

# Installation Tools For Accu-Lok™ Blind Bolt Fasteners

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## Assembly Tool Systems

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**Alcoa  
Fastening  
Systems**



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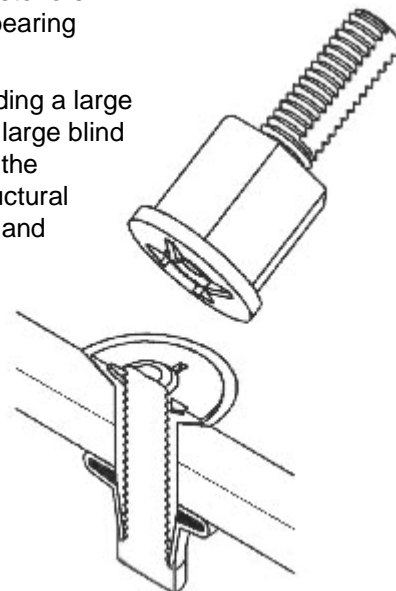
The Accu-Lok™ fastener and DRYV-CAP™ are protected by  
US patent number 6,454,502 with other patents pending

# General Product Description

## Accu-Lok™ Blind Bolt System

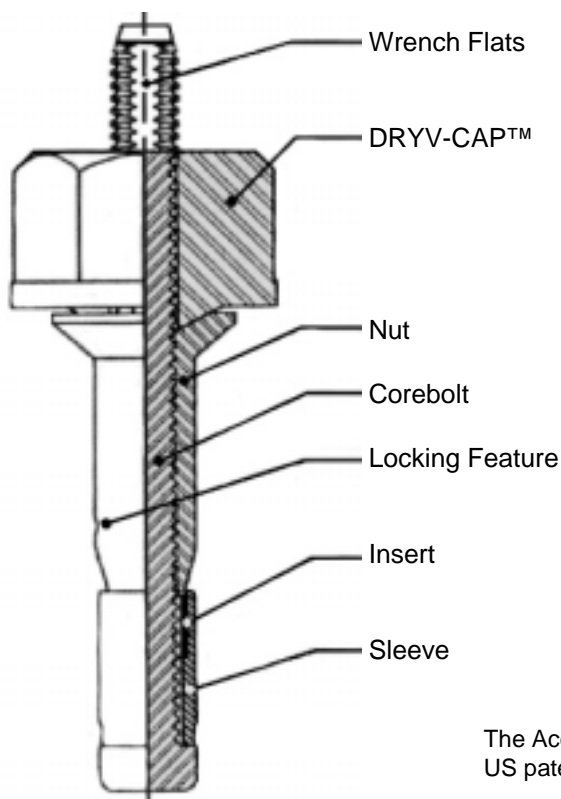
Composite structures being used in today's aircraft are capable of sustaining high loads but are subject to delamination when fastened with conventional fasteners. This is especially true when blind fasteners are used or where high unit bearing stresses are imparted to the joint.

The Accu-Lok™ blind bolt overcomes damage to the composite by providing a large blind side upset that distributes the bearing loads over a large area. This large blind side "foot print" permits the fastener to exert very high clamp-up loads to the structure without damage to the composite. A locking feature insures structural integrity under severe vibration. It is completely compatible with graphite and is not subject to galvanic corrosion. In addition Accu-Lok™ simplifies the installation procedure with the addition of the DRYV-CAP™.



### ACCU-LOK™ OFFERS THESE MAJOR ADVANTAGES

- **INITIALLY DESIGNED FOR COMPOSITES** - but the same positive features make it suitable for metal structures
- **LARGE BLIND UPSET** - eliminates detrimental composite damage
- **LIGHT WEIGHT** - greater payload and fuel savings
- **VISUAL LOCKING FEATURE** - resists loosening due to vibration
- **CONTROLLED CLAMP-UP** - no gaps and tighter assemblies
- **MATERIAL COMPATIBILITY** - resists galvanic corrosion, Titanium and CRES materials available
- **EASY INSTALLATION** - the new DRYV-CAP™ design delivers a quick and trouble free installation with greater tool life
- **NO DAMAGE TO THE TOP OF THE FASTENER**

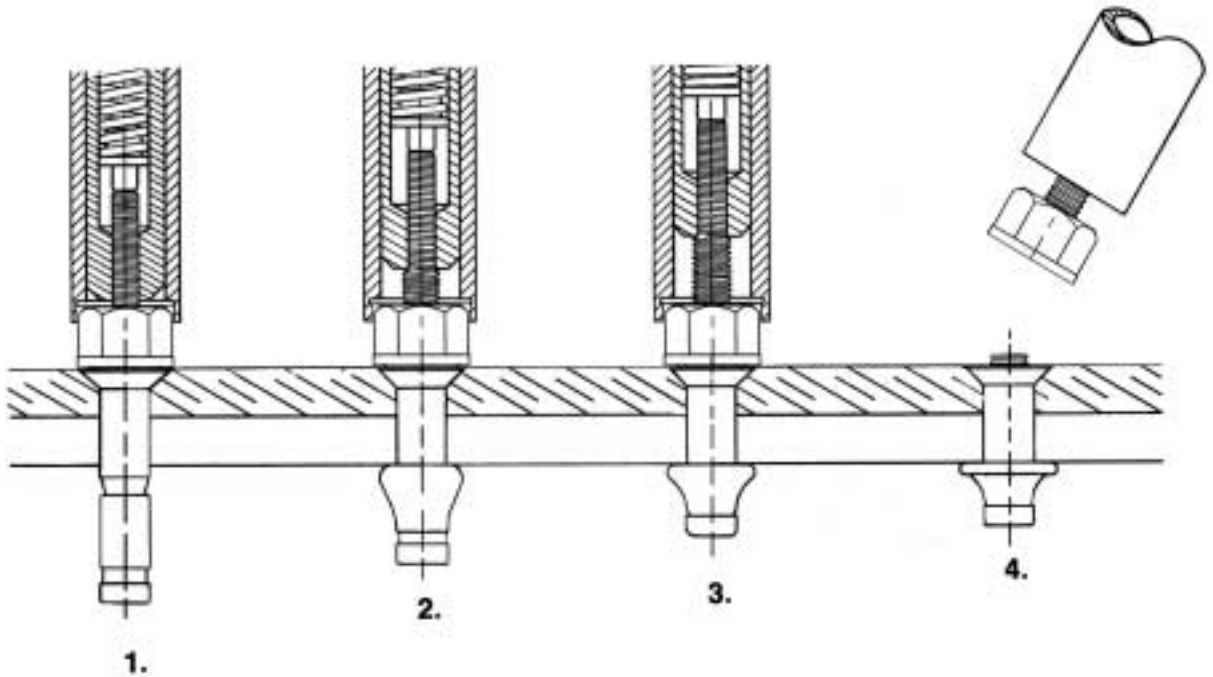


### THE DRYV-CAP™ FEATURE

- Only two nose pieces are required for installation of 5/32" through 3/8" diameter fasteners! Any head style! One drives 5/32" through 1/4" and the other 5/16" through 3/8". (A separate wrench adapter is still required for each diameter).
- Cam-outs are completely eliminated on flush and protruding head fasteners.
- Nose pieces never wear out
- The DRYV-CAP™ stays on the discarded pintail after installation minimizing the tendency of small pintails to find their way into F.O.D. critical areas. The steel DRYV-CAP™ permits easier retrieval (including magnetic pick-up).

The Accu-Lok™ fastener and DRYV-CAP™ are protected by US patent number 6,454,502 with other patents pending

# The Installation Principle



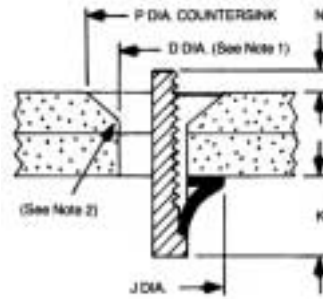
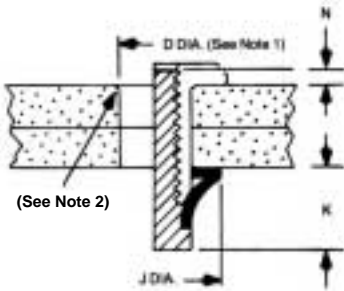
1. The Accu-Lok™ fastener is inserted into the prepared hole. The installation tool is placed over the fastener simultaneously engaging the wrench flats on the core pin and the DRYV-CAP™.

2. Torque is applied to the fastener while the DRYV-CAP™ is held stationary by the installation tool socket. The threaded core pin advances through the nut body causing the sleeve to be drawn up over the tapered nose of the nut. Initial blind head formation is started.

3. Continued tightening completes the formation of large blind head and clamps the sheets tightly together.

4. Once the sleeve forms tightly against the blind side of the structure the core pin fractures in the break groove. The tool is pulled away and the core pin and DRYV-CAP™ assembly is discarded.

# Hole Preparation and Installed Dimensions



## PROTRUDING HEAD

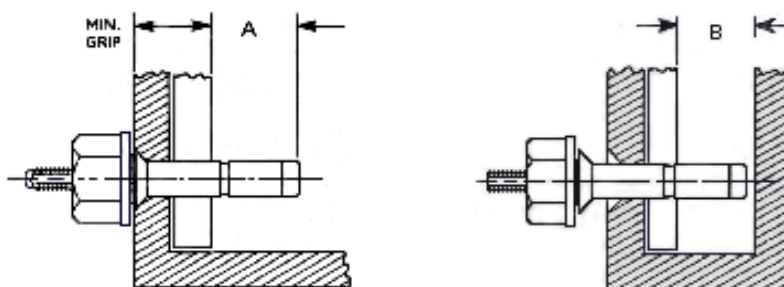
FCBF2010 / FCBF2110 / FCBF2120  
FCBF2011 / FCBF2111 / FCBF2121

## FLUSH HEAD

FCBF2012 / FCBF2112 / FCBF2122  
FCBF2013 / FCBF2113 / FCBF2123

| DIA. DASH NUMBER | D. DIA. RECOMMENDED HOLE SIZE | 100° & 130° CSK P DIA | "J" DIA MIN | "K" MAX | "N" COREBOLT BREAK-OFF LIMITS |
|------------------|-------------------------------|-----------------------|-------------|---------|-------------------------------|
| -5               | .165 - .168                   | .325 - .332           | .250        | .300    | .000 - .103<br>(See Note 4)   |
| -6               | .199 - .202                   | .378 - .385           | .300        | .350    |                               |
| -7               | .228 - .231                   | .409 - .416           | .350        | .400    |                               |
| -8               | .260 - .263                   | .499 - .507           | .400        | .450    |                               |
| -9               | .290 - .293                   | .530 - .538           | .450        | .500    |                               |
| -10              | .312 - .315                   | .626 - .635           | .475        | .550    |                               |
| -11              | .344 - .347                   | .657 - .666           | .525        | .575    |                               |
| -12              | .375 - .378                   | .752 - .762           | .575        | .625    |                               |

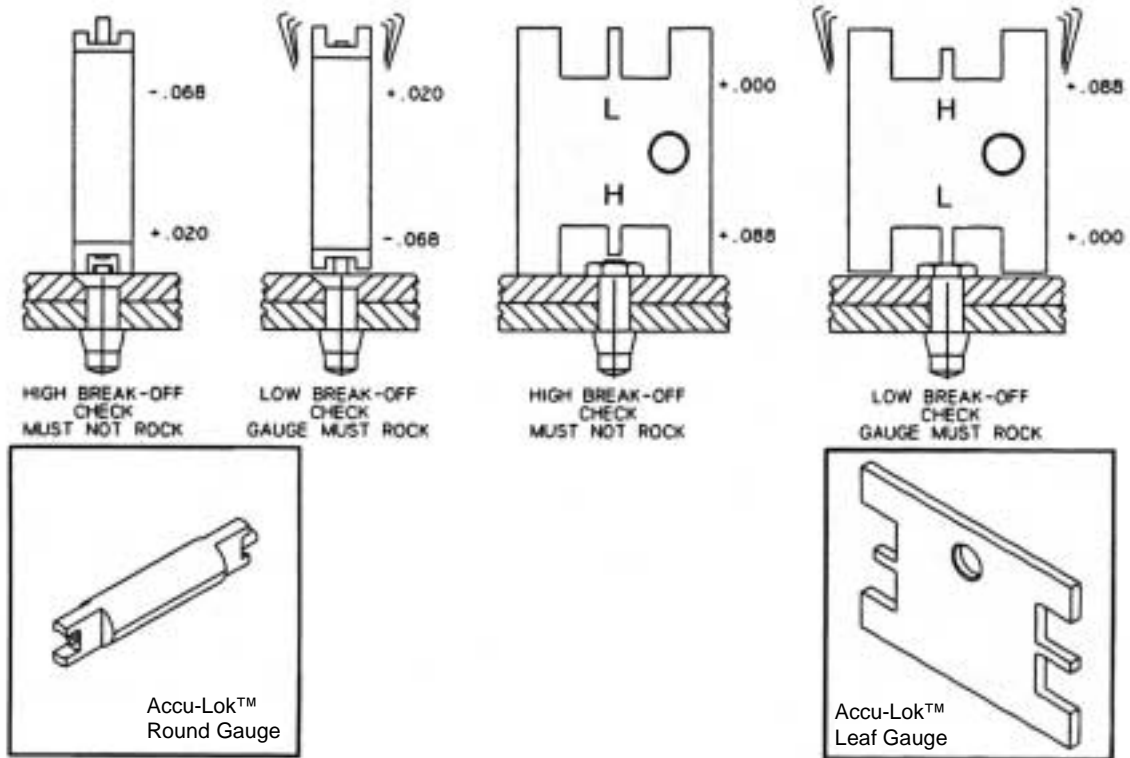
- Notes:
- Holes should be straight and perpendicular to surface.  
Holes should be reasonably round and free from delamination.
  - Edge of holes should be given a slight chamfer.
  - Sheets should be firmly clamped together during drilling.
  - Corebolt break-off limits are measured from skin surface.



| Nominal Size Diameter | (A) Blind Side Protrusion In. Min. Grip | (B) Blind Side Protrusion |
|-----------------------|---|---------------------------|
| -5 (5/32)             | .552                                    | .382                      |
| -6 (3/16)             | .615                                    | .435                      |
| -7 (7/32)             | .670                                    | .485                      |
| -8 (1/4)              | .740                                    | .550                      |
| -9 (9/32)             | .855                                    | .625                      |
| -10 (5/16)            | .932                                    | .662                      |
| -11 (11/32)           | .981                                    | .715                      |
| -12 (3/8)             | 1.130                                   | .790                      |

The Accu-Lok™ Fastener may be "walked in" tight clearance applications.

# Protrusion Gauges for Accu-Lok™ Fasteners



**Round Gauges:** To check core bolt break-off on a flush head Accu-Lok™ fastener, place the gauge on the installed fastener as shown. When checking high break-off, the gauge prongs must straddle both sides of the core bolt. If the gauge rocks, the break-off is too high.

When checking low break-off, repeat the procedure using the low break-off end of the gauge as shown. If the gauge does not rock, the break-off is too low.

**Leaf Gauges:** To check the core bolt break-off on a protruding head Accu-Lok™ fastener, place the leaf gauge on the installed fastener as shown. When checking high break-off, the gauge prongs must straddle both sides of the core bolt. If the gauge rocks, the break-off is too high.

When checking low break-off, repeat the procedure using the low break-off end of the gauge as shown. If the gauge does not rock, the break-off is too low.

# Protrusion Gauges for Accu-Lok™ Fasteners

| Dia.        | Accu-Lok™ Series | Inspection Gauges | Gauge Description     | Break-Off Limits   |
|-------------|------------------|-------------------|-----------------------|--------------------|
| -5 (5/32)   | FCBF2110-5       | FLFP7-CL          | Protruding Leaf Gauge | + 0.103<br>+ 0.000 |
|             | FCBF2111-5       |                   | Protruding Leaf Gauge |                    |
|             | FCBF2112-5       | FLF8-F5           | Flush Round Gauge     |                    |
|             | FCBF2113-5       |                   | Flush Round Gauge     |                    |
| -6 (3/16)   | FCBF2110-6       | FLFP7-CL          | Protruding Leaf Gauge |                    |
|             | FCBF2111-6       |                   | Protruding Leaf Gauge |                    |
|             | FCBF2112-6       | FLF8-F6           | Flush Round Gauge     |                    |
|             | FCBF2113-6       |                   | Flush Round Gauge     |                    |
| -7 (7/32)   | FCBF2110-7       | FLFP7-CL          | Protruding Leaf Gauge |                    |
|             | FCBF2111-7       |                   | Protruding Leaf Gauge |                    |
|             | FCBF2112-7       | FLF8-F7           | Flush Round Gauge     |                    |
|             | FCBF2113-7       |                   | Flush Round Gauge     |                    |
| -8 (1/4)    | FCBF2110-8       | FLFP7-CL          | Protruding Leaf Gauge |                    |
|             | FCBF2111-8       |                   | Protruding Leaf Gauge |                    |
|             | FCBF2112-8       | FLF8-F8           | Flush Round Gauge     |                    |
|             | FCBF2113-8       |                   | Flush Round Gauge     |                    |
| -9 (9/32)   | FCBF2110-9       | FLFP7-CL          | Protruding Leaf Gauge |                    |
|             | FCBF2111-9       |                   | Protruding Leaf Gauge |                    |
|             | FCBF2112-9       | FLF8-F9           | Flush Round Gauge     |                    |
|             | FCBF2113-9       |                   | Flush Round Gauge     |                    |
| -10 (5/16)  | FCBF2110-10      | FLFP7-CL          | Protruding Leaf Gauge |                    |
|             | FCBF2111-10      |                   | Protruding Leaf Gauge |                    |
|             | FCBF2112-10      | FLF8-F10          | Flush Round Gauge     |                    |
|             | FCBF2113-10      |                   | Flush Round Gauge     |                    |
| -11 (11/32) | FCBF2110-11      | FLFP7-CL          | Protruding Leaf Gauge |                    |
|             | FCBF2111-11      |                   | Protruding Leaf Gauge |                    |
|             | FCBF2112-11      | FLF8-F11          | Flush Round Gauge     |                    |
|             | FCBF2113-11      |                   | Flush Round Gauge     |                    |
| -12 (3/8)   | FCBF2110-12      | FLFP7-CL          | Protruding Leaf Gauge |                    |
|             | FCBF2111-12      |                   | Protruding Leaf Gauge |                    |
|             | FCBF2112-12      | FLF8-F12          | Flush Round Gauge     |                    |
|             | FCBF2113-12      |                   | Flush Round Gauge     |                    |

# Installation Tooling - General Information

The installation tools and accessories in this section have been engineered to assure proper performance of Accu-Lok™ blind bolts. These tools will also install Visu-Lok™ blind bolts to the proper specifications with the proper nose assemblies.

Several pneumatic and hand installation tools are available in a variety of configurations to properly install blind bolts in limited access applications.

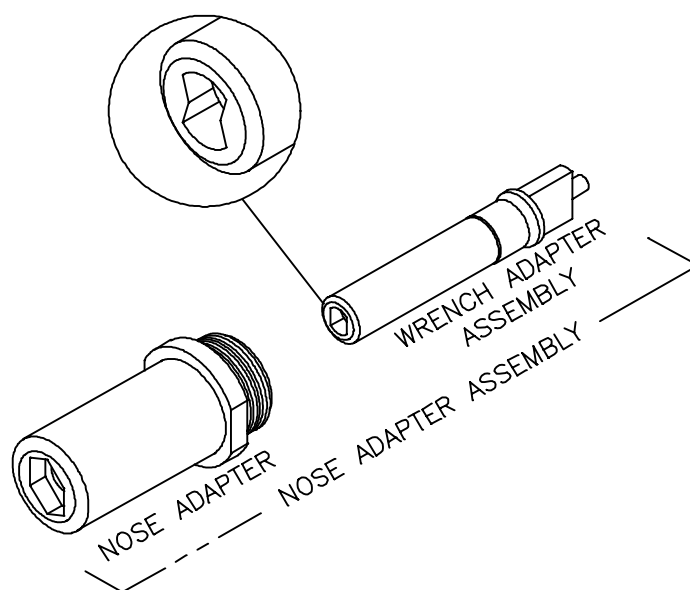
All installation tooling consists of a “driver”, “nose adapter” and a specific “wrench adapter” will install all basic Accu-Lok™ fastener diameters from 5/32” thru 3/8”.

1. **The Driver** - Pneumatic power motor or hand driver

2. **The Nose Adapter Assembly** - Consists of the nose adapter and the proper wrench adapter for the fastener to be installed.

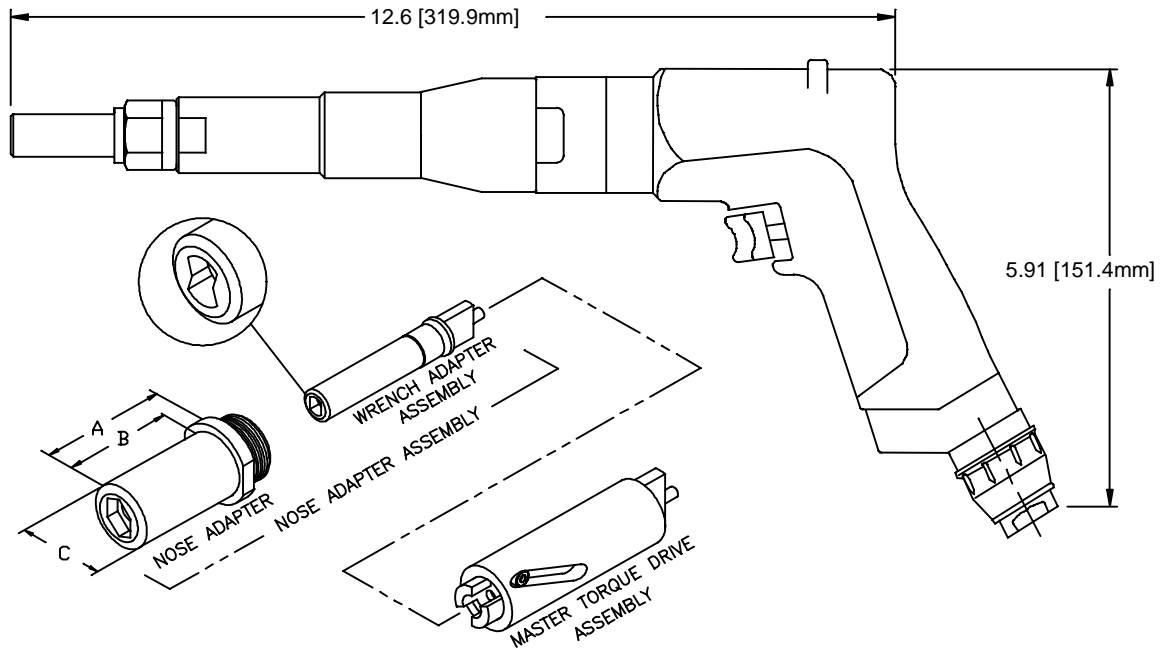
2a. **The Nose Adapter** - The nose adapter connects to the power motor housing or hand driver handle. Its function is to engage the fastener nut and prevent rotation.

2b. **The Wrench Adapter** - The wrench adapter is enclosed by the nose adapter and connects directly to the power source. This component is matched specifically to the fastener diameter. Its function is to apply the driving force to the fastener wrenching end and eject it after break-off.



# Pneumatic, Pistol Grip Installation Tool

## Accu-Lok™ Type Fasteners



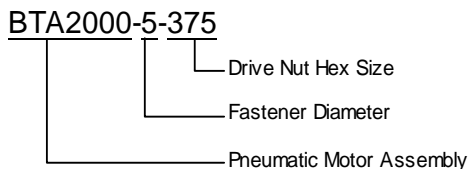
| Basic Dia. | Accu-Lok Fastener Part Number | Pneumatic Motor Assembly | Complete Adapter Nose Assembly * | Nose Adapter (Holds Nut) | Wrench Adapter (Turns Screw) | A (Ref.)         | B (Ref.)         | C (Ref.)         |
|------------|-------------------------------|--------------------------|----------------------------------|--------------------------|------------------------------|------------------|------------------|------------------|
| -5         | See Table 1                   | BTA2000                  | ALA-5                            | ALNA-8                   | ALWA-5                       | 1.38<br>[35.1mm] | 1.25<br>[31.8mm] | .675<br>[17.2mm] |
| -6         |                               |                          | ALA-6                            |                          | ALWA-6                       |                  |                  |                  |
| -7         |                               |                          | ALA-7                            |                          | ALWA-7                       |                  |                  |                  |
| -8         |                               |                          | ALA-8                            |                          | ALWA-8                       |                  |                  |                  |

\* Complete Adapter Nose Assembly includes Nose Adapter and Wrench Adapter

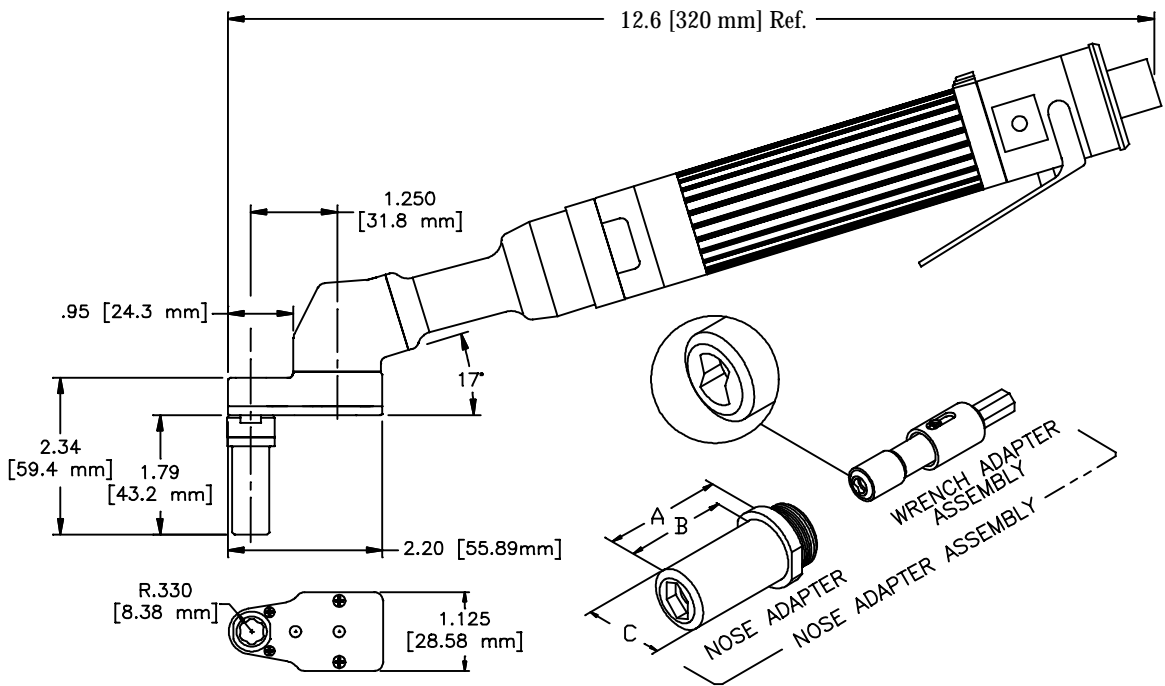
TABLE 1: FASTENER PART NUMBERS INSTALLED WITH THIS TOOL

|          |          |          |          |  |
|----------|----------|----------|----------|--|
| FCBF2110 | FCBF2130 | FCBF3003 | FCBF3012 |  |
| FCBF2111 | FCBF2132 | FCBF3004 | FCBF3015 |  |
| FCBF2112 | FCBF2133 | FCBF3005 | FCBF3016 |  |
| FCBF2113 | FCBF2134 | FCBF3006 | FCBF7010 |  |
| FCBF2120 | FCBF2210 | FCBF3008 | FCBF7012 |  |
| FCBF2121 | FCBF2112 | FCBF3009 | FCBF7013 |  |
| FCBF2122 | FCBF2113 | FCBF3010 |          |  |
| FCBF2123 | FCBF3002 | FCBF3011 |          |  |

Example For Ordering a Complete Tool and Nose Assembly



# Pneumatic, 17° Angle Head Installation Tool Accu-Lok™ Type Fasteners



| Basic Dia. | Accu-Lok Fastener Part Number | Pneumatic Motor Assembly | Complete Adapter Nose Assembly * | Nose Adapter (Holds Nut) | Wrench Adapter (Turns Screw) | A (Ref.)         | B (Ref.)         | C (Ref.)         |
|------------|-------------------------------|--------------------------|----------------------------------|--------------------------|------------------------------|------------------|------------------|------------------|
| -5         | See Table 1                   | BTA3173                  | ALAS-5                           | ALNA-8                   | ALWAS-5                      | 1.38<br>[35.1mm] | 1.25<br>[31.8mm] | .675<br>[17.2mm] |
| -6         |                               |                          | ALAS-6                           |                          | ALWAS-6                      |                  |                  |                  |
| -7         |                               |                          | ALAS-7                           |                          | ALWAS-7                      |                  |                  |                  |
| -8         |                               |                          | ALAS-8                           |                          | ALWAS-8                      |                  |                  |                  |
| -9         |                               |                          | ALAS-9                           |                          | ALWAS-9                      |                  |                  |                  |

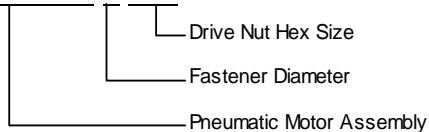
\* Complete Adapter Nose Assembly includes Nose Adapter and Wrench Adapter

TABLE 1: FASTENER PART NUMBERS INSTALLED WITH THIS TOOL

|          |          |          |          |  |
|----------|----------|----------|----------|--|
| FCBF2110 | FCBF2130 | FCBF3003 | FCBF3012 |  |
| FCBF2111 | FCBF2132 | FCBF3004 | FCBF3015 |  |
| FCBF2112 | FCBF2133 | FCBF3005 | FCBF3016 |  |
| FCBF2113 | FCBF2134 | FCBF3006 | FCBF7010 |  |
| FCBF2120 | FCBF2210 | FCBF3008 | FCBF7012 |  |
| FCBF2121 | FCBF2112 | FCBF3009 | FCBF7013 |  |
| FCBF2122 | FCBF2113 | FCBF3010 |          |  |
| FCBF2123 | FCBF3002 | FCBF3011 |          |  |

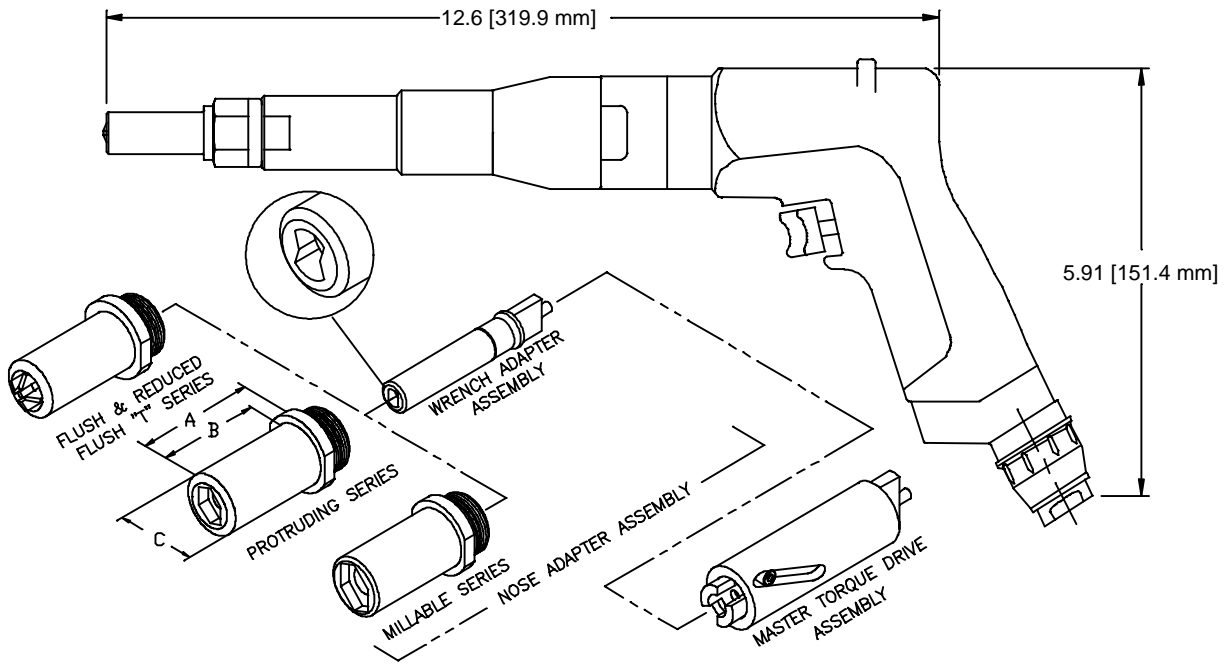
Example For Ordering a Complete Tool and Nose Assembly

**BTA3173-5-375**



# Pneumatic, Pistol Grip Installation Tool

## Visu-Lok™ Type Fasteners



| Fastener Dia. | Pneumatic Motor Assembly | Complete Adapter Nose Assembly** | Nose Adapter (Holds Nut) | Wrench Adapter (Turns Screw) | A (Ref.)     | B (Ref.)      | C (Ref.)      |
|---------------|--------------------------|----------------------------------|--------------------------|------------------------------|--------------|---------------|---------------|
| -5            | BTV2000                  | VLA-5 (*)                        | VLNA-5 (*)               | VLWA-5                       | 1.4 [35.5mm] | 1.25 [31.8mm] | .531 [13.5mm] |
| -6            |                          | VLA-6 (*)                        | VLNA-6 (*)               | VLWA-6                       |              |               | .531 [13.5mm] |
| -7            |                          | VLA-7 (*)                        | VLNA-7 (*)               | VLWA-7                       |              |               | .531 [13.5mm] |
| -8            |                          | VLA-8 (*)                        | VLNA-8 (*)               | VLWA-8                       |              |               | .531 [13.5mm] |
| -10           |                          | VLA-10 (*)                       | VLNA-10 (*)              | VLWA-10                      |              |               | .625 [15.9mm] |

\* Select fastener code from Table 1

\*\* Complete Adapter Nose Assembly includes Nose Adapter and Wrench Adapter

*Example For Ordering a Complete Tool and Nose Assembly*

**BTV2000 - 5 P - 250**

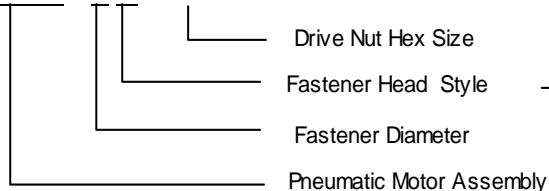
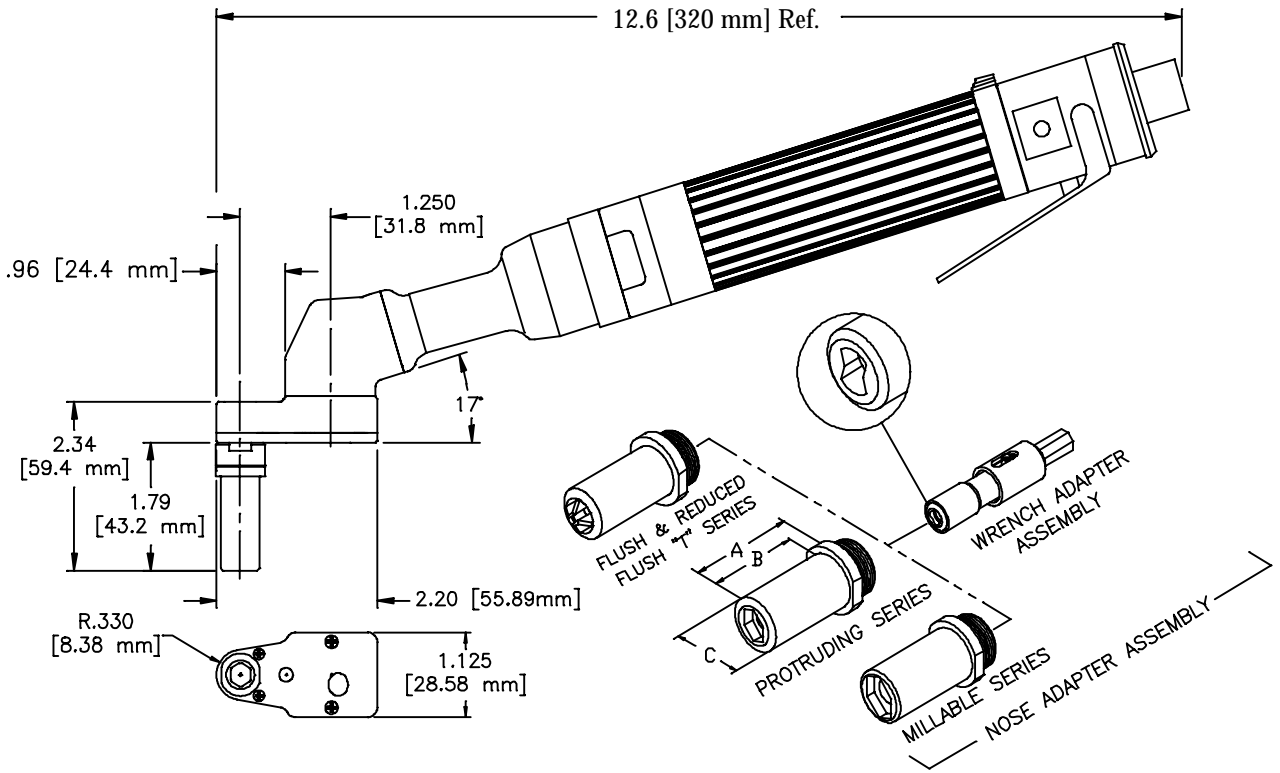


Table 1 (Fastener Code)

- P - Protruding Hex
- F - Flush, 100 Degree
- T - Reduced Flush, 100 Degree
- A - Protruding Millable Head

# Pneumatic, 17° Angle Head Installation Tool Visu-Lok™ Type Fasteners



| Fastener Dia. | Pneumatic Motor Assembly | Complete Adapter Nose Assembly** | Nose Adapter (Holds Nut) | Wrench Adapter (Turns Screw) | A (Ref.)        | B (Ref.)         | C (Ref.)      |
|---------------|--------------------------|----------------------------------|--------------------------|------------------------------|-----------------|------------------|---------------|
| -5            | BTV3173                  | VLAS-5 (*)                       | VLNA-5 (*)               | VLWAS-5                      | 1.4<br>[35.5mm] | 1.25<br>[31.8mm] | .531 [13.5mm] |
| -6            |                          | VLAS-6 (*)                       | VLNA-6 (*)               | VLWAS-6                      |                 |                  | .531 [13.5mm] |
| -7            |                          | VLAS-7 (*)                       | VLNA-7 (*)               | VLWAS-7                      |                 |                  | .531 [13.5mm] |
| -8            |                          | VLAS-8 (*)                       | VLNA-8 (*)               | VLWAS-8                      |                 |                  | .531 [13.5mm] |
| -10           |                          | VLAS-10 (*)                      | VLNA-10 (*)              | VLWAS-10                     |                 |                  | .625 [15.9mm] |

\* Select fastener code from Table 1

\*\* Complete Adapter Nose Assembly includes Nose Adapter and Wrench Adapter

*Example For Ordering a Complete Tool and Nose Assembly*

**BTV3173 -5 P - 312**

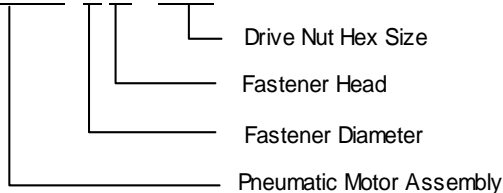
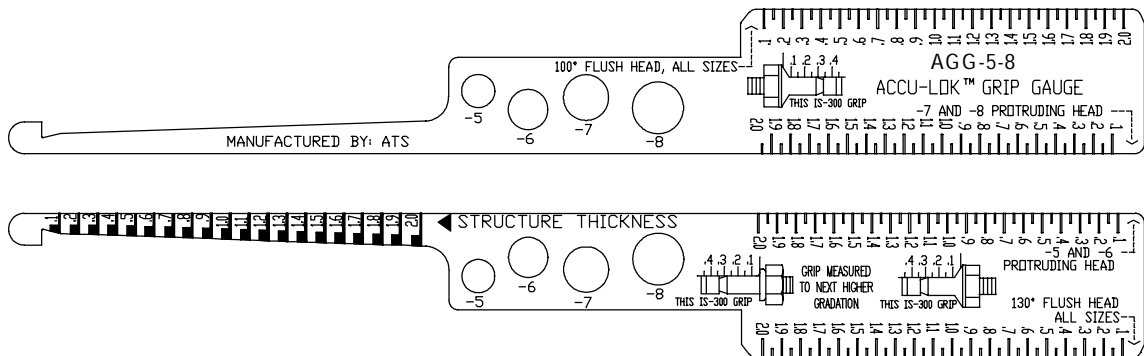


Table 1 (Fastener Code)

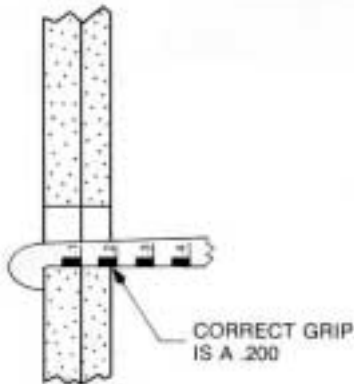
- P - Protruding Hex
- F - Flush, 100 Degree
- T - Reduced Flush, 100 Degree
- A - Protruding Millable Head

# Grip Scale for Accu-Lok™ Fasteners

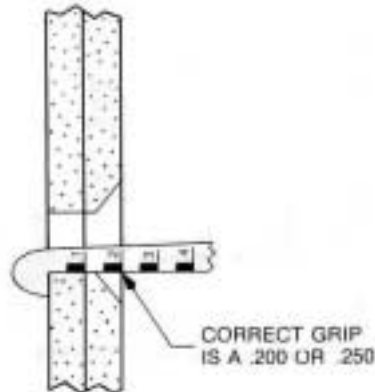


## Grip Scale: AGG-5-8

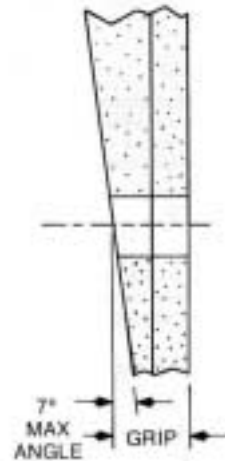
### PROTRUDING OR HEX



### COUNTERSUNK



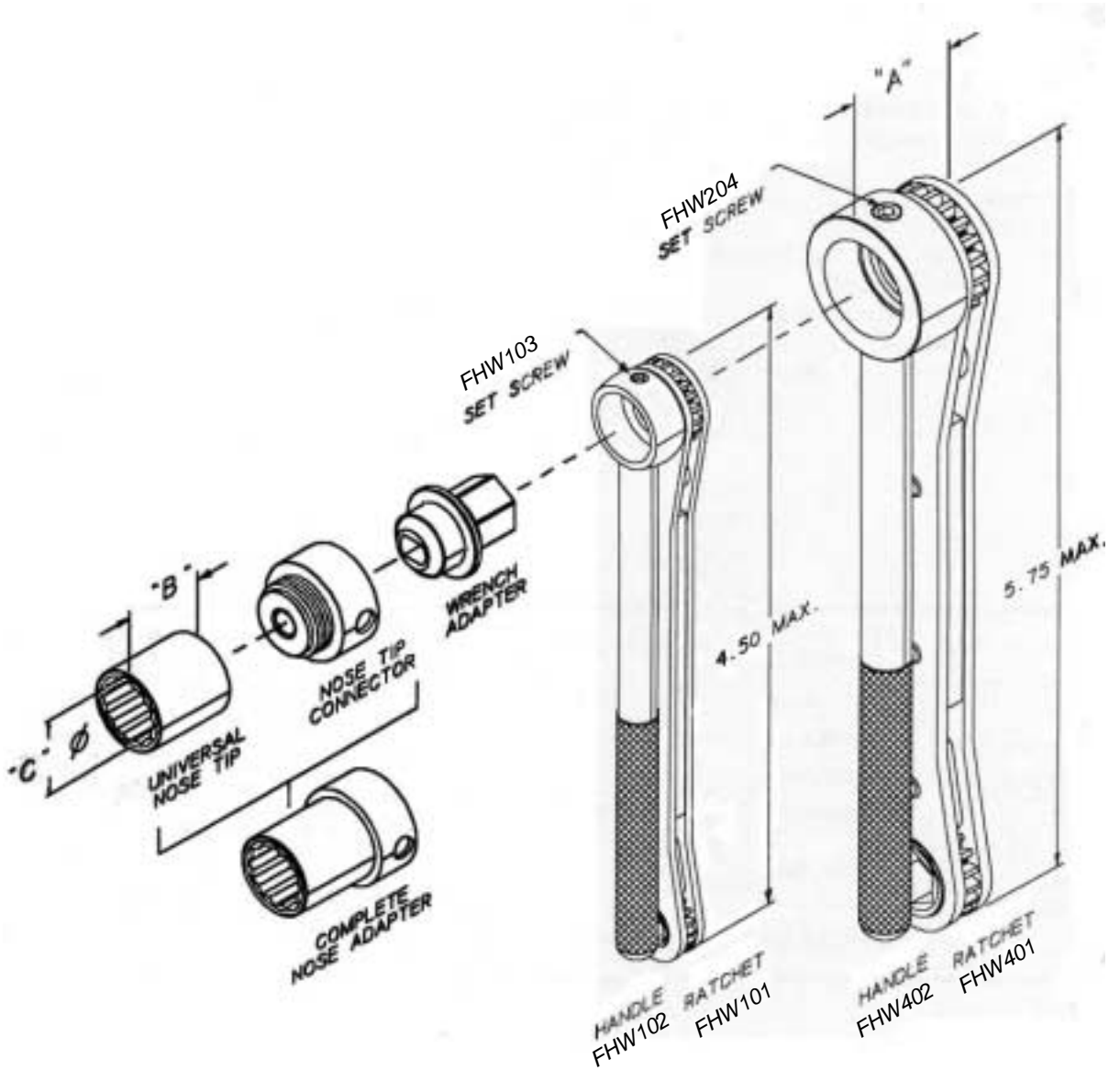
### TAPERED SHEET



Measure the material thickness with a grip gage as shown. Insert gage into the hole, draw the gage back until the hook contacts the blind sheet. Read where the front surface coincides with the numbers and lines on the gage. If the reading is directly on the line you may use either that grip or the next longer grip.

In those applications where a tapered sheet condition exists on the blind side, the grip length must be determined by the depth at the centerline of the hole as illustrated above.

# Hand Installation Tools for Close Quarter Applications



# Hand Installation Tools for Close Quarter Applications

## How to Order:

1. Select the diameter and match with the table on this page.
2. From the corresponding row select the complete assembly part number or the parts needed.

Example: FHC-5AABF

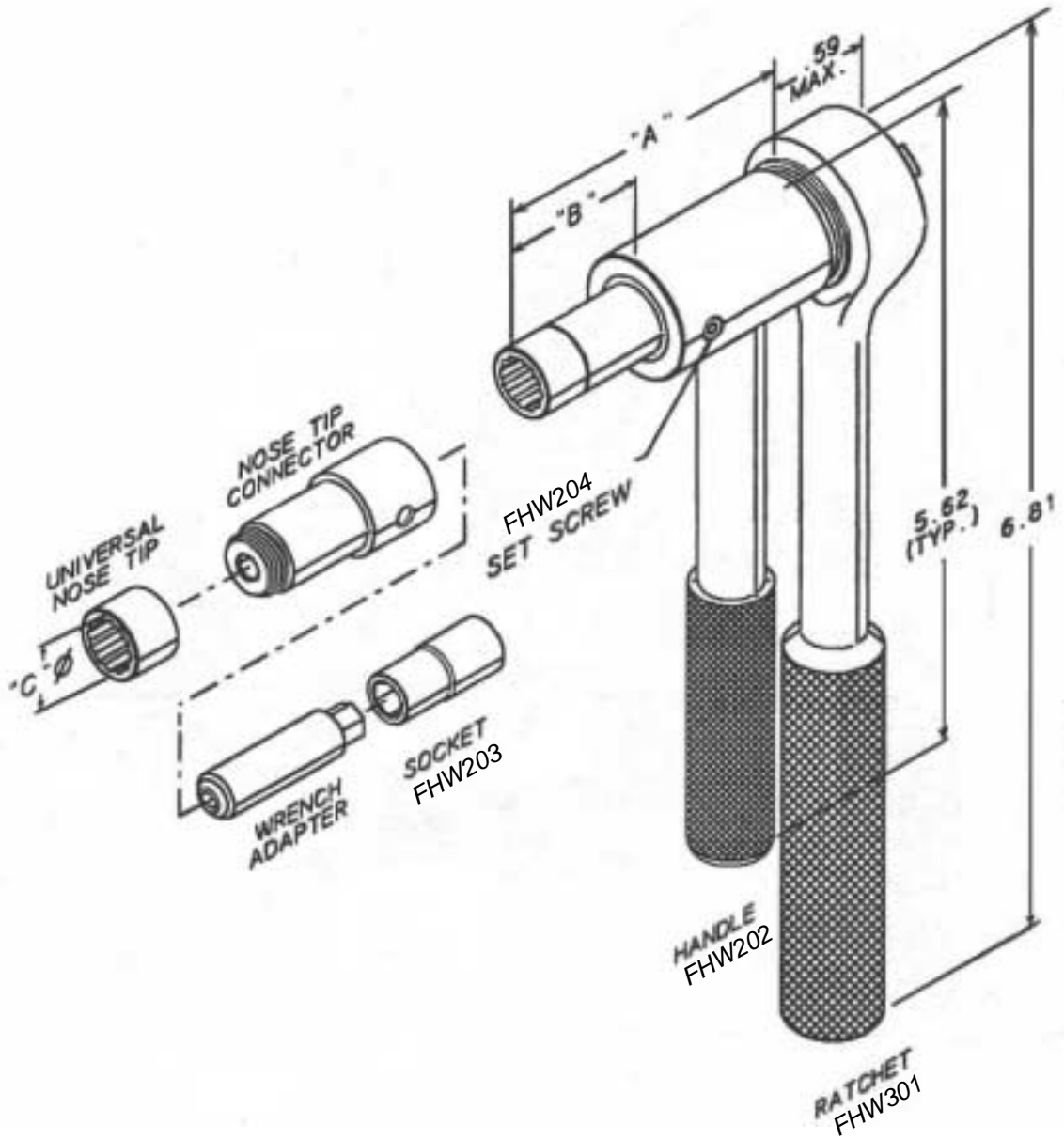
Part Number Includes:

- FHW101 Ratchet Driver
- FHW102 Holder
- FHCC-5-6 Nose Tip Connector
- FHUT-5-6 Universal Nose Tip
- FHW-5BF Wrench Adapter

| Fastener Dia. | Fastener Part Number | Complete Assembly | Ratchet Driver | Adapter Assembly | Complete Nose Adapter | Nose Tip Connector | Universal Nose Tip | Wrench Adapter |
|---------------|----------------------|-------------------|----------------|------------------|-----------------------|--------------------|--------------------|----------------|
| -5 (5/32)     | FCBF2110             | FHC-5AABF         | FHW101         | FHC-5ABF         | FHC-5-6               | FHCC-5-6           | FHUT-5-6           | FHW-5BF        |
| -6 (3/16)     | FCBF2120             | FHC-6AABF         |                | FHC-6ABF         |                       |                    |                    | FHW-6BF        |
| -7 (7/32)     | FCBF2111             | FHC-7AABF         | FHW401         | FHC-7ABF         | FHC-8                 | FHCC-8             | FHUT-8             | FHW-7BF        |
| -8 (1/4)      | FCBF2121             | FHC-8AA           |                | FHC-8A           |                       |                    |                    | FHW-8          |
| -9 (9/32)     | FCBF2112             | FHC-10AA          |                | FHC-10A          | FHC-12                | FHCC-12            | FHUT-12            | FHW-10         |
| -10 (5/16)    | FCBF2113             |                   |                | FHC-12A          |                       |                    |                    | FHW-12         |
| -11 (11/32)   | FCBF2123             | FHC-12AA          |                |                  |                       |                    |                    | FHW-12         |
| -12 (3/8)     |                      |                   |                |                  |                       |                    |                    |                |

| Dia         | Complete Nose | Dimensions |      |      |
|-------------|---------------|------------|------|------|
|             |               | A          | B    | C    |
| -5 (5/32)   | FHC-5AABF     | 0.65       | 0.51 | 0.56 |
| -6 (3/16)   | FHC-6AABF     |            |      |      |
| -7 (7/32)   | FHC-7AABF     |            | 0.46 |      |
| -8 (1/4)    | FHC-8AA       | 0.80       |      | 0.75 |
| -9 (9/32)   | FHC-10AA      |            |      |      |
| -10 (5/16)  |               |            |      |      |
| -11 (11/32) | FHC-12AA      |            | 0.67 |      |
| -12 (3/8)   |               |            |      |      |

# Standard Ratchet Hand Tool For Accu-Lok™ Fasteners



# Standard Ratchet Hand Tool For Accu-Lok™ Fasteners

## How to Order:

1. Select the diameter and match with the table on this page.
2. From the corresponding row select the complete assembly part number or the parts needed.

Example: FHS-5AABF

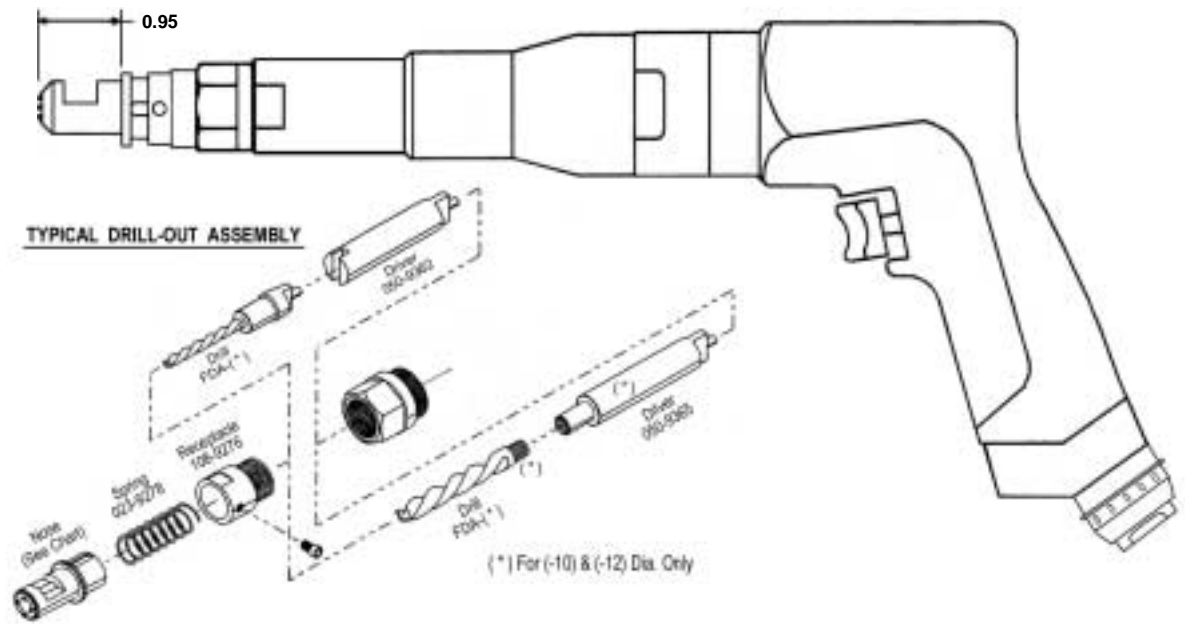
Part Number Includes:

- FHSW301 Ratchet Wrench
- FHSW202 Holder
- FHC-5-6 Nose Tip Connector
- FHUT-5-6 Universal Nose Tip
- FHSW-5BF Wrench Adapter

| Fastener Dia. | Fastener Part Number | Complete Assembly | Ratchet Driver | Adapter Assembly | Complete Nose Adapter | Nose Tip Connector | Universal Nose Tip | Wrench Adapter |
|---------------|----------------------|-------------------|----------------|------------------|-----------------------|--------------------|--------------------|----------------|
| -5 (5/32)     | FCBF2110             | FHS-5AABF         | FHW301         | FHS-5ABF         | FSH-5-6BF             | FHSC-5-6BF         | FHUT-5-6           | FHSW-5BF       |
| -6 (3/16)     | FCBF2120             | FHS-6AABF         |                | FHS-6ABF         |                       |                    |                    | FHSW-6BF       |
| -7 (7/32)     | FCBF2111             | FHS-7AABF         |                | FHS-7ABF         | FSH-8BF               | FHSC-8BF           | FHUT-8             | FHSW-7BF       |
| -8 (1/4)      | FCBF2121             | FHS-8AABF         |                | FHS-8ABF         |                       |                    |                    | FHSW-8BF       |
| -9 (9/32)     | FCBF2112             | FHS-10AABF        |                | FHS-10ABF        | FSH-12BF              | FHSC-12BF          | FHUT-12            | FHSW-10BF      |
| -10 (5/16)    | FCBF2113             | FHS-12AABF        |                | FHS-12ABF        |                       |                    |                    | FHSW-12BF      |
| -11 (11/32)   | FCBF2123             |                   |                |                  |                       |                    |                    | FHSW-12BF      |
| -12 (3/8)     |                      |                   |                |                  |                       |                    |                    |                |

| Complete Nose | Dimensions |      |      |
|---------------|------------|------|------|
|               | A          | B    | C    |
| -5 (5/32)     | 2.94       | 1.50 | 0.56 |
| -6 (3/16)     |            |      |      |
| -7 (7/32)     |            |      |      |
| -8 (1/4)      | 3.07       | 1.62 |      |
| -9 (9/32)     | 3.14       | 1.70 | 0.75 |
| -10 (5/16)    |            |      |      |
| -11 (11/32)   |            |      |      |
| -12 (3/8)     | 0.16       | 1.72 |      |

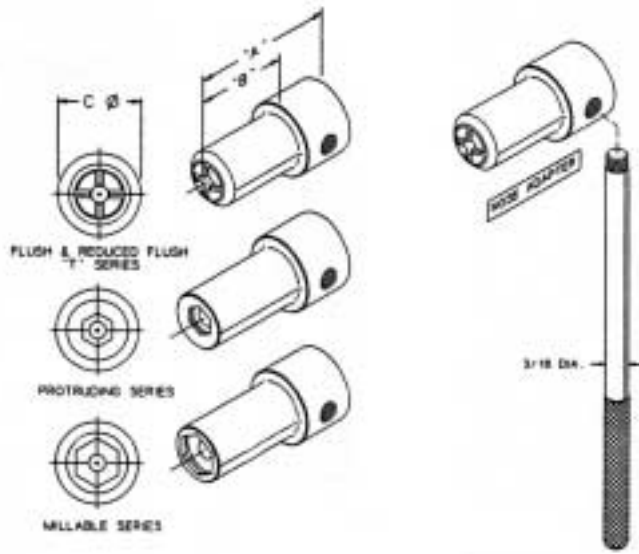
# Pneumatic Drill-Out Tool for Accu-Lok™ Fasteners



**Table - Pneumatic Drill-Out Components**

| Dia.        | Accu-Lok™ Series | Complete Assembly | Drill-Out Assembly | Nose Part Number | Drill Part Number |
|-------------|------------------|-------------------|--------------------|------------------|-------------------|
| -5 (5/32)   | FCBF2111-5       | BDO2000-5P        | FMDO-5P            | FDO-5P           | FDA-5             |
|             | FCBF2110-5       | BDO2000-5F        | FMDO-5F            | FDO-5F           |                   |
|             | FCBF2112-5       |                   |                    |                  |                   |
|             | FCBF2113-5       |                   |                    |                  |                   |
| -6 (3/16)   | FCBF2111-6       | BDO2000-6P        | FMDO-6P            | FDO-6P           | FDA-6             |
|             | FCBF2110-6       | BDO2000-6F        | FMDO-6F            | FDO-6F           |                   |
|             | FCBF2112-6       |                   |                    |                  |                   |
|             | FCBF2113-6       |                   |                    |                  |                   |
| -7 (7/32)   | FCBF2111-7       | BDO2000-6P        | FMDO-6P            | FDO-6P           | FDA-6             |
|             | FCBF2110-7       | BDO2000-6F        | FMDO-6F            | FDO-6F           |                   |
|             | FCBF2112-7       |                   |                    |                  |                   |
|             | FCBF2113-7       |                   |                    |                  |                   |
| -8 (1/4)    | FCBF2111-8       | BDO2000-8P        | FMDO-8P            | FDO-8P           | FDA-8             |
|             | FCBF2110-8       | BDO2000-8F        | FMDO-8F            | FDO-8F           |                   |
|             | FCBF2112-8       |                   |                    |                  |                   |
|             | FCBF2113-8       |                   |                    |                  |                   |
| -9 (9/32)   | FCBF2111-9       | BDO2000-8P        | FMDO-8P            | FDO-8P           | FDA-8             |
|             | FCBF2110-9       | BDO2000-8F        | FMDO-8F            | FDO-8F           |                   |
|             | FCBF2112-9       |                   |                    |                  |                   |
|             | FCBF2113-9       |                   |                    |                  |                   |
| -10 (5/16)  | FCBF2111-10      | BDO2000-10P       | FMDO-10P           | FDO-10P          | FDA-10            |
|             | FCBF2110-10      | BDO2000-10F       | FMDO-10F           | FDO-10F          |                   |
|             | FCBF2112-10      |                   |                    |                  |                   |
|             | FCBF2113-10      |                   |                    |                  |                   |
| -11 (11/32) | FCBF2111-11      | BDO2000-10P       | FMDO-10P           | FDO-10P          | FDA-10            |
|             | FCBF2110-11      | BDO2000-10F       | FMDO-10F           | FDO-10F          |                   |
|             | FCBF2112-11      |                   |                    |                  |                   |
|             | FCBF2113-11      |                   |                    |                  |                   |
| -12 (3/8)   | FCBF2111-12      | BDO2000-12P       | FMDO-12P           | FDO-12P          | FDA-12            |
|             | FCBF2110-12      | BDO2000-12F       | FMDO-12F           | FDO-12F          |                   |
|             | FCBF2112-12      |                   |                    |                  |                   |
|             | FCBF2113-12      |                   |                    |                  |                   |

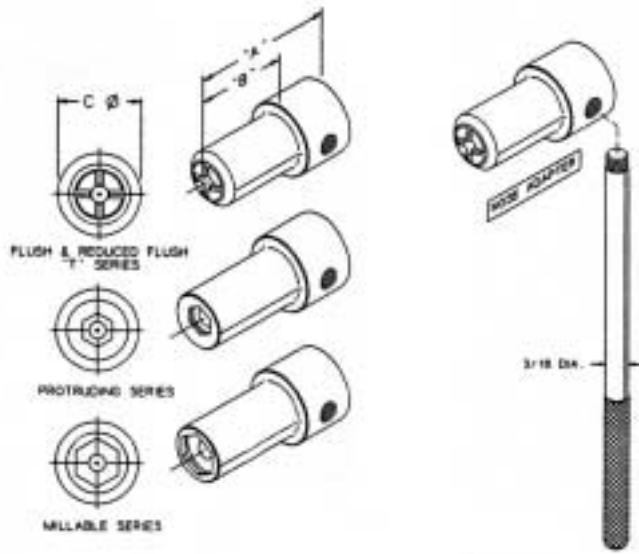
# Hand Drill-Out Tools for Accu-Lok™ Fasteners



**TABLE 1**

| Dia. | Accu-Lok Series  | ATS Hand Drill Out   | A  | B      | C   | Drill Size |     |      |       |      |
|------|--|--|--|--------|-----|------------|-----|------|-------|------|
| -5   | FCBF2111<br>FCBF2121   | FHDP-5   | 1.6  | 1.0    | 0.5 | 9/64       |     |      |       |      |
|      | FCBF2110<br>FCBF2120<br>FCBF2112<br>FCBF2122<br>FCBF2113<br>FCBF2123 | FHDF-5   | 1.5  | 0.9    | 0.6 |            |     |      |       |      |
|      | -6   | FCBF2111<br>FCBF2121   | FHDP-6   | 1.6    | 1.0 |            | 0.5 | 5/32 |       |      |
|      |  | FCBF2110<br>FCBF2120<br>FCBF2112<br>FCBF2122<br>FCBF2113<br>FCBF2123 | FHDF-6   | 1.5    | 0.9 |            | 0.6 |      |       |      |
|      |  | -7   | FCBF2111<br>FCBF2121   | FHDP-7 | 1.6 |            | 1.0 |      | 0.5   | 5/32 |
|      |  |  | FCBF2110<br>FCBF2120<br>FCBF2112<br>FCBF2122<br>FCBF2113<br>FCBF2123 | FHDF-6 | 1.5 |            | 0.9 |      | 0.6   |      |
| -8   |  |  | FCBF2111<br>FCBF2121   | FHDP-8 | 1.6 | 1.0        | 0.6 |      | 13/64 |      |
|      |  |  | FCBF2110<br>FCBF2120<br>FCBF2112<br>FCBF2122<br>FCBF2113<br>FCBF2123 | FHDF-8 | 1.5 | 0.9        | 0.6 |      |       |      |

# Hand Drill-Out Tools for Accu-Lok™ Fasteners



| Dia.   | Accu-Lok Series  | ATS Hand Drill Out   | A       | B   | C   | Drill Size |     |     |     |
|--|--|--|---------|-----|-----|------------|-----|-----|-----|
| -9   | FCBF2111<br>FCBF2121   | FHDP-9   | 1.6     | 1.0 | 0.6 | 13/64      |     |     |     |
|  | FCBF2110<br>FCBF2120<br>FCBF2112<br>FCBF2122<br>FCBF2113<br>FCBF2123 | FHDF-8   | 1.5     | 0.9 | 0.6 |            |     |     |     |
|  | FCBF2111<br>FCBF2121   | FHDP-10  | 1.6     | 1.0 | 0.6 |            | 1/4 |     |     |
|  | FCBF2110<br>FCBF2120<br>FCBF2112<br>FCBF2122<br>FCBF2113<br>FCBF2123 | FHDF-10  | 1.5     | 0.9 | 0.6 |            |     |     |     |
|  | -11  | FCBF2111<br>FCBF2121   | FHDP-11 | 1.6 | 1.0 |            |     | 0.6 | 1/4 |
|  |  | FCBF2110<br>FCBF2120<br>FCBF2112<br>FCBF2122<br>FCBF2113<br>FCBF2123 | FHDF-10 | 1.5 | 0.9 |            |     | 0.6 |     |
| FCBF2111<br>FCBF2121   |  | FHDP-12  | 1.6     | 1.0 | 0.6 | 9/32       |     |     |     |
| FCBF2110<br>FCBF2120<br>FCBF2112<br>FCBF2122<br>FCBF2113<br>FCBF2123 |  | FHDF-12  | 1.5     | 0.9 | 0.6 |            |     |     |     |

# Other Tool Products



## 2-Piece Fastening Systems

- Eddie Bolt® Tooling
- K-FAST™ Torque Controlled Tools
- Frangible Collar Tools - Hi-Loks®
- Automated Fastening Systems
- Limited Access Tools
- Tools For Motor Vehicle Industry
- Atlas Copco® Tools



## Insert & Threaded Stud Tools

- Keensert® Insert & Stud Tooling
- Slimsert® Tooling
- Ring Locked® Inserts & Fluid Fittings
- Perma Thread® Tools



## Panel Fastener & 1/4 Turn Tools

- Milson® Tooling
- Trimil™ Tooling
- Mark IV™ Tooling
- Camloc® Tooling