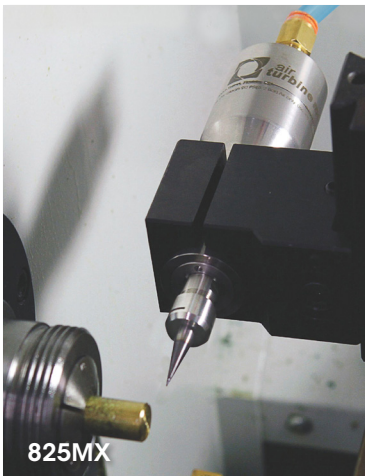
## Always Operate in Compliance With the Following

1. **CAUTION:** Your Air Turbine Live Tool® will rotate **immediately** when air is connected.
2. Safety code for portable air tools - ANSI 186.1, etc. Always use eye + face protection.
3. General industry safety & health regulations, part 1910 and 2206 OSHA, etc.
4. Federal, state and local regulations and laws in your country.
5. Cutting tool manufacturers operating instructions. Ensure your cutting tool is rated for the rotational speed you are using. Your tool must be balanced and truly concentric. Incorrect tool selection results in unbalanced rotation or overloading, which will result in stress on the bearings and premature failure. The stick-out extension length of the cutting tool from your collet should optimally be no more than 3 times the diameter of your cutting tool.



### WARNING

Failure to comply with all safety regulations could result in serious injury.



For further assistance call our factory technicians for support at +1-561-994-0500 or email us at [ask@airturbinetools.com](mailto:ask@airturbinetools.com).

**Read all instructions thoroughly before installation and use.**

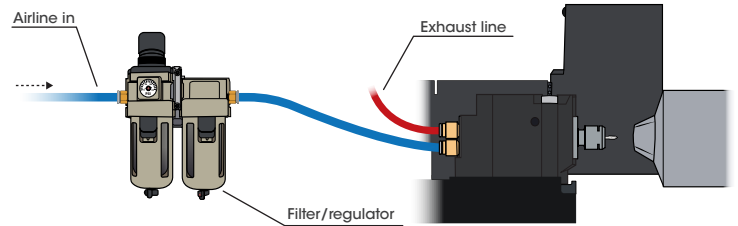
### Initial Installation

Install a new dedicated clean air line from a filter/regulator to your **Air Turbine Live Tool®** as shown in **figure 1**. filter/regulators are included with the Air Turbine Live Tools® and are available for an additional purchase.

**Ensure all air lines and fittings meet the minimum internal diameter specified for your model as specified in figure 2.** Additionally, place a plug in any air inlet that is not being used.

Install exhaust hoses as shown in **figure 1**. Internal diameters of exhaust hoses must be no smaller than the specified minimum required ID for your model as shown in **figure 2**.

**Optional:** If you have a manual shut-off valve, install it after the filter/regulator. Using a manual valve is recommended.



**Figure 1:** A clean airline from a filter/regulator to a mounted Air Turbine Live Tool® with exhaust hoses installed.



#### WARNING

Connection to air supply starts live tool rotation. Do not connect air to your tool until installation is complete.

Model	Hose/Connector Minimum Required Internal Diameter	
	Metric	Imperial
<ul style="list-style-type: none"> <li>› 800LT</li> <li>› 822CX</li> <li>› 825CX</li> </ul>	4 mm	5/32"
<ul style="list-style-type: none"> <li>› 820MX</li> <li>› 822MX</li> </ul>	5 mm	0.1969"
› 825MX	6 mm	15/64"

### Air Hoses and Fittings Requirements

**Avoid fittings, couplings and hoses with a smaller internal diameter than the minimum required for your model.** Any connections smaller than the minimum will restrict air flow and reduce power to your **Air Turbine Live Tool®**. You can find the minimum required internal diameter (ID) for fittings and hoses for your tool on the table shown in **figure 2**.

Air flow restrictions (such as air leaks and obstructions) will cause underpower performance and drag your tool through the material, damaging the bearings. **Some fittings with nominal internal dimensions may have an ID passage that is smaller than stated and restrict air flow and power.** It only takes one fitting with an internal diameter that is too small to reduce air flow and power of your **Air Turbine Live Tool®**.

#### General Air Fitting Dimensions

- › **1/4" male > ID** - Usually 0.210" but some variations occur.
- › **1/4" male (high flow, harbor) ID** - 0.277" with 1/4" NPT male thread.
- › **3/8" male hole** - 0.283" to 0.285" with thread of 3/8" - NPT (internal ID of female mating OD appears even smaller ID).
- › **1/2" male hole** - 0.375" (0.655" OD).

#### General Hoses

Actual internal diameter on brass fittings (i.e. swaged on ends) of standard Goodyear, etc. brands of 1/2" & 3/8" hose have various internal dimensions. As an example, Goodyear 1/2" Red hose with 3/8" / 9.5 mm NPT fitting has an internal diameter hole of 0.282", which is sufficient for models that require a minimum ID of 6 mm, but not for models that require a minimum ID of 8 mm. Goodyear black 3/8" / 9.5 mm hose has an internal diameter hole on swaged fittings of ~0.265" and is suitable for models requiring a 6 mm ID or smaller.



#### WARNING

When mounting your Air Turbine Live Tool® ensure that the fixture is not clamped over the bearings by clamping only along the designated mounting area for your model as shown in figure 4 on page 2.



822CX

### Air Requirements

Do not oil or lubricate. Use dry, clean, oil free 90 psi (6.2 bar) air supply only.

Ensure there is sufficient volume of clean compressed air flow at **90 psi/6.2 bar** with the specified air flow volume CFM (L/s) for your model as shown in **figure 3** to maintain working air consumption. Depending on application, consider peak or stall capacity consumption. Our governor increases air flow volume on demand to keep rotation at the high speed when your tool starts to cut. **Air pressure and flow volume must therefore be available on demand and remain constant with no drop over time or when cutting.**

Refer to **figure 3** for the idle CFM (L/s) rating vs. working air consumption ratings for all models of **Air Turbine Live Tools®**.

Avoid pressure below 90 psi (6.2 bar), which causes the tool to be dragged through the material, causing rapid bearing wear and underpowered performance. Do not use more than 100 psi (6.9 bar) pressure which will burst the turbine power producer.

Air pressure and flow must remain constant with no drops under cutting load. Insufficient flow will cause the rotation of your tool to slow or stop suddenly, damaging the bearings. If a drop in psi (bar) occurs below 90 psi (6.2 bar), your compressor may not have enough CFM (L/s) to power the Air Turbine Live Tool® or there is a flow restriction in the air line.



#### WARNING

Connection to air supply starts live tool rotation. Do not connect air to your tool until installation is complete.

**Air Turbine Live Tools® Idle and Working Air Consumption Ratings**

Model	Speed	Air Consumption Idle	Air Consumption Working Flow
800LT, 822CX, 825CX	60,000 RPM	3.5 CFM (1.65 L/s)	5 CFM (2.36 L/s)
	80,000 RPM		
820MX, 822MX	50,000 RPM	4 CFM (1.89 L/s)	6 CFM - 9 CFM (2.83 L/s - 4.24 L/s)
	65,000 RPM		
825MX	40,000 RPM	5 CFM (2.36 L/s)	7 CFM - 10 CFM (3.3 L/s - 4.72 L/s)
	50,000 RPM	6 CFM (2.83 L/s)	

### Idle CFM/L/s Rating vs. Working Air Consumption Ratings

Air Turbine Live Tools® consume more air as the cutting load or the amount of material removed increases.

This is normal operation of our patented governor which maintains high speed on your tool path and makes **Air Turbine Live Tools®** efficient in air consumption.

**Figure 3:** Idle CFM (L/s) and working air consumption ratings for Air Turbine Live Tools®.

### Maintenance

Your Air Turbine Live Tool® must be run at least 10 minutes every 30 days from manufacture date to maintain optimal performance. Run at least 10 minutes before initial use.

The airline must be impeccably clean with no coupling or hose smaller than the minimum internal diameter required for your model as described in **figure 2** on **page 2** so that air flow volume is unrestricted.

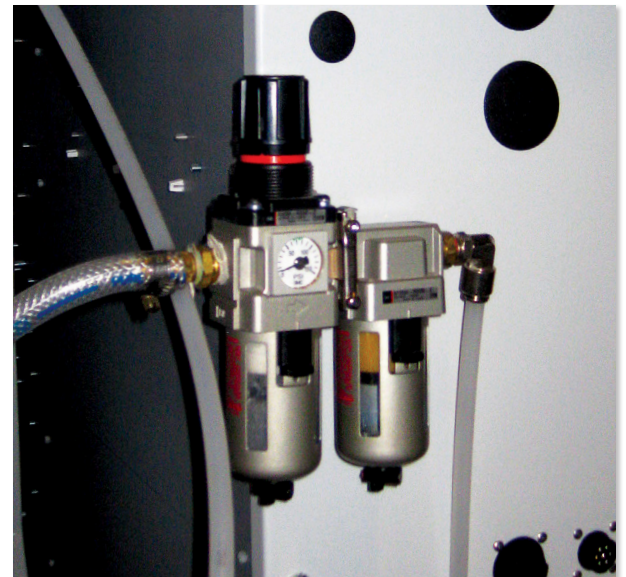
Purge the airline of contamination before each use.

A 0.3 micron filter extractor regulator combination is a necessary accessory for Air Turbine Live Tools® to eliminate impurities in your air supply.

Contamination will damage your turbine components and require repair.

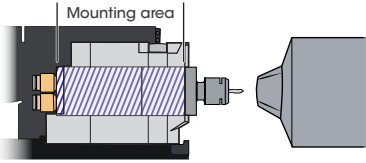
Filters are included with **Air Turbine Live Tools®** and are required for all Air Turbine Live Tool® models. Replacement elements and a repair service are available on our website.

Filter elements need to be changed periodically and extractor drained in regular maintenance cycles.





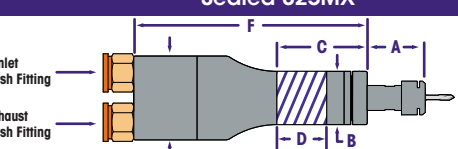
### Mounting Air Turbine Live Tools® into your Lathe

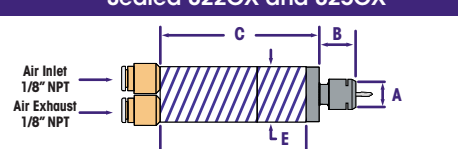


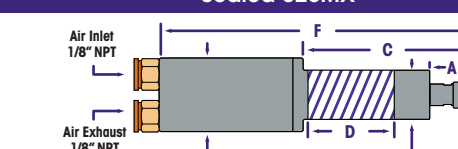
**Figure 4:** A mounted 825CX showing that the fixture is only clamped within the labeled mounting area.

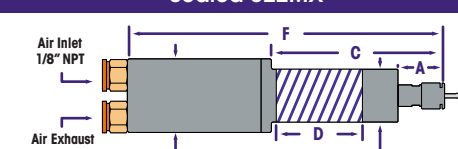
It is important that your fixture is not clamped over the bearings when mounting your **Air Turbine Live Tool®**. Incorrect positioning or over tightening of the clamp on your **Air Turbine Live Tool's®** steel barrel **results in pressure on the bearings causing premature failure**. To avoid this error in installation refer to **figure 4**.

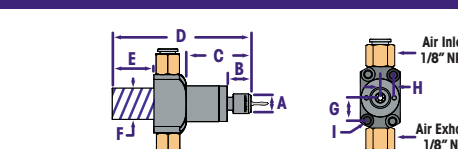
Use **figure 5** to reference where the mounting area is for each **Air Turbine Live Tool®** model is located.

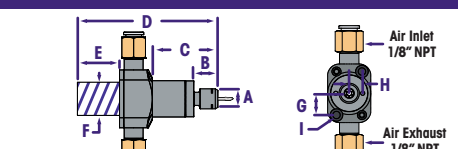
Sealed 825MX					
					
<b>A</b>	1.09" (27.61 mm)	<b>C</b>	1.5" (38.1 mm)	<b>E</b>	Ø 1.57" (40 mm)
<b>B</b>	Ø 1.0" (25.4 mm)	<b>D</b>	0.5" (12.7 mm)	<b>F</b>	4.0" (101.6 mm)

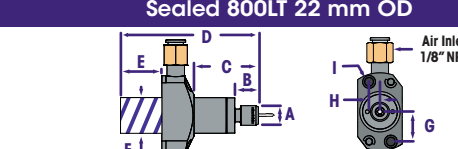
Sealed 822CX and 825CX					
					
<b>A</b>	Ø 0.47" (12 mm)	<b>C</b>	3.09" (78.36 mm)	<b>E</b>	822CX: Ø 0.86" (22 mm) 825CX: Ø 0.98" (25 mm)
<b>B</b>	0.72" (18.29 mm)	<b>D</b>	2.9" (73.53 mm)		

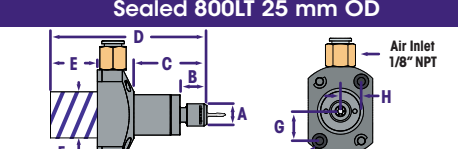
Sealed 820MX					
					
<b>A</b>	0.65" (16.51 mm)	<b>C</b>	2.03" (51.56 mm)	<b>E</b>	Ø 1.18" (30 mm)
<b>B</b>	Ø 0.79" (20 mm)	<b>D</b>	1.99" (50.55 mm)	<b>F</b>	4.99" (126.75 mm)

Sealed 822MX					
					
<b>A</b>	0.65" (16.51 mm)	<b>C</b>	2.03" (51.56 mm)	<b>E</b>	Ø 1.18" (30 mm)
<b>B</b>	Ø 0.85" (21.6 mm)	<b>D</b>	1.99" (50.55 mm)	<b>F</b>	4.99" (126.75 mm)

Sealed 800LT 19.05 mm OD					
					
<b>A</b>	Ø 0.47" (12 mm)	<b>D</b>	3.34" (84.84 mm)	<b>G</b>	0.51" (12.95 mm) TYP (2)
<b>B</b>	0.57" (14.47 mm)	<b>E</b>	1.0" (25.4 mm)	<b>H</b>	0.3" (7.62 mm) TYP (2)
<b>C</b>	1.56" (39.62 mm)	<b>F</b>	Ø 0.75" (19.05 mm)	<b>I</b>	Ø 0.17" (4.32 mm) THRU Ø 0.29" (7.36 mm) ±0.16" (4.06 mm) TYP (2)

Sealed 800LT 20 mm OD					
					
<b>A</b>	Ø 0.47" (12 mm)	<b>D</b>	3.34" (84.84 mm)	<b>G</b>	0.51" (12.95 mm) TYP (2)
<b>B</b>	0.57" (14.47 mm)	<b>E</b>	1.0" (25.4 mm)	<b>H</b>	0.3" (7.62 mm) TYP (2)
<b>C</b>	1.56" (39.62 mm)	<b>F</b>	Ø 0.79" (20 mm)	<b>I</b>	Ø 0.17" (4.32 mm) THRU Ø 0.29" (7.36 mm) ±0.16" (4.06 mm) TYP (2)

Sealed 800LT 22 mm OD					
					
<b>A</b>	Ø 0.47" (12 mm)	<b>D</b>	3.34" (84.84 mm)	<b>G</b>	0.74" (18.8 mm) TYP (2)
<b>B</b>	0.57" (14.47 mm)	<b>E</b>	1.0" (25.4 mm)	<b>H</b>	0.27" (6.86 mm) TYP (2)
<b>C</b>	1.56" (39.62 mm)	<b>F</b>	Ø 0.87" (22 mm)	<b>I</b>	Ø 0.22" (5.58 mm) THRU Ø 0.32" (8.13 mm) ±0.3" (7.62 mm) TYP (2)

Sealed 800LT 25 mm OD					
					
<b>A</b>	Ø 0.47" (12 mm)	<b>D</b>	3.34" (84.84 mm)	<b>G</b>	0.65" (16.51 mm) TYP (2)
<b>B</b>	0.57" (14.47 mm)	<b>E</b>	1.0" (25.4 mm)	<b>H</b>	0.45" (11.43 mm) TYP (2)
<b>C</b>	1.56" (39.62 mm)	<b>F</b>	Ø 0.98" (24.89 mm)	<b>I</b>	Ø 0.17" (4.32 mm) THRU Ø 0.32" (8.13 mm) ±0.46" (11.68 mm) TYP (2)

**Figure 5:** Tables that show the proper mounting area and dimensions for mounting Air Turbine Live Tools®



#### WARNING

Connection to air supply starts rotation. Do not oil or lubricate.  
Use dry, clean, oil-free 90 psi (6.2 Bar) air supply only.

Variables for Calculating	
Variable	Example Value
Standard Live Tool RPM	6,000 RPM
Standard Live Tool Feed Rate	0.001 IPR
Standard Live Tool Cycle Time	60 Minutes
Air Turbine Live Tool® RPM	60,000 RPM

## Calculating Your New Feed Rate and Cycle Time

You do not need to change the set RPM in your program to operate **Air Turbine Live Tools®** in your lathe. Instead, change the feed rate in your program.

All **Air Turbine Live Tools®** operate at a constant factory-set fixed speed, and are tested and rated to be within 10% of the designated speed. The formula in **figure 6** below is an **approximation** for calculating what your new feed rate and cycle time should be. **Always consult with an Air Turbine technician for your specific application.**

**1.**  $60,000 \text{ RPM} \div 6,000 \text{ RPM} = 10$

Divide your **Air Turbine Live Tool®** RPM by the RPM of your main spindle to determine how many times faster the RPM is.

**2.**  $0.001 \text{ IPR} \times 10 = 0.01 \text{ IPR}$

Calculate your new feed rate when using your **Air Turbine Live Tool®** by multiplying your current feed rate by how many times faster the RPM is.

**3.**  $60 \text{ Minutes} \div 10 = 6 \text{ Minutes}$

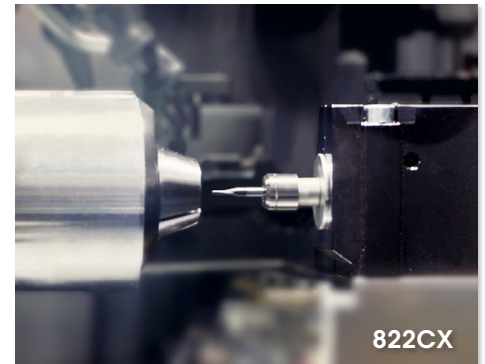
Calculate your new cycle time by dividing your current cycle time by how many times faster the RPM is.

**Figure 6:** A set of formulas used to determine your approximate new feed rate and cycle time with an Air Turbine Live Tool® using your main spindles RPM, your current feed rate, and current cycle time.

## Operation

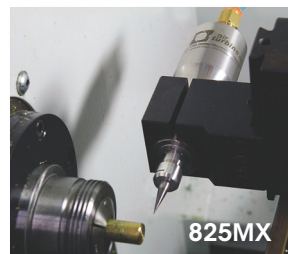
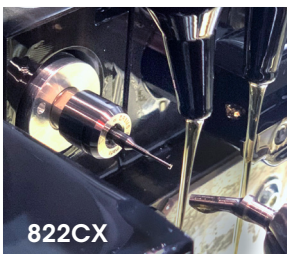
Purge the line of contamination and run at least 10 minutes before initial use to ensure the bearing lubrication does not solidify.

**Always monitor the air pressure gauge during operation** of your **Air Turbine Live Tool®**. The key to successful high-speed machining and optimized tool performance is to program light passes at very high feed rates. Start with a light pass observing surface finish quality and gradually step down or increase your rate of advance for optimal cutting conditions. Do not try to cut too aggressively. You will overload your turbine causing your cutting tool to stall or drag in the material. Dragging your tool on the work or a sudden stop will cause stress to the bearings and force the grease out, causing premature failure.



## When Working in a Wet Environment

**Air Turbine Live Tools®** are sealed for wet environments. In a wet environment, turn on the air supply to your **Air Turbine Live Tool®** **before** you turn on the coolant flow. **At the end of the cycle turn the coolant off first.** Only after the coolant flow is off, **then** you can turn off the air flow to your tool.



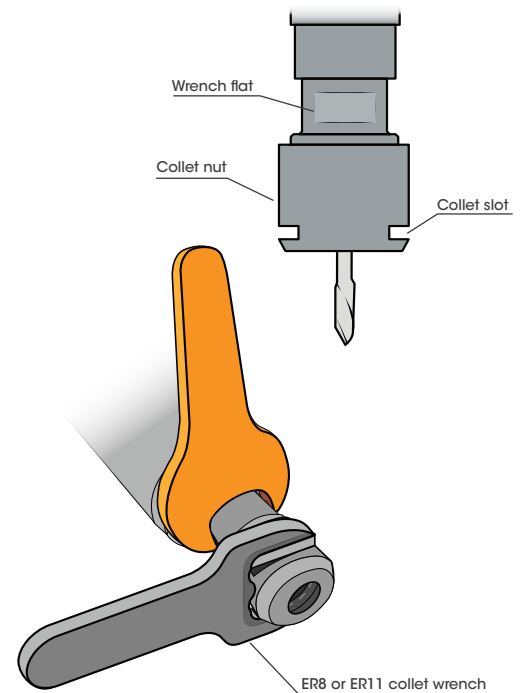
### Selecting the Correct Cutting Tool

Ensure your cutting tool is rated for the rotational speed you are using. **Your tool must be balanced and truly concentric to operate at the high speed of Air Turbine Live Tools®.**

Incorrect tool selection results in unbalanced rotation or overloading, which will result in stress on the bearings and premature failure. **The stick-out extension length of the cutting tool from your collet should optimally be no more than 3 times the diameter of your cutting tool.** Do not impact the collet when opening your collet.

### Collet and Cutting Tool Installation

1. Take the wrench included with your **Air Turbine Live Tool®** and insert it to the wrench flat of your **Air Turbine Live Tools®** shaft.
2. Take the ER8 or ER11 collet wrench included with your Air Turbine Live Tool® and apply it on the collet slot as shown in **figure 7**. Turn the wrench counterclockwise to release the current cutting tool.
3. After the cutting tool is free, continue to turn the collet nut counterclockwise with the ER8 or ER11 collet wrench to fully remove the collet nut and release the existing collet. Remove the wrench from the shaft.
4. Remove the existing collet from the shaft and replace it with the new collet. Re-apply the collet nut by turning it clockwise on the shaft, use **figure 9** to **determine the torque (ft-lbs) needed for your collet.**
5. Insert the new cutting tool by sliding it into the shaft of your Air Turbine Live Tools®. Ensure that the new cutting tool goes completely through the collet as shown in **figure 8**.
6. Re-insert the wrench onto the wrench flat of your **Air Turbine Live Tools®** shaft, and turn the collet nut clockwise until it's firmly held. **Do not over tighten the collet nut,** refer to **figure 9** for the torque needed for your collet.
7. Insert the collet wrench into the collet nut and turn it clockwise as shown in **figure 7** to ensure the new collet and cutting tool is firmly held.



**Figure 7:** Correct insertion of both the wrench and the ER8 or ER11 collet wrench to remove or secure the collet nut.



**Figure 8:** A comparison showing the correct and incorrect way to insert the cutting tool into the collet. **Ensure that the cutting tool goes completely through the collet** and that the stick-out extension length of the cutting tool from your collet is no more than 3 times the diameter of your cutting tool.

Collet Type	Collet Size	ft-lbs	Torco-Fix
ER8	Ø 0.039" (1.0 mm) - 0.196" (5.0 mm)	4	Micro
ER11	Ø 0.039" (1.0 mm) - 0.098" (2.9 mm)	7	Micro, S
	Ø 0.118" (3.0 mm) - 0.256" (7.0 mm)	7	Micro, S

**Figure 9:** Rego-Fix recommended torque (ft-lbs) for ER8 and ER11 collet nuts.



**WARNING**  
Never hit the collet nut with the wrench.