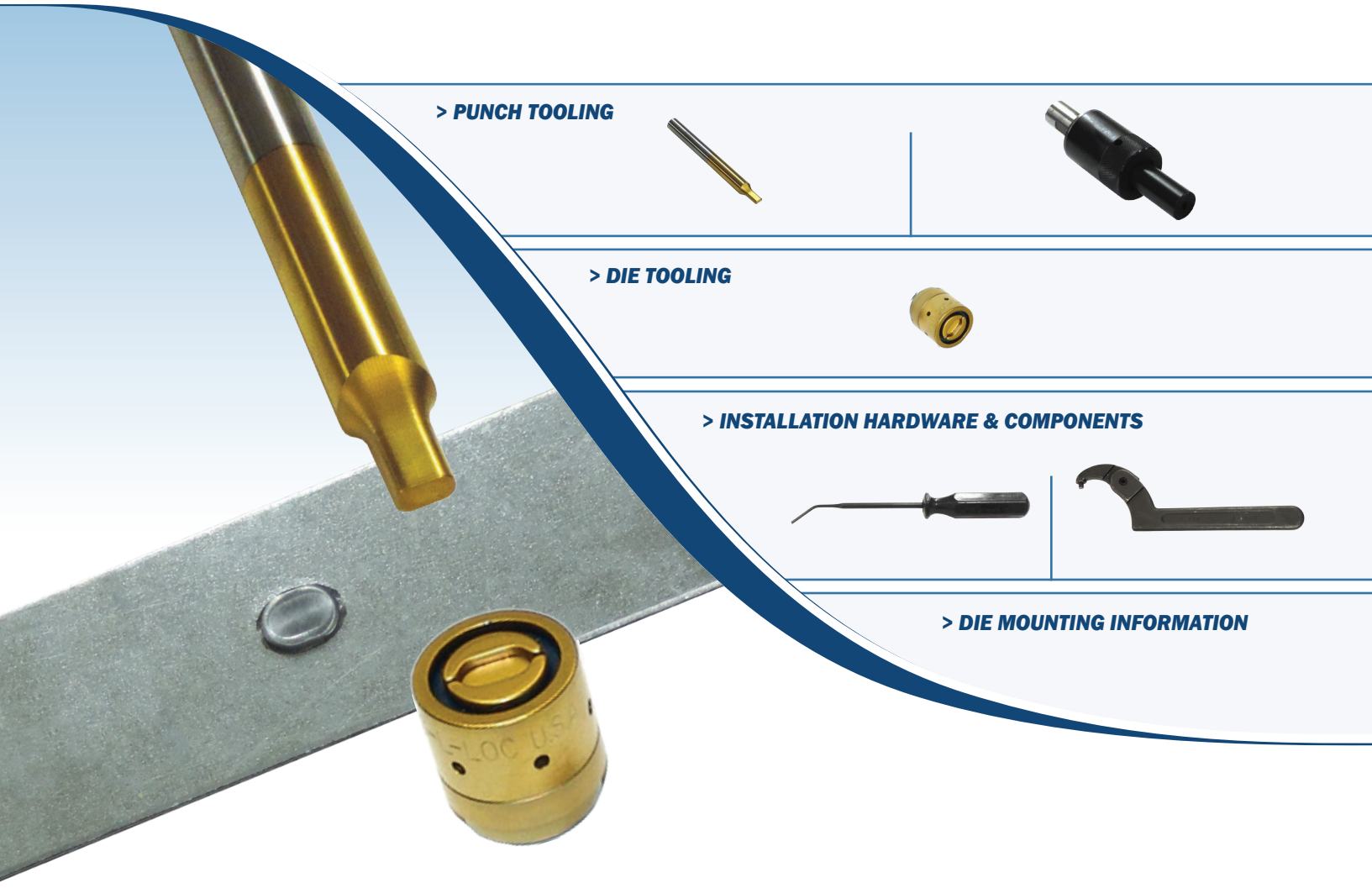
Oval-Loc® Clinch Tooling Catalog

Combining rotation resistance with leak-proof characteristics



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

www.btmcomp.com/oval-loc.html

BTM® KOREA

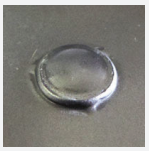
www.BTMKOREA.com

031-477-4202

LEARN MORE ONLINE:

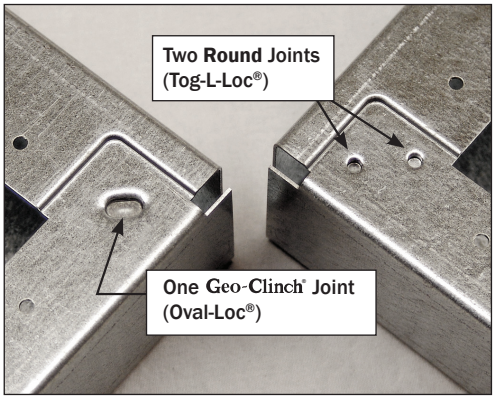
www.btmcomp.com/clinching-solutions.html

STANDARD CLINCHING SOLUTIONS

	ROUND JOINTS		Geo-Clinch® JOINTS	
	 Tog-L-Loc®	 V-Loc™	 Oval-Loc®	 Lance-N-Loc®
Ideal for joining:	Mild Steel	Aluminum	Mild Steel	Harder Metals
Leak-Proof	Yes	Yes	Yes	No
Single Joint Rotation Resistance?	No*	No*	Yes	Yes

ROUND JOINTS

Tog-L-Loc® and V-Loc™ clinch joints are the most widely used. These round clinch joints have very good strength across a broad spectrum of material combinations, are aesthetically pleasing and at low cost. V-Loc™ performs especially well when joining combinations of aluminum. BTM's round clinch joints are an economical solution to fastening sheet metal parts. However, round joints, while most popular, have the ability to rotate when used singularly, so BTM also offers Geo-Clinch® joints.



Geo-Clinch® JOINTS

BTM's Geo-Clinch® joints resist rotation, and also have the added benefit of increasing the rigidity of a sheet metal assembly.

Geo-Clinch® joints set the combined geometry of two separate parts in an assembly as required by GD&T. This makes Geo-Clinch® joints ideal for use in Geo-Set applications.

Oval-Loc® IS A Geo-Clinch® JOINT

Oval-Loc® was created from the vision of combining all of the advantages of 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.

! BTM reserves the right to make changes to its literature without any prior notice.
Go to www.btmcomp.com for latest version.

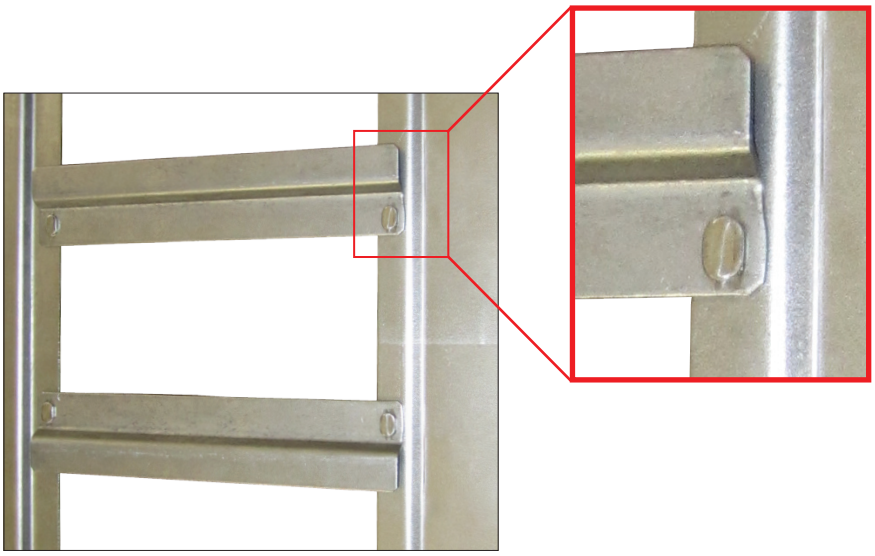
Now you can assemble your sheet metal parts with even less cost

using our innovative Oval-Loc® clinch tools which deliver the following advantages:

- **Parts with limited overlap area and requiring a non-rotating connection can be joined using a single Oval-Loc® punch and die**
- **Oval-Loc® offers tool life similar to Tog-L-Loc, is also leakproof, and keeps coatings intact.**
- **The non-round shape creates non-rotating rigidity and high strength with only one joint.**

This makes Oval-Loc® ideal for setting the orientation geometry or **"Geo-Clinching"** assembled parts.

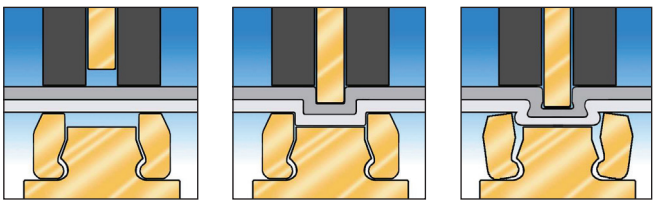
Now parts can be inexpensively "tacked" together to significantly reduce the cost of tooling for spot welding sheet metal assemblies by reducing the amount of clamps and gaging required during ongoing welding steps.



Contact our Application Engineering department for more information about using BTM products for reducing the cost of spot welded sheet metal assemblies.

HOW AN Oval-Loc® JOINT IS MADE

A typical Oval-Loc® joint may be created in a as little as one second. The process is very similar to Tog-L-Loc®:



Step 1: Clamp **Step 2: Draw** **Step 3: Lock**

Step 1: Clamps
The stripper clamps the materials to be joined.

Step 2: Draws
The punch draws the material into the die.

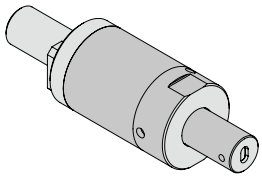
Step 3: Locks
As the material flows into the die, the sides of the die expand, allowing the material to flow into an interlock.

TO LEARN MORE ABOUT OVAL-LOC® VISIT OUR WEBSITE:

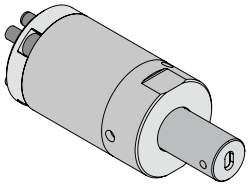
WWW.BTMCOMP.COM/OVAL-LOC.HTML

TERMINOLOGY

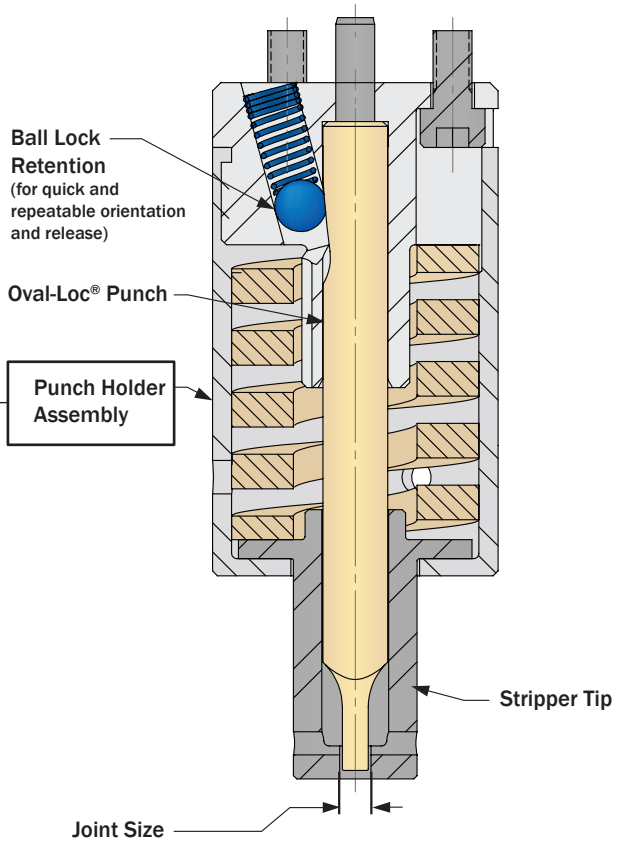
Punch Holder Assemblies

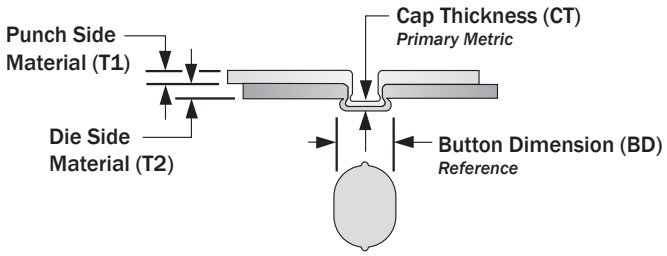


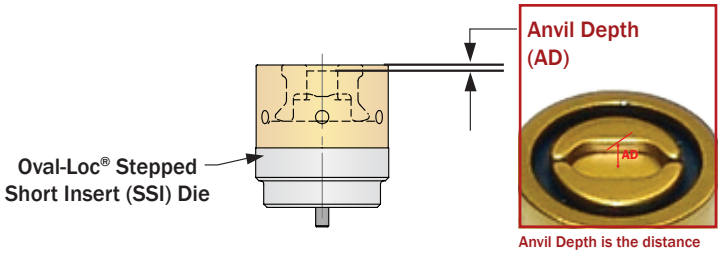
Shank Punch Holder



Die Set Punch Holder





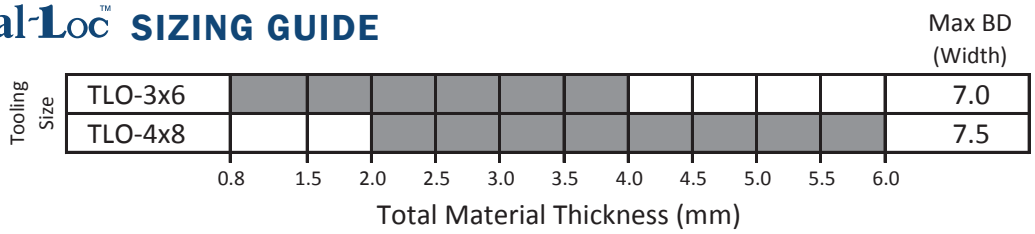


Anvil Depth is the distance from the lowest point of the anvil to the top of the die blades.

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.

Oval-Loc™ SIZING GUIDE



Minimum Single Layer Thickness 0.4mm

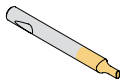
If material is not of equal thickness, it is preferred to have thick material on Punch Side, not to exceed 3:1.

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.

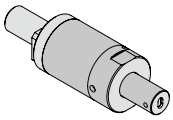
Upon completion of testing, you will receive a "Sample Process Sheet" which includes tooling and clinch parameters as well as Shear and Peel strength for the material combination as tested.

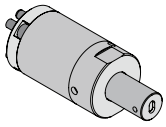
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940 SERIES STEPPED SHORT INSERT (SSI) DIES

3x6 11
4x8 11



INSTALLATION HARDWARE

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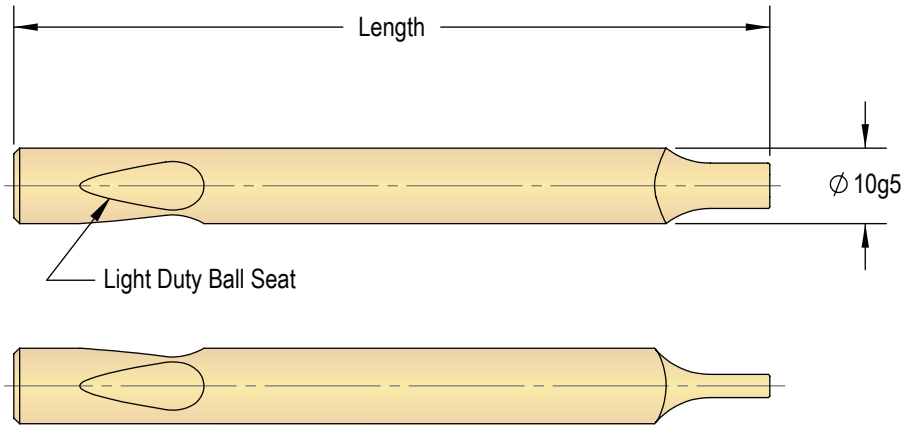
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STANDARD PUNCHES

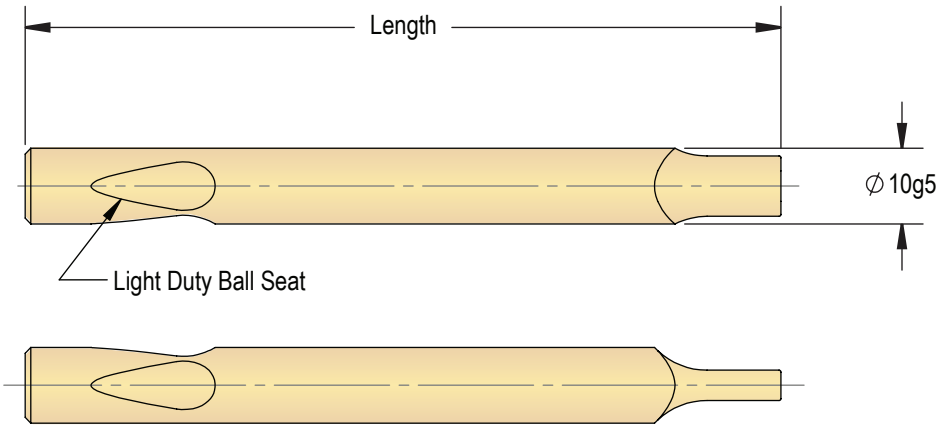
TLO-3X6

Length	BTM Number
100mm	PD275201G



TLO-4X8

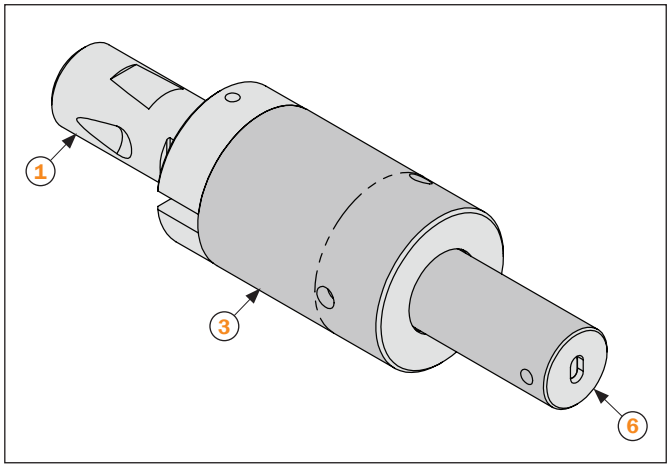
Length	BTM Number
100mm	PD267801G

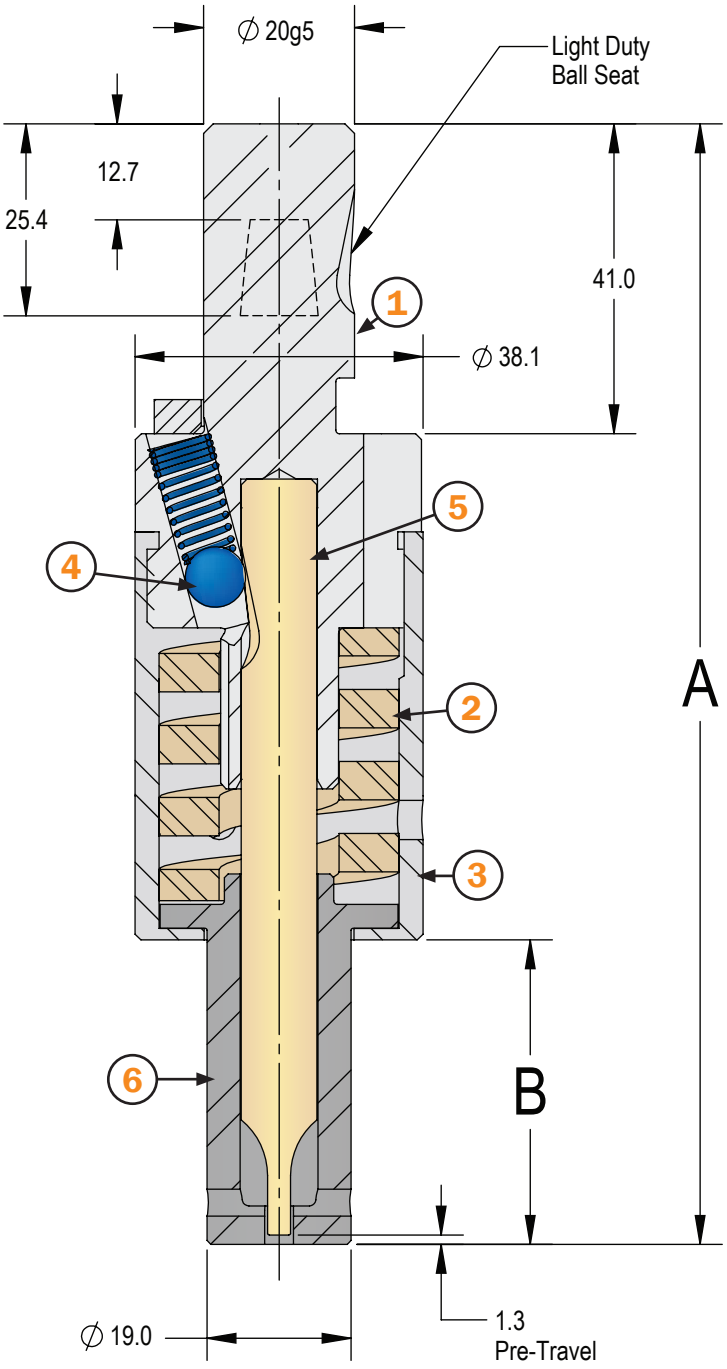


SS20 SHANK PUNCH HOLDER [METRIC]

ASSEMBLY INCLUDES:

1. (1) Punch Holder
2. (1) Stripper Spring
3. (1) Stripper Can
4. (1) Ball & Retaining Spring
5. (1) Oval-Loc® 3x6 Punch
6. (1) Stripper Tip





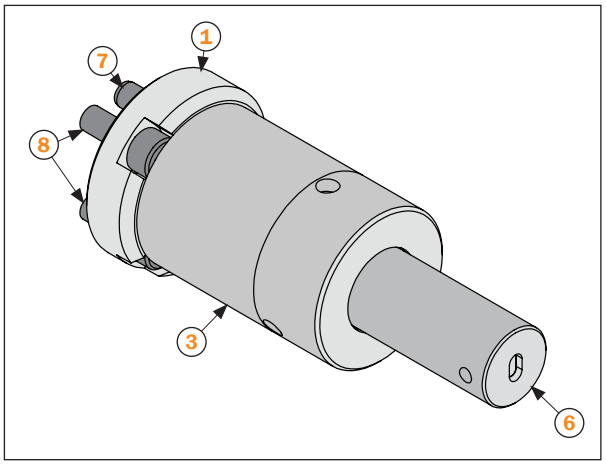
TLO-3X6

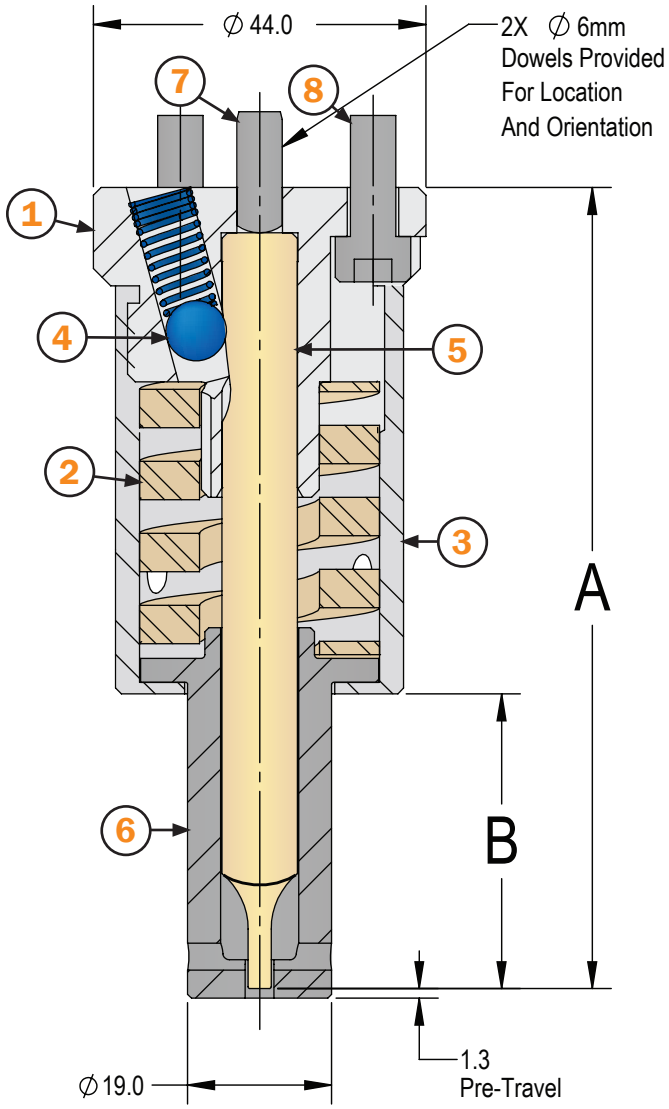
Punch Length	A	B	BTM Number
100	147	39	PD281000G

SS20 DIE SET PUNCH HOLDER

ASSEMBLY INCLUDES:

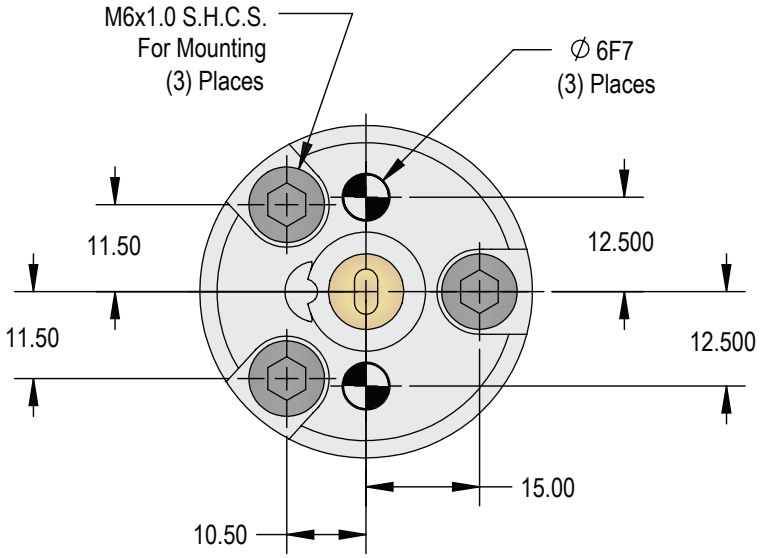
1. (1) Punch Holder
2. (1) Stripper Spring
3. (1) Stripper Can
4. (1) Ball & Retaining Spring
5. (1) Oval-Loc® 3x6 Punch
6. (1) Stripper Tip
7. (2) Dowel Pins
8. (3) Mounting Screws





TL0-3X6

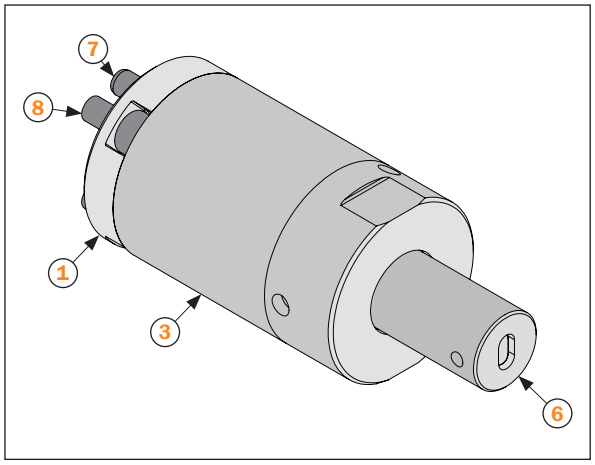
Punch Length	A	B	BTM Number
100	106	39	PD275200G

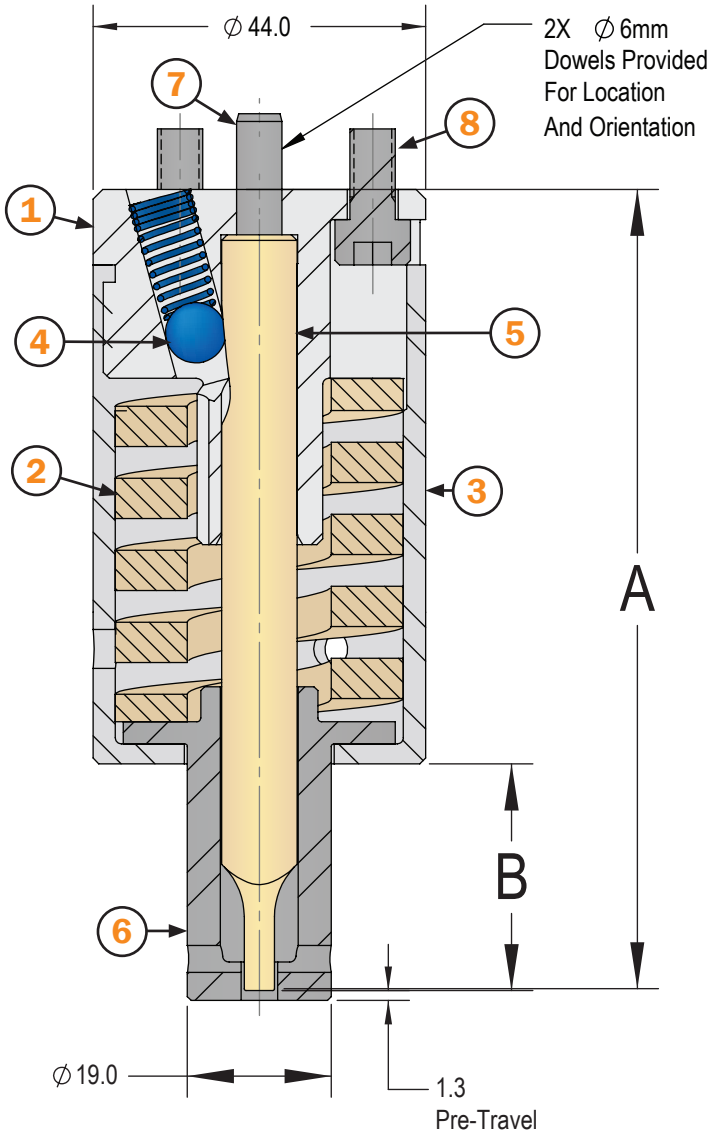


SS25 DIE SET PUNCH HOLDER

ASSEMBLY INCLUDES:

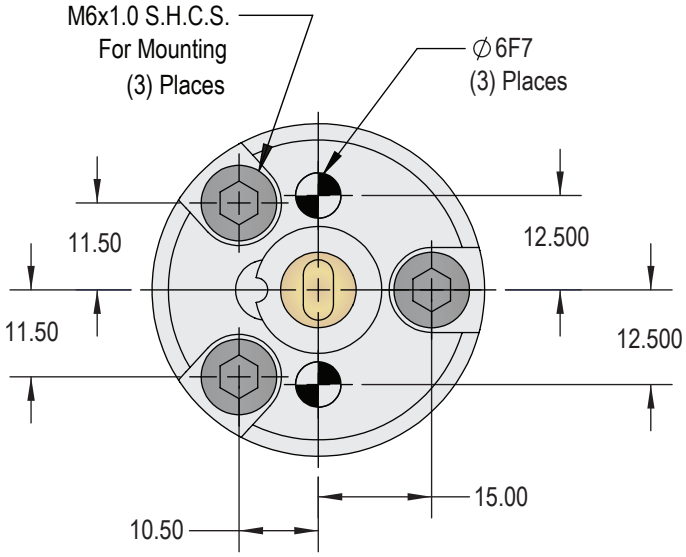
1. (1) Punch Holder
2. (1) Stripper Spring
3. (1) Stripper Can
4. (1) Ball & Retaining Spring
5. (1) Oval-Loc® 4x8 Punch
6. (1) Stripper Tip
7. (2) Dowel Pins
8. (3) Mounting Screws





TL0-4X8

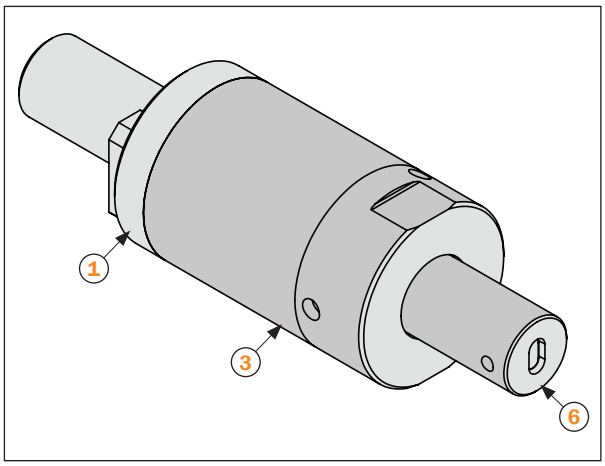
Punch Length	A	B	BTM Number
100	106	30	PD287700E

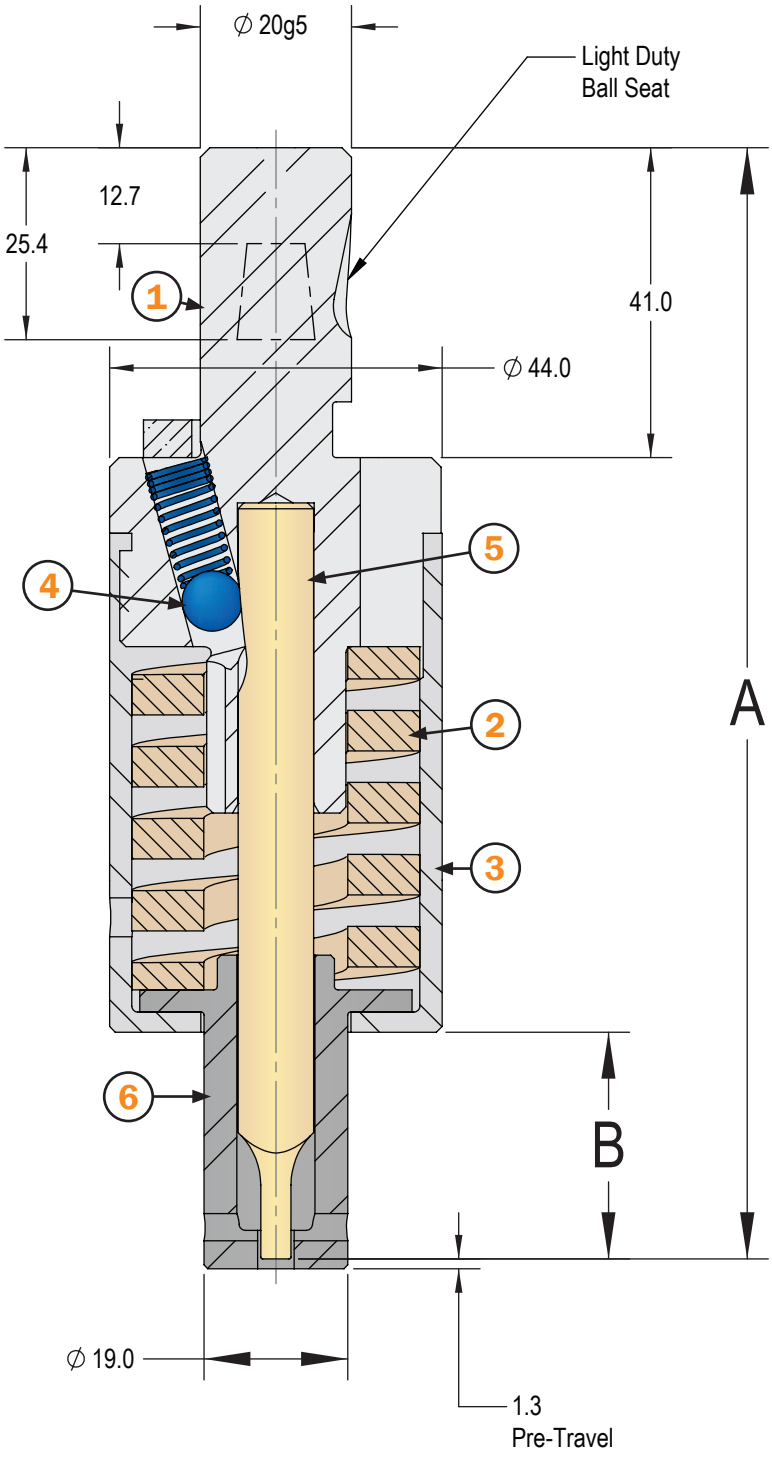


SS25 SHANK PUNCH HOLDER [METRIC]

ASSEMBLY INCLUDES:

1. (1) Punch Holder
2. (1) Stripper Spring
3. (1) Stripper Can
4. (1) Ball & Retaining Spring
5. (1) Oval-Loc® 4x8 Punch
6. (1) Stripper Tip



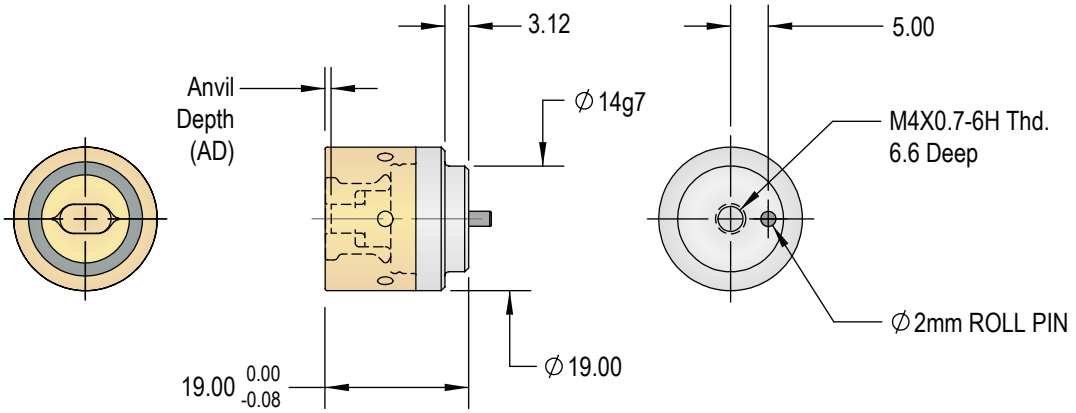


TLO-4X8

Punch Length	A	B	BTM Number
100	147	30	PD283700E

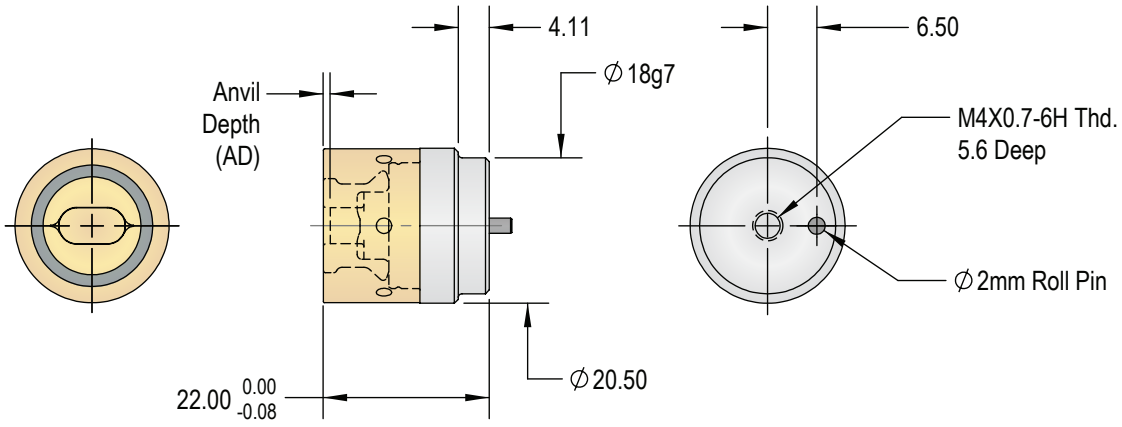
TLO-3X6
STEPPED SHORT INSERT (SSI) DIE

Anvil Depth	BTM Number
.020	PD275100BE
.025	PD275100CE
.030	PD275100DE
.035	PD275100EE
.040	PD275100FE
.045	PD275100GE
.050	PD275100HE
.055	PD275100JE
.060	PD275100KE

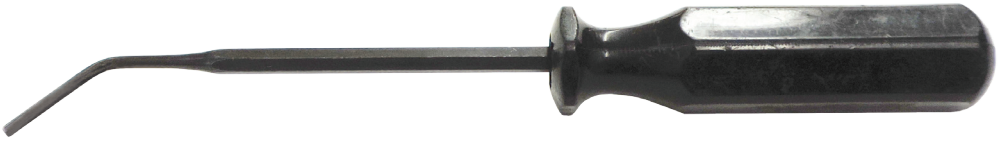


TLO-4X8
STEPPED SHORT INSERT (SSI) DIE

Anvil Depth	BTM Number
.020	PD272100BE
.025	PD272100CE
.030	PD272100DE
.035	PD272100EE
.040	PD272100FE
.045	PD272100GE
.050	PD272100HE
.055	PD272100JE
.060	PD272100KE



BALL LOCK RELEASE TOOL



The Ball Lock Release Tool is used to release a ball from a ball seat.

This tool may be used for both the punch holder assembly, and the punch.

BTM Number
044514

HOW TO USE A BALL LOCK RELEASE TOOL

Simply push the end of the tool onto the ball to release it from the ball seat.

► *USING A BALL LOCK RELEASE TOOL TO UNINSTALL A PUNCH HOLDER*





► *USING A BALL LOCK RELEASE TOOL TO UNINSTALL A PUNCH*



SEE IT IN ACTION!

WWW.BTMCOMP.COM/OVAL-LOC-SERVICE.HTML

SPANNER WRENCHES



STRIPPER CAN WRENCH

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

BTM Number
048749

STRIPPER TIP WRENCH

This tool is used to control stripper tip orientation at set-up and tool change.

BTM Number
053648

HOW TO USE THE SPANNER WRENCHES

Use the Stripper Can Wrench to tighten/loosen the stripper can, and the Stripper Tip Wrench to adjust alignment.



SEE THEM IN ACTION!

WWW.BTMCOMP.COM/OVAL-LOC-SERVICE.HTML

DIE MOUNTING INFORMATION

"940" Series Die Retention

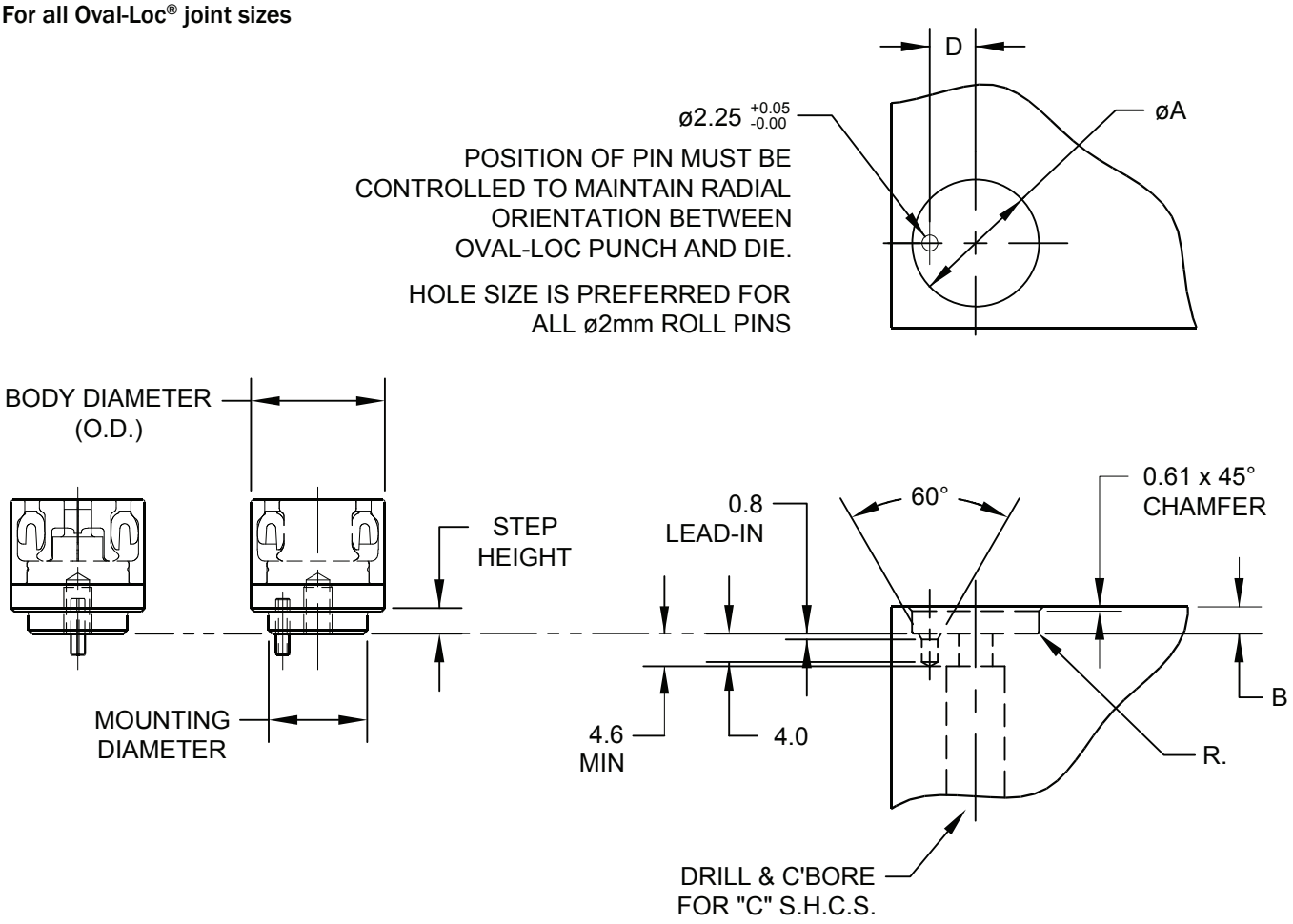
The location tolerance to the centerline of the die hole should be ±0.013mm.

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 Oval-Loc® joint sizes



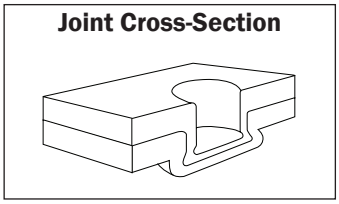
Tooling Size	A	B	C	D	R
3x6	Ø14H6	2.84 ±0.13	M4x0.7	5.000 ±0.013	R0.33 ±0.13
4x8	Ø18H6	3.84 ±0.13	M4x0.7	6.500 ±0.013	R0.33 ±0.13

ALSO OFFERS THESE CLINCHING SOLUTIONS:

Tog-L-Loc®

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

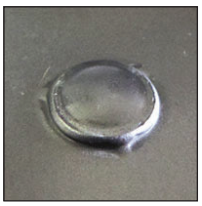


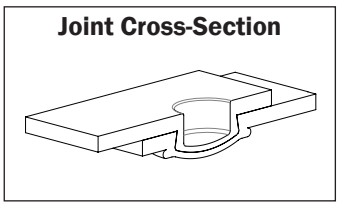


BTM's patented Tog-L-Loc® sheet metal joining system is the simple solution for fastening plain or coated sheet metals. Tog-L-Loc® forms a strong, leakproof "button" headed joint without welding or riveting in almost any combination of ductile sheet metals. The Tog-L-Loc® system is widely used in the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

V-Loc™

www.btmcomp.com/v-loc.html



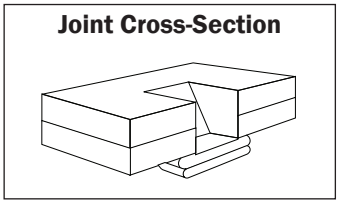


If you are joining Aluminum or your product requires a high-quality; visually pleasing appearance, consider the V-Loc™ clinch joint. V-Loc™ solves many of the challenges associated with joining todays light weight high strength aluminum alloys with or without adhesives. V-Loc™'s unique geometry improves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

Lance-N-Loc®

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





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.btmcorp.com/clinching-equipment.html

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

WWW.BTMKOREA.COM