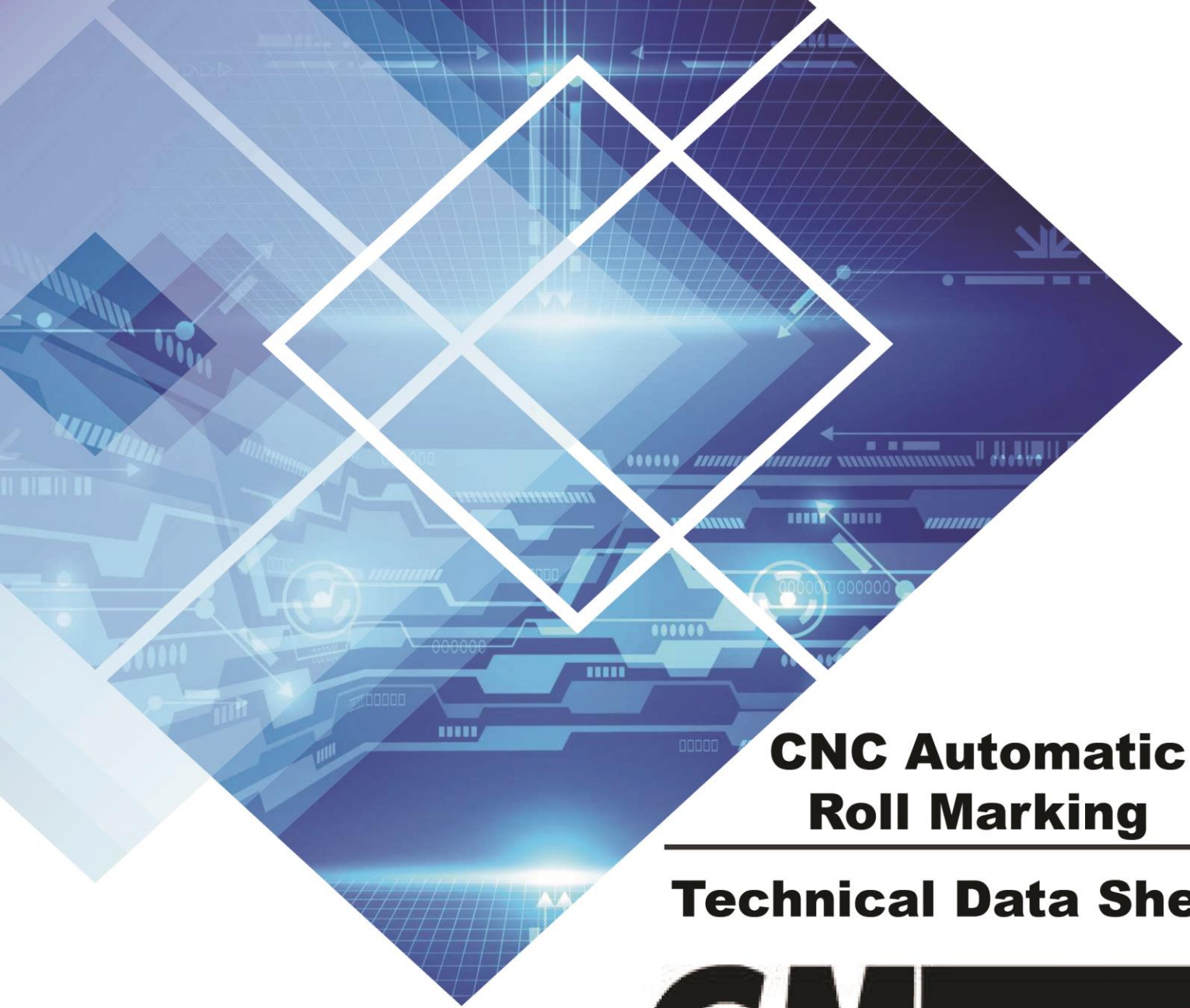




CNC Automatic Roll Marking

Technical Data Sheet

CMT COLUMBIA
MARKING
TOOLS



Table of Contents

Other Resources	2
CNC Automatic Roll Marking.....	3
Normal Tooling Mount – R800	5
R800 – Parts	7
Outside Tooling Mount – R900.....	8
R900 Parts	11
Roll Die – R500RD	13
Roll Die – R900RD	15
Roll Type Holder – RS500.....	17
RS500 – Parts.....	18
Roll Type – CMNS.....	19
Drawing.....	19
Standard Dimensions.....	20
How to Order Standard Stamps	20
Character Face Styles.....	22
Standard Sharp Face	22
Custom Dot Style	22
Starting Cam	23
How to Order Multi-character or Logo Dies	24
Multi-character Dimensions.....	25
Standard Font	26
Punctuation	27
Operational Instructions – R800-R900	28
How to add stamp inserts into the R-800/RSA500 holder	30

Other Resources

- [Overestimates of Character size](#)
- [Character Size Data](#)
- [Symbols](#)
- [Estimated Hammer Force](#)
- [Marking Pressure Chart](#)
- [Engraving Depth](#)
- [Character Size on Rounds](#)
- [Style of Fractions](#)



Our goal at Columbia Marking Tools is to engineer and manufacture high quality industrial marking machine tooling. CMT's CNC automated roll marking attachments are engineered to deliver precise, consistent marking while minimizing downtime, ensuring that each mark is accurately applied without sacrificing production speed. By automating the marking process, these tools help reduce operator intervention, lower the risk of errors, and increase overall throughput, ultimately improving the bottom line for our customers.



CNC Automatic Roll Marking

CMT's Automatic Roll Marking Attachments are designed to be seamlessly integrated into the primary metal forming processes of CNC machining centers. By combining operations, these attachments reduce part handling, minimize production time, and significantly increase throughput. This streamlined approach not only enhances efficiency but also ensures precise and reliable marking without interrupting the overall workflow.

- Combine marking and metal forming operations
- Reduce material handling
- Increase through-put and production rate.

The roll type attachments are used as interchangeable tooling in CNC lathe operations. The marking dies indent the OD of the material to provide the identification required.





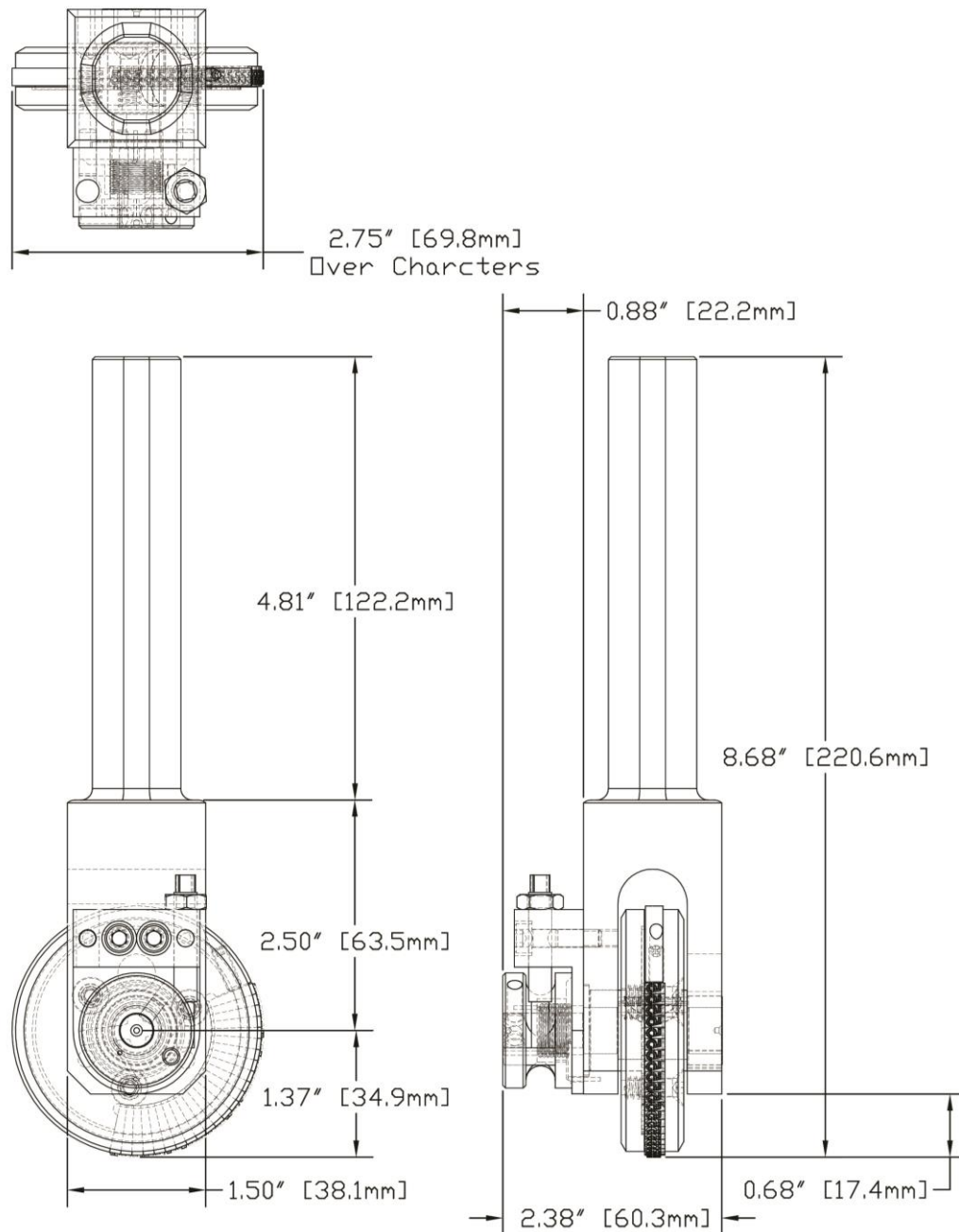
CNC automated roll marking attachments are offered in two styles:

1. **Normal Die Mount** – R800 Roll type attachment standard with options for mounting style, rotation, and marking dies or type.
2. **Outside Die Mount** – R900 Roll type attachment for marking nearest the machine collet face with options for mounting style, rotation, and marking dies or type.

Normal Tooling Mount – R800



Part Number	Shank Style
R80075	.75" [19.05mm] Round
R80075S	.75" [19.05mm] Square
R800100	1.00" [25.4mm] Round
R800100S	1.00" [25.4mm] Square
R800125	1.25" [31.75mm] Round
R800125S	1.25" [31.75mm] Square
R800150	1.50" [38.1mm] Round
R800150S	1.50" [38.1mm] Square



Note:

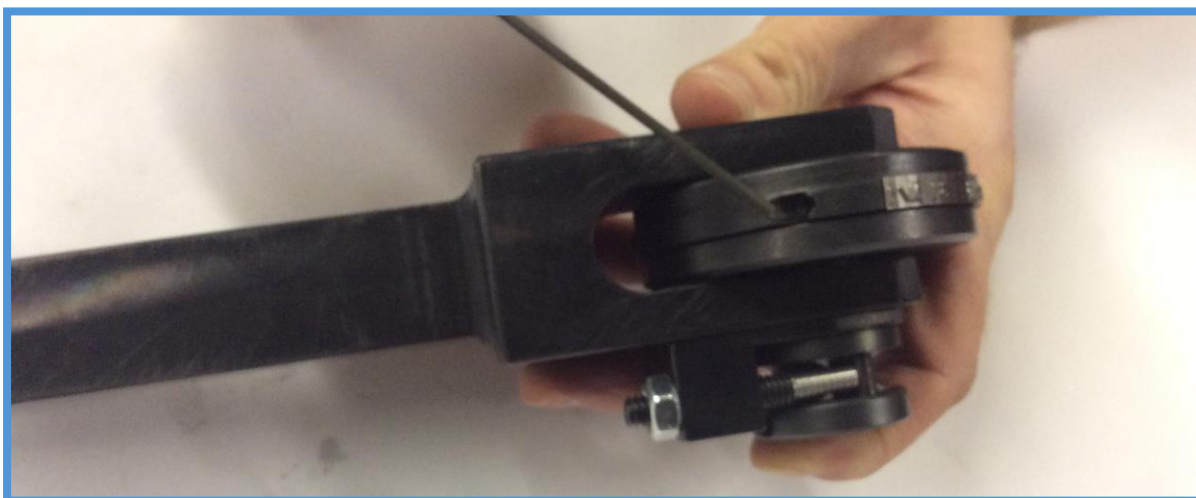
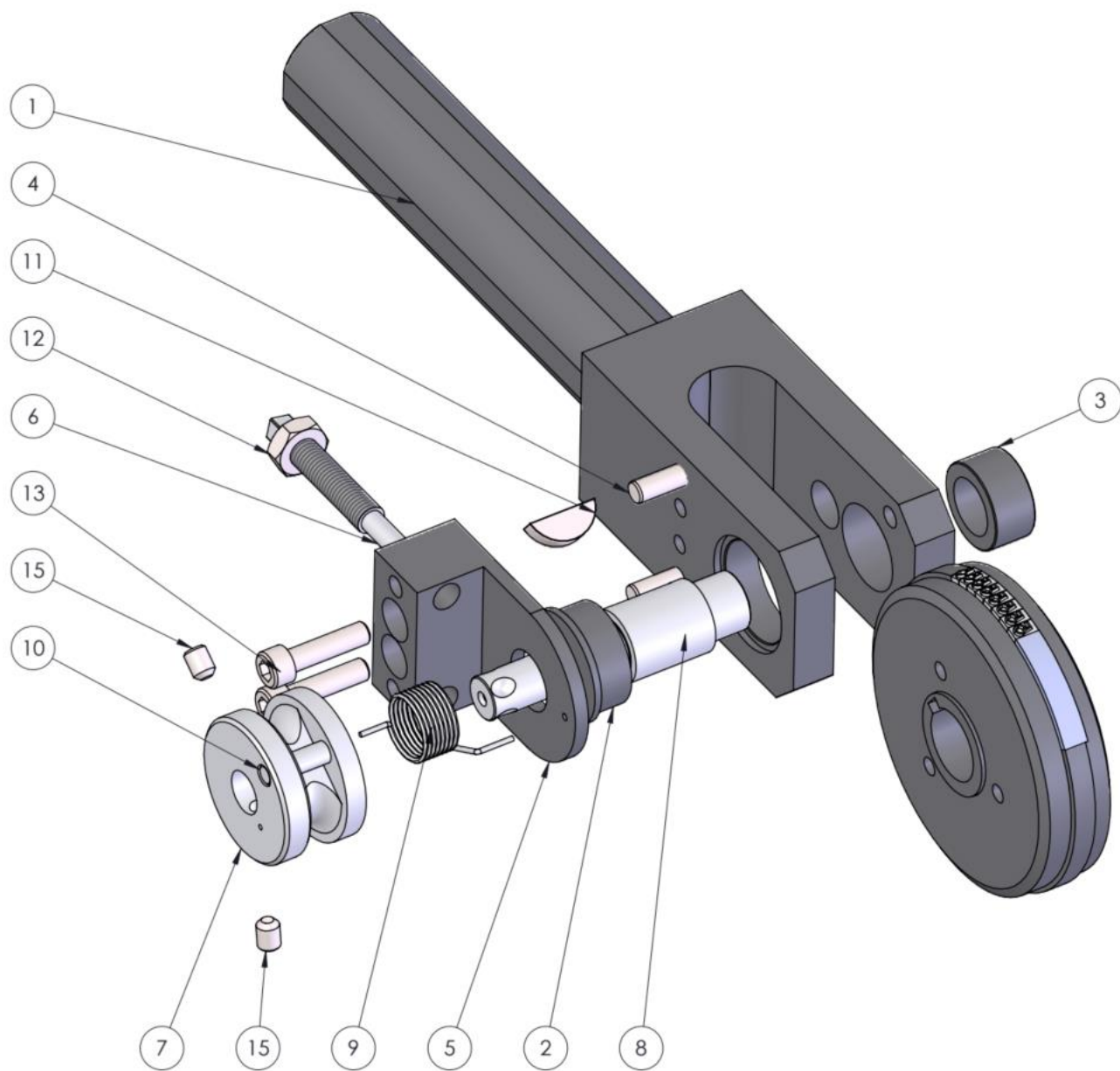
- Normal setup is for clockwise rotation and uses LH wound spring (det 9). Counterclockwise rotation would use RH wound spring (det 9RH) and move adjusting screw to opposite size.
- Shank size and shape is per specified size on part order chart
- Roll type holder or 1 piece die sold separately

R800 – Parts

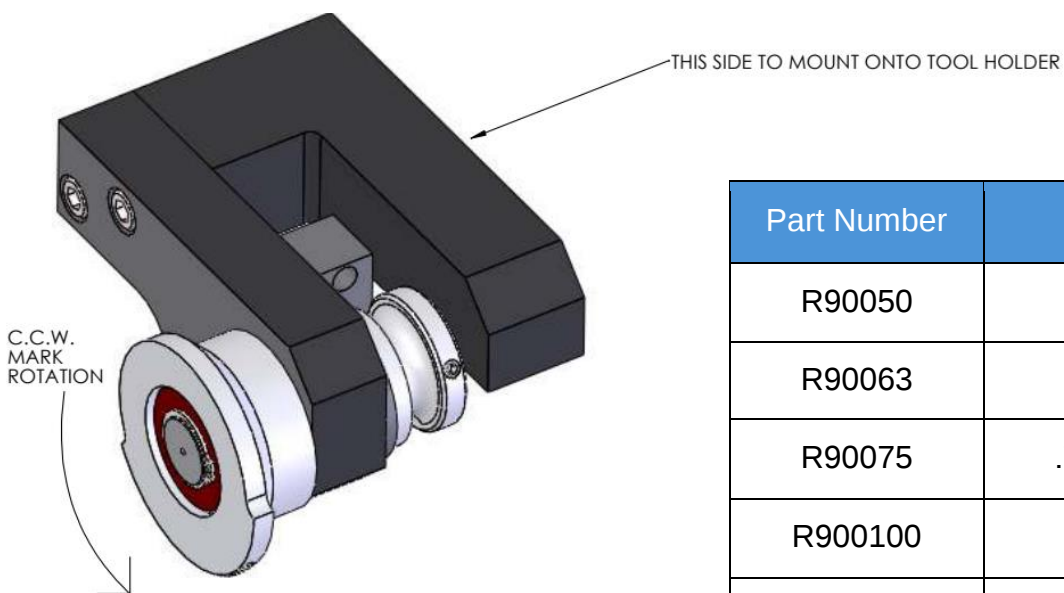
Detail #	Description	Qty
1	Frame	1
2	Bearing 1	1
3	Bearing 2	1
4	Dowel	2
5	Plate	1
6	Adjusting Screw	1
7	Retainer (sold with detail 10)	1
8	Shaft	1
9	Return Spring LH - Standard	1
9RH	Return Spring RH	Optional
10	Pin (sold with detail 7)	1
11	Woodruff Key	1
12	Hex Jam Nut	1
13	Socket Head Cap Screw	2
14	RS500 Holder and Type or R500RD Roll Die	Sold Separately
15	Set screw	2

Suggested spare parts:

- Detail 9 Return Spring – standard is left hand
- Detail 2 Bearing 1 – most commonly replaced
- Detail 11 Woodruff Key
- Detail 12 Hex Jam Nut
- Die or Type needed for marking



Outside Tooling Mount – R900

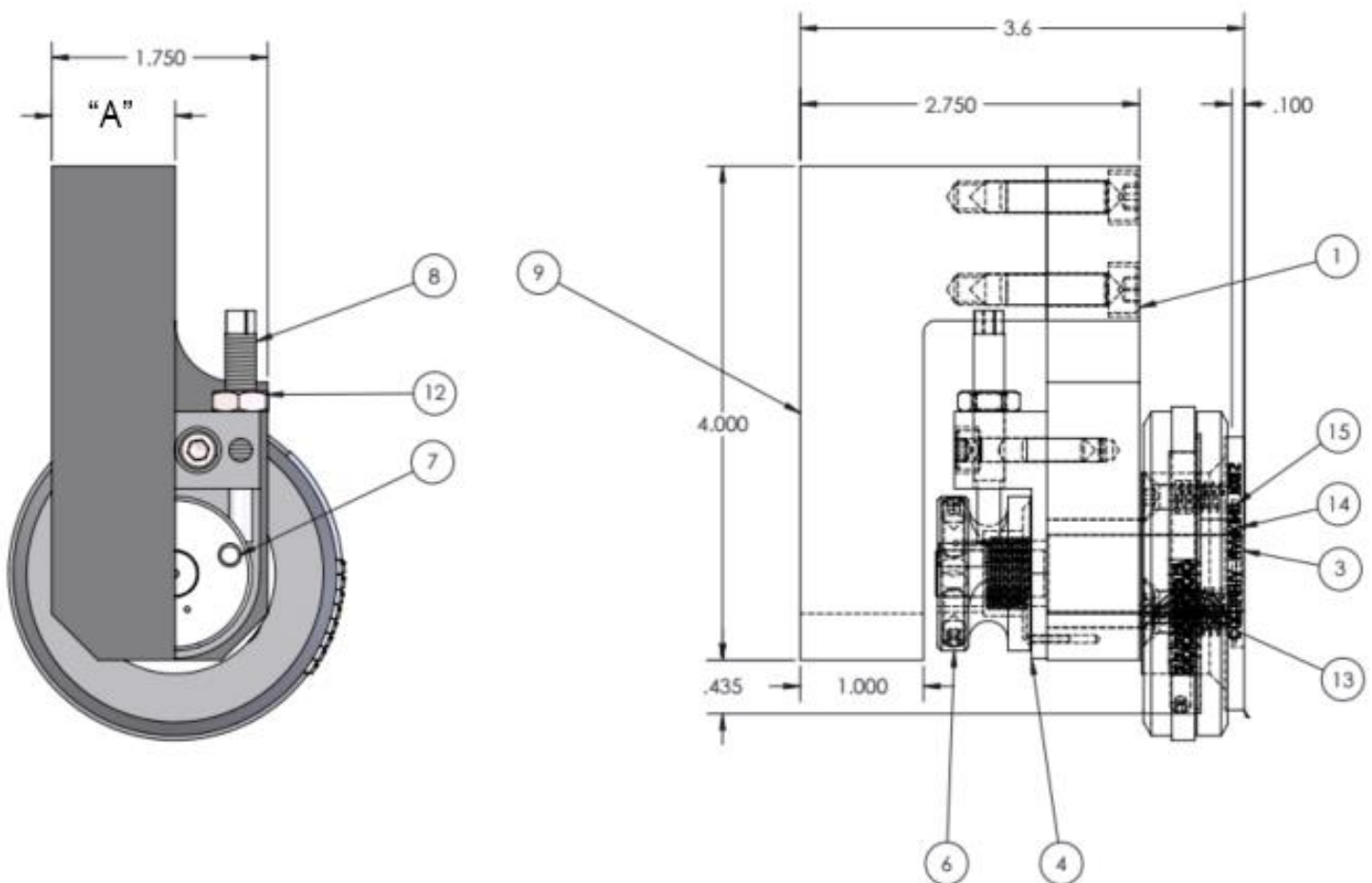


Shown as mounted in a left-hand tool holder.

Part Number	Shank Size A
R90050	.50" [12.7mm]
R90063	.63" [16.1mm]
R90075	.75" [19.05mm]
R900100	1.00" [25.4mm]
R900125S	1.25" [31.75mm]
R900150	1.50" [38.1mm]

The R900 outer die mount automatic roll marking attachment is best for marking as close to the collet as possible. Options include:

- Standard rotation counterclockwise with LH spring. All units are set up in this motion, with the RH spring included in the package
- Selection of shank dimensions: $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ", 1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ "
- The R900 may be used with three tooling options
 - [R900RD](#) unique roll die for marking in recesses
 - [R500RD](#) standard roll die design
 - [RS500](#) Holder and type for use with variable marking information

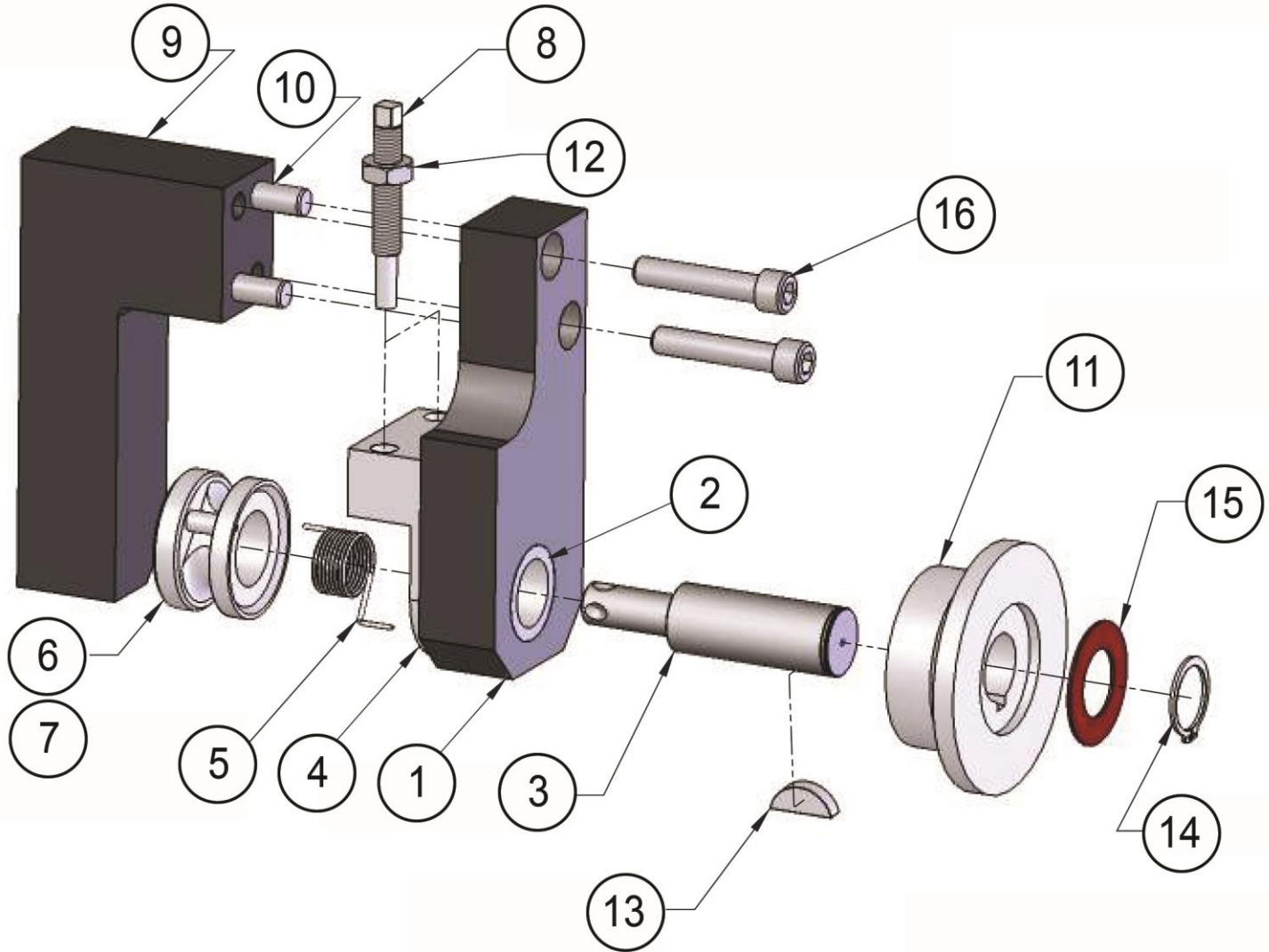


R900 Parts

Detail #	Description	Qty
1	Frame	1
2	Bearing	1
3	Shaft	1
4	Plate	1
5	Spring LH	1
5RH	Spring RH	Optional
6	Retainer (sold with Detail 7)	1
7	Pin (sold with Detail 6)	1
8	Adjusting Screw	1
9	CNC Mounting Shank	1
10	Dowel	2
11	Roll Die	Sold Separately
12	Hex Jam Nut	1
13	Woodruff Key	1
14	Tru Arc	1
15	Thrust Washer	1
16	Shank Mounting Bolts	2

Suggested spare parts:

- Detail 5 Return Spring – standard is left hand
- Detail 2 Bearing
- Detail 13 Woodruff Key
- Detail 12 Hex Jam Nut
- Die or Type needed for marking



Helpful Setup suggestions

- On CNC lathes often the tool to part distance is programmable and thus should be treated like a typical knurl or other lathe tool.
- The slowest speed is recommended however many operators increase speed as they become more familiar with the tool and material they are marking.
- The closer to the cam you start to the lettering, the less pressure you will exert between the roll and the piece you are marking, the shallower the impression depth. The closer to the beginning of the cam you start, further from the lettering, the more pressure you exert between the roll and the piece you are marking, therefore giving you a deeper impression.

Roll Die – R500RD



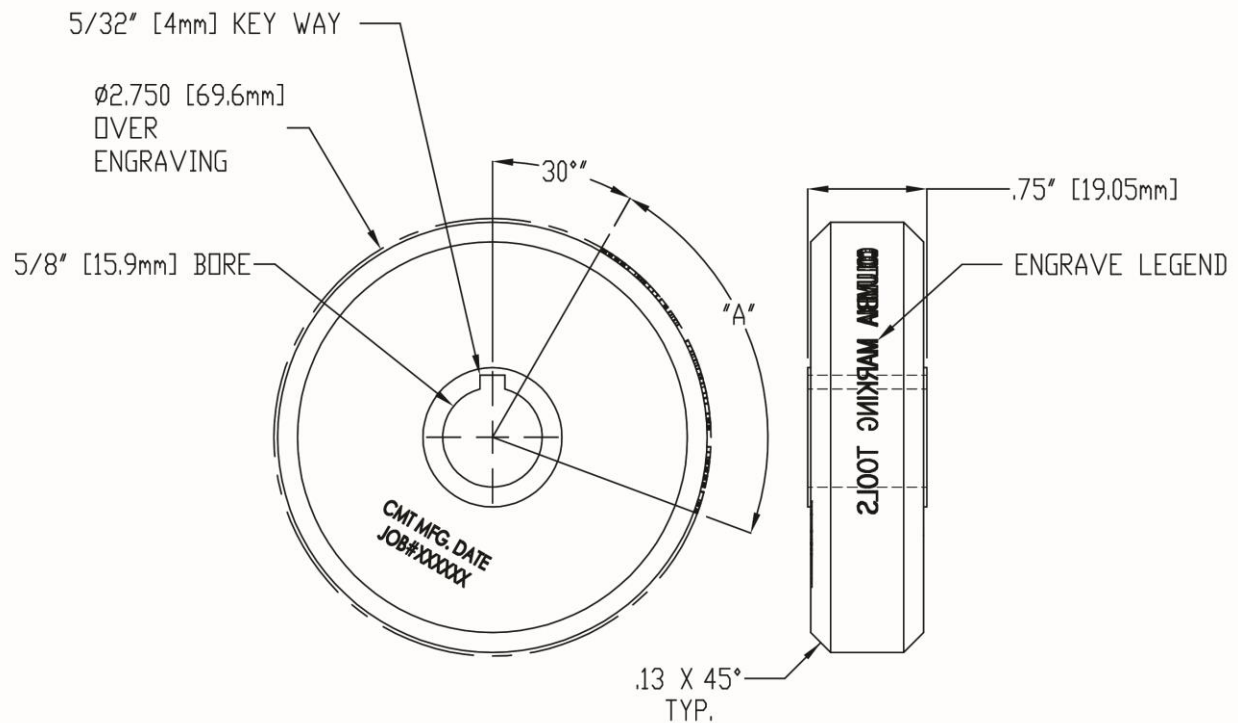
The R500RD roll die may be used with either the R800 or R900 automatic roll attachments. There are three types of marking legends that may be engraved on this die:

- 1) A single line of alpha/numeric characters
- 2) Two or more lines of characters
- 3) Logos and/or characters

When requesting a quotation please provide exact reading details including: characters size, alignment, and spacing requirements.

Technical Specifications:

- Double pass engraved (NOT EDM)
- W-1 Tool Steel
- 45 Degree engraving angle
- Sharp face character
- Gothic standard (San Serif) font
- Heat treated to 57-59 Rc
- Deburred
- Acc Coating for long life



Marking Legend Length

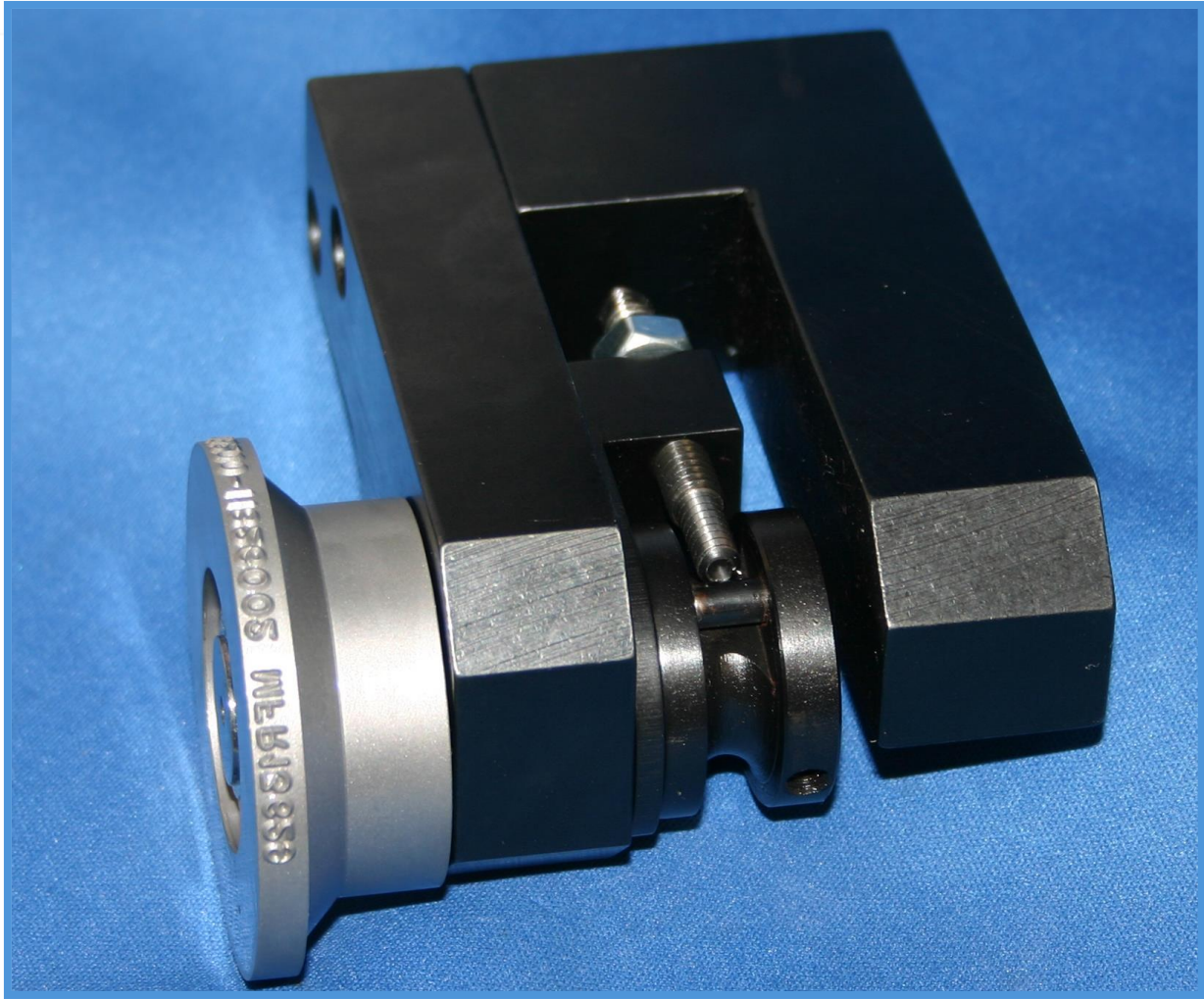
The marking legend length provided in the chart is for the **OPTIMUM** return spring life. CMT strongly recommends a marking legend of 3.5" [88.9mm] or shorter for the best tooling design.

CMT understands that sometimes requirements for applications exceed the recommended length. Please note that the longer marking legends will require more maintenance, and spare parts.

- 4.5" [114.3mm] – 20% reduction in spring life
- 5.5" [139.7mm] – 40% reduction in spring life

Char. Size	Catalog Number	Max Characters	Engraving Depth
1/16" 1.6mm	R500RD06	52	.018" .5mm
3/32" 2.4mm	R500RD09	40	.020" .5mm
1/8" 3.2mm	R500RD13	32	.023" .6mm
5/32" 4mm	R500RD16	27	.025" .6mm
3/16" 4.8mm	R500RD19	24	.025" .6mm
1/4" 6.3mm	R500RD25	18	.030" .8mm

Roll Die – R900RD

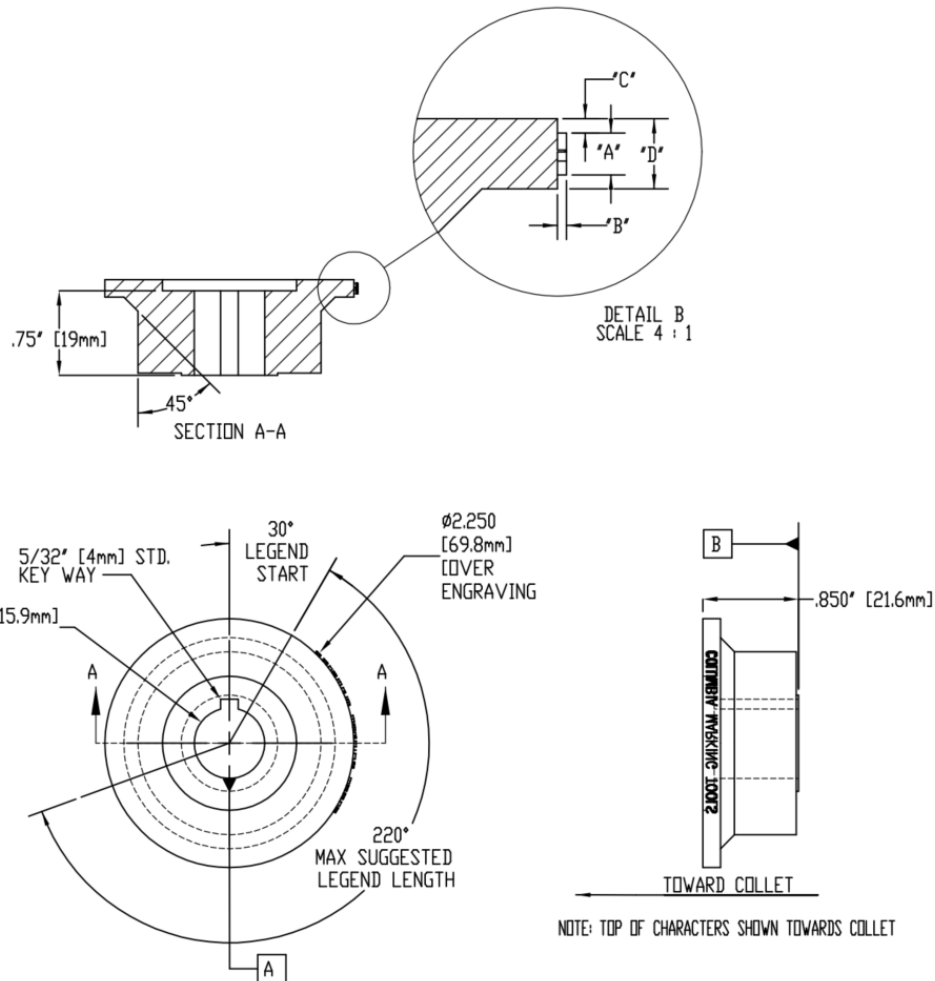


The R900RD is designed for use with the R900 outer die mount to allow for the closest mark to the machine collet.

The R900 roll die is offered in a choice of character sizes. Customizations include: additional bevel, character orientation and clearance.

Technical Specifications:

- Double pass engraved (NOT EDM)
- W-1 Tool Steel
- 45 Degree engraving angle
- Sharp face character
- Gothic standard (San Serif) font
- Heat treated to 57-59 Rc
- Deburred
- Acc Coating for long life



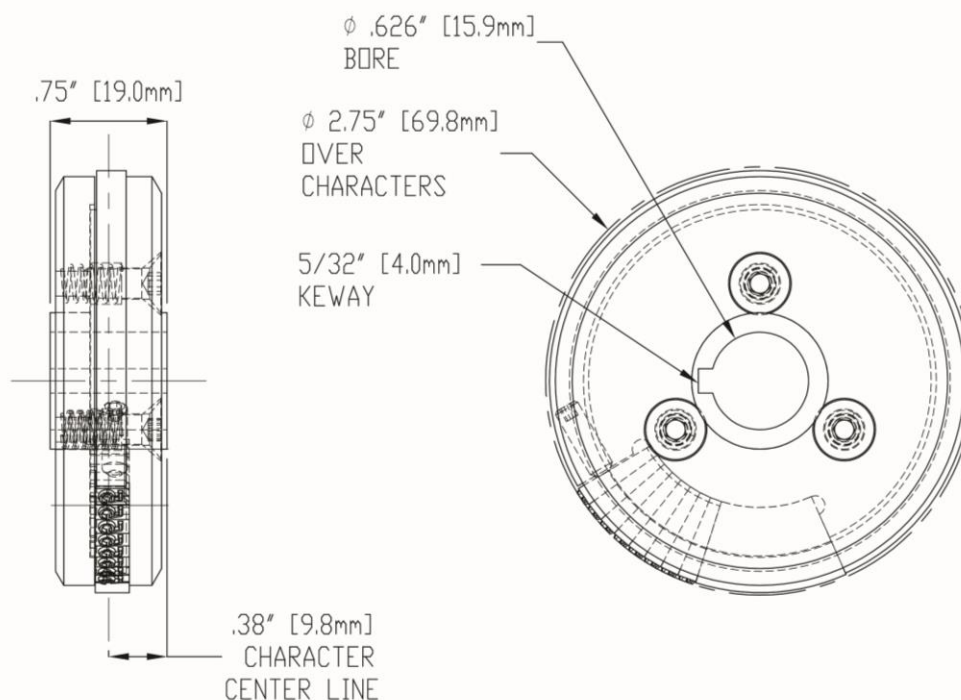
Char. Size "A"	Catalog Number	Max Characters	Engraving Depth "B"	C	D
1/16" 1.6mm	R900RD06	64	.018" .5mm	.032" .8mm	.125" 3.2mm
3/32" 2.4mm	R900RD09	50	.020" .5mm	.032" .8mm	.156" 4mm
1/8" 3.2mm	R900RD13	40	.023" .6mm	.032" .8mm	.188" 4.8mm
5/32" 4mm	R900RD16	34	.025" .6mm	.032" .8mm	.234" 5.9mm
3/16" 4.8mm	R900RD19	30	.025" .6mm	.039" 1.0mm	.250" 6.35mm

- Legend length based on optimal spring wear – 220 degrees, 4.31"
- Standard character orientation is the top of the characters toward the collet.
- R900RD is the best for marking as close to the collet as possible.

Roll Type Holder – RS500

The RS500 holders may be used either the R800 or R900 automatic roll marking attachments.

Catalog Number	Pocket Width	Char. Size	Max .Characters	Stamp#
RSA50020	2.00" [50.8mm]	1/16" [1.6mm]	32	CMNS06
		3/32" [2.4mm]	21	CMNS09
		1/8" [3.2mm]	16	CMNS13
RSA50030	3.00" [76.2mm]	1/16" [1.6mm]	48	CMNS06
		3/32" [2.4mm]	32	CMNS09
		1/8" [3.2mm]	24	CMNS13
RSB50020	2.00" [50.8mm]	5/32" [4mm]	12	CMNS16
		3/16" [4.8mm]	10	CMNS19
RSB50030	3.00" [76.2mm]	5/32" [4mm]	19	CMNS16
		3/16" [4.8mm]	16	CMNS19
RSC50020	2.00" [50.8mm]	1/4" [6.3mm]	8	CMNS25
RSC50030	3.00" [76.2mm]	1/4" [6.3mm]	12	CMNS25

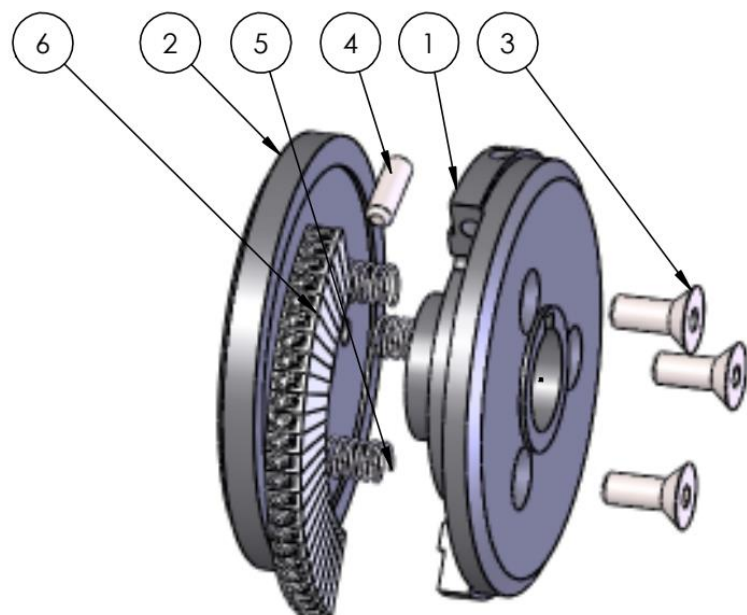


RS500 – Parts

Detail #	Description	Qty
RSA5002D01 RSA5003D01 RSB5002D01 RSB5003D01 RSC5002D01 RSC5003D01	Hub	1
RSA5002D02 RSA5003D02 RSB5002D02 RSB5003D02 RSC5002D02 RSC5003D02	Cover Plate	1
RS500D03	Flat Head screw	3
RS500D04	Flat Point	1
RS500D05	Spring	1
6	CMNS inserts sold separately	Varies

Notes:

- Details 1,2 and 6 are per holder configuration
 - For detail 1 or 2, please use the prefix that matches your required holder configuration
- Details 3,4, and 5 are all the same for all holders, and are the recommend spare parts.

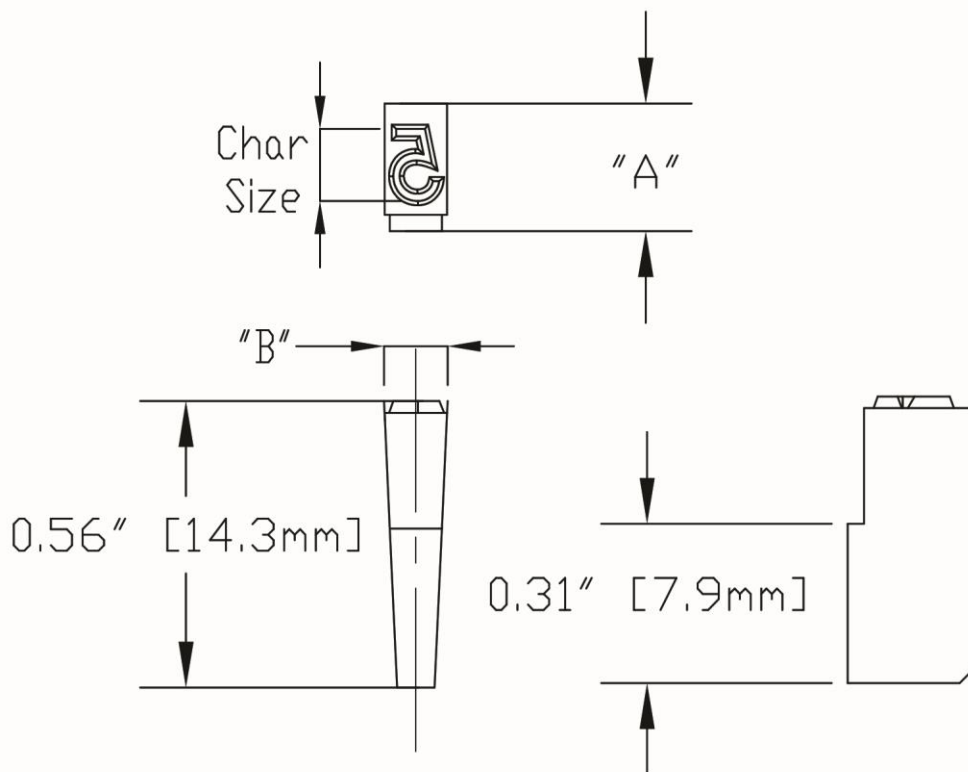


Roll Type – CMNS



The CMNS – wedge type is used in the RS500 holders. The CMNS wedge type are made in the USA with a double pass engraving for quality, clarity of mark, and longevity of the tool.

Drawing



A = Height

B = Width

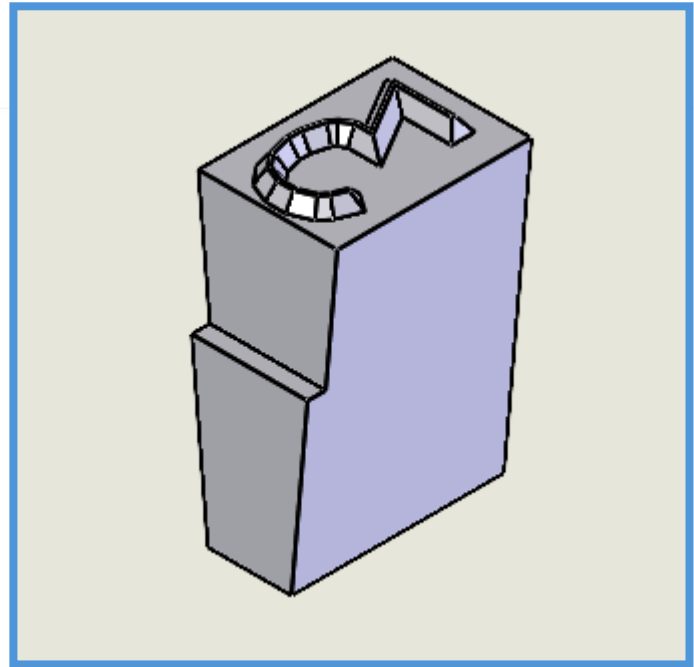
Char Size –
Measured from
the top of the
character.

Char Width –
Style 2A, width is
50% of the
character size.

Tolerance -
+.000\"/>

Technical Specifications:

- Double pass engraved (NOT EDM)
- W-1 Tool Steel
- 45 Degree engraving angle
- Sharp face character
- Gothic standard (San Serif) font
- Heat treated to 57-59 Rc
- Deburred
- Acc Coating for long life



The 1/16", 3/32" and 1/8" characters all fit in the RSA500 holders. These characters are interchangeable.

The 5/32" and 3/16" characters fit in the RSB500 holders

The 1/4" characters fit in the RSC500 holders.

Standard Dimensions

Char. Size	Catalog Number	"A"	"B"	Engraving Depth
1/16" 1.6mm	CMNS06	1/16" 1.6mm	1/4" 6.3mm	.018" .5mm
3/32" 2.4mm	CMNS09	3/32" 2.4mm	1/4" 6.3mm	.020" .5mm
1/8" 3.2mm	CMNS13	1/8" 3.2mm	1/4" 6.3mm	.023" .6mm
5/32" 4mm	CMNS16	3/16" 4.8mm	5/16" 7.9mm	.025" .6mm
3/16" 4.8mm	CMNS19	3/16" 4.8mm	5/16" 7.9mm	.025" .6mm
1/4" 6.3mm	CMNS25	1/4" 6.3mm	3/8" 9.5mm	.025" .6mm



How to Order Standard Stamps

Build catalog number as shown.

- 1) Start with the basic model/stamp style.
- 2) Add the 2-digit character size notation.
- 3) Finish with the reading, alpha-numeric characters, punctuation codes, or Symbol numbers. Some symbols may require a double sized insert.

To order individual **LETTERS** and **FIGURES** add suffix of actual letter or figure to part number

CMNS	09	-A
Style	Char Size	Letter or Figure

To order **BLANK SPACERS** add suffix of "-00" to part number

CMNS	13	-00
Style	Char Size	Blank Spacer

To order **PUNCTUATION** add suffix from [table](#) to part number

CMNS	25	-RR
Style	Char Size	Asterisk Suffix

2 Digit Character Size

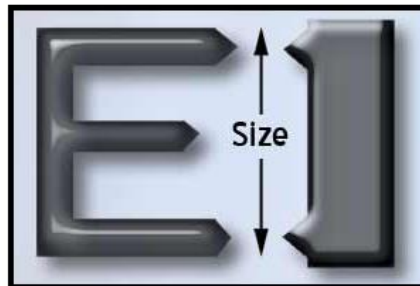
- 1/32" – 03
- 1/16" – 06
- 3/32" – 09
- 1/8" – 13
- 5/32" – 16
- 3/16" – 19
- 1/4" – 25
- 5/16" – 31
- 3/8" – 38
- 1/2" – 50



Character Face Styles

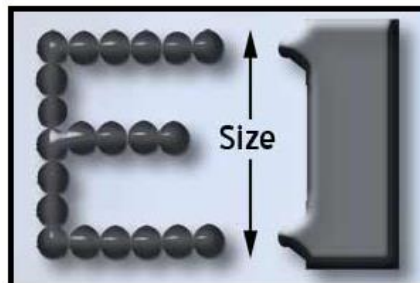
Standard Sharp Face

Standard CMF Flat Stamps are engraved as sharp face characters. This type of face style is engraved with a sharp edge. A sharp face tool penetrates more easily than flat face style.



Custom Dot Style

Dot Style Characters are engraved with a series of conical dots for the lowest possible stress when marking. Recommended for high pressure fittings, aircraft, and other parts where sharp tools might disrupt the molecular structure of the metal.



To order individual **DOT STYLE** letters and figures add DOT notation to part number as shown.

CMNS	09	DOT	-A
Style	Char Size	Dot-Style Notation	Letter or Figure

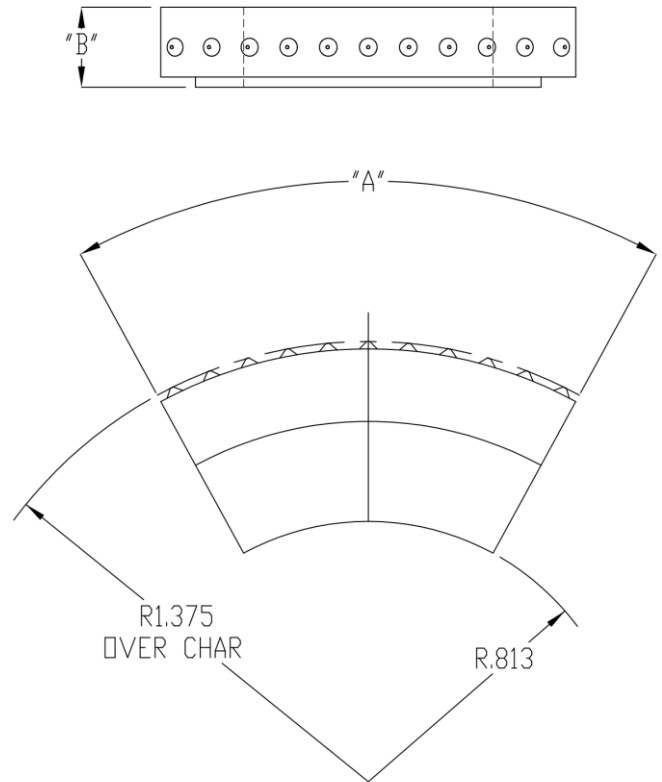
Starting Cam

A starting cam may be required for some CNC roll marking operations. The purpose of the starting cam is to provide a “ramp” into the marking legend and extend the life of the marking dies. The carry dots take the first impact of the marking legend.

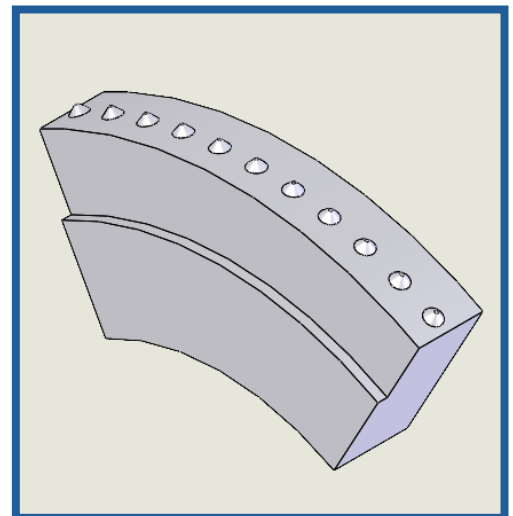
CMT suggest about a 3/4” [19mm] length for the starting cam. Longer and shorter length are available.

SCMNSAACBSC

Where **AA** is the 2-digit character size denotation, and **B** is the number of spaces or carry dots required.



Char. Size	Catalog Number	“A”	“B”	Engraving Depth
1/16” 1.6mm	SCMNS06C12SC	3/4” 19mm	1/4” 6.3mm	.018” .5mm
3/32” 2.4mm	SCMNS09C8SC	3/4” 19mm	1/4” 6.3mm	.020” .5mm
1/8” 3.2mm	SCMNS13C6SC	3/4” 19mm	1/4” 6.3mm	.023” .6mm
5/32” 4mm	SCMNS16C5SC	.78” 19.8mm	5/16” 7.9mm	.025” .6mm
3/16” 4.8mm	SCMNS19C4SC	3/4” 19mm	5/16” 7.9mm	.025” .6mm
1/4” 6.3mm	SCMNS25C3SC	3/4” 19mm	3/8” 9.5mm	.025” .6mm



CMNS13C11SC shown above.

How to Order Multi-character or Logo Dies

To order **LOGO DIES** (multiple character stamps) in Flat stamp style add prefix "L" and suffix of **ACTUAL LEGEND** to catalog number.

S	CMNS	13	-FoMoCo
----------	-------------	-----------	----------------

Logo Die Style Char Size Stamp reads "FoMoCo". Width is A*6

S	CMNS	13	-COMPANY
----------	-------------	-----------	-----------------

Logo Die Style Char Size Stamp reads "COMPANY". Width is A*7

Dimensions for multi-character dies

MA = Number of characters in the legend x individual character width

B = Same as individual character height

C= Same as individual character length

Benefits of multi-character dies

1. Characters are exactly lined up.
2. Ability to reduce spacing or marking length.
3. Same wear, all characters mark same depth.
4. Easily add custom logos or characters



For Custom logo dies, please email artwork or logo, stamp style, and size required to quotes@columbiamt.com.

Multi-character Dimensions

MA = Width is determined by the number of character and spaces. Multiple the standard width of A by the total number of character and spaces.

B = Height

Char Size – Measured from the top of the character.

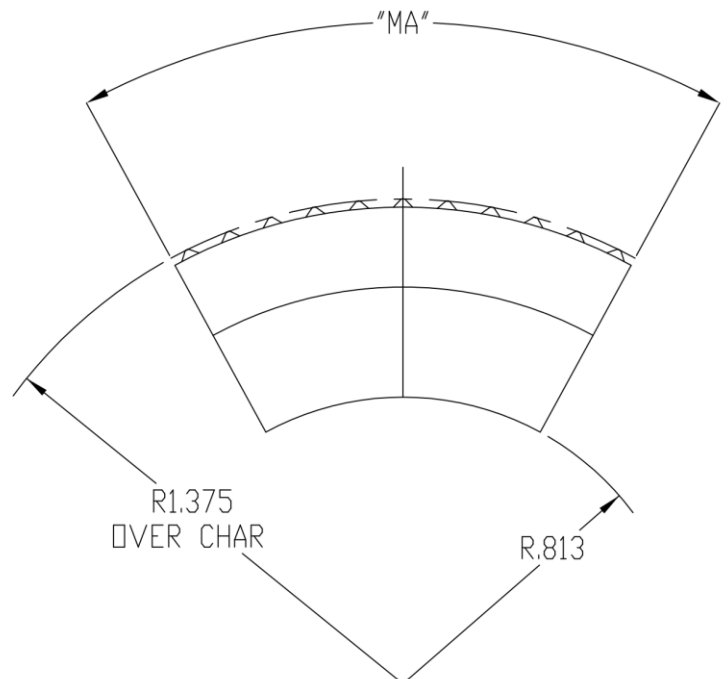
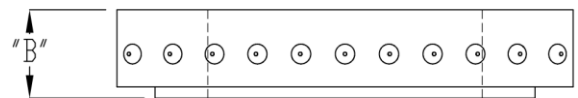
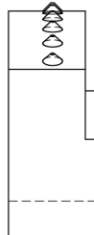
Char Width – Style 2A, width is 50% of the character size.

Tolerance - $\pm .000$ "/ $\pm .001$ " on all dimensions.



Consideration for overall length of multi-character stamps:

- Spaces may be reduced to less than 1 standard space wide.
- Narrow characters may be reduced less than 1 standard space wide.
- A double wide stamp blank is required for some of the symbols. Symbols where the width is about the same as the height. One example is Symbol #110.



Standard Font

Columbia Marking Tools uses a font called "Gothic". This sans serif font is plain and easy to read.

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
0 1 2 3 4 5 6 7 8 9

" ' # / , : . * ~ - > < + % \$ = & x

The alpha/numeric listing above is a reference for the style of font CMT uses. However, there are slight variations between different manufacturing processes.

Even from year to year, the exact font changes slightly. The top part on figure 3, or the top flag on the figure one may be slightly more curved or a different size. CMT strongly recommends providing a picture or rubbing for the exact font recreation when required.



Punctuation

All CMT standard die and stamps are available with a wide variety of punctuation or symbols.

How to order:

For a CMF 3/8" flat type with an Ampersand - the following code would be used:

CMF38AA

To order punctuation on a die or stamps use the appropriate code from the following list.



- AA Ampersand (&)
- BB Dollar Sign (\$)
- BS Back Slash (\)
- CC Comma (,)
- DD Dash (-)
- EE Equals Sign (=)
- GG Semi Colon (;)
- HH Apostrophe (')
- II Inch Mark, Quotes (")
- JJ Underscore (_)
- KK Question Mark (?)
- LL Colon (:)
- MM Multiplication (X)
- NN Number Sign (#)
- Degree Symbol (°)

- PP Period (.)
- QQ Percent Sign (%)
- RR Asterisk (*)
- SS Slash, Diagonal (/)
- TT Number Sign (#)
- US Underscore (_)
- UU Plus Sign (+)
- VV Left Parenthesis ([)
- WW Right Parenthesis (])
- YY Exclamation Point (!)
- ZZ At Sign (@)
- REG- Registration Symbol (®)
- PEN- Pentastar
- PUN- Punctuation Other Examples < > ^ ~ []

Operational Instructions – R800-R900

1. Mount the holder into the acceptable tool holder (WITHOUT THE WORK ROTATING).
 2. The lathe slide is brought in so that the cam rise of the marking roll touches the work. (WORK MUST NOT ROTATE) Apply enough pressure to indent the mark between .002 and .004 (cam rise of the roll against the work) back tool away, start machine, and bring holder and roll in contact with the work.
 3. At this point, the cam on the roller should engage against the work, causing the roll to rotate and imprint the work.
 4. If the mark made by the roller is too shallow, push the arbor shaft out only far enough to the splines. Rotate the roll one or two notches in the direction that will cause the cam to contact the work closer to the beginning of the cam rise.
 5. Depth of impression will change. It is necessary to go through the first procedure again, for now there will not be enough pressure between the work and cam to start roll rotating or so much pressure it may cause roll to jam or slip, depending upon which way you rotate.
- If the impression is too deep, rotate the roll in a direction that will cause the cam to turn toward the work, thereby making the roll contact the work closer to the engraved lettering.
 - General - The closer to the cam you start to the lettering, the less pressure you will exert between the roll and the piece you are marking, the shallower the impression depth. The closer to the beginning of the cam you start, further from the lettering, the more pressure you exert between the roll and the piece you are marking, therefore giving you a deeper impression.
 - On CNC lathes often the tool to part distance is programmable and thus should be treated like a typical knurl or other lathe tool.
 - The slowest speed is recommended however many operators increase speed as they become more familiar with the tool and material they are marking.

- The shaft of the roller should be on the same centerline as the work or as much as 1/64" below the center, but this is maximum.

**R900 - Suggested spare parts:**

- Detail 5 Return Spring – standard is left hand
- Detail 2 Bearing – most commonly replaced
- Detail 13 Woodruff Key
- Detail 12 Hex Jam Nut
- Die or Type needed for marking

R800 - Suggested spare parts:

- Detail 9 Return Spring – standard is left hand
- Detail 2 Bearing 1 – most commonly replaced
- Detail 11 Woodruff Key
- Detail 12 Hex Jam Nut
- Die or Type needed for marking

How to add stamp inserts into the R-800/RSA500 holder

Step 1. Loosen all (3) Flat head SHCS. You will need a 1/8" hex wrench.



Step 2. Once all three hex screws have been loosened, the pocket will open enough to fit the stamp inserts in. Please note the step of the stamp must point towards the spring return.



Step 3. Fill the stamp pocket. The pocket must be filled. Use blank spacers where characters are not needed.



Step 4. Tighten the hex screws back up.



Step 5. Tighten the pocket screw. This will make sure that the stamp inserts stay tight inside the pocket.

