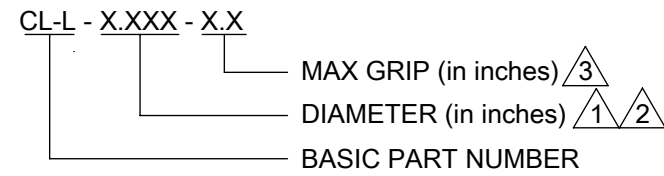


**FUNCTION OF TOOL:**

=> USED TO TEMPORARILY CLAMP & ALIGN DRILL JIG TO PRODUCTION PART.  
 => USED TO CLAMP AND ALIGN PRODUCTION PART STACKS.

**TOOL ORDERING CODE:**



- 1 Use lower Spec. Limit (LSL) when ordering. For example: If engineering calls out a hole diameter of  $\phi 0.498$  to  $\phi 0.505$ , then callout X.XXX as 0.498
- 2 Tool diameter (X.XXX) is manufactured 0.001 to 0.002 less than X.XXX callout. For example: if X.XXX is called out as 0.498, the tool's manufactured diameter is  $\phi 0.497$  to  $\phi 0.496$
- 3 When ordering, specify desired Tool Grip (X.X) - plus 1/4" for minimum recommended clearance. See Table II for minimum allowed Tool Grips. Maximum Tool Grip and increments as shown in Table II are preferred, but others can be ordered. Tool Clamping Range = Stroke
- 4 For requests outside of standards shown in table, call for engineering support.
- 5 Clamping force causes finger to "bulge" slightly in the radial direction - this helps with alignment.
- 6 The torque values shown only apply to certified nutsetters. The values listed are recommendations only. Jig strength and clamping requirements should be weighed carefully. All usage is at the discretion of the user.

**EXAMPLE TOOL CODE:**

CL-L-0.375-4.5  
 => LSL for engineering hole diameter is 0.375  
 => Tool will apply clamp to stack heights between 4.5 inch thick and 1.5 inch thick.  
 => Tool manufactured diameter will be between  $\phi 0.374$  to  $\phi 0.373$

4 Table II  
 CROSS REFERENCE TABLE

TOOL DASH NUMBER (ref only)	"Stroke" (standard values)	"Max Grip" (recommended largest value)	"Max Grip" (recommended smallest value)	Nominal Hole Size	Hole Diam Callout Range	"A" Dimension (Body Length)	"C" Dimension (Body Hex)	"D" Dimension (Drive Hex)
-10 thru -14	3.0	7.0	3.0	5/16 thru 7/16	0.307 thru 0.444	9.3	3/4	5/8
-16 thru -21	3.0	9.0	3.0	1/2 thru 21/32	0.495 thru 0.650	9.3	1.0	7/8
-22 thru -32	3.0	11	3.0	11/16 thru 1.0	0.683 thru 1.001	10.4	1 1/2	1 3/8

Tool sizes are generally designed around nominal fractional (in 1/32) drill sizes.  
 Example: 5/16 drill size converts to 10/32 as a 1/32 based fraction.  
 This is expressed as a "Dash Number" for short, in other words, a "-10".

6 Table I

Recommended torque - clamping force cross reference				
Nominal CL Diam	Approx. MAX Clamping Force	Req'd Torque at 1000 lbs Clamp Force	Req'd Torque at 2000 lbs Clamp Force	Req'd Torque at 3000 lbs Clamp Force
3/16	800 lbs	20 in*lbs (600 lb Clamp)	---	---
1/4	1300 lbs	35 in*lbs	---	---
5/16	1900 lbs	45 in*lbs	---	---
3/8	2200 lbs	45 in*lbs	90 in*lbs	---
7/16 to 15/32	3200 lbs	45 in*lbs	90 in*lbs	---
1/2 to 21/32	5000 lbs	75 in*lbs	150 in*lbs	225 in*lbs
22/32 to 1.0	12000 lbs	120 in*lbs	240 in*lbs	360 in*lbs
1 1/8 to 1 1/4	30000 lbs	150 in*lbs	300 in*lbs	450 in*lbs

NOTES:

EXCEPT FOR USES EXPRESSLY GRANTED, INFORMATION DISCLOSED HEREON IS CONFIDENTIAL AND ALL PATENT, PROPRIETARY, SALES, MANUFACTURING, USE, DESIGN, AND REPRODUCTION RIGHTS ARE RESERVED BY CENTRIX, Inc.

PATENT #7,300,042 B2 & PENDING

CL-L-0.505-3.0 SHOWN

25329 74th Ave South Kent, WA 98032  
 Ph: 253-872-4773  
 www.CENTRIX-LLC.com

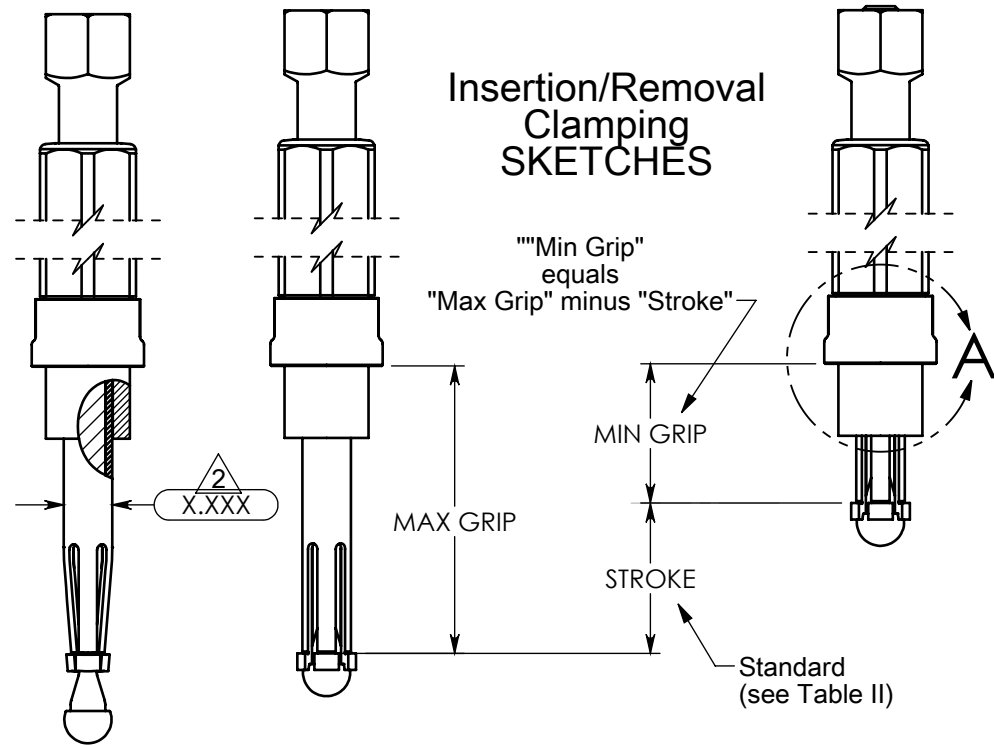
**CENTRIX LLC**

**CL-L - X.XXX - X.X**

TEMPORARY FASTENER

REV -

**SHEET 1 OF 1**  
 USAGE AND ORDERING SHEET

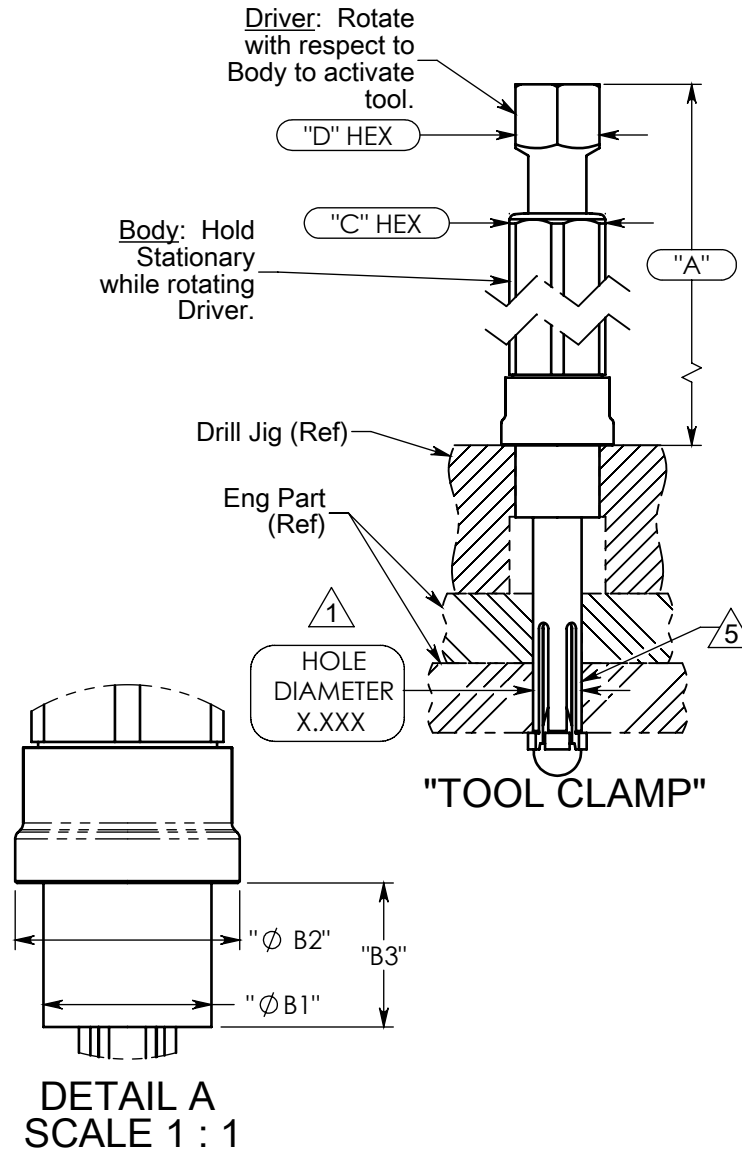


**Table III**  
LOCK COLLAR CROSS REFERENCE TABLE

LOCK COLLAR SERIES	B2 $\frac{+0.00}{-0.01}$
21000	0.57
22000	1.17
23000	1.42
24000	1.67
25000	2.22

**All B Dimensions and Tolerances:**

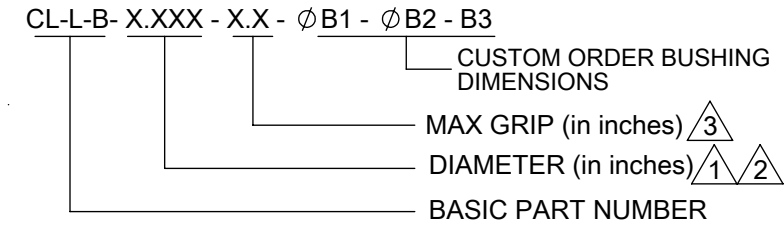
B1 in inches;  
tolerances +.000/-0.001  
B2 in inches;  
tolerances +.00/-0.01  
(see Table III)  
B3 in inches - ;  
tolerances +.0/-1



**FUNCTION OF TOOL:**

=> USED TO TEMPORARILY CLAMP & ALIGN DRILL JIG TO PRODUCTION PART.

**TOOL ORDERING CODE:**



- 1 Use lower Spec. Limit (LSL) when ordering. For example: If engineering calls out a hole diameter of  $\phi 0.498$  to  $\phi 0.505$ , then callout X.XXX as 0.498
- 2 Tool diameter (X.XXX) is manufactured 0.001 to 0.002 less than X.XXX callout. For example: if X.XXX is called out as 0.498, the tool's manufactured diameter is  $\phi 0.497$  to  $\phi 0.496$
- 3 When ordering, specify desired Tool Grip (X.X) - plus 1/4" for minimum recommended clearance. See Table II for minimum allowed Tool Grips. Maximum Tool Grip and increments as shown in Table II are preferred, but others can be ordered. Tool Clamping Range = Stroke
- 4 For requests outside of standards shown in table, call for engineering support.
- 5 Clamping force causes finger to "bulge" slightly in the radial direction - this helps with alignment.
- 6 The torque values shown only apply to certified nutsetters. The values listed are recommendations only. Jig strength and clamping requirements should be weighed carefully. All usage is at the discretion of the user.

**EXAMPLE TOOL CODE:**

CL-L-B-0.375-4.5-.875-1.17-.75  
=> CL-L with flanged bushing.  
=> LSL for engineering hole diameter is 0.375  
=> Tool will apply clamp to stack heights between 4.5 inch thick and 1.5 inch thick.  
=> Tool manufactured diameter will be between  $\phi 0.374$  to  $\phi 0.373$   
=> Bushing ID will be: OD= $\phi .875/\phi .874$ , Step OD= $\phi 1.17/\phi 1.16$ , Length=1.0/0.9

**Table II**  
CROSS REFERENCE TABLE

TOOL DASH NUMBER (ref only)	"Stroke" (standard values)	"Max Grip" (recommended largest value)	"Max Grip" (recommended smallest value)	Nominal Hole Size	Hole Diam Callout Range	"A" Dimension (Body Length)	"C" Dimension (Body Hex)	"D" Dimension (Drive Hex)
-10 thru -14	3.0	7.0	3.0	5/16 thru 7/16	0.307 thru 0.444	9.3	3/4	5/8
-16 thru -21	3.0	9.0	3.0	1/2 thru 21/32	0.495 thru 0.650	9.3	1.0	7/8
-22 thru -32	3.0	11	3.0	11/16 thru 1.0	0.683 thru 1.001	10.4	1 1/2	1 3/8

Tool sizes are generally designed around nominal fractional (in 1/32) drill sizes.  
Example: 5/16 drill size converts to 10/32 as a 1/32 based fraction . This is expressed as a "Dash Number" for short, in other words, a "-10".

**Table I**

Recommended torque - clamping force cross reference

Nominal CL Diam	Aprox. MAX Clamping Force	Req'd Torque at 1000 lbs Clamp Force	Req'd Torque at 2000 lbs Clamp Force	Req'd Torque at 3000 lbs Clamp Force
3/16	800 lbs	20 in*lbs (600 lb Clamp)	---	---
1/4	1300 lbs	35 in*lbs	---	---
5/16	1900 lbs	45 in*lbs	---	---
3/8	2200 lbs	45 in*lbs	90 in*lbs	---
7/16 to 15/32	3200 lbs	45 in*lbs	90 in*lbs	---
1/2 to 21/32	5000 lbs	75 in*lbs	150 in*lbs	225 in*lbs
22/32 to 1.0	12000 lbs	120 in*lbs	240 in*lbs	360 in*lbs
1 1/8 to 1 1/4	30000 lbs	150 in*lbs	300 in*lbs	450-300 in*lbs

Recommended max clamp force for power feed drilling up to 0.375 diameter, for mounting drill jigs and for clamping airplane parts together.

NOTES:

EXCEPT FOR USES EXPRESSLY GRANTED, INFORMATION DISCLOSED HEREON IS CONFIDENTIAL AND ALL PATENT, PROPRIETARY, SALES, MANUFACTURING, USE, DESIGN, AND REPRODUCTION RIGHTS ARE RESERVED BY CENTRIX-LLC.

PATENT #7,300,042 B2 & PENDING

CL-L-B-0.505-3.0-.875-1.17-.75 WITH BUSHINGSHOWN

25329 74th Ave South Kent, WA 98032  
Ph: 253-872-4773  
www.CENTRIX-LLC.com

**CENTRIX LLC**

WITH BUILT IN BUSHING

CL-L-B- X.XXX - X.X - φ B1 - φ B2 - B3

TEMPORARY FASTENERS

REV -

SHEET 1 OF 1

USAGE AND ORDERING SHEET

NOTES:

4

3

2

1

REVISIONS

REV	DESCRIPTION	CHANGE D BY	APPROVE D BY	APPROVA L DATE
-	ECN 2985 - INITIAL RELEAE	-	-	-

**Centrix®** Engineered Aerospace Solutions

**TITLE:** CENTRIX -- CL-L - PRODUCT SHEETS

**CONFIG:**

REV | DWG. NO. | SIZE

CENTRIX -- CL-L - PRODUCT SHEETS **B**

SHEET 6 OF 6 | SCALE: 1:2

	ASME Y14.5M - 2009	
	NAME	DATE
DRAWN	AMM	9/30/2022
CHECKED	KPC	9/30/2022
STRESS	-	-
MFG.	-	-
Q.A.	-	-
ENG.	-	-

**UNLESS OTHERWISE SPECIFIED:**  
DIMENSIONS ARE IN INCHES  
TOLERANCES:  
X". ±0.1  
X.X. ±0.1  
X.XX. ±0.01  
X.XXX. ±0.005  
BREAK EDGES: 0.005-0.010  
SURFACES ROUGHNESS: 63  
Rq OR BETTER  
USED ON  
NEXT ASSY

**PROPRIETARY AND CONFIDENTIAL**  
THE INFORMATION CONTAINED IN THIS DOCUMENT AND DOCUMENT ITSELF, IN WHOLE OR IN PART, IN ANY FORM, IS PROPRIETARY AND/OR CONFIDENTIAL PROPERTY OF CENTRIX®, CENTRIX® AND ITS SUCCESSORS AND ASSIGNEES RETAIN AND RESERVE ALL RIGHT, TITLE AND INTEREST IN THIS INFORMATION IN WHOLE OR IN PART AND IN ALL FORMS. THIS INFORMATION IS PROVIDED TO THE ORIGINAL RECIPIENT ONLY FOR CONFIDENTIAL USE, WITH THE UNDERSTANDING THAT IT WILL NOT BE USED IN ANY MANNER DETRIMENTAL TO THE INTEREST OF CENTRIX®, ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF CENTRIX® IS PROHIBITED.

4

3

2