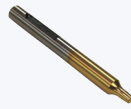


# V-LOC™ 940 Series Clinch Tooling Catalog

The Standard for Clinching Aluminum

> PUNCH TOOLING



> DIE TOOLING



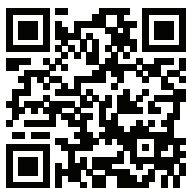
> INSTALLATION HARDWARE & COMPONENTS



> DIE MOUNTING INFORMATION

Learn more about this *Clinching Solution* online!

[www.btmcorp.com/v-loc.html](http://www.btmcorp.com/v-loc.html)



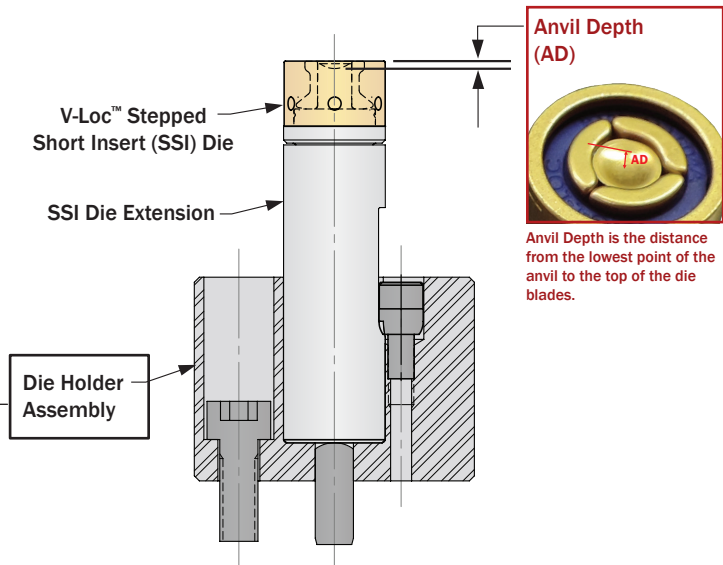
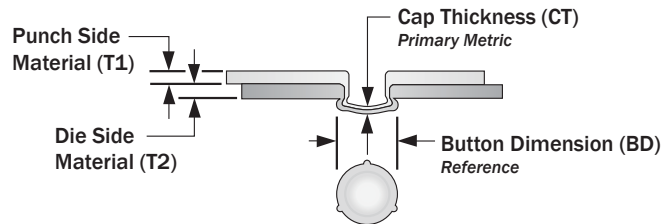
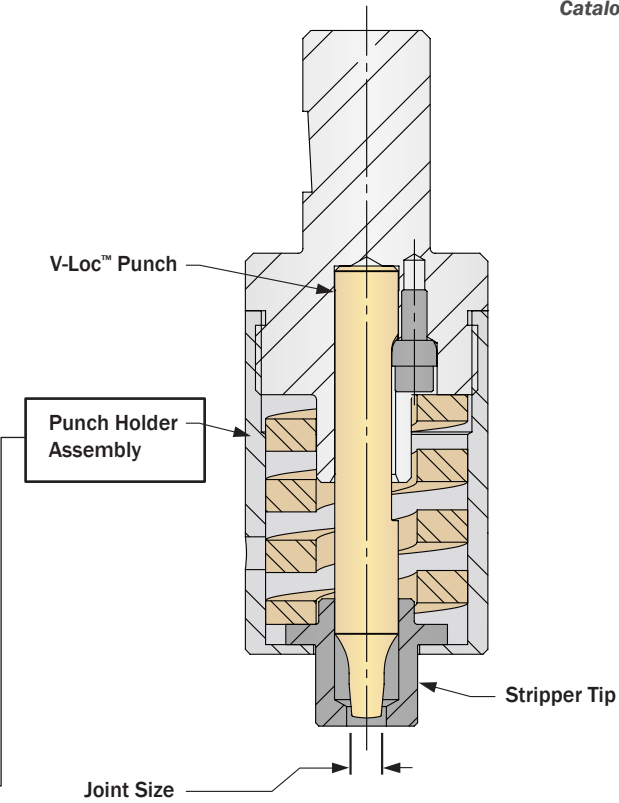
**BTM**  
CORPORATION

[www.BTMcorp.com](http://www.BTMcorp.com)

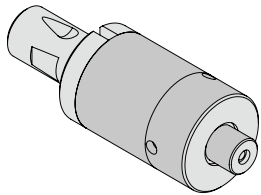
810-364-4567

If you are joining Aluminum or your product requires a high-quality; visually pleasing appearance, consider the V-Loc™ clinch joint. V-Loc™ solves many of the challenges associated with joining today's light weight high strength aluminum alloys with or without adhesives. V-Loc™'s unique geometry improves material flow producing a clinch that is resistant to necking and the effects of prestrain.

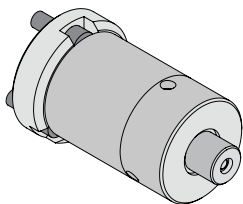
Whether you are joining aluminum to aluminum, dissimilar materials or looking to take your product to the next level through form and function V-Loc™ is the solution.



**940 SERIES PUNCH HOLDERS**

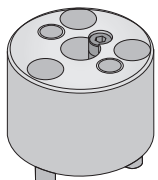


SS20 Shank Punch Holder  
 SS30 Shank Punch Holder

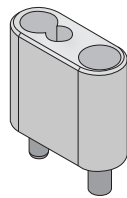


Die Set Punch Holder

**940 SERIES DIE HOLDERS**



Round Die Holder



Thin Die Holder

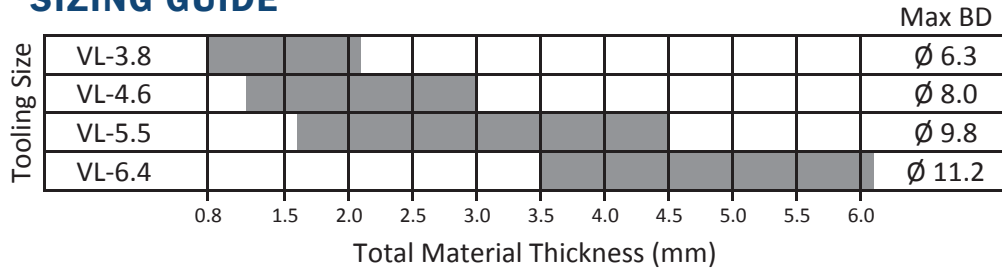


**SAFETY NOTE**

It is the customer and/or user's responsibility to provide proper safety controls and/or guarding when a pinch point is present.

BTM reserves the right to make changes to its literature without any prior notice. Go to [www.btmcorp.com](http://www.btmcorp.com) for latest version.

# V-LOC® SIZING GUIDE



Minimum Single Layer Thickness 0.4mm

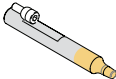
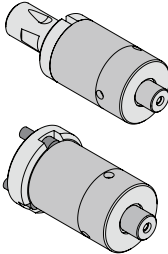
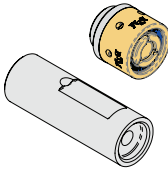
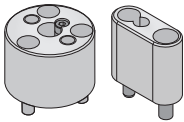
If material is not of equal thickness, it is preferred to have thick material on Punch Side, not to exceed 3:1.

When Die Side material is thicker, a ratio of not less than 1:2 is preferred.

**Contact BTM for testing and optimization of your application.**

**Upon completion of testing, you will receive a “Sample Process Sheet” which includes tooling and clinch parameters as well as Shear and Peel strength for the material combination as tested.**

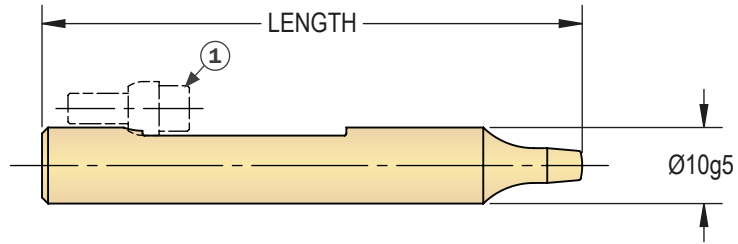
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**STANDARD PUNCHES**

**VL-3.8**

Length	BTM Number
71mm	PD277101A
100mm	PD277101G

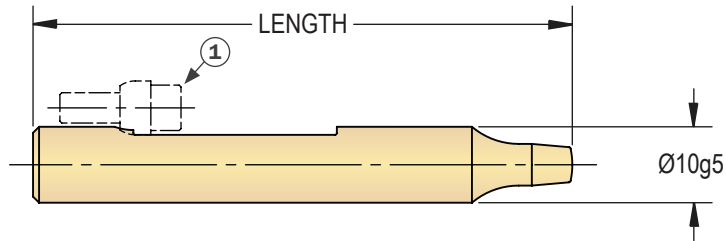


**NOT INCLUDED**

- ① One (1) Punch Retaining Screw Ass'y [BTM No. 018217]

**VL-4.6**

Length	BTM Number
71mm	PD264600A
100mm	PD264600G

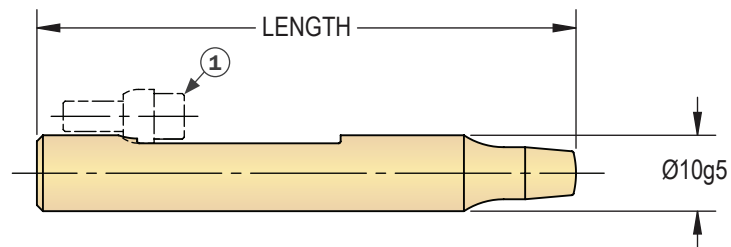


**NOT INCLUDED**

- ① One (1) Punch Retaining Screw Ass'y [BTM No. 018217]

**VL-5.5**

Length	BTM Number
71mm	PD264500A
100mm	PD264500G

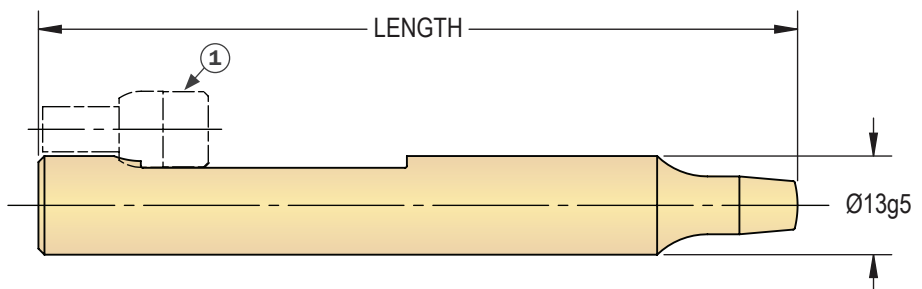


**NOT INCLUDED**

- ① One (1) Punch Retaining Screw Ass'y [BTM No. 018217]

**VL-6.4**

Length	BTM Number
125mm	PD276801C



**NOT INCLUDED**

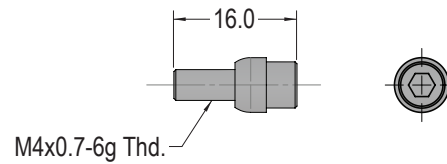
- ① One (1) Punch Retaining Screw Ass'y [BTM No. 023228]

**RETAINER SCREWS****M4 THREAD**

BTM Number
018217

**TOOLING COMPATIBILITY**

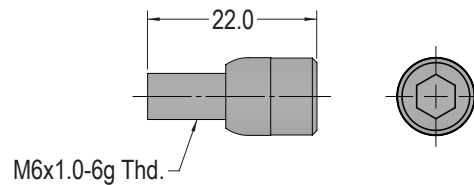
VL-3.8 940 Series Punch  
 VL-3.8 940 Series SSI Die Extension  
 VL-4.6 940 Series Punch  
 VL-4.6 940 Series SSI Die Extension  
 VL-5.5 940 Series Punch  
 VL-5.5 940 Series SSI Die Extension

**M6 THREAD**

BTM Number
023228

**TOOLING COMPATIBILITY**

VL-6.4 940 Series Punch  
 VL-6.4 940 Series SSI Die Extension

**SPANNER WRENCH**

This tool is used to tighten/loosen the stripper can onto a punch holder.

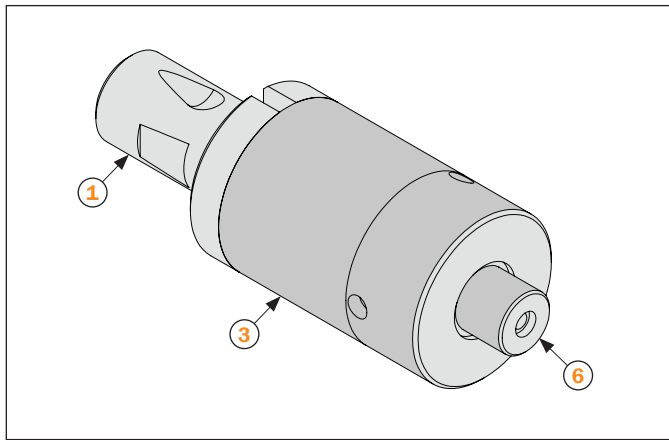
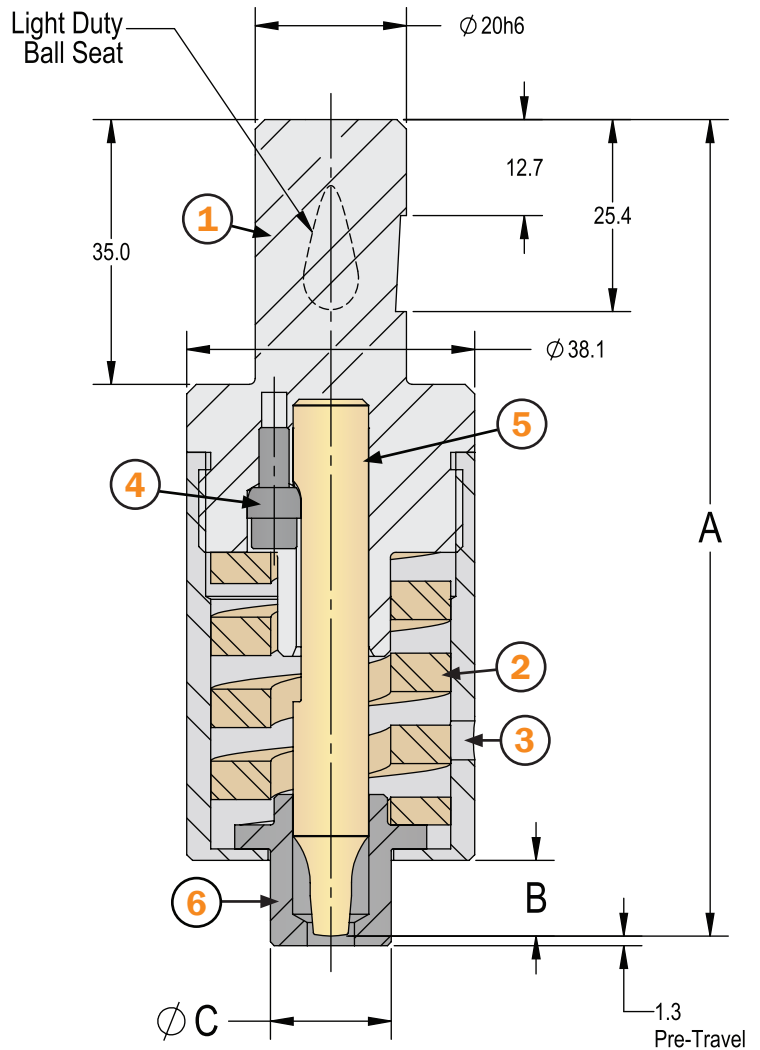
BTM Number
048749



**SS20 SHANK PUNCH HOLDER [METRIC]**

**ASSEMBLY INCLUDES:**

- ① (1) Punch Holder
- ② (1) Stripper Spring
- ③ (1) Stripper Can
- ④ (1) Punch Retaining Screw
- ⑤ (1) V-Loc™ Punch
- ⑥ (1) Stripper Tip



**VL-3.8**

Punch Length	A	B	C	BTM Number
71	108	Ø10.0	Ø14.0	PD277100A
100	137	Ø39.0	Ø14.0	PD277100G

**VL-4.6**

Punch Length	A	B	C	BTM Number
71	108	Ø10.0	Ø16.0	PD275700A
100	137	Ø39.0	Ø16.0	PD275700G

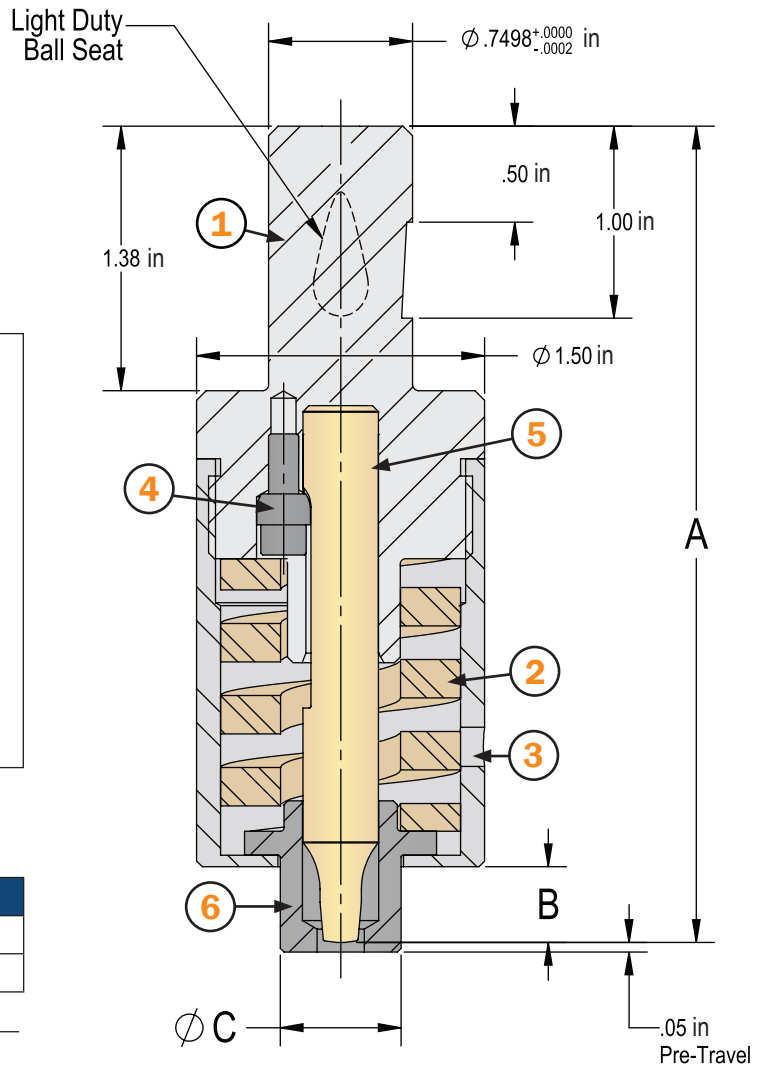
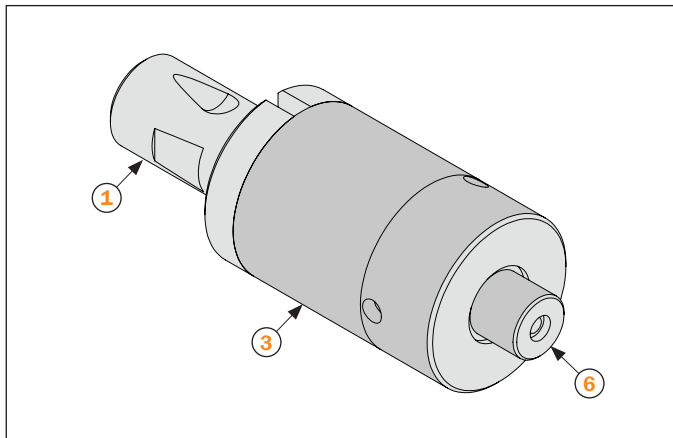
**VL-5.5**

Punch Length	A	B	C	BTM Number
71	108	Ø10.0	Ø19.1	PD277000A
100	137	Ø39.0	Ø19.1	PD277000G

**SS20 SHANK PUNCH HOLDER [IMPERIAL]**

**ASSEMBLY INCLUDES:**

- ① (1) Punch Holder
- ② (1) Stripper Spring
- ③ (1) Stripper Can
- ④ (1) Punch Retaining Screw
- ⑤ (1) V-Loc™ Punch
- ⑥ (1) Stripper Tip



**VL-3.8**

Punch Length	A	B	C	BTM Number
71	4.252in	Ø.39in	Ø.55in	PD286300A
100	5.394in	Ø1.54in	Ø.55in	PD286300G

**VL-4.6**

Punch Length	A	B	C	BTM Number
71	4.252in	Ø.39in	Ø.63in	PD286500A
100	5.394in	Ø1.54in	Ø.63in	PD286500G

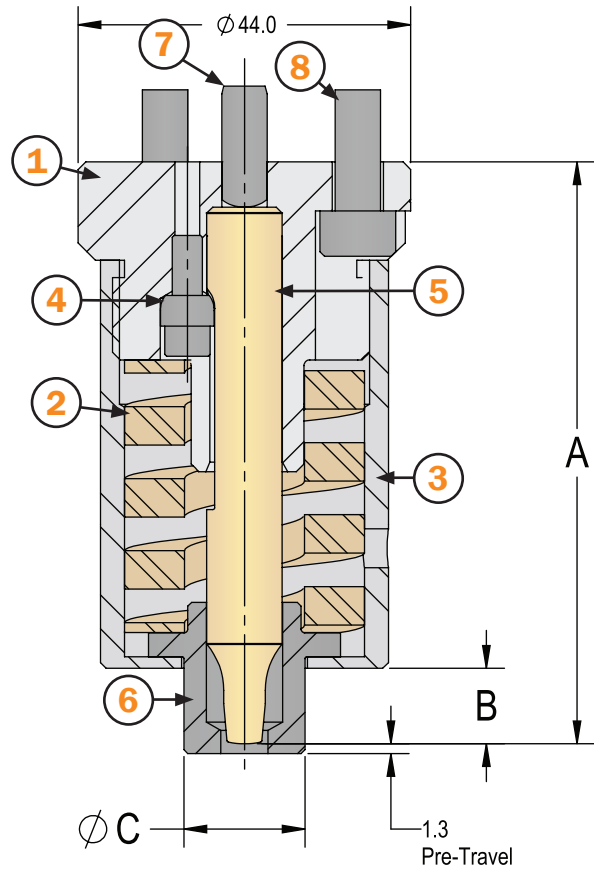
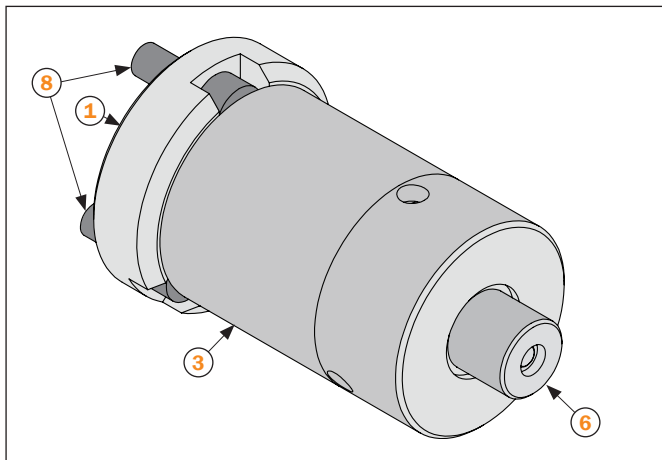
**VL-5.5**

Punch Length	A	B	C	BTM Number
71	4.252in	Ø.39in	Ø.75in	PD286700A
100	5.394in	Ø1.54in	Ø.75in	PD286700G

**SS20 DIE SET PUNCH HOLDER**

**ASSEMBLY INCLUDES:**

- ① (1) Punch Holder
- ② (1) Stripper Spring
- ③ (1) Stripper Can
- ④ (1) Punch Retaining Screw
- ⑤ (1) V-Loc™ Punch
- ⑥ (1) Stripper Tip
- ⑦ (1) Dowel Pin
- ⑧ (3) Mounting Screws



**VL-3.8**

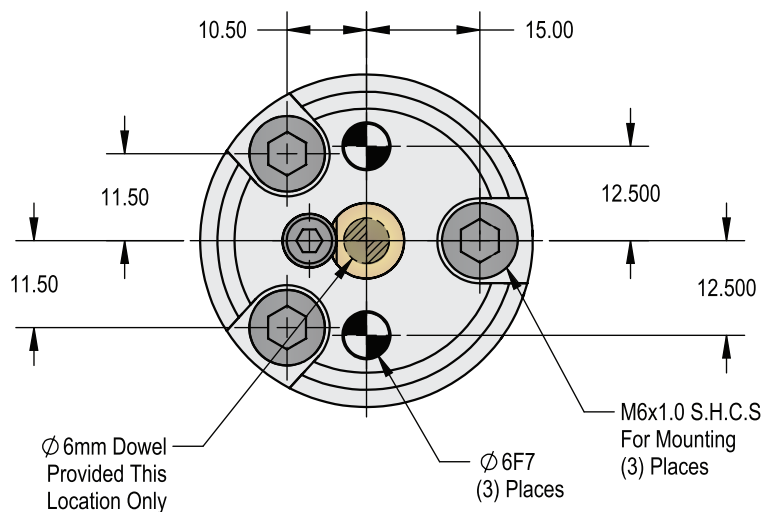
Punch Length	A	B	C	BTM Number
71	77	Ø10.0	Ø14.0	PD286400A
100	106	Ø39.0	Ø14.0	PD286400G

**VL-4.6**

Punch Length	A	B	C	BTM Number
71	77	Ø10.0	Ø16.0	PD286600A
100	106	Ø39.0	Ø16.0	PD286600G

**VL-5.5**

Punch Length	A	B	C	BTM Number
71	77	Ø10.0	Ø19.1	PD282500A
100	106	Ø39.0	Ø19.1	PD282500G

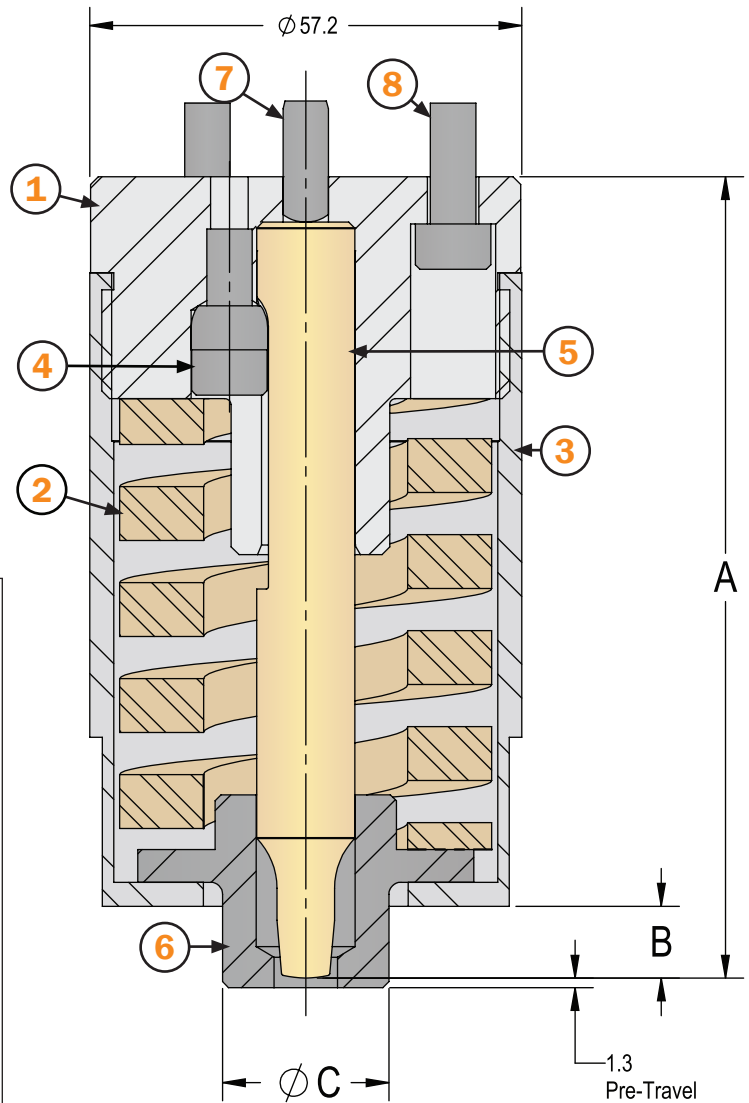
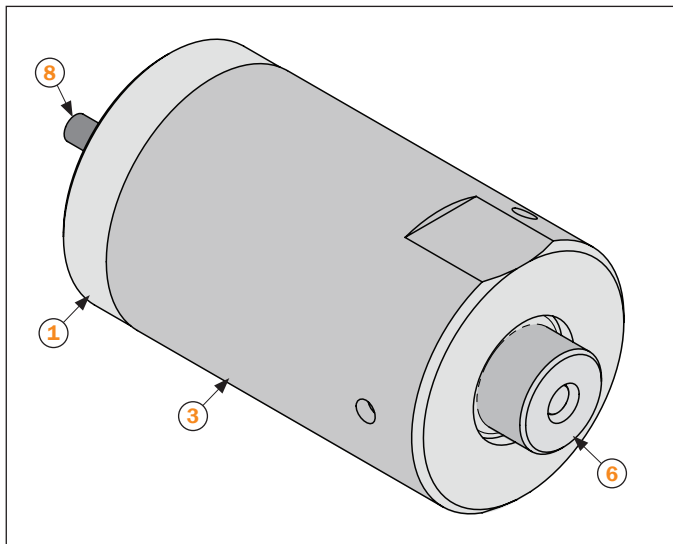




**SS30 DIE SET PUNCH HOLDER**

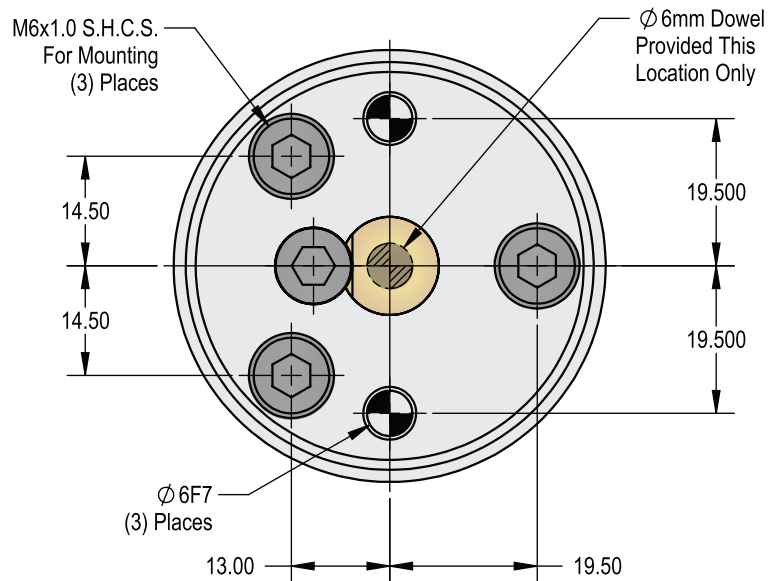
**ASSEMBLY INCLUDES:**

- ① (1) Punch Holder
- ② (1) Stripper Spring
- ③ (1) Stripper Can
- ④ (1) Punch Retaining Screw
- ⑤ (1) V-Loc™ Punch
- ⑥ (1) Stripper Tip
- ⑦ (1) Dowel Pin
- ⑧ (3) Mounting Screws



**VL-6.4**

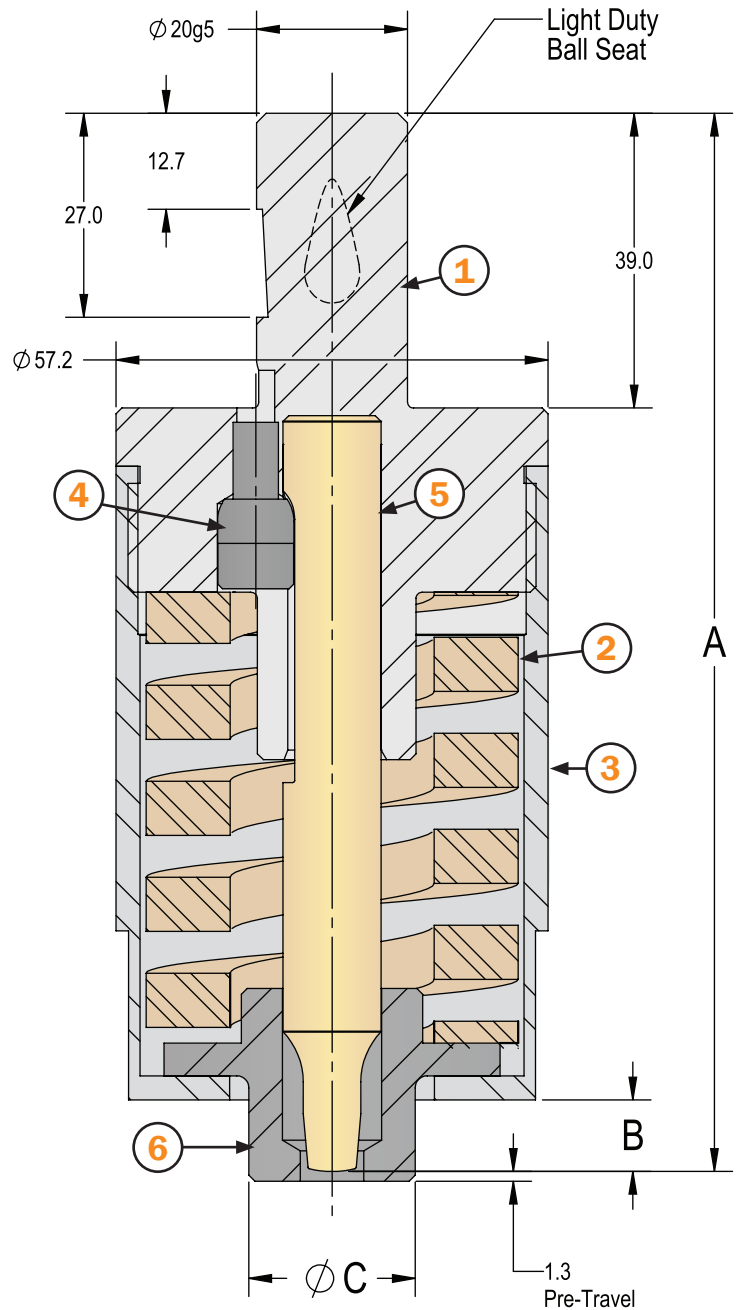
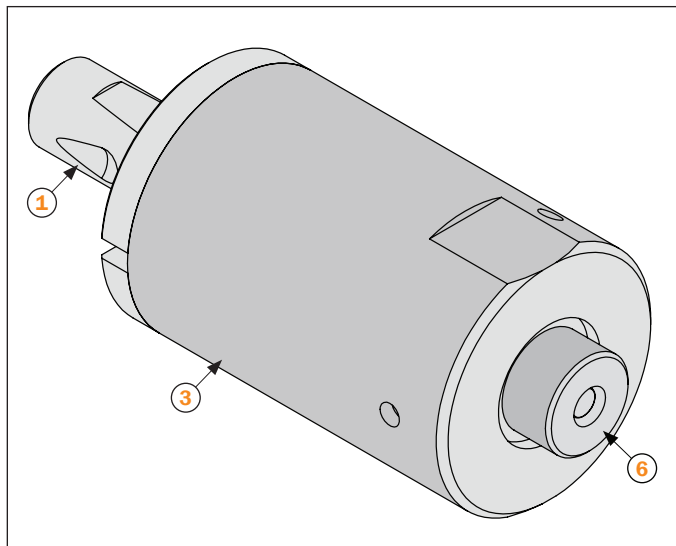
Punch Length	A	B	C	BTM Number
125	131	34.5	Ø22.0	PD287000C



**SS30 SHANK PUNCH HOLDER [METRIC]**

**ASSEMBLY INCLUDES:**

- ① (1) Punch Holder
- ② (1) Stripper Spring
- ③ (1) Stripper Can
- ④ (1) Punch Retaining Screw
- ⑤ (1) V-Loc™ Punch
- ⑥ (1) Stripper Tip



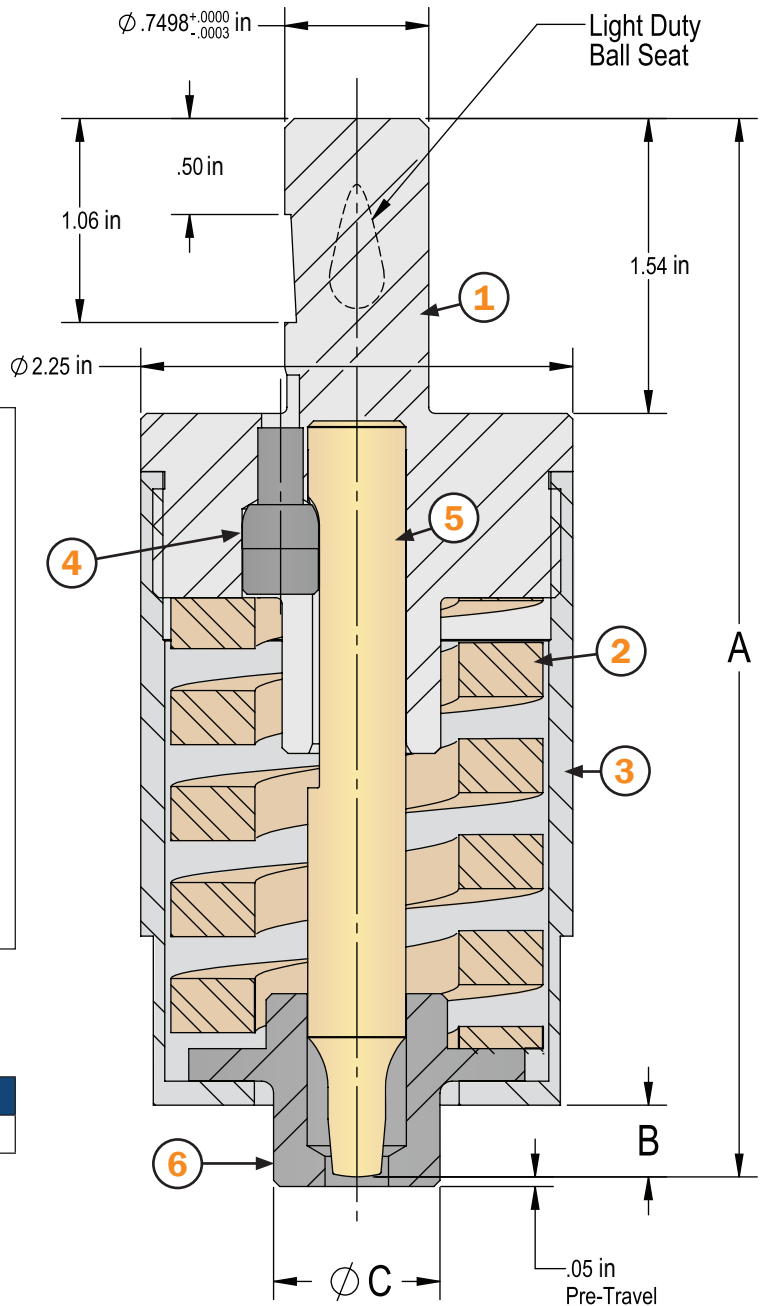
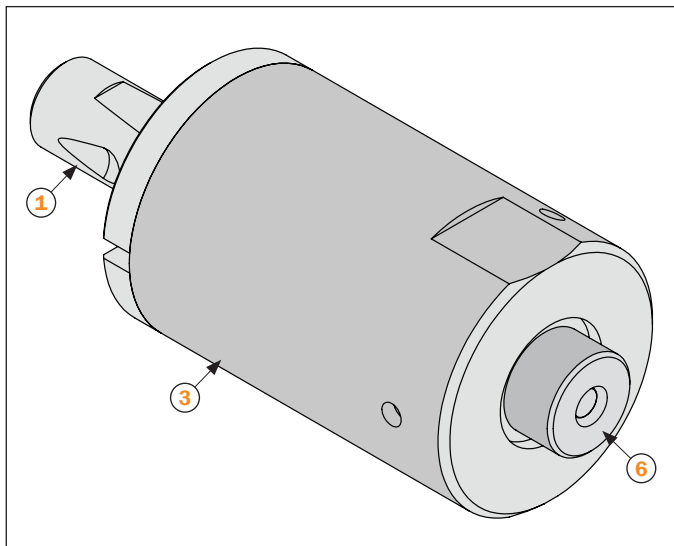
**VL-6.4**

Punch Length	A	B	C	BTM Number
125	165	34.5	$\phi 22.0$	PD276800C

**SS30 SHANK PUNCH HOLDER [IMPERIAL]**

**ASSEMBLY INCLUDES:**

- ① (1) Punch Holder
- ② (1) Stripper Spring
- ③ (1) Stripper Can
- ④ (1) Punch Retaining Screw
- ⑤ (1) V-Loc™ Punch
- ⑥ (1) Stripper Tip



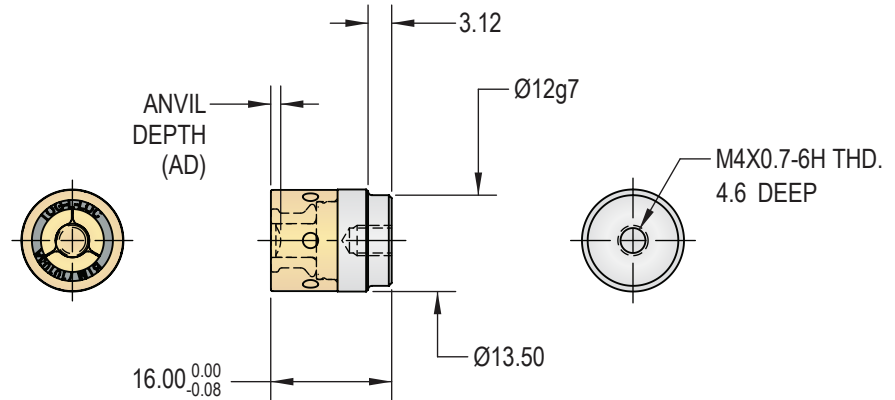
**VL-6.4**

Punch Length	A	B	C	BTM Number
125	6.496in	1.36in	Ø.87in	PD286900C

**VL-3.8**  
**STEPPED SHORT INSERT (SSI) DIE**

Anvil Depth	BTM Number
.020	PD275300BE
.025	PD275300CE
.030	PD275300DE
.035	PD275300EE
.040	PD275300FE
.045	PD275300GE
.050	PD275300HE
.055	PD275300JE

Max. Button Diameter: Ø6.3



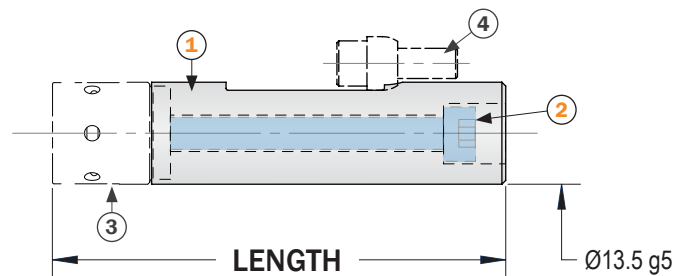
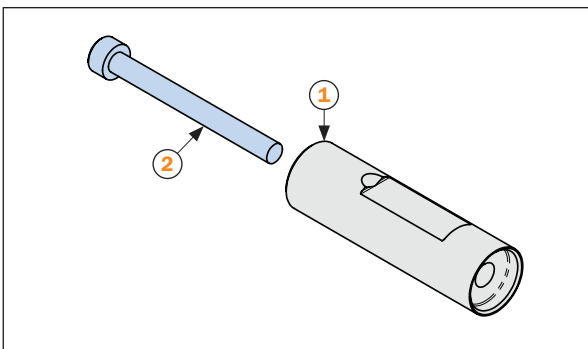
**VL-3.8**  
**SSI DIE EXTENSIONS**

**ASSEMBLY INCLUDES:**

- ① (1) Extension
- ② (1) Die Retaining Screw

**NOT INCLUDED:**

- ③ (1) 3.8 SSI V-Loc™ Die
- ④ (1) 940 Retaining Screw [BTM No. 018217]

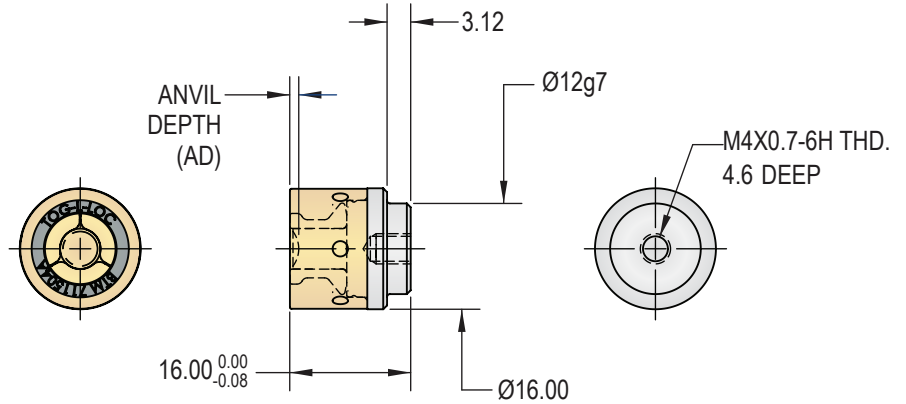


Length	BTM Number
40	796800A
60	796800B
80	796800C
100	796800D

**VL-4.6**  
**STEPPED SHORT INSERT (SSI) DIE**

Anvil Depth	BTM Number
.020	PD264700BE
.025	PD264700CE
.030	PD264700DE
.035	PD264700EE
.040	PD264700FE
.045	PD264700GE
.050	PD264700HE
.055	PD264700JE
.060	PD264700KE

Max. Button Diameter: Ø8.0



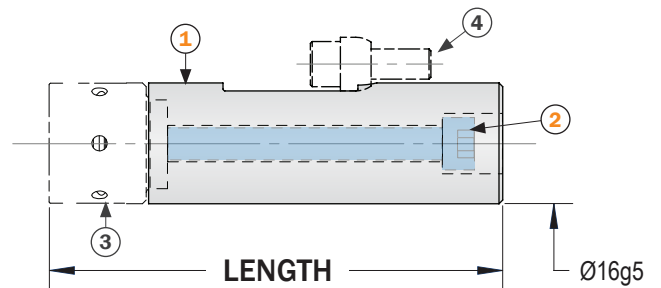
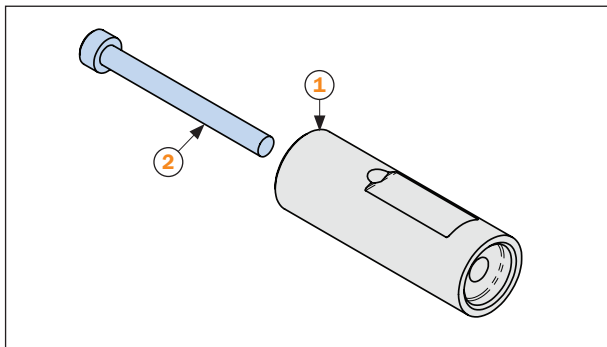
**VL-4.6**  
**SSI DIE EXTENSIONS**

**ASSEMBLY INCLUDES:**

- ① (1) Extension
- ② (1) Die Retaining Screw

**NOT INCLUDED:**

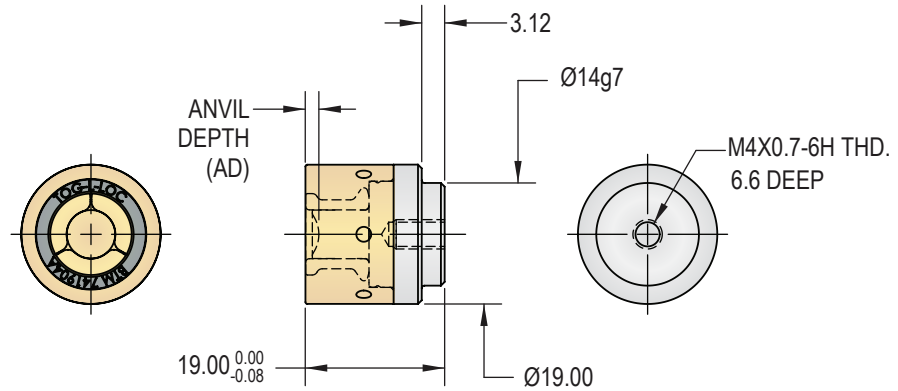
- ③ (1) 4.6 V-Loc™ Die
- ④ (1) 940 Retaining Screw [BTM No. 018217]



Length	BTM Number
60	PD220900B
80	PD220900C
100	PD220900D

**VL-5.5**  
**STEPPED SHORT INSERT (SSI) DIE**

Anvil Depth	BTM Number
.025	PD264400BE
.030	PD264400CE
.035	PD264400DE
.040	PD264400EE
.045	PD264400FE
.050	PD264400GE
.055	PD264400HE
.060	PD264400JE
.065	PD264400KE
.070	PD264400LE



Max. Button Diameter: Ø9.8

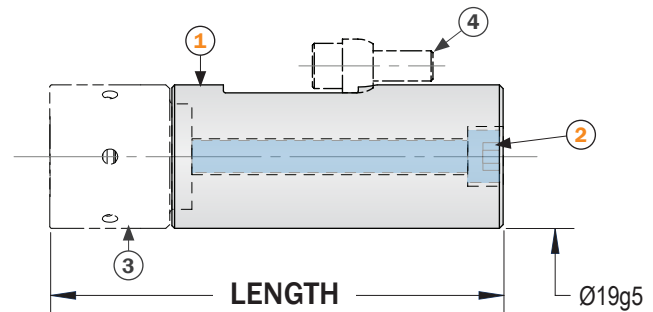
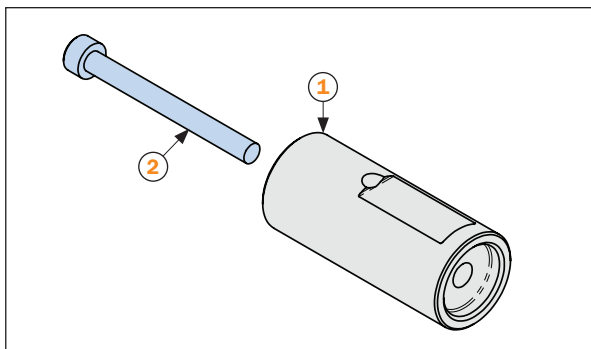
**VL-5.5**  
**SSI DIE EXTENSIONS**

**ASSEMBLY INCLUDES:**

- ① (1) Extension
- ② (1) Die Retaining Screw

**NOT INCLUDED:**

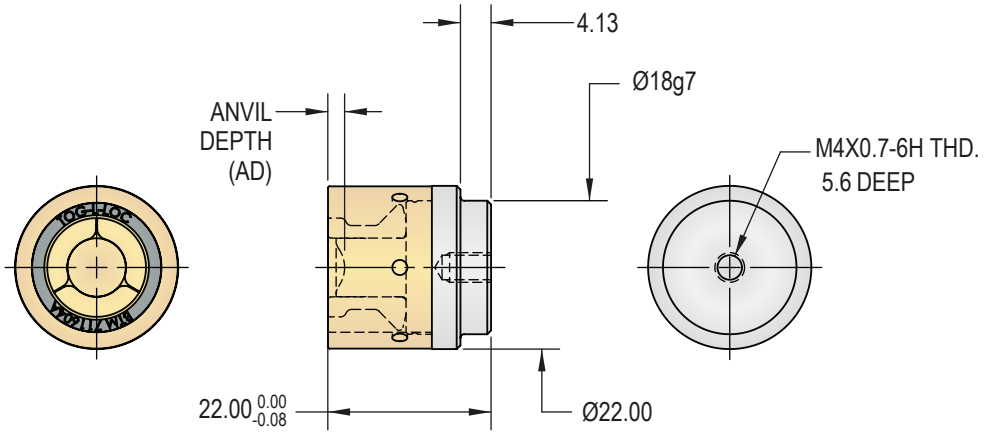
- ③ (1) 5.5 SSI V-Loc™ Die
- ④ (1) 940 Retaining Screw [BTM No. 018217]



Length	BTM Number
60	PD220600B
80	PD220600C
100	PD220600D

**VL-6.4**  
**STEPPED SHORT INSERT (SSI) DIE**

Anvil Depth	BTM Number
.030	PD276900DE
.035	PD276900EE
.040	PD276900FE
.045	PD276900GE
.050	PD276900HE
.055	PD276900JE
.060	PD276900KE
.065	PD276900LE
.070	PD276900ME
.075	PD276900NE
.080	PD276900PE



Max. Button Diameter: Ø11.2

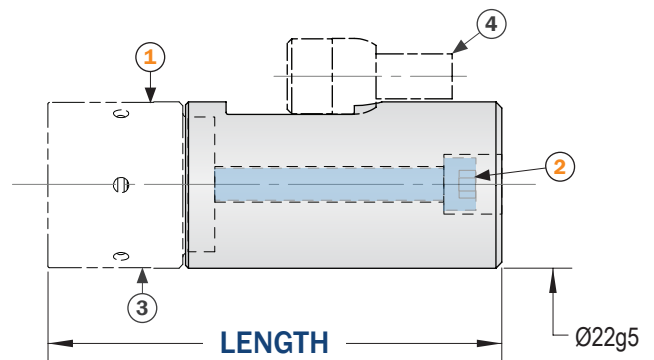
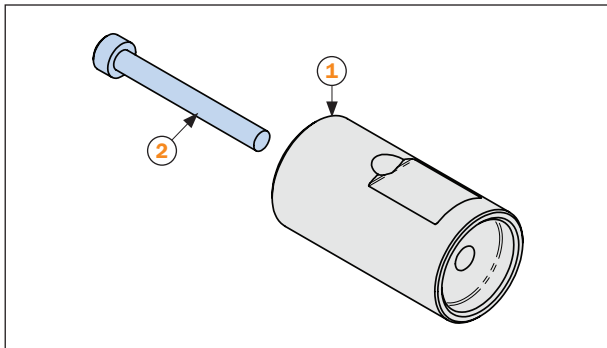
**VL-6.4**  
**SSI DIE EXTENSIONS**

**ASSEMBLY INCLUDES:**

- ① (1) Extension
- ② (1) Die Retaining Screw

**NOT INCLUDED:**

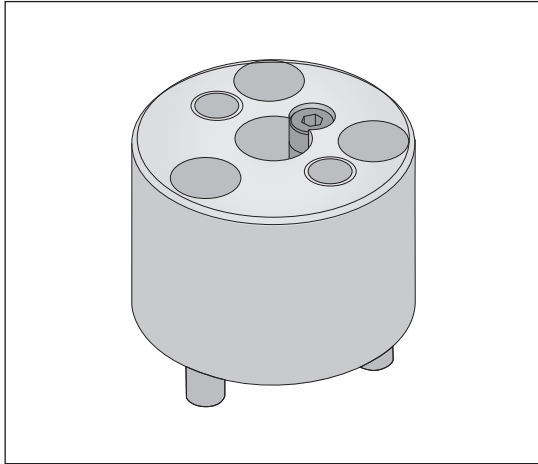
- ③ (1) 6.4 V-Loc™ Die
- ④ (1) 940 Retaining Screw [BTM No. 018217]



Length	BTM Number
60	PD214700B
80	PD214700C
100	PD214700D

**ROUND DIE HOLDER**

For 940 series SSI dies with an extension.

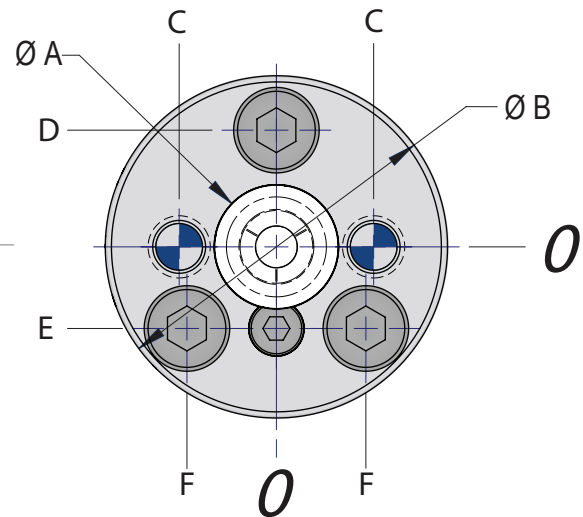
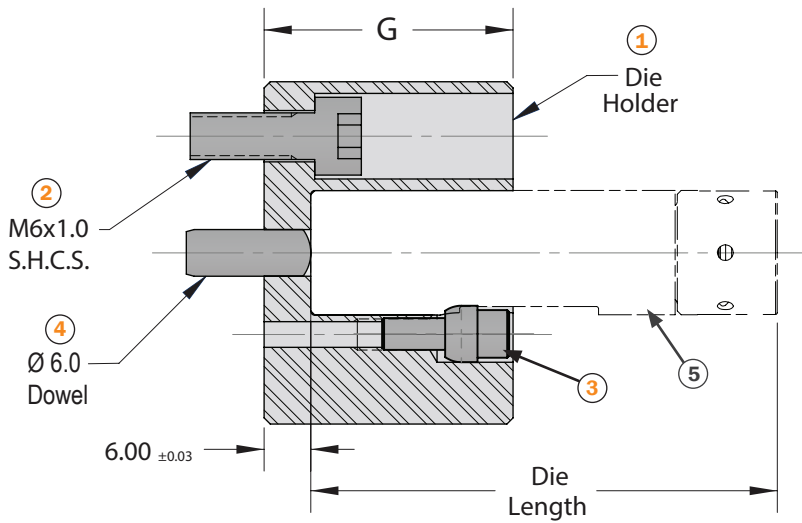


**ASSEMBLY INCLUDES:**

- ① (1) Die Holder
- ② (3) Mounting Screws
- ③ (1) Die Retaining Screw
- ④ (1) Dowel Pin

**NOT INCLUDED:**

- ⑤ (1) SSI Die w/ Extension

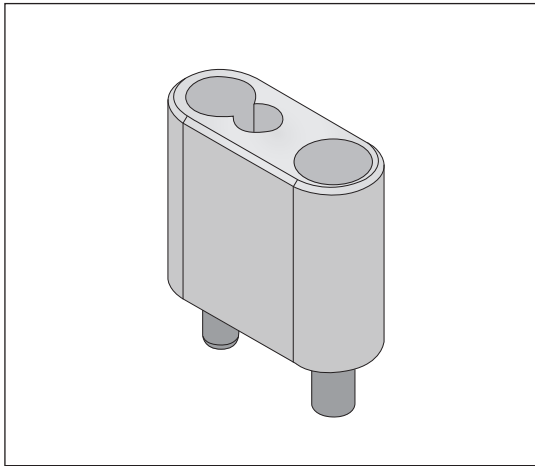


Tooling Size	A	B	C	D	E	F	G	BTM Number
3.8	Ø13.5	Ø44	12.5	15.0	10.5	11.5	32.0	796800E
4.6	Ø16	Ø44	12.5	15.0	10.5	11.5	32.0	713600A
5.5	Ø19	Ø52	19.5	19.5	13.0	14.5	32.0	743500A
6.4	Ø22	Ø52	19.5	19.5	13.0	14.5	35.0	PD214800A



**THIN DIE HOLDER**

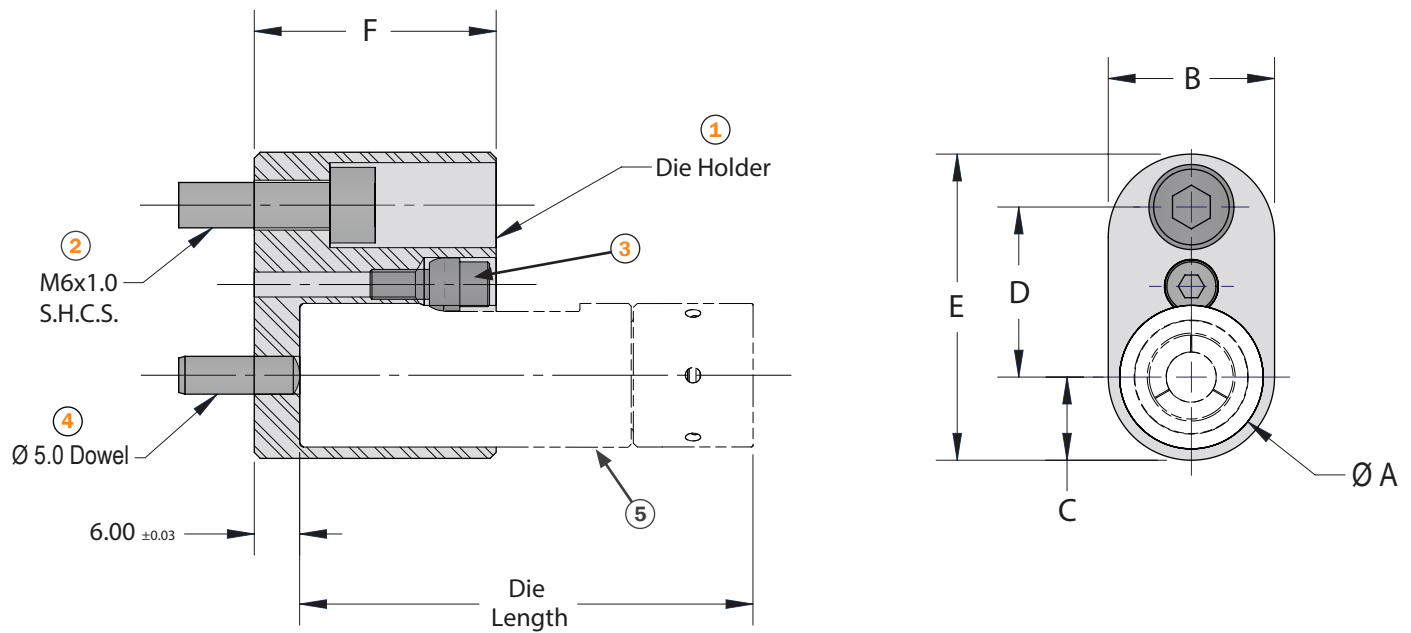
For 940 series SSI dies with an extension.

**ASSEMBLY INCLUDES:**

- ① (1) Die Holder
- ② (1) Mounting Screw
- ③ (1) Die Retaining Screw
- ④ (1) Dowel Pin

**NOT INCLUDED:**

- ⑤ (1) SSI Die w/ Extension



Tooling Size	A	B	C	D	E	F	BTM Number
3.8	Ø13.5	16.5	8.3	22.5	37.8	32.0	PD250100A
4.6	Ø16	19.0	9.5	22.5	39.0	32.0	737400C
5.5	Ø19	22.0	11.0	22.5	40.5	32.0	737400H
6.4	Ø22	25.0	12.5	25.0	44.6	35.0	PD214900A

**DIE MOUNTING INFORMATION**

**“940” Series Die Retention**

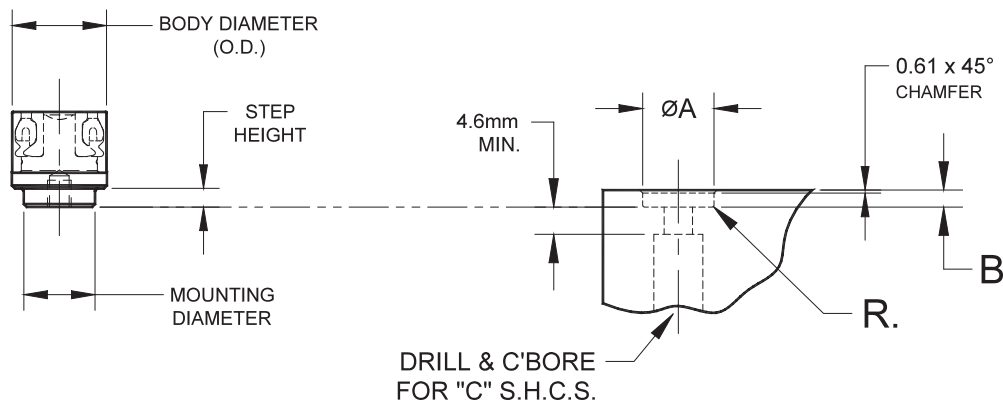
The location tolerance to the centerline of the die hole should be  $\pm 0.013\text{mm}$ .

Because the 940 die has a built in blade shield, the top of the die should not be flush with the detail it's mounted in.

If anvil strength is not an issue, the typical design method would expose the ring of small holes in the guard can.

**Stepped Short Insert (SSI) Die Mounting**

For all V-Loc™ joint sizes



Tooling Size	A	B	C	R
3.8	Ø12H6	2.84 ±0.13	M4x0.7	R0.25 MAX
4.6	Ø12H6	2.84 ±0.13	M4x0.7	R0.33 ±0.13
5.5	Ø14H6	2.84 ±0.13	M4x0.7	R0.33 ±0.13
6.4	Ø18H6	3.84 ±0.13	M4x0.7	R0.33 ±0.13

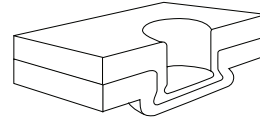


## ALSO OFFERS THESE CLINCHING SOLUTIONS:

**Tog-L-Loc<sup>®</sup>**  
[www.btmcorp.com/tog-l-loc.html](http://www.btmcorp.com/tog-l-loc.html)



Joint Cross-Section

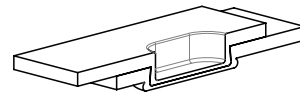


BTM's patented Tog-L-Loc<sup>®</sup> sheet metal joining system is the simple solution for fastening plain or coated sheet metals. Tog-L-Loc<sup>®</sup> forms a strong, leakproof "button" headed joint without welding or riveting in almost any combination of ductile sheet metals. The Tog-L-Loc<sup>®</sup> system is widely used in the manufacture of automobiles, appliances, furniture, electrical products, building supplies, and more.

**Oval-Loc<sup>™</sup>**  
[www.btmcorp.com/oval-loc.html](http://www.btmcorp.com/oval-loc.html)



Joint Cross-Section

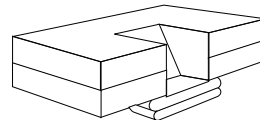


Oval-Loc<sup>™</sup> was born from the vision of combining our popular Tog-L-Loc<sup>®</sup> round clinch joint with the rotation resistance of our Lance-N-Loc<sup>™</sup> sheet metal joining system. The Oval-Loc<sup>™</sup> process features the leak-proof and long tool life characteristics of a traditional Tog-L-Loc<sup>®</sup> joint, but also provides improved strength.

**Lance-N-Loc<sup>™</sup>**  
[www.btmcorp.com/lance-n-loc.html](http://www.btmcorp.com/lance-n-loc.html)



Joint Cross-Section



Lance-N-Loc<sup>™</sup> is a sheet metal clinching system which creates a strong mechanical joint without the use of external fasteners or welding. The metals are lanced and squeezed to form an interlock below the bottom layer of the sheet metal.

Lance-N-Loc<sup>™</sup> is good for joining harder materials, multiple layers, and is ideal for use where electrical conductivity is required.



**BTM offers a range of Production Equipment for applying our Clinch tooling.**

**Unitized "C-Frame" Tooling**



BTM's unitized "C-Frame" tooling is a low cost way to utilize the patented Tog-L-Loc® sheet metal joining system and is available with a wide range of throat depths. The units are easily mounted, and are ready to install into your brake or stamping press.

**Die Sets**



Clinch tooling can be inexpensively designed into single or compound motion die set packages.

**Hand Held Units**



BTM's handheld units are an economical approach to fastening sheet metal assemblies. Pneumatic, Hydraulic, and Self-Contained Units in a variety of styles are available. The units can be set up to join a range of thicknesses.

**Special Fixtures**



Manually loaded and unloaded dedicated tooling can be built for a single part or a family of parts.

**Universal Presses**



Universal presses easily adapt to join a variety of parts.

**Special Systems**



Achieve faster cycle times with automatic part transfer and by combining processes.

**Specialized Units**



BTM provides pneumatic, hydraulic, air/oil, and electrically driven units with single or dual motions for both stationary and robotic applications.

**Find more information online:**



[www.btmcorp.com/clinching-equipment.html](http://www.btmcorp.com/clinching-equipment.html)



For more information, or to see our full line of products, please visit:

**WWW.BTMCORP.COM**