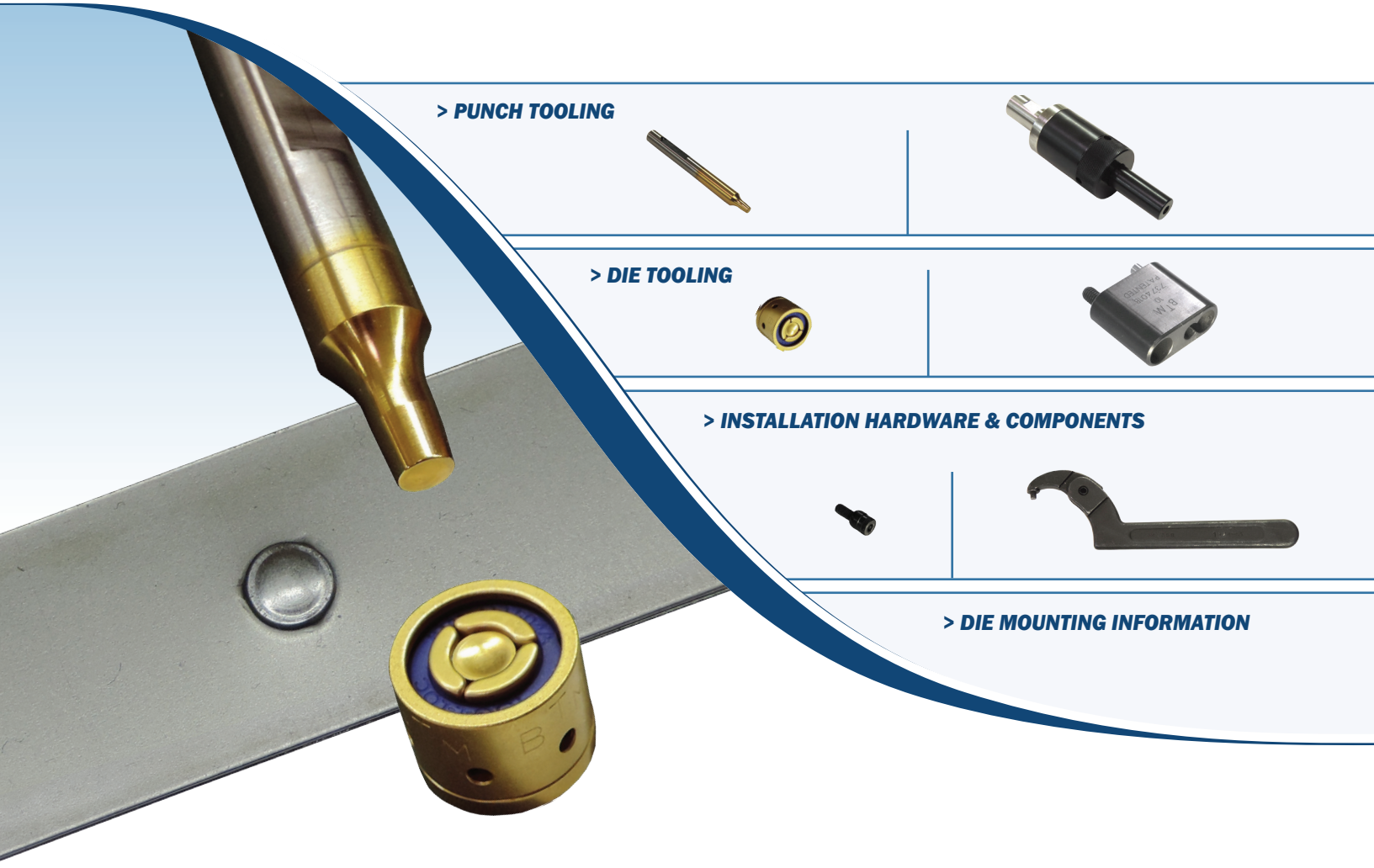
V-Loc™ 940 Series Clinch Tooling Catalog

The Standard for Clinching Aluminum



> PUNCH TOOLING

> DIE TOOLING

> INSTALLATION HARDWARE & COMPONENTS

> DIE MOUNTING INFORMATION

Learn more about this ***Clinching Solution*** online!

www.btmcomp.com/v-loc.html

BTM® KOREA

www.BTMKOREA.com

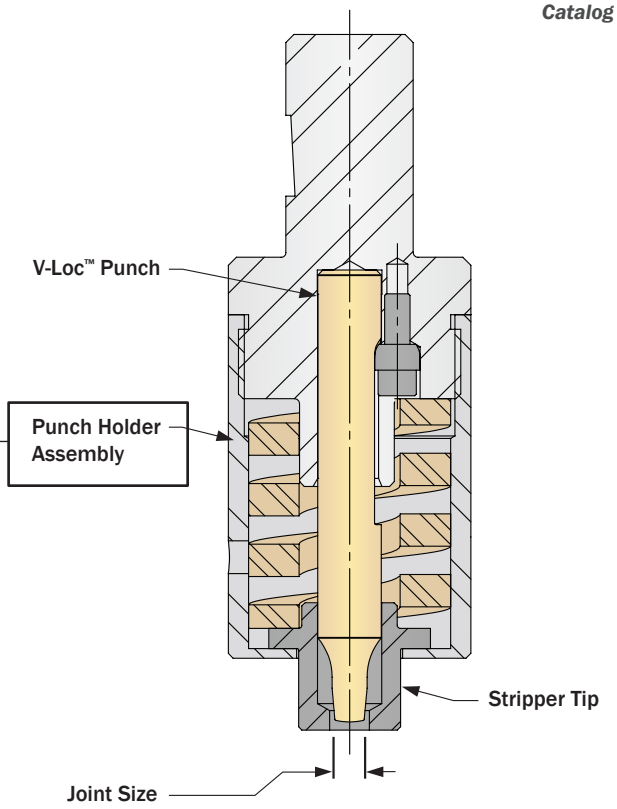
031-477-4202

BTM® V-Loc™

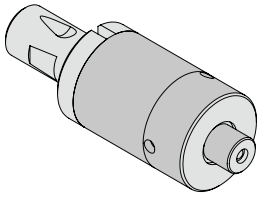
WWW.BTMCOMP.COM/V-LOC.HTML

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 todays light weight high strength aluminum alloys with or without adhesives. V-Loc™'s unique geometry improves material flow producing a clinch that is resistent to necking and the effects of prestrain.

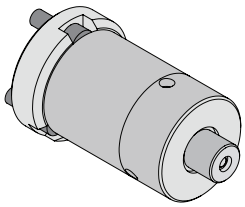
Whether you are joining aluminum to aluminum, dissimiliar materials or looking to take your product to the next level through form and function V-Loc™ is the solution.



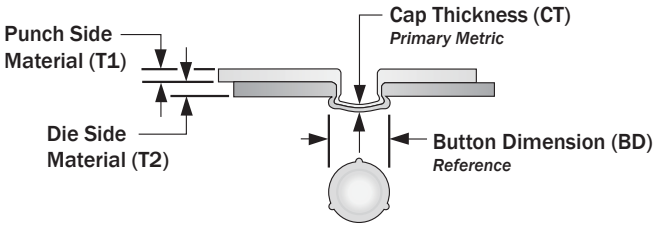
940 SERIES PUNCH HOLDERS

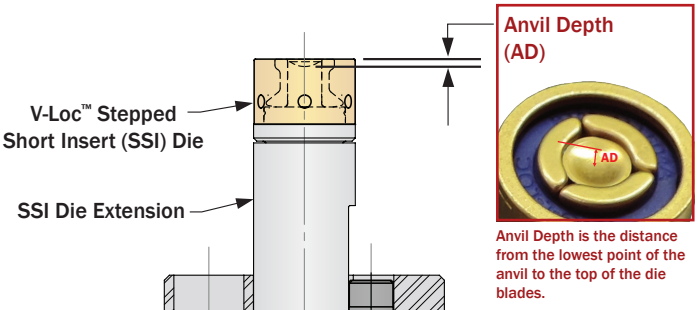


SS20 Shank Punch Holder
SS30 Shank Punch Holder



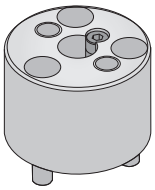
Die Set Punch Holder



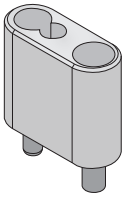


Anvil Depth is the distance from the lowest point of the anvil to the top of the die blades.

940 SERIES DIE HOLDERS



Round Die Holder



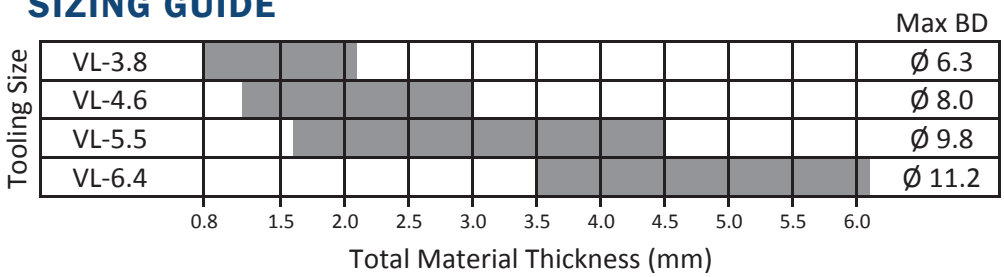
Thin Die Holder

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.btmcomp.com for latest version.

V-LOC™ SIZING GUIDE



Minimum Single Layer Thickness 0.4mm

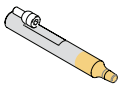
If material is not of equal thickness, it is preferred to have thick material on Punch Side, not to exceed 3:1.

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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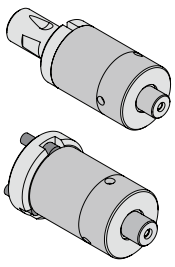
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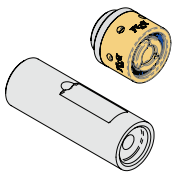
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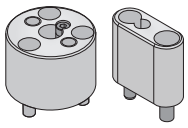
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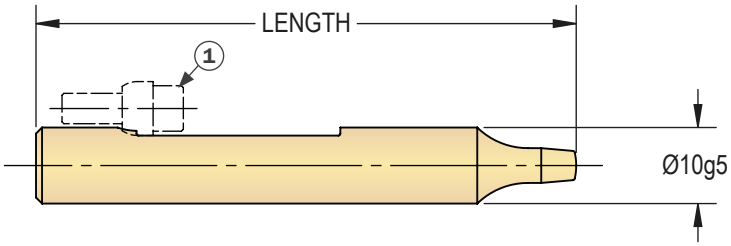
USING 940 DIES

Mounting Information 18

STANDARD PUNCHES

VL-3.8

Length	BTM Number
71mm	PD277101A
100mm	PD277101G

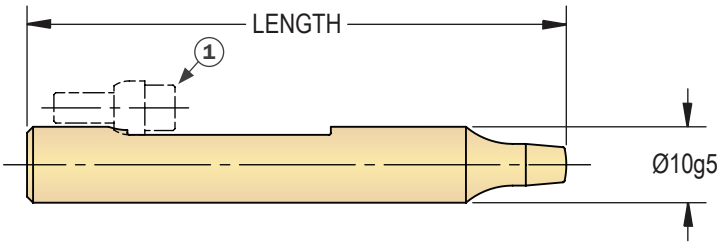


NOT INCLUDED

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

VL-4.6

Length	BTM Number
71mm	PD264600A
100mm	PD264600G

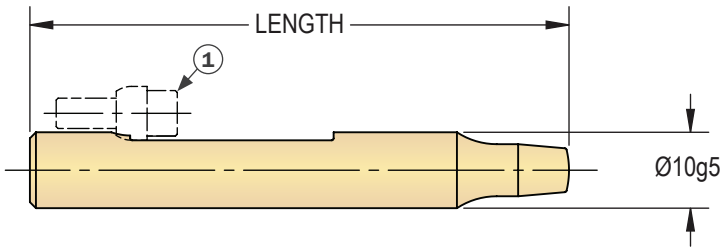


NOT INCLUDED

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

VL-5.5

Length	BTM Number
71mm	PD264500A
100mm	PD264500G

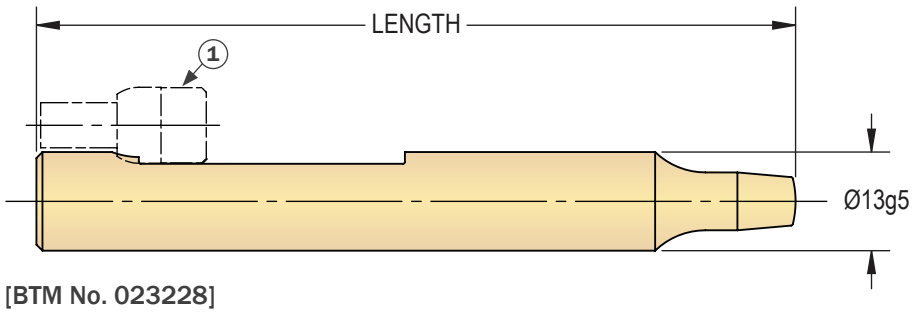


NOT INCLUDED

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

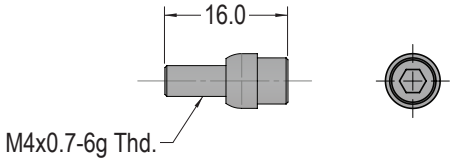
BTM Number
018217

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

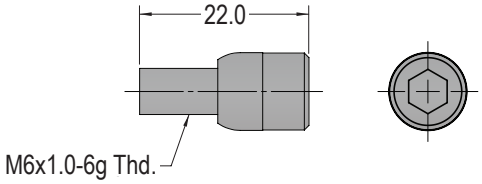


M6 THREAD

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.

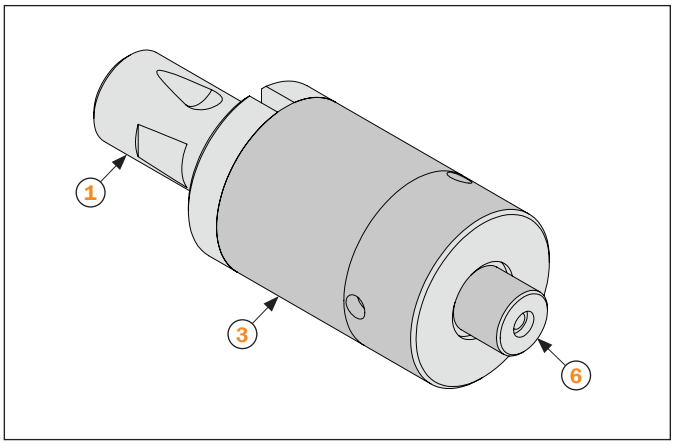
BTM Number
048749

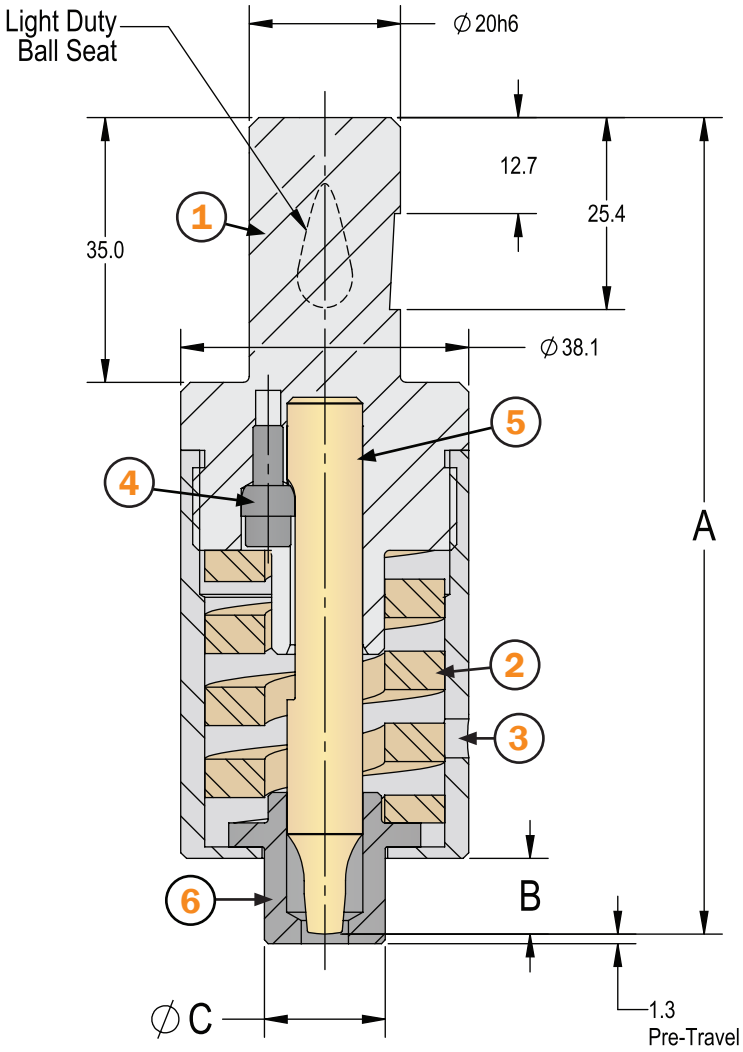


SS20 SHANK PUNCH HOLDER [METRIC]

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

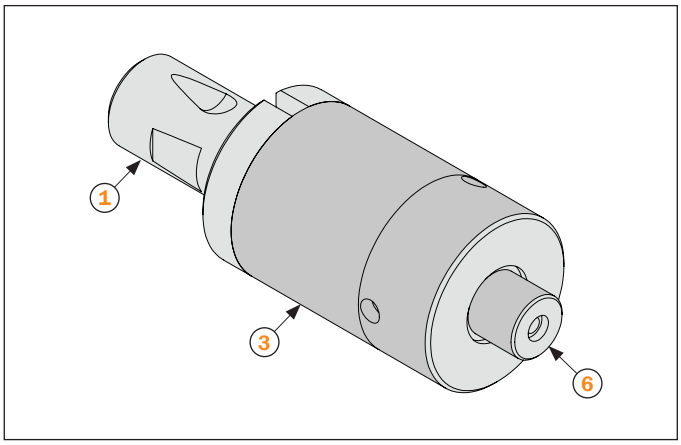
VL-5.5

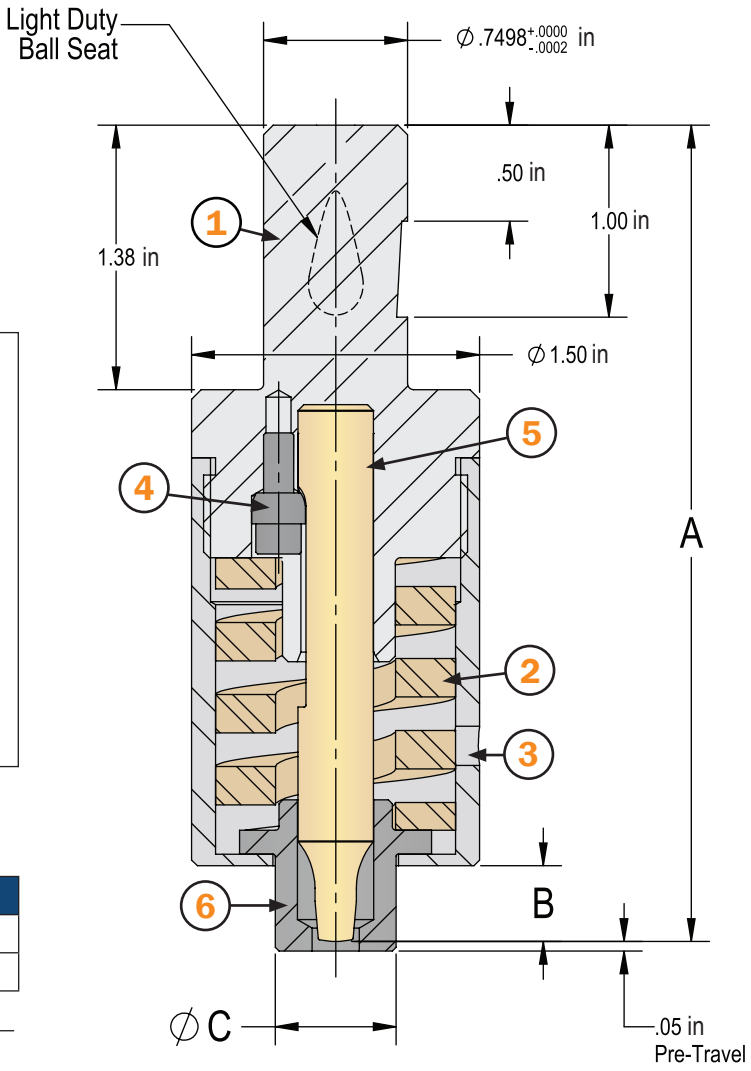
Punch Length	A	B	C	BTM Number
71	108	Ø10.0	Ø19.1	PD277000A
100	137	Ø39.0	Ø19.1	PD277000G

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

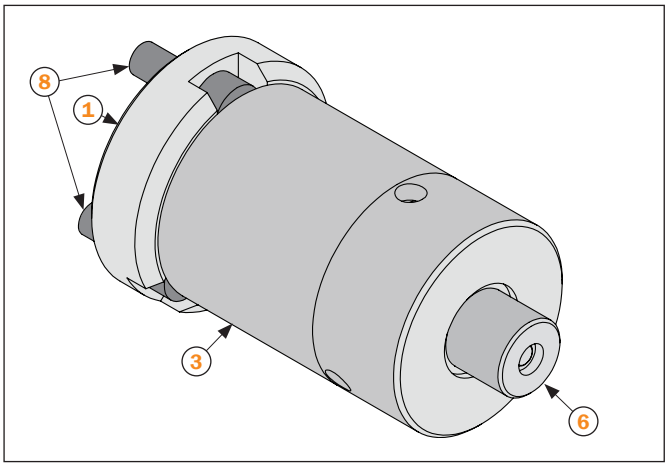
VL-5.5

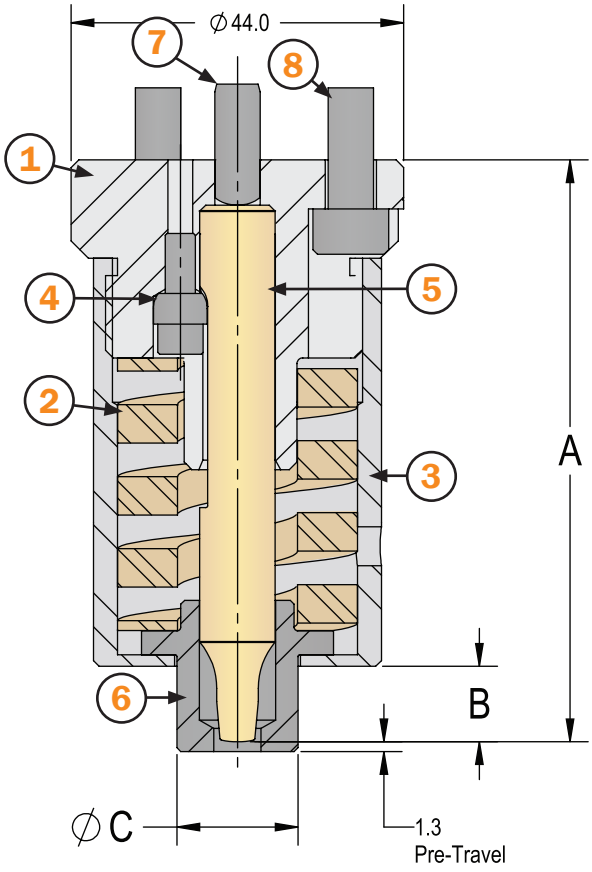
Punch Length	A	B	C	BTM Number
71	4.252in	Ø.39in	Ø.75in	PD286700A
100	5.394in	Ø1.54in	Ø.75in	PD286700G

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

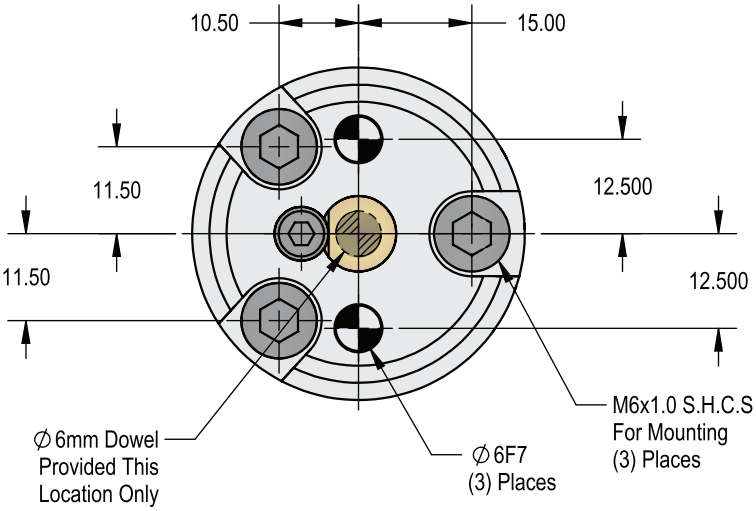
Punch Length	A	B	C	BTM Number
71	77	Ø10.0	Ø14.0	PD286400A
100	106	Ø39.0	Ø14.0	PD286400G

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

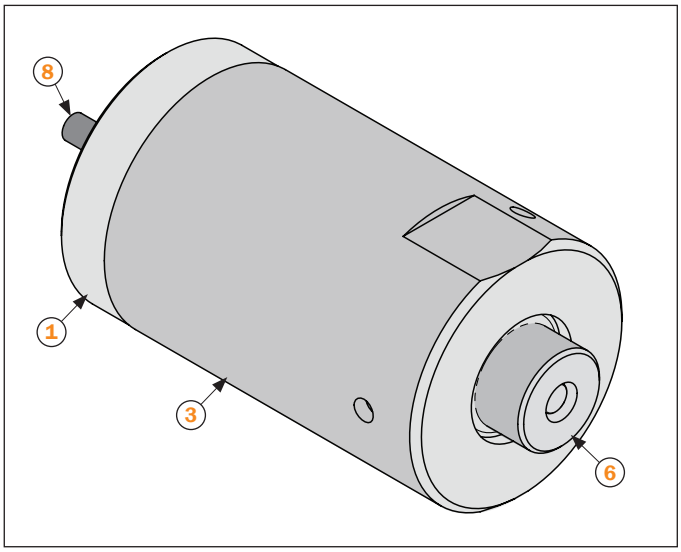
Punch Length	A	B	C	BTM Number
71	77	Ø10.0	Ø19.1	PD282500A
100	106	Ø39.0	Ø19.1	PD282500G

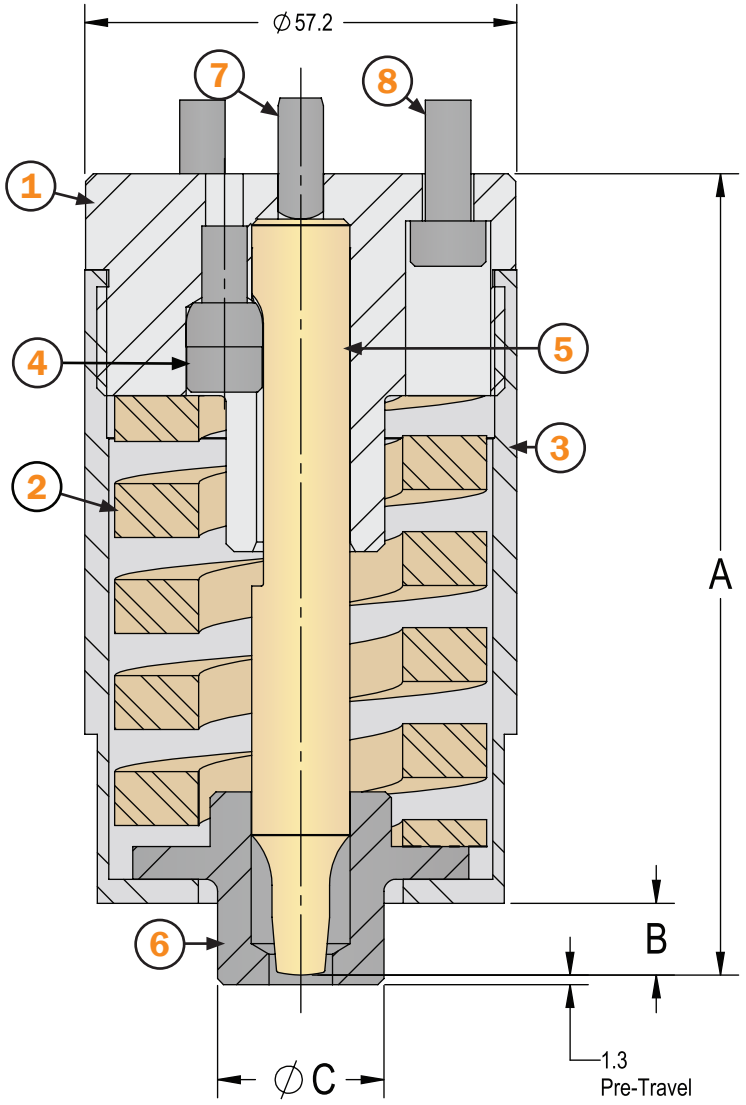


SS30 DIE SET PUNCH HOLDER

ASSEMBLY INCLUDES:

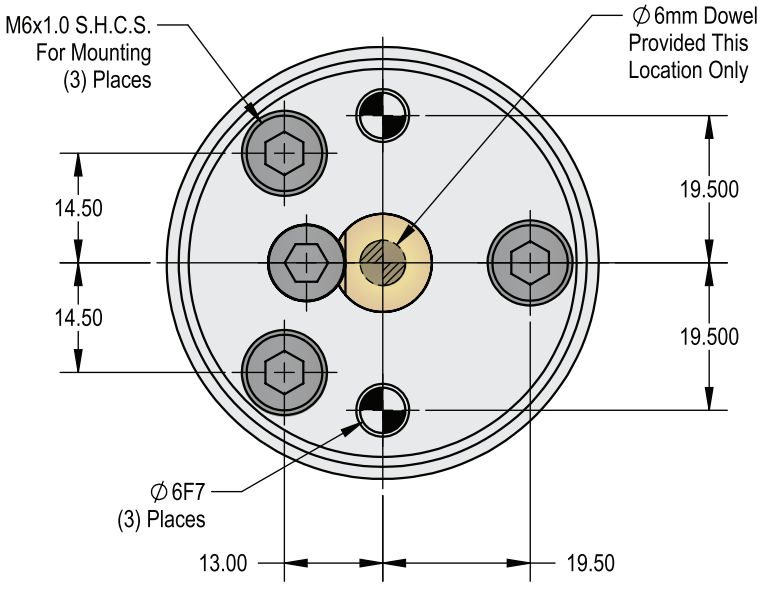
1. (1) Punch Holder
2. (1) Stripper Spring
3. (1) Stripper Can
4. (1) Punch Retaining Screw
5. (1) V-Loc™ Punch
6. (1) Stripper Tip
7. (1) Dowel Pin
8. (3) Mounting Screws





VL-6.4

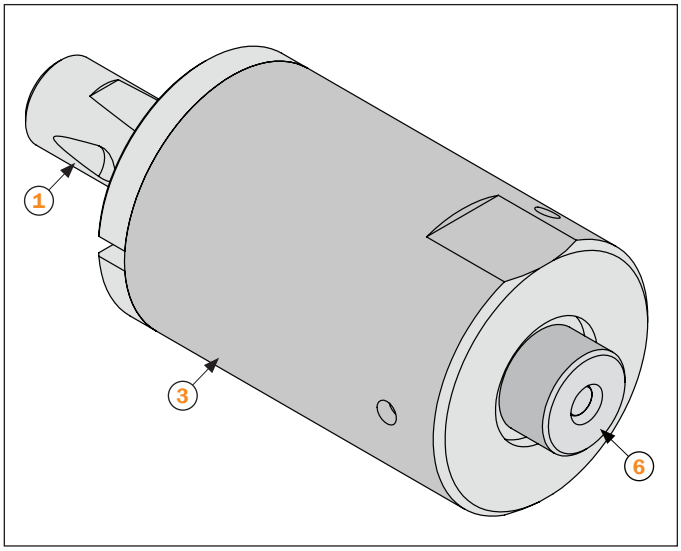
Punch Length	A	B	C	BTM Number
125	131	34.5	Ø22.0	PD287000C

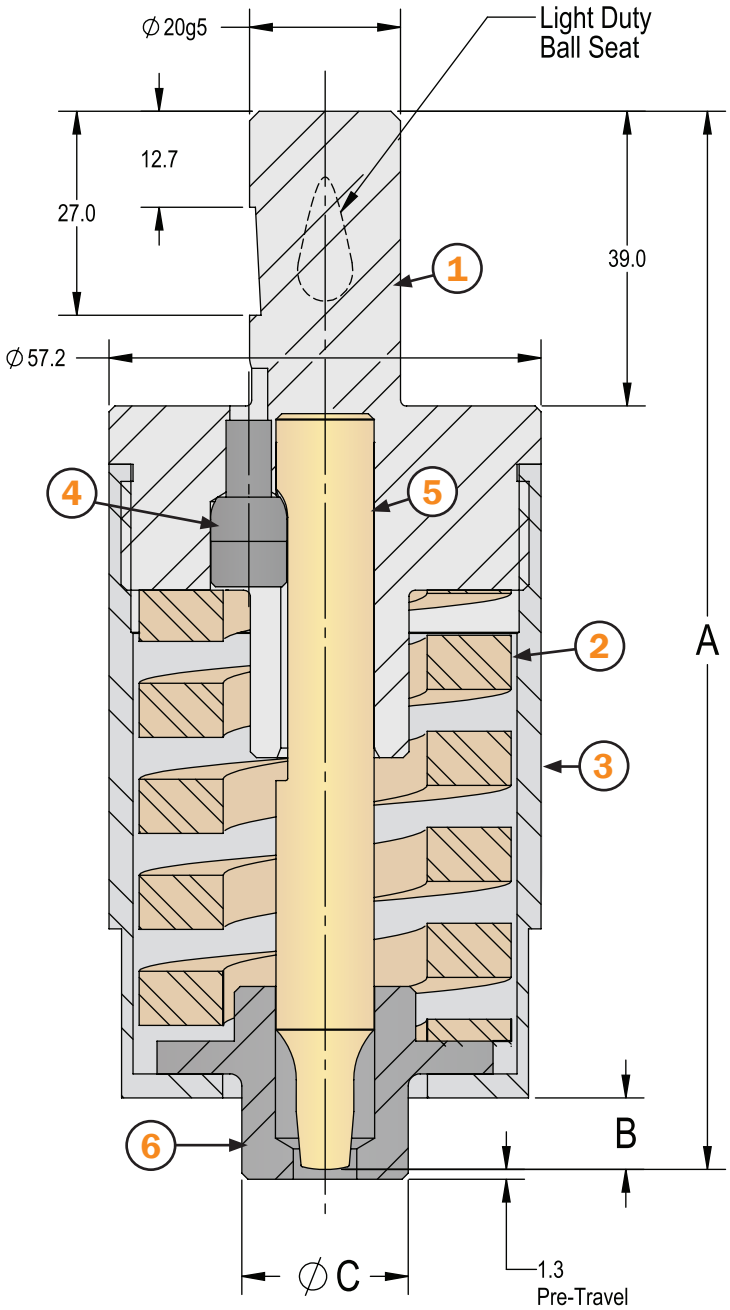


SS30 SHANK PUNCH HOLDER [METRIC]

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





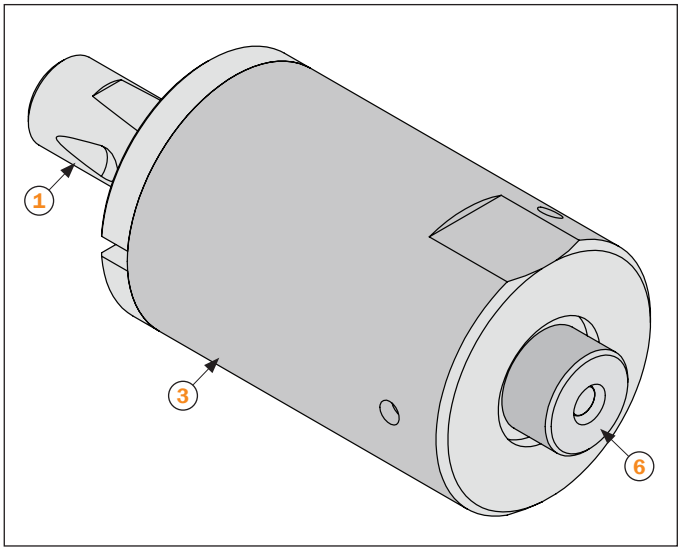
VL-6.4

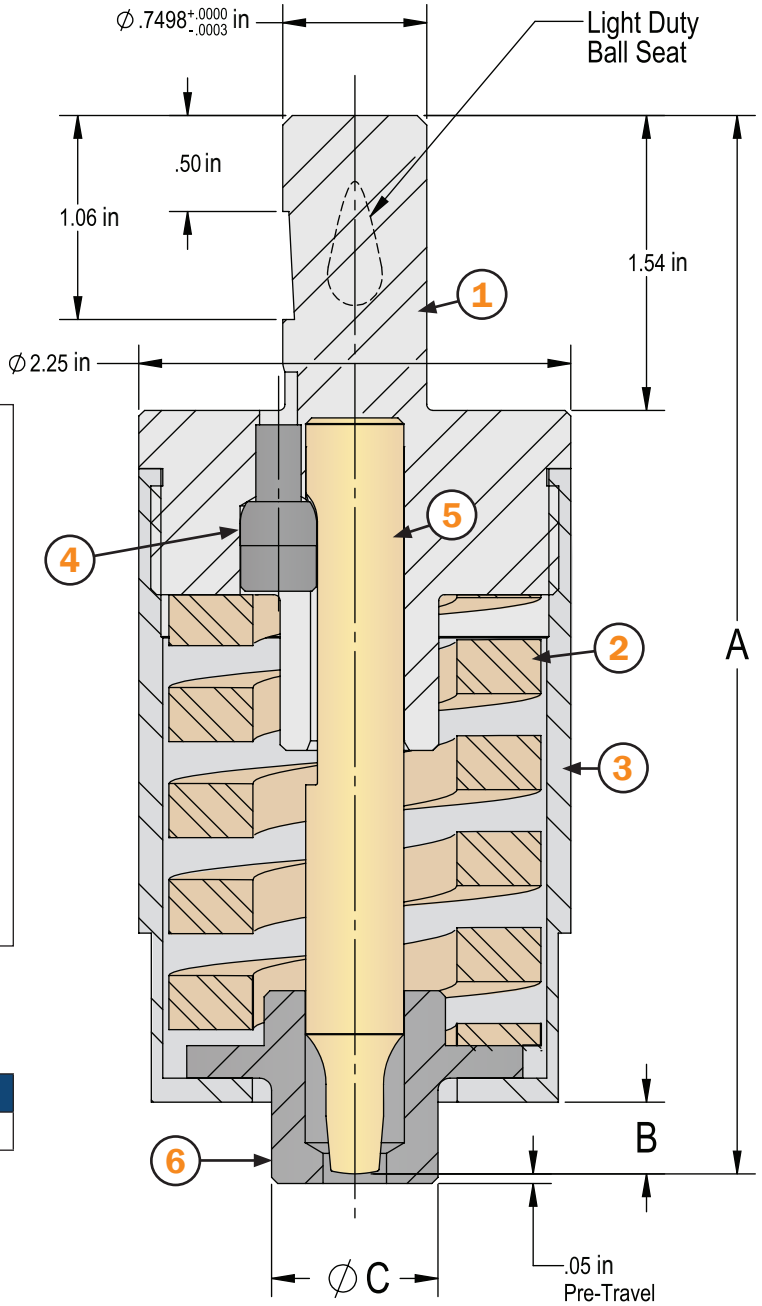
Punch Length	A	B	C	BTM Number
125	165	34.5	Ø22.0	PD276800C

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





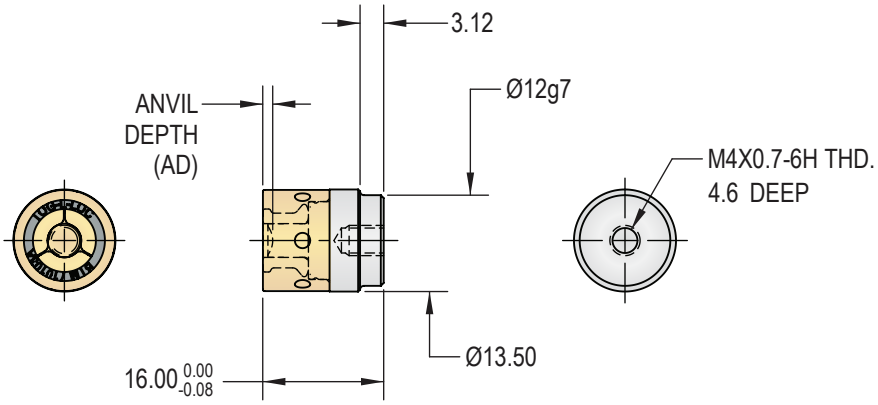
VL-6.4

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



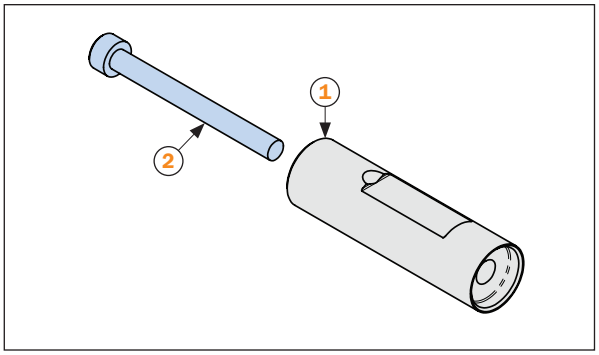
VL-3.8
SSI DIE EXTENSIONS

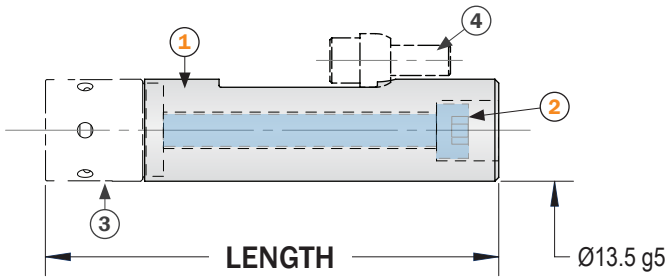
ASSEMBLY INCLUDES:

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]



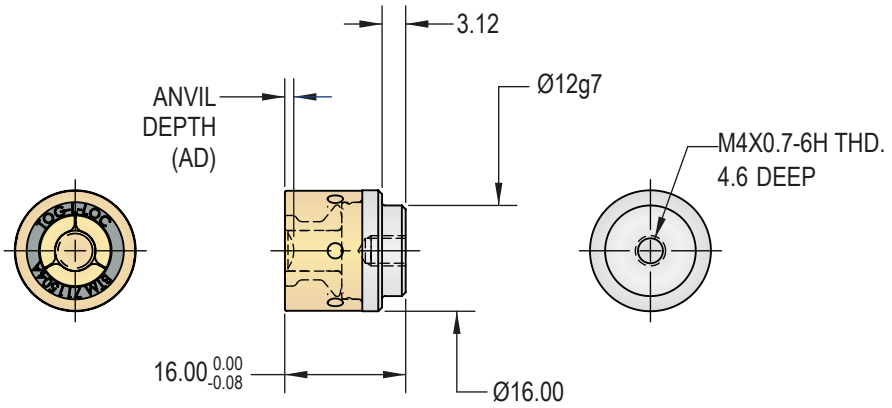


Length	BTM Number
40	796800A
60	796800B
80	796800C
100	796800D

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



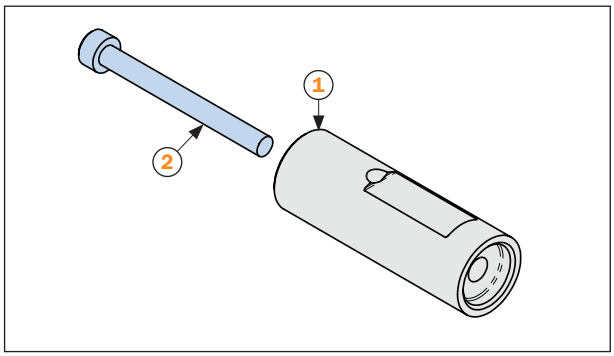
VL-4.6
SSI DIE EXTENSIONS

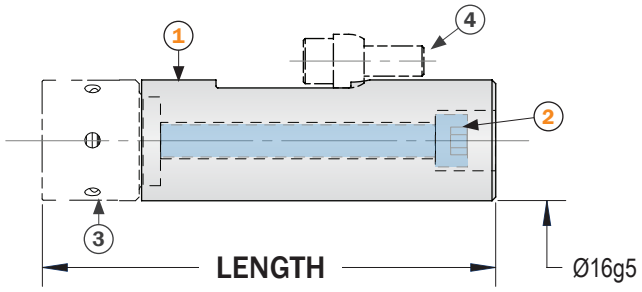
ASSEMBLY INCLUDES:

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]



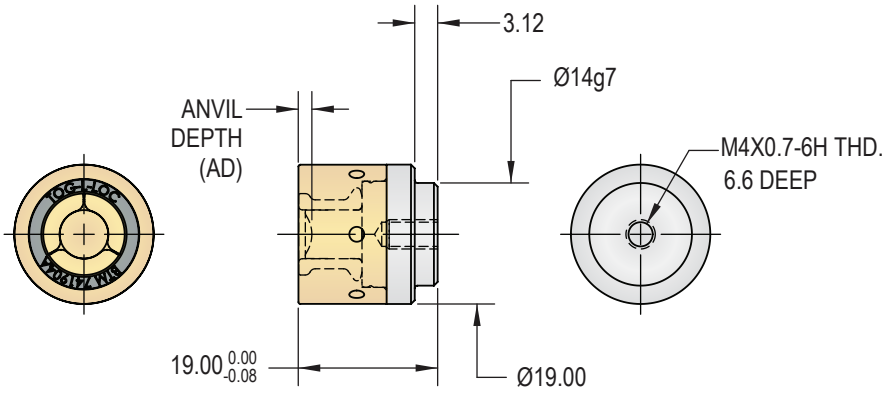


Length	BTM Number
60	PD220900B
80	PD220900C
100	PD220900D

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



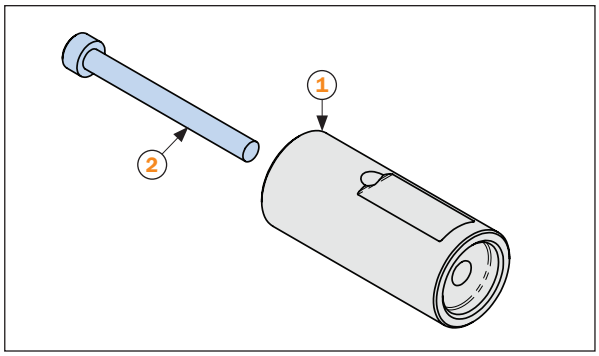
VL-5.5
SSI DIE EXTENSIONS

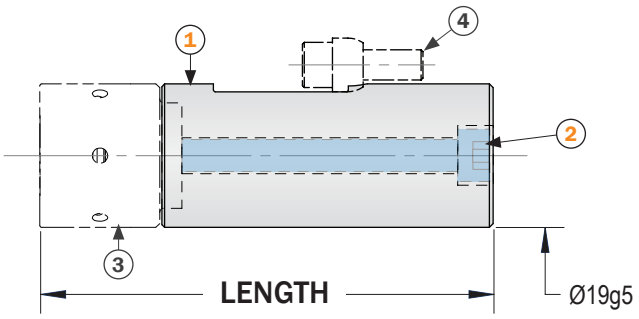
ASSEMBLY INCLUDES:

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]



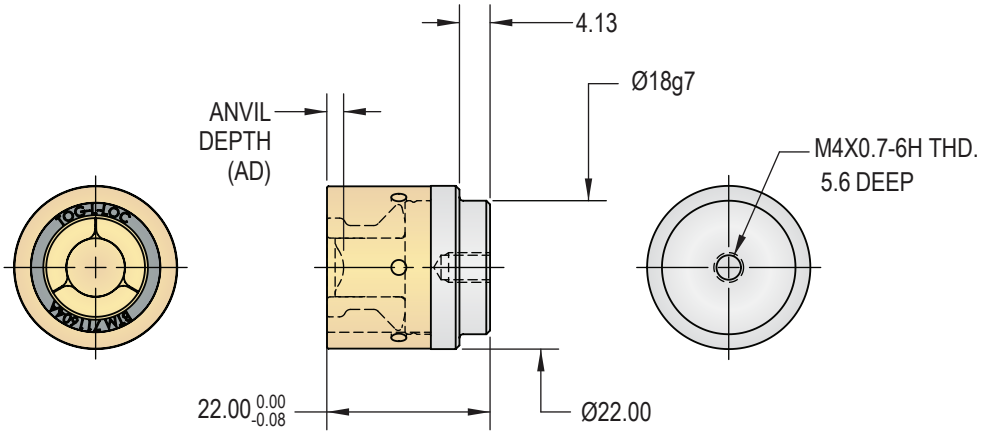


Length	BTM Number
60	PD220600B
80	PD220600C
100	PD220600D

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



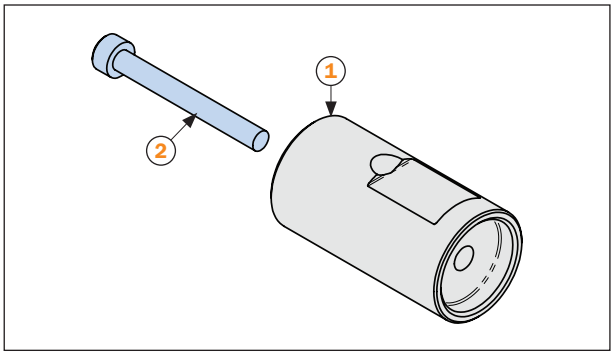
VL-6.4
SSI DIE EXTENSIONS

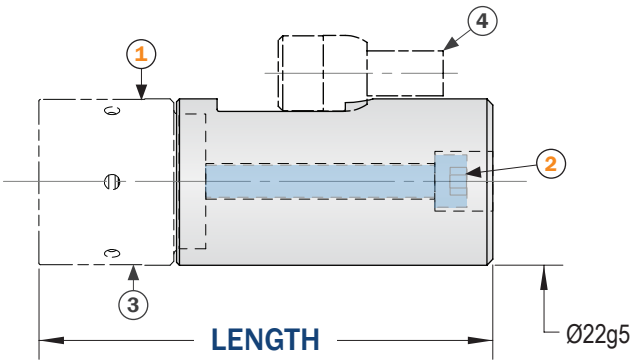
ASSEMBLY INCLUDES:

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]

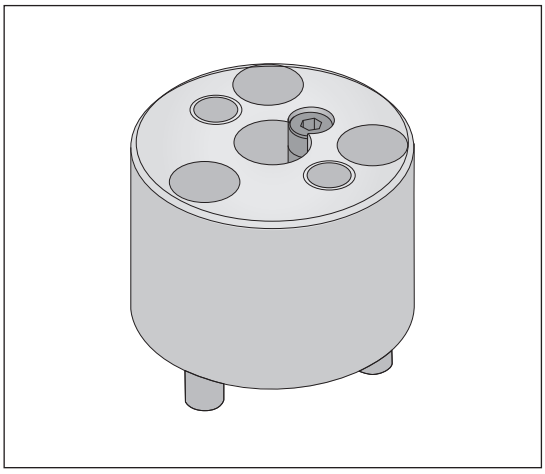




Length	BTM Number
60	PD214700B
80	PD214700C
100	PD214700D

ROUND DIE HOLDER

For 940 series SSI dies with an extension.

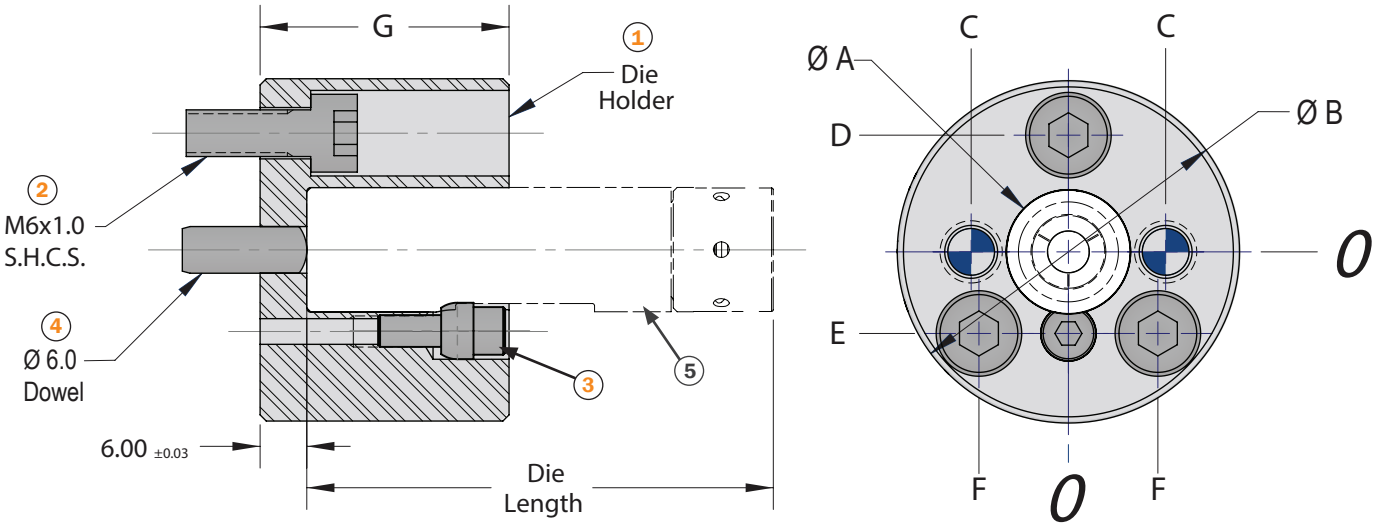


ASSEMBLY INCLUDES:

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

NOT INCLUDED:

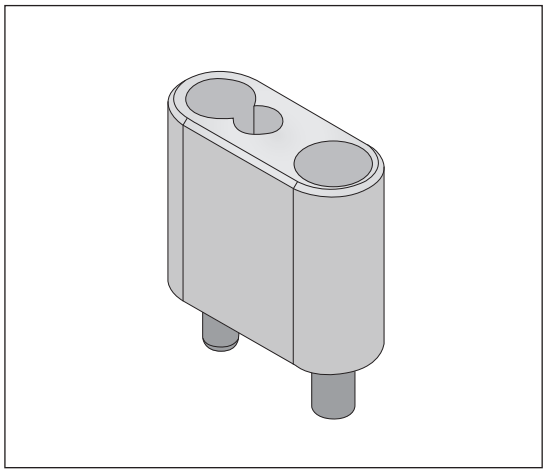
5. (1) SSI Die w/ Extension



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.

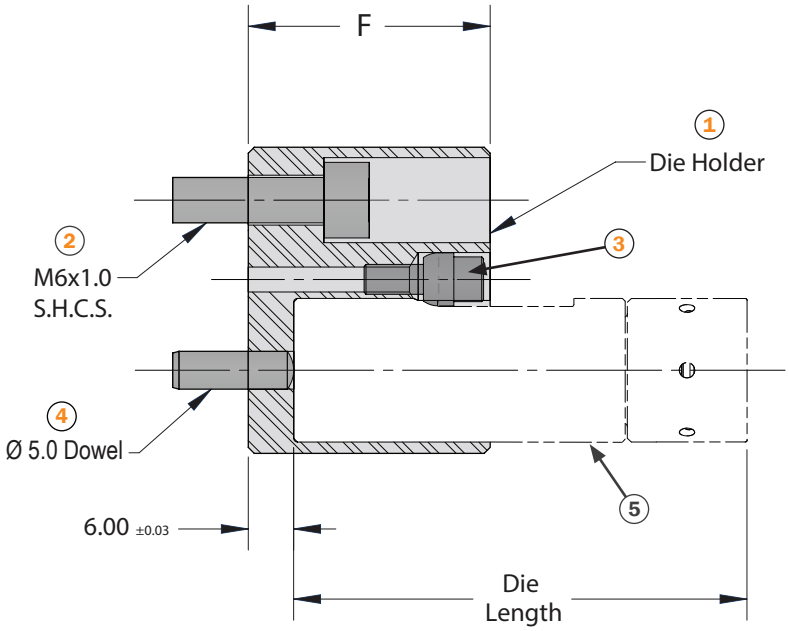


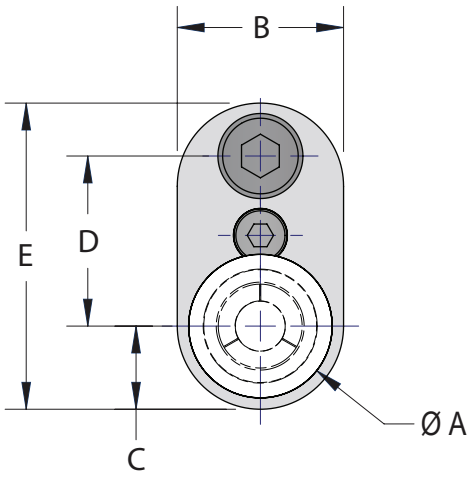
ASSEMBLY INCLUDES:

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

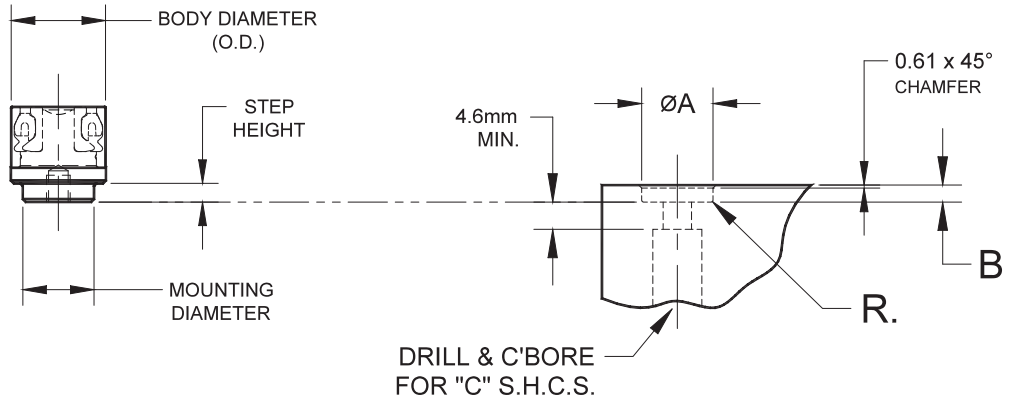
The location tolerance to the centerline of the die hole should be ±0.013mm.

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

BTM®

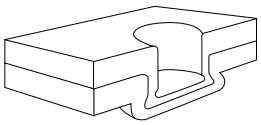
ALSO OFFERS THESE CLINCHING SOLUTIONS:

Tog-L-Loc®

www.btmcorp.com/tog-l-loc.html



Joint Cross-Section



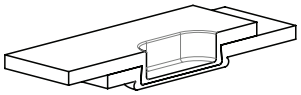
BTM's patented Tog-L-Loc® sheet metal joining system is the simple solution for fastening plain or coated sheet metals. Tog-L-Loc® forms a strong, leakproof "button" headed joint without welding or riveting in almost any combination of ductile sheet metals. The Tog-L-Loc® system is widely used in the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

Oval-Loc®

www.btmcorp.com/oval-loc.html



Joint Cross-Section



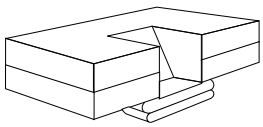
Oval-Loc® was born from the vision of combining our popular Tog-L-Loc® round clinch joint with the rotation resistance of our Lance-N-Loc™ sheet metal joining system. The Oval-Loc® process features the leak-proof and long tool life characteristics of a traditional Tog-L-Loc® joint, but also provides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

Lance-N-Loc®

www.btmcorp.com/lance-n-loc.html



Joint Cross-Section



Lance-N-Loc® 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® is good for joining harder materials, multiple layers, and is ideal for use where electrical conductivity is required.

BTM® KOREA

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

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.

Die Sets



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

Universal Presses



Universal presses easily adapt to join a variety of parts.

Special Fixtures



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

Specialized Units



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

Special Systems



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

Find more information online:

www.btmcomp.com/clinching-equipment.html

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

WWW.BTMKOREA.COM