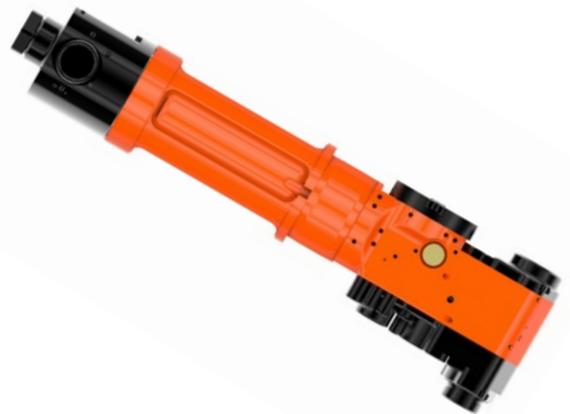


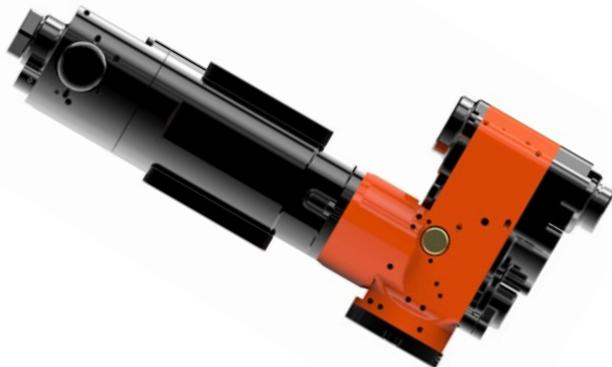
**A1 Series**  
Advanced Drilling



Turbine - Inline



Turbine - Right Angle



Rotary Vane - Inline



Rotary Vane - Right Angle





# Contents

<b>1</b>	<b>Product Safety Information</b>	<b>4</b>
1.1	Intended Use .....	4
1.2	General Safety Instructions .....	4
1.3	Product Installation .....	4
1.4	Product Operation .....	6
1.5	Operation Safety Considerations.....	6
1.6	Storage Instructions.....	6
1.7	Disposal.....	6
1.8	Safety Signal Words .....	7
1.9	Equipment .....	7
1.10	Cutters .....	7
1.11	Safety Maintenance Checklist .....	7
1.12	Copyright Protection .....	8
1.13	EC Declaration of Conformity .....	8
1.14	Noise and Vibration .....	8
<b>2</b>	<b>Proper Working Positions</b>	<b>9</b>
<b>3</b>	<b>Product Specifications</b>	<b>10</b>
3.1	Product Description .....	10
<b>4</b>	<b>Positive Feed Drill Operation</b>	<b>11</b>
4.1	Stopping The Tool.....	11
4.2	Non-Cutting Test Cycle (Bench Test).....	11
4.3	Operation.....	11
<b>5</b>	<b>Maintenance</b>	<b>12</b>
<b>6</b>	<b>Optional Accessories</b>	<b>13</b>
<b>7</b>	<b>Indexer</b>	<b>14</b>
<b>8</b>	<b>Stroke Setting</b>	<b>15</b>

The original language of this manual is English.

## 1 Product Safety Information:

### 1.1 Intended Use:

**WARNING!** This positive feed drill is designed for fixtured drilling applications.



This equipment must not be modified in any manner unless approved in writing by Corvaer or Corvaer S.A.S. All safety devices must be properly installed and maintained in good working order.

Any abuse or misuse of this equipment can cause equipment damage, death, or serious injury.

Failure to observe all safety warnings could result in equipment failure or personnel injury.

### 1.2 General Safety Instructions:

For additional product safety information refer to Corvaer or Corvaer S.A.S. document CE-2009, General Safety Fixtured Drills.

These safety instructions must be accessible to the operator at all times. They must be shown and made available to all personnel involved in the operation of this equipment.



The operator must read and understand the safety instructions contained in this document before operating this equipment.

These safety instructions are not intended to be all inclusive. Study and comply with all applicable Federal, State and local regulations.

Do not remove any labels from this equipment. Replace any label that has been damaged and can not be easily read.

**WARNING!**



To avoid serious injury, keep hands free from rotating equipment.

Before operating this equipment, coordinate with your workplace safety professional to conduct a hazard assessment of the setup, operation, emergency shut down, start-up, and maintenance of this equipment prior to use. Always use identified safeguards, tooling, and safety procedures identified in the hazard assessment before operating this tool.

### 1.3 Product Installation:

**WARNING!** Only qualified and trained personnel should install, adjust, repair or use this equipment.



***Do not exceed equipment ratings.***

Never attempt to operate this equipment at more than it's rated capacity. Overloading will cause equipment failure and possible personnel injury.

#### **Air Supply:**

The positive feed drill A1 type has been designed to be used at 89.9 to 108.8 psi (6.2 to 7.5 bar) dynamic air pressure and a flow rate of 80 cfm (2300 L/min).

In order to get a correct automatic cycle and a maximum output, the minimum dynamic air pressure must not be lower than 89.9 psi (6.2 bar). The minimum inside diameter of the air supply hose must be 7/16" (11mm) to allow sufficient air flow.

Product Information

**CAUTION!**



**DO NOT LUBRICATE THE TURBINE MOTOR. LUBRICATING THE TURBINE MOTOR WILL CAUSE DAMAGE.**

The compressed air must be clean and dry to maintain proper tool performance. Install a filter-regulator-lubricator in the air supply line. Improper lubrication can affect the performance and life of the equipment.

Install the filter-regulator-lubricator at the same height or higher than the work station and a maximum hose length of 16 feet (5 m).

Compressed air quality according to ISO 8573-1: 2010 [2:4:3]:

**Recommended oil (rotary vane motors only):**

Airlube 533485 (1 US Gallon / 3L)

Airlube 540397 (1 US Quart / 0.9L)

Adjust the inline lubricator to dispense 2 drops of oil per minute at nominal flow.

**Recommended grease (gear head and planetary):**

Accrolube® High Efficiency Grease with PTFE (manufactured by Accro-Seal)

Any deviation of these instructions could generate abnormal operation on drill cycle of the tool, for which the manufacturer cannot be held responsible.

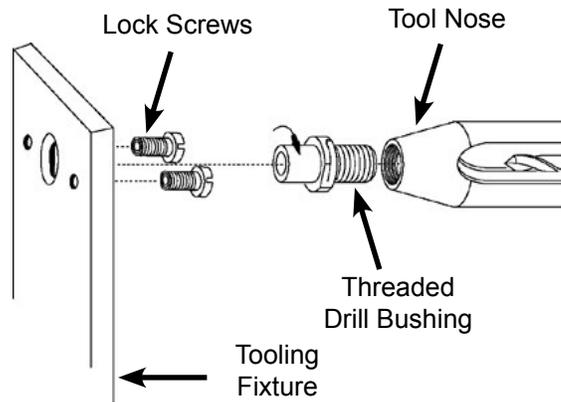
**WARNING!**



Before mounting this equipment, check the lock screws in the tooling fixture and drill bushing. Make sure both are in good condition and securely tightened.

Positive feed drills can exert high torques and high thrust loads. If failure of the lock screws or drill bushing occurs, the drill may suddenly spin and back away from the drill fixture.

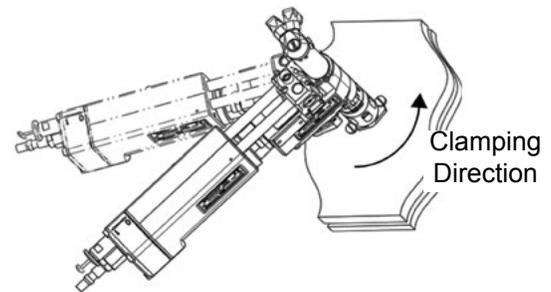
The cutting tools used with this equipment are very sharp. Handle with extreme caution to avoid injury.



**Vertical Fixturing Applications:**

Lock the tool in position by rotating 1/4 turn as illustrated. The body of the tool must be positioned to the left. This will allow the weight of the machine to assure a good grip on the fixture.

Before beginning the drilling cycle, run on non-cutting test cycle to assure the tool is functioning properly and is securely mounted.



**1.4 Product Operation:**

WARNING!



Safety glasses or a face shield must be worn when operating this equipment. Wear hearing protection and other protective equipment, as required by the work environment and drilling application.

If the work environment or drilling application requires the use of protective gloves, avoid contact with the rotating parts of the tool.

Do not wear loose clothing, jewelry or rings and keep long hair away from the tool. Avoid direct skin contact with lubricants, grease or adhesives.

Make certain all personnel in the immediate area of the drilling operation are equipped with the appropriate personal protective equipment before operating the tool.

**1.5 Operating Safety Considerations:**

WARNING!



- Do not remove any labels and replace any that are damaged or unreadable.
- Do not use this equipment in an explosive environment.
- Disconnect the air supply before performing any service or cutter changes.
- Make sure the air supply line is securely attached to the tool before operating.
- Keep hands away from the ejecting area near the nose unit.
- Use care when handling the sharp cutters.
- Keep clear of all moving parts during the tool's operating cycle.
- Before starting the drilling cycle, make sure the nose piece is securely mounted.
- Before starting the tool, make sure the "STOP" button is working properly.
- Before operating this equipment, run one non-cutting work test cycle.

**1.6 Storage Instructions:**

This equipment should be stored at temperatures of +40° - +100° F (4° - 38°C) with a maximum relative humidity of 80%.

Note: The electronic cycle counter option contains a battery.

**1.7 Disposal:**



Observe all local disposal guidelines for all components of this equipment and its packaging.

## Product Information

**1.8 Safety Signal Words:****WARNING!**

Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

**CAUTION!**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

**1.9 Equipment:**

If the tool is supplied with dedicated equipment, adhere to the following instructions as well as all safety instructions:

The gaps should be checked periodically to insure proper tool performance. It is recommended for reaming/countersinking the maximum gap of 1.3 times (1.5 in drilling) of initial maximum gap (generally H7/g6) by design between the spindle and bushing.

Check that the jigs are clean without excessive gap and for concentric collet equipment without oil.

**1.10 Cutters:**

Cutters: For optimal results, the cutter should be checked regularly:

- The cutting edges should be clear of chips.
- The lubrication holes should be clean and the lubricant should flow to the tip of the cutter.
- In case of deviation on the hole geometry, check the concentricity between the cutter body and the edges as well as the concentricity between the spindle and cutter. The deviation must not exceed some thousands of inches.

**1.11 Safety Maintenance Checklist:**

Implement a comprehensive safety maintenance program to provide regular inspection for all phases of tool operation and air supply equipment. Replace worn or damaged parts using only genuine brand replacement parts manufactured by Corvaer or Corvaer S.A.S.

The use of parts other than those provided by the manufacturer may result in a drop in output or increased maintenance and may cancel the manufacturer's warranty.

Never lubricate the tool with flammable or volatile liquid, gazoil, aircraft fuel, etc.

Disconnect the air supply before performing any maintenance on this equipment.

**Daily:**

- Visual inspection of air supply hose and connections.
- If lubrication is used, check the oil tank level and operation.
- Inspect all external tool components.
- Inspect the cutter for cracks or damage.
- Make sure lock screws and drill bushing are securely mounted.
- Inspect the tool for loose fasteners.
- Check the tool for excessive noise or vibration.

**Weekly:**

- Inspect the air supply hose for damage.
- Make sure the air inlet connection is securely tightened.
- Check the free speed of the tool.
- Make sure all tool fasteners are properly tightened.
- Inspect any guards (if equipped) for damage.

**6 Months or sooner if needed:**

- Check individual parts and replace as necessary.
- Replace all o-rings, seals and gaskets.

Only qualified and trained personnel should repair this equipment. Refer to the Sales and Service Center listing on the back of this document for authorized Corvaer or Corvaer S.A.S. repair facilities.

**1.12 Copyright protection:**

Corvaer reserves the right to modify, supplement or improve this document or the product without prior notice. This document may not be reproduced in any way, shape or form, in full or parts thereof, or copied to another natural or machine readable language or to a data carrier, whether electronic, mechanical, optical or otherwise without the express permission of Corvaer.

**1.13 EC Declaration of Conformity:**

We affirm that this machine is in accordance with the following EC regulations (2006/42/EC). Applied harmonized standards are ISO 12100:2010.

**1.14 Noise and Vibration:**

Noise:  $L_{pA} = 73.4$  dBA

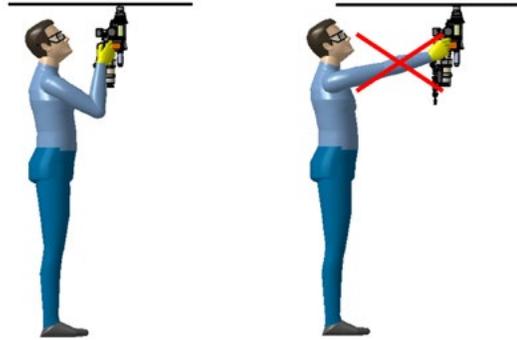
Noise:  $L_{WA} = 84.4$  dBA

Vibration:  $< 2.5$  m<sup>2</sup>/s

Product Information

**2 Proper Working Positions:**

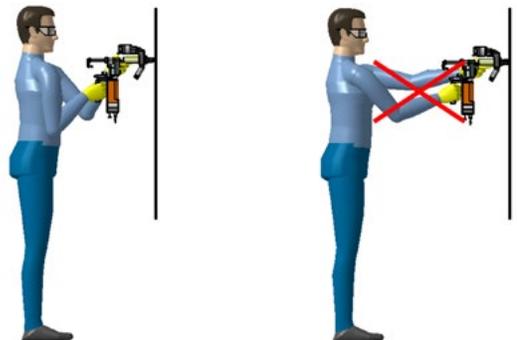
Proper working position for lower surface applications.



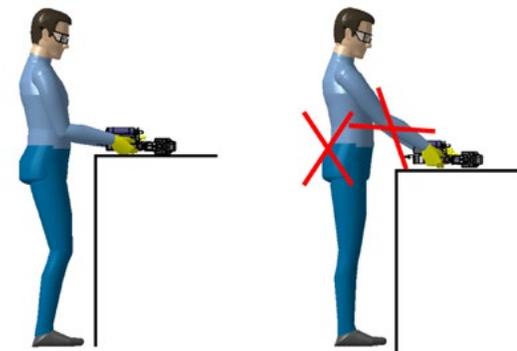
Proper working position for upper surface applications.



Proper working position for horizontal surface applications.



Proper working position for table top activities.



### 3 Product Specifications:

A Series Base Tool Options													
Base Tool		Base weight		Noise	Configuration		Standard Option		Rated Speeds -0/+10%			Feeds	
Code		lbs	kg		Code	Configuration	Turbine	Vane		ipr	mm/rev		
(2)A14V		7.3	3.3	<=85dBA	Right Angle Vane Motor	M	Internal Mitis	3200	3100	760	0.001	0.025	
(2)A14T		6.9	3.1	<=82dBA	Right Angle Turbine			2500	2800	670	0.002	0.05	
(2)A16V		7.1	3.2	<=85dBA	In Line Vane Motor			1700	2500	600	0.003	0.08	
(2)A16T		6.7	3.0	<=82dBA	In Line Turbine			950	2100	510	0.004	0.10	
								750	1900	460	0.006	0.15	
								600	1700	410	0.007	0.18	
								400	1450	350	0.008	0.20	
									950	320			
									850	250			

A Series Base Tool Configurations - Refer to Specific Service Parts Section										
Gear Head	Speed Specific Parts Rotary Vane					Speed Specific Parts Turbine				
	Type	Speed	Ratio	Assembly	Motor Speed	Governor	Turbine	Planetary Ratio	Assembly	
Right Angle	3100	3.3	642409PT	10250	641336	3200	3.3	642409PT		
In Line	2800	4.1	642410PT	11400	641333	2500	4.1	642410PT		
	2500	4.1	642410PT	10250	641336	1700	6.0	642411PT		
Mitis	2100	4.1	642410PT	8700	641335	950	10.7	642412PT		
Non Mitis	1900	6.0	642411PT	11400	641333	750	13.5	642413PT		
	1700	6.0	642411PT	10250	641336	600	17.0	642414PT		
	1450	6.0	642411PT	8700	641335	400	24.8	642415PT		
	950	10.7	642412PT	10250	641336					
	850	13.5	642413PT	11400	641333					
	760	13.5	642413PT	10250	641336					
	670	17.01563	642414PT	11400	641333					
	600	17.01563	642414PT	10250	641336					
	510	17.01563	642414PT	8700	641335					
	460	24.75	642415PT	11400	641333					
Motor	410	24.75	642415PT	10250	641336					
Type	350	24.75	642415PT	8700	641335					
Turbine	320	24.75	642415PT	8000	641332					
Rotary Vane	250	24.75	642415PT	6300	641334					

#### 3.1 Product Description:

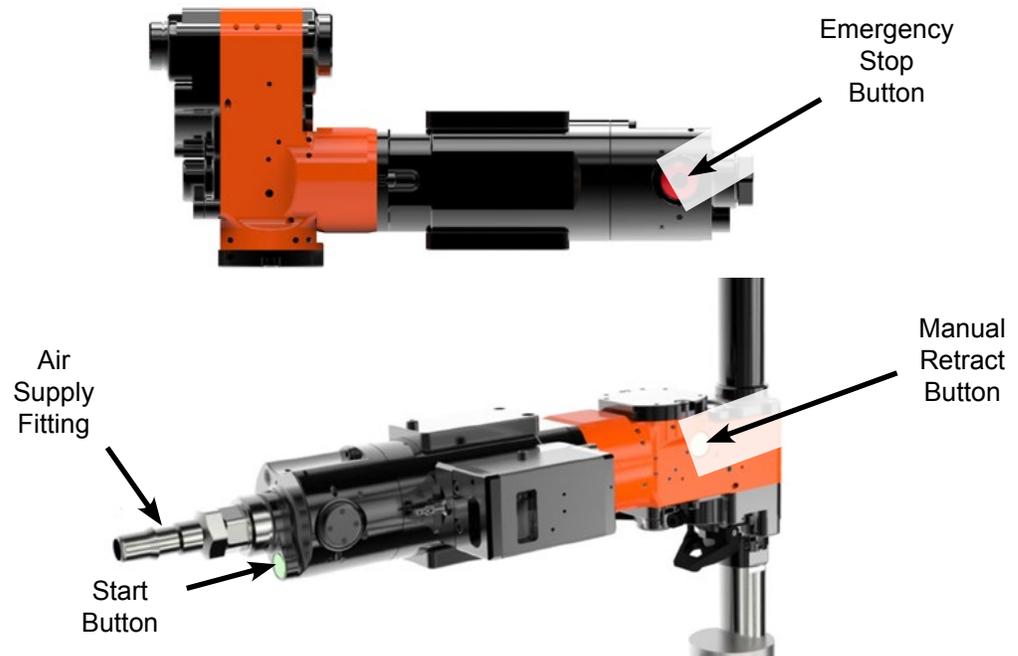
This portable, pneumatic powered machine is designed for drilling, boring or milling in aerospace manufacturing applications. This machine consists of the following components:

- Power supply assembly
- Geared motor unit
- Gear unit assembly for rotation and feed
- Logic components
- Valve
- Spindle screw
- Cutting tool
- Nosepiece
- Various options

## Product Information

**4 Positive Feed Drill Operation:****4.1 Stopping the Tool:**

When air is supplied to the tool and the start button is pressed, the red emergency stop button will protrude above the surface of the motor housing and the motor will start and transmit power to the gear head. At any time during operation, the red emergency stop button can be pressed by the operator and it will interrupt air supply to the tool and stop it immediately.



Tool shown with optional Fluid Inducer, Electronic Counter, Vacuum Nose, and Indexer

**4.2 Non-Cutting Test Cycle (Bench Test):**

After installing a new cutter, changing tool configuration, or performing maintenance; a non-cutting test cycle should be performed to verify tool functions correctly.

With the tool securely installed in a vise and supply air connected to the tool, press the start button. The spindle will begin rotating and advancing forward. The spindle will continue to advance forward until either: (a) the manual retract button is pressed by the operator or (b) the spindle travels full depth and the retract nut contacts its stop point. As a result of either of these conditions, the spindle will continue to turn but will travel backward to its retracted position. Once the spindle has fully retracted, the motor will turn off and the drill is ready to start.

**4.3 Operation:**

With the tool securely installed in drill fixture, supply air connected to the tool, and the spindle in the retracted position, the drill is ready for start of cycle.

After pressing the start button, the spindle begins rotating and advancing forward. The spindle will continue to advance forward until either: (a) the manual retract button is pressed by the operator; (b) the spindle travels full depth and the retract nut contacts its stop point; or (c) excessive thrust is generated due to damaged cutter, incorrect drill configuration, etc. As a result of any of these conditions, the spindle will continue to turn but will travel backward to its retracted position. Once the spindle has fully retracted, the motor will turn off and the drill is ready to start another cycle.

**5 Maintenance:**

**General Notes:**

Note: Intervals between inspection depend on a number of operation and use factors, most significant of which are:

- the operation frequency of the tool
- number of drilling cycles per use
- drilling torque and thrust required
- cycle time in use
- cleanliness of operation - lubricant/chip cleanup
- quality of air supply

The following recommendations are initial guidelines and should be adapted according to the tool utilization.

For additional information or guidance please contact your local Corvaer representative.

**Recommended Minimum Service Intervals \***

Schedule	Calendar Time	Cycles V	Run Time/hrs	Action
W1	Daily **	NA	NA	Ensure tool is cleaned - all chips/debris removed
				Visually Inspect air supply hose, all pneumatic connections
				Inspect airline filter, regulator and lubricator for proper lubrication
				Check Air Supply Pressure (90psi dynamic)
				Check spindle stop nuts are securely mounted
				Check all guards are fitted
				Check the tool for excessive vibration/unusual noise
				Visual inspect all external components - Especially inder if fitted for wear
				Check Tool Function - Emergency Stop/Start/Manual Retract/Automatic Retract
W2	3 Months	100,000	500	Check Motor Speed - If Low Clean Inlet Screen and Clean or Change Muffler then check/replace Motor Blades as necessary
				Check for External Air Leaks - Replace O Rings as necessary
				Inspect Fluid Inducer End Seal/Tube for wear/leaks - replace if necessary
				Apply grease to Gear Head
				Check operation of Lubricator
				Check thrust overload setting
W3	6 Months	200,000	2,500	Inspect All O Rings/Seals - Replace as necessary
				Check spindle for wear on threads
W4	1 Year	300,000	7,500	Replace All Bearings/Inspect Gears - refer to spare parts manualfor guidelines
				Check All springs

\* Recommended Service Interval is based on 3 possible factors - Calendar Time, Run Time or Run Cycles - the number achieved first should be used to set maintenance schedule

\*\* Alternatively Before or After Each Shift

Product Information

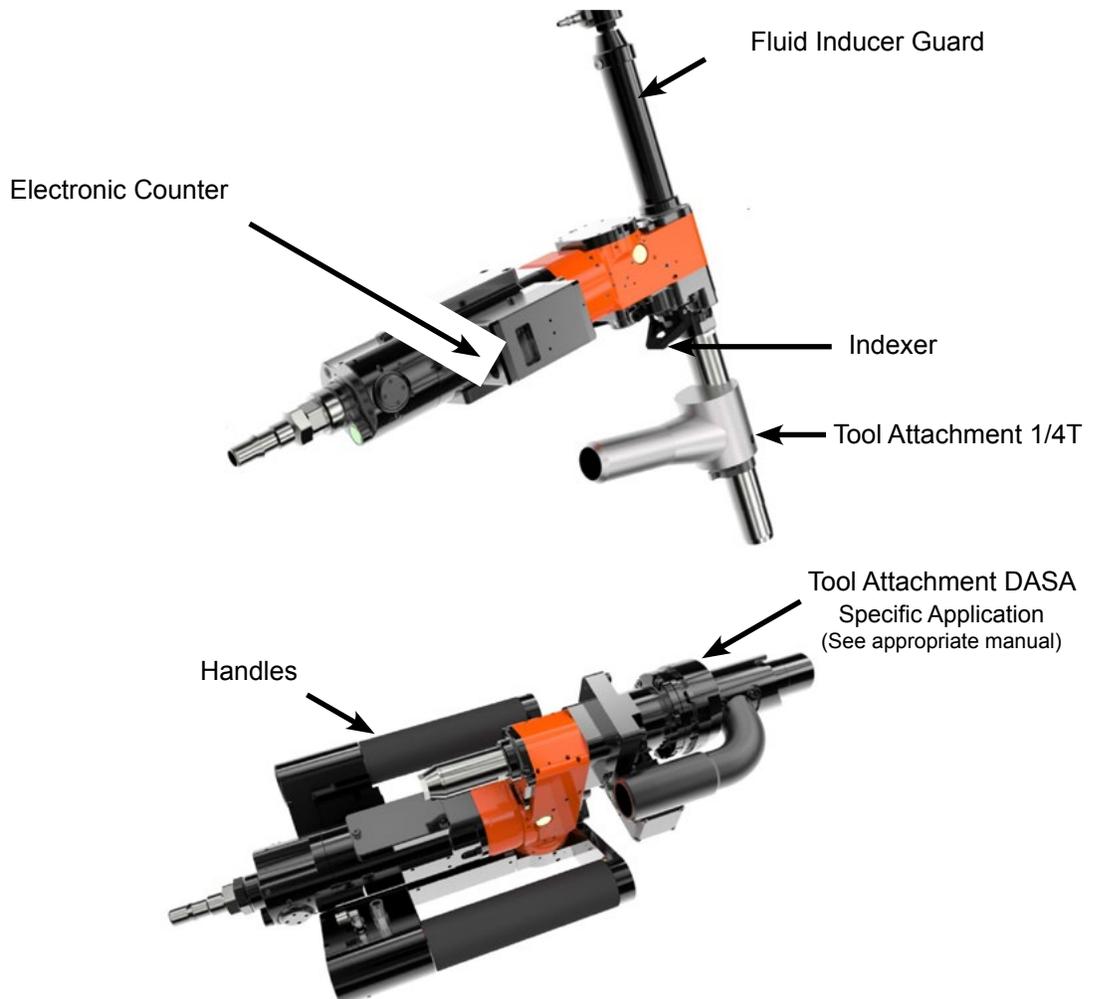
MITIS™ Service Intervals				
Feed Rate		Stroke Basis (S)		Recommended Service Interval ( C )
IPR	mm/rev	inches	mm	Number of Cycles
0.001	0.03	1	25.4	333
0.002	0.05	1	25.4	667
0.003	0.08	1	25.4	1,000
0.004	0.10	1	25.4	1,333
0.005	0.13	1	25.4	1,667
0.006	0.15	1	25.4	2,000
0.007	0.18	1	25.4	2,333
0.008	0.20	1	25.4	2,667
0.009	0.23	1	25.4	3,000
0.010	0.25	1	25.4	3,333

To calculate a User Specific Service interval based on actual stroke.

$$\text{Service Interval (Cycles)} = \frac{\text{Stroke Basis (S)}}{\text{Actual Stroke}} \times \text{Recommended Service Intervals ( C )}$$

Note: To service MITIS, access the MITIS components. Remove and inspect for wear and replace as necessary. Reassemble and grease. Refer to PL92-5008 for instructions.

6 **Optional Accessories:**



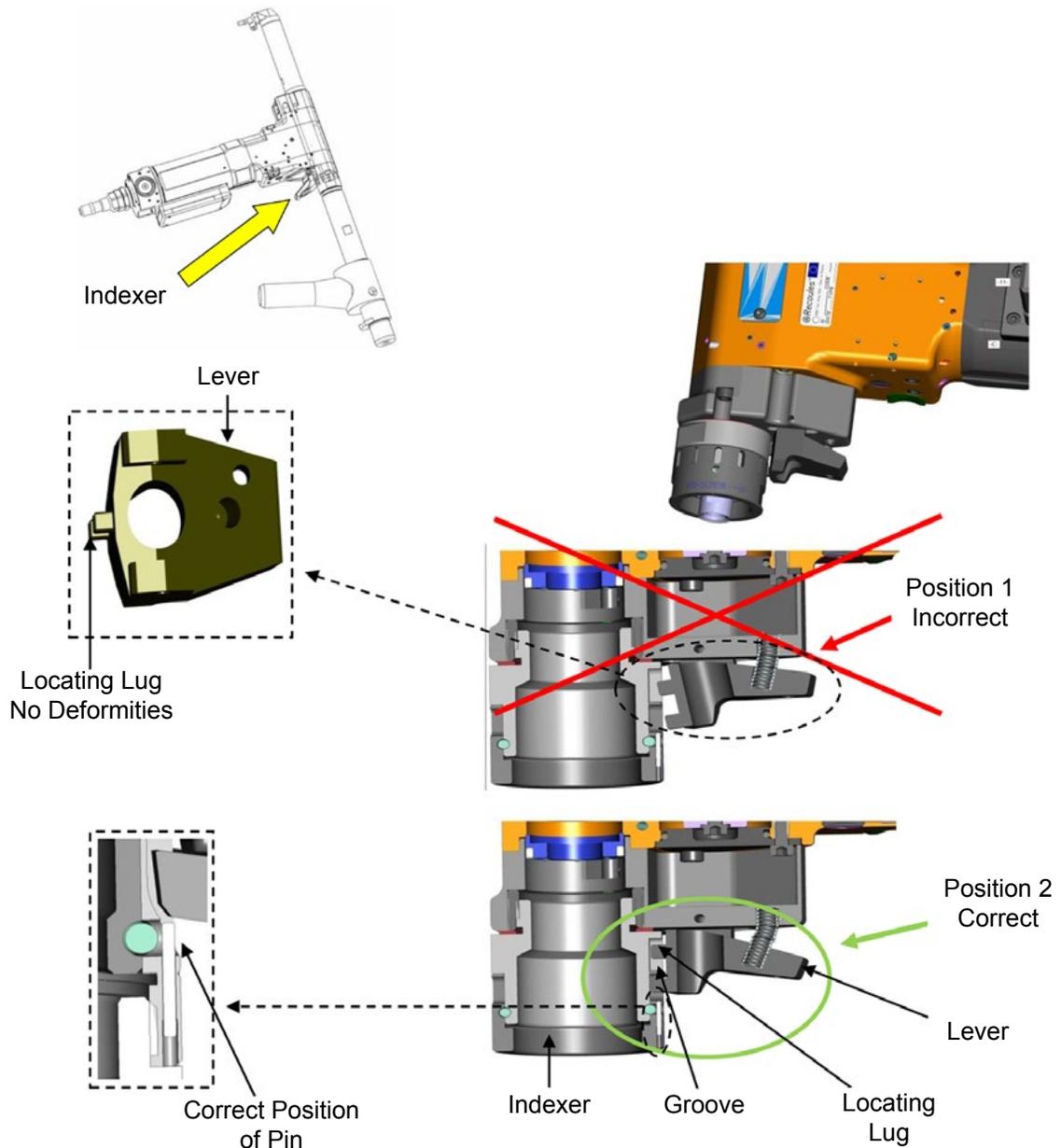
7 **Indexer:**

**WARNING!**



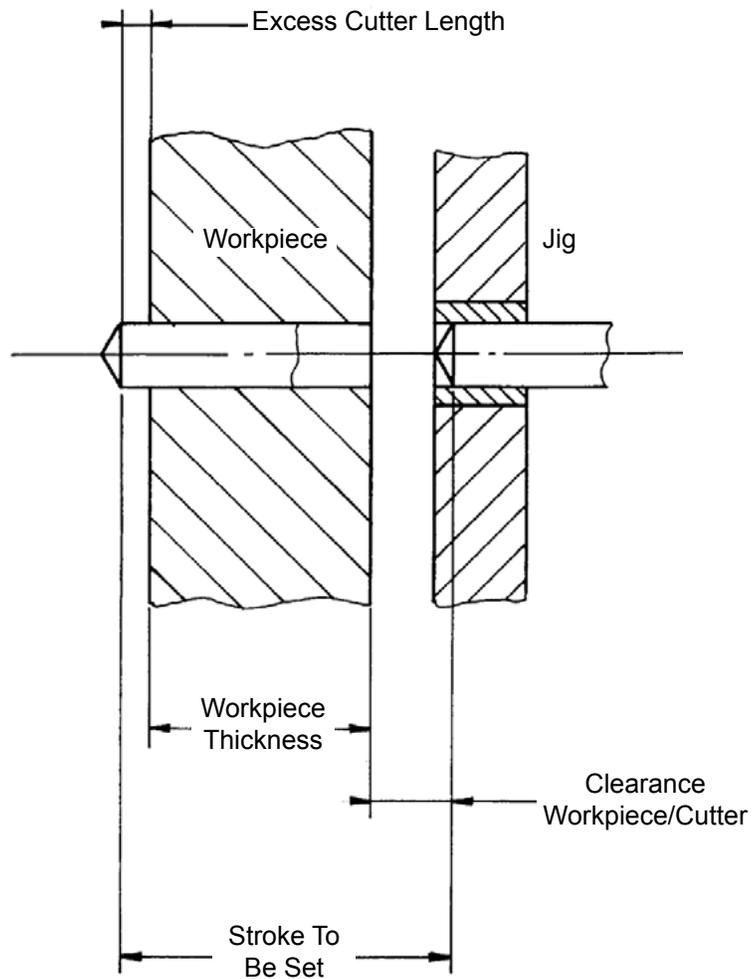
Before using the machine and launching of the drilling cycle:

- Check the lever index to make certain it latches correctly (Position 2).
- Ensure the absence of chips into the notches of the indexer.
- Check that the locating lug is positioned in the groove.
- Ensure the spring is still in place and in proper position.
- Make sure when the lever is in position "To Push", the index rotates freely without special effort.
- Ensure the absence of all kinds of deformations of the locating lug at the level of the lever.



Product Information

8 Stroke Setting:



$$\text{Stroke to be set} = \text{Clearance Workpiece / Cutter} + \text{Workpiece Thickness} + \text{Excess Cutter Length}$$

# Sales & Service Centers

**Note:** All locations may not service all products. Please contact the nearest Sales & Service Center for the appropriate facility to handle your service requirements.

Fort Worth, TX

**Corvaer**

**Sales & Service Center**

3133 South Grove St.

Fort Worth, TX 76110

Tel: Tel: 817 274 7418

France

**Corvaer SAS**

**Sales & Service Center**

Zone Industrielle

25, avenue Maurice Chevalier

77330 Ozoir-la-Ferrière - France

Tel: +33 164 432 217