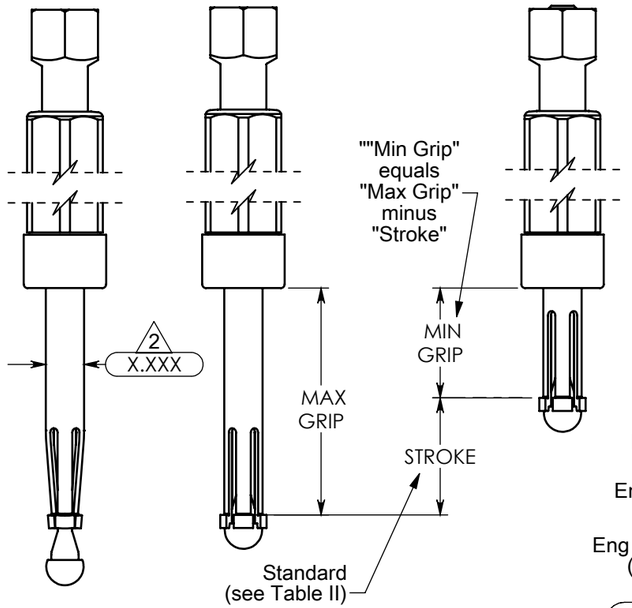
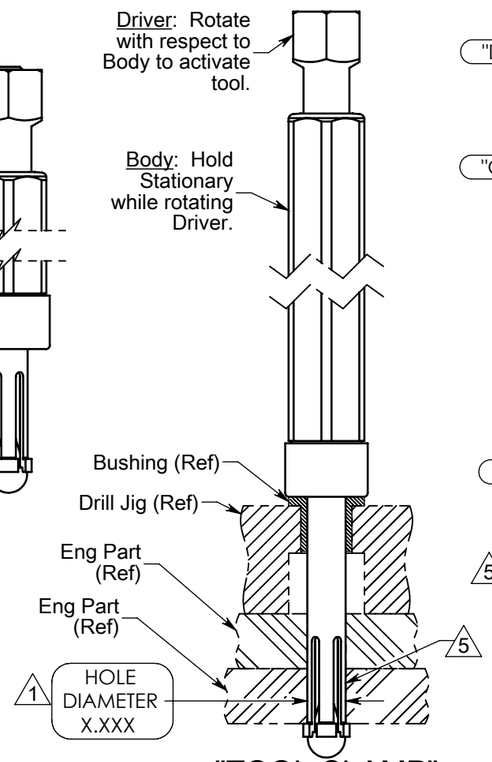
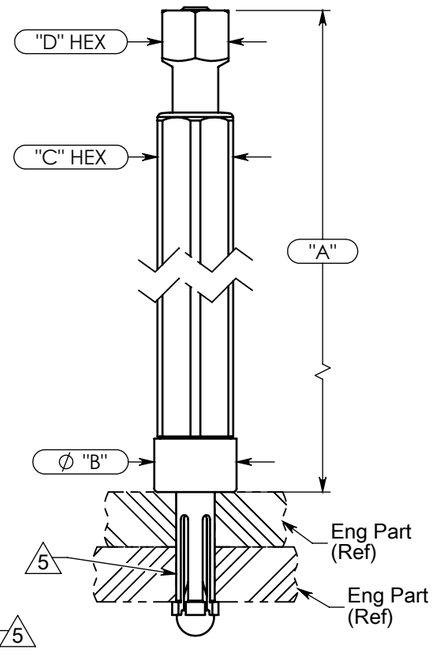


Insertion/Removal - Clamping SKETCHES



"TOOL CLAMP"



"PART CLAMP"

FUNCTION OF TOOL:

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

TOOL ORDERING CODE:

CL-L - X.XXX - X.X

- X.X: MAX GRIP (in inches) △3
- X.XXX: DIAMETER (in inches) △1 △2
- CL-L: BASIC PART NUMBER

△1 Use lower Spec. Limit (LSL) when ordering. For example: If engineering calls out a hole diameter of ∅0.498 to ∅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 ∅0.497 to ∅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 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 ∅0.374 to ∅0.373

△4 Table II
CROSS REFERENCE TABLE

TOOL DASH NUMBER (ref only)	"Stroke" (standard values)	"Max Grip" (recomended largest value)	"Max Grip" (recomended 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	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 in*lbs

CL-L-0.505-3.0 SHOWN

SCALE: 1:2 & NOTED

SHEET 1 OF 1
USAGE AND ORDERING SHEET

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CL-L - X.XXX - X.X

TEMPORARY FASTENER

NOTES:

PATENT #7,300,042 B2 & PENDING