

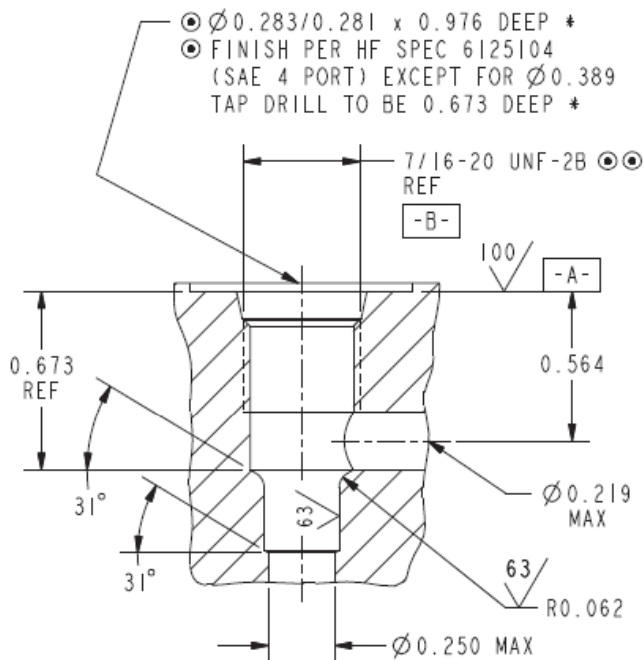


CARTRIDGE CAVITIES



SERIES 04

VC04-2



NOTES:

- FEATURES (EXCEPT FOR PILOT DRILL, CROSS DRILL AND SAE 4 PORT) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

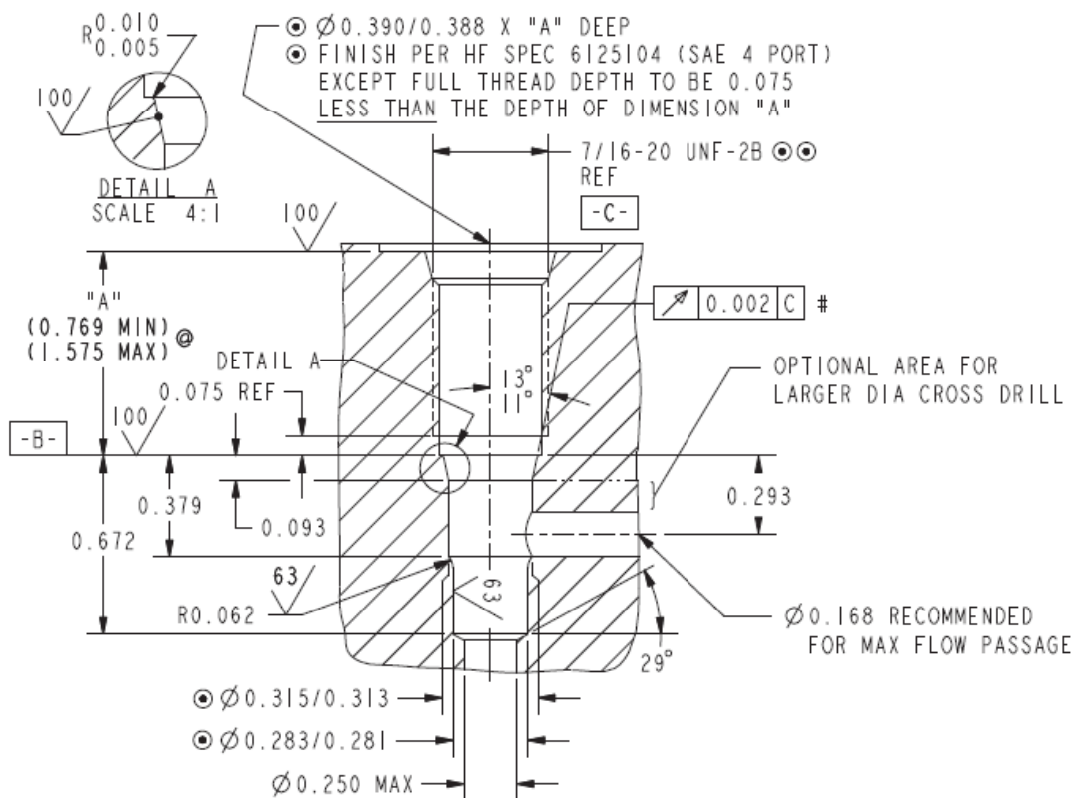
Ⓞ		0.001	A	ⓄⓄ		0.001	A
		0.002	B			0.0009	(PITCH DIA)

* - DEPTHS ARE FROM DATUM -A- .

- UNSPECIFIED TOLERANCES ARE ± 0.005 .

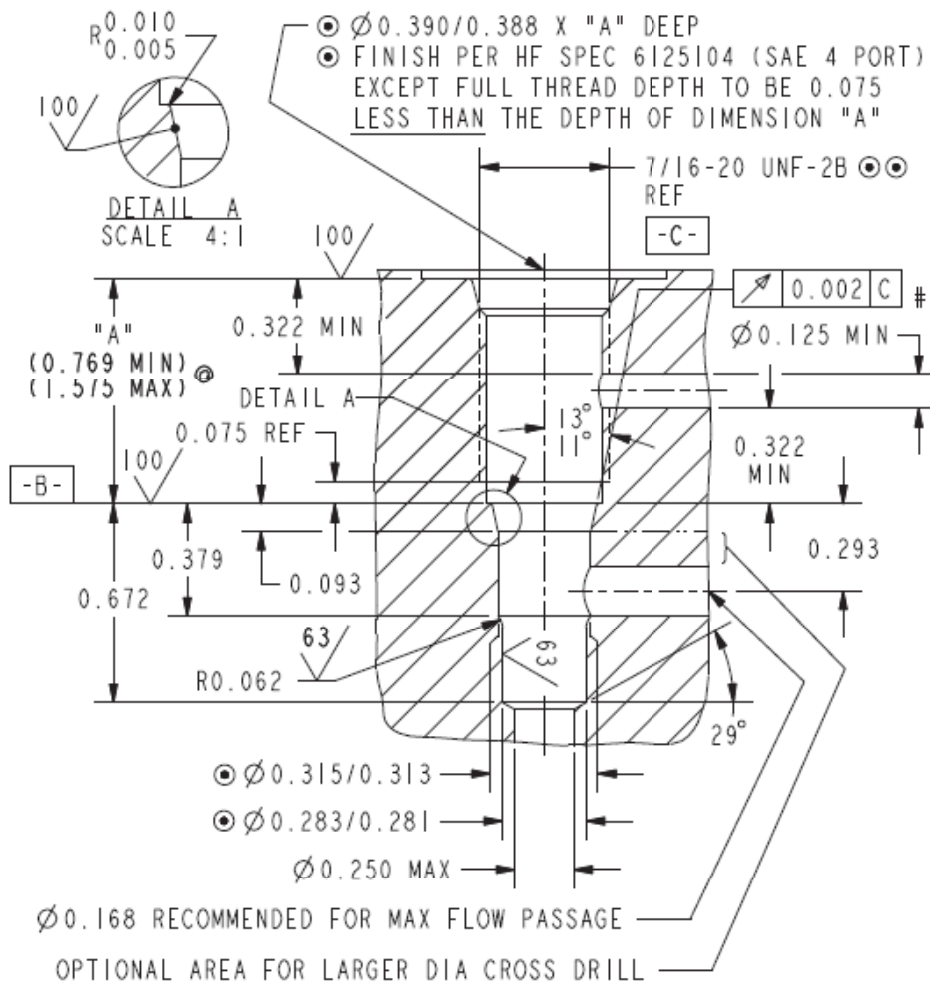
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

VC04-B2



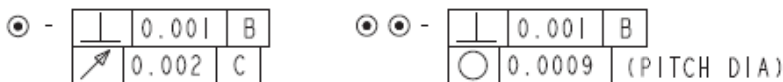
SERIES 04

VC04-B3



NOTES:

- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL, CROSS DRILLS AND SAE 4 PORT) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.



- UNSPECIFIED TOLERANCES ARE ± 0.005 .

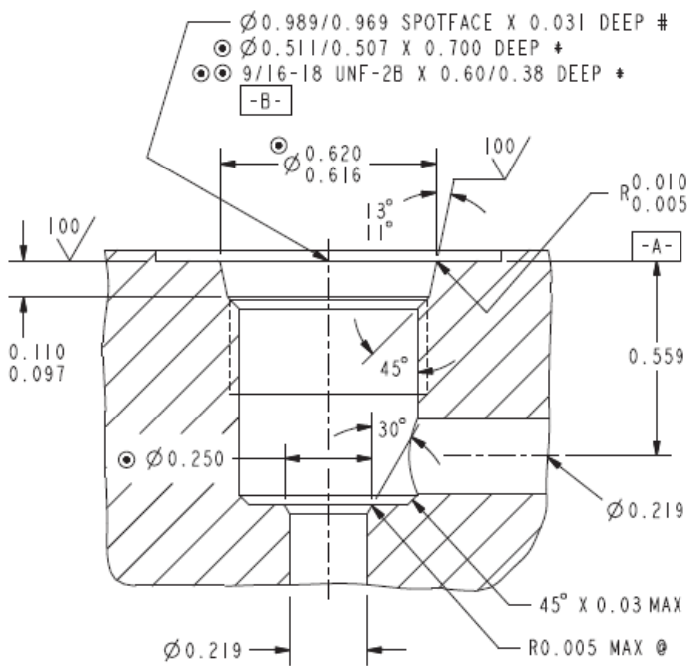
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

Ⓞ - WITH HF FORM TOOLS AND USING 0.020/0.010 SPOTFACE DEPTH.

- THIS SURFACE IS A VALVE SEAT, IT MUST BE FREE OF NICKS AND TOOL MARKS.

SERIES 06

VC06-1



VC06-1
NOTES:

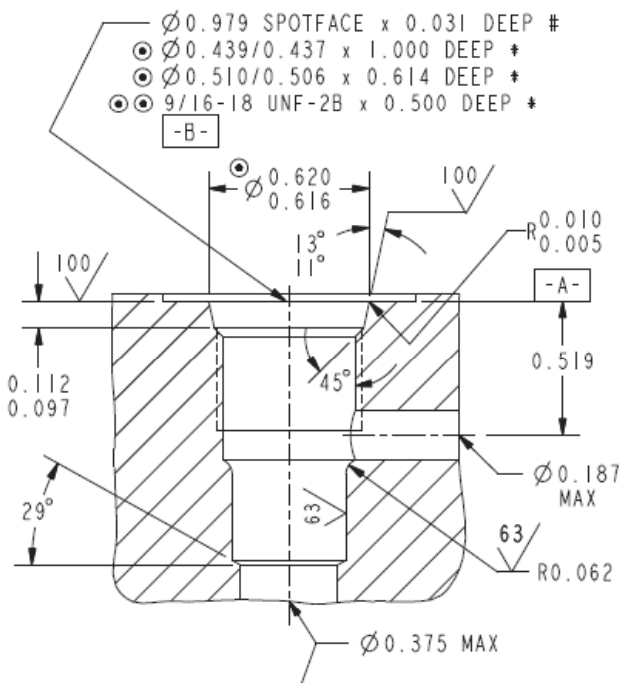
- \odot -

	0.001	A		
↗	0.002	B		

 $\odot \odot$ -

	0.001	A		
○	0.0009	(PITCH DIA)		
- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
 - UNSPECIFIED TOLERANCES ARE ± 0.005 .
 - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- \odot - THIS SURFACE IS A VALVE SEAT. IT MUST BE FREE OF NICKS AND TOOL MARKS.

VC06-2



VC06-2
NOTES:

- FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.
- \odot -

	0.001	A		
↗	0.002	B		

 $\odot \odot$ -

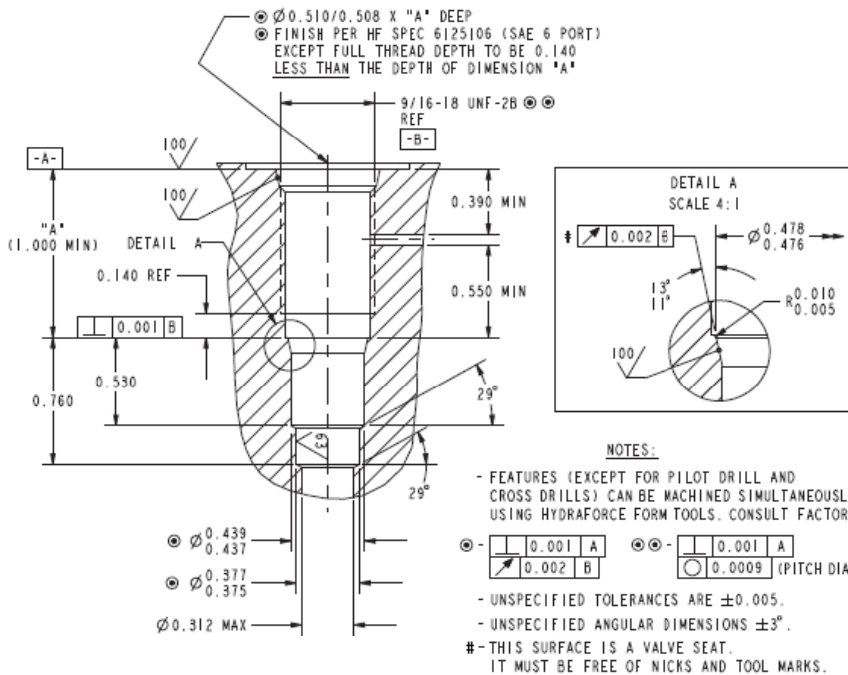
	0.001	A		
○	0.0009	(PITCH DIA)		
- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
 - UNSPECIFIED TOLERANCES ARE ± 0.005 .
 - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- ** - FEATURES OF VARIATION 'A' ARE ONLY REQUIRED IF NOTED ON A SPECIFIC PRODUCT CATALOG PAGE.

NOTE: CAVITY VARIATION 'A' **
 MINIMUM PILOT DRILL $\varnothing 0.375$ TO
 MINIMUM DEPTH OF 1.10 FROM DATUM -A-

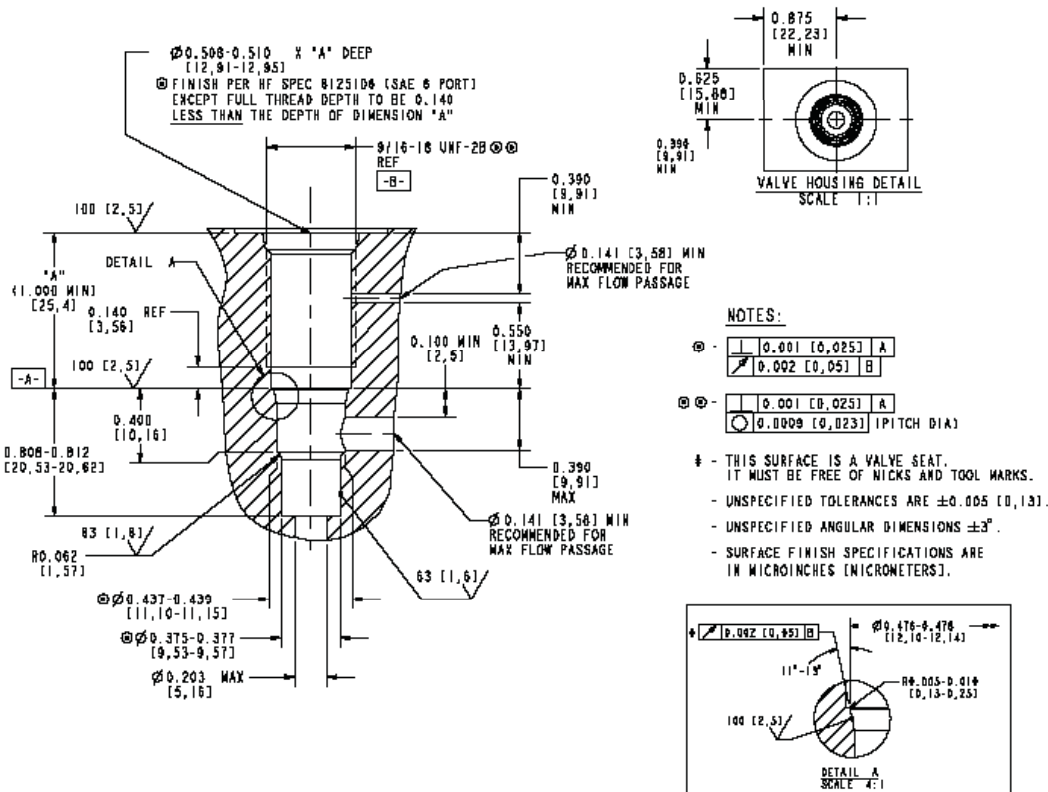


SERIES 06

VC06-B2

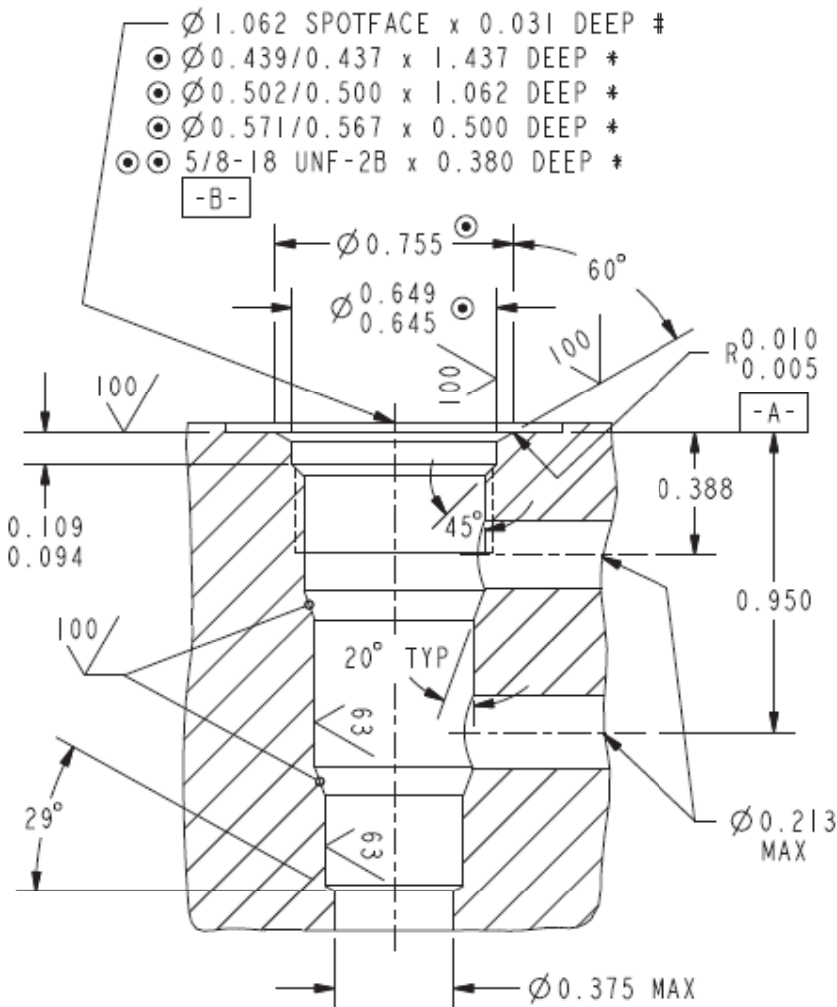


HVC06-B3



SERIES 07

VC07-3



NOTES:

- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

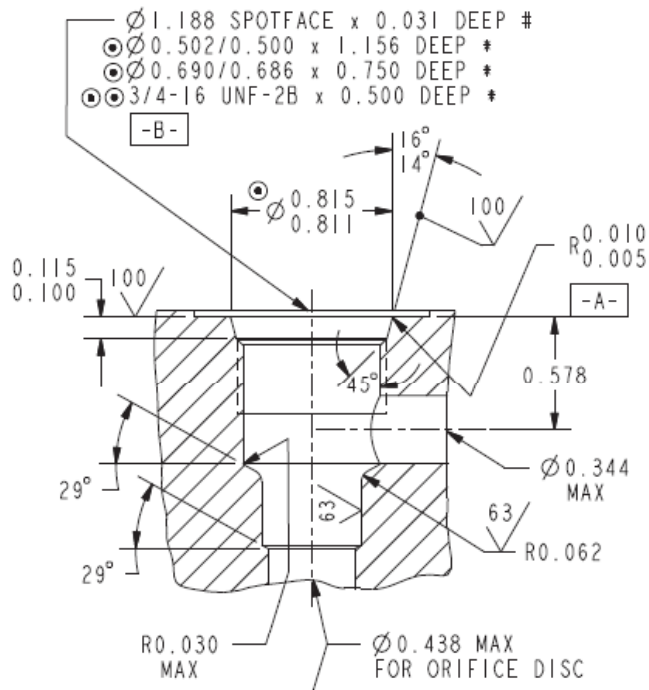
⊙		0.001	A	⊙⊙		0.001	A
			0.002			B	

- * - DEPTHS ARE FROM DATUM **-A-** .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ±0.005.
- UNSPECIFIED ANGULAR DIMENSIONS ±3° .



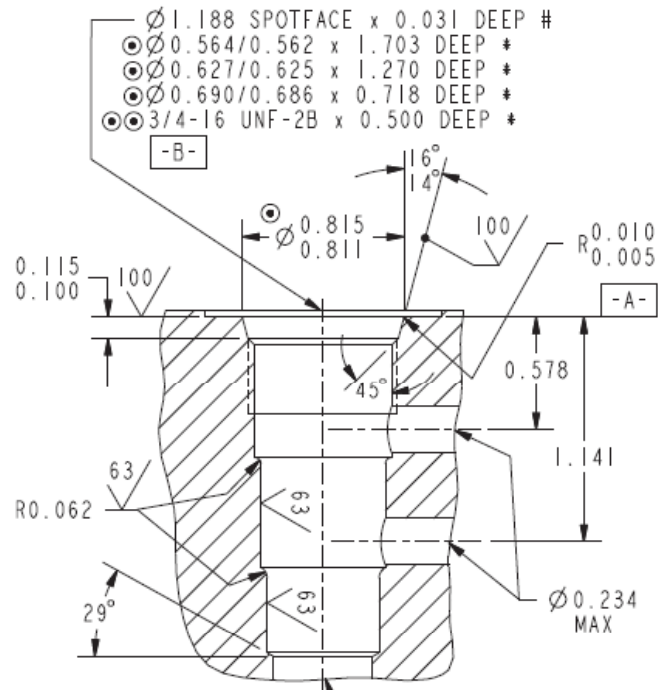
SERIES 08

VC08-2



NOTE:
 CAVITY VARIATION 'A'***
 PILOT DRILL $\varnothing 0.469$ MIN.
 REQUIRED TO MIN. DEPTH
 OF 1.32 FROM SPOTFACE

VC08-3



NOTE:
 CAVITY VARIATION 'A'***
 PILOT DRILL $\varnothing 0.500$ MIN.
 REQUIRED TO MIN. DEPTH
 OF 1.81 FROM SPOTFACE

NOTES:

- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

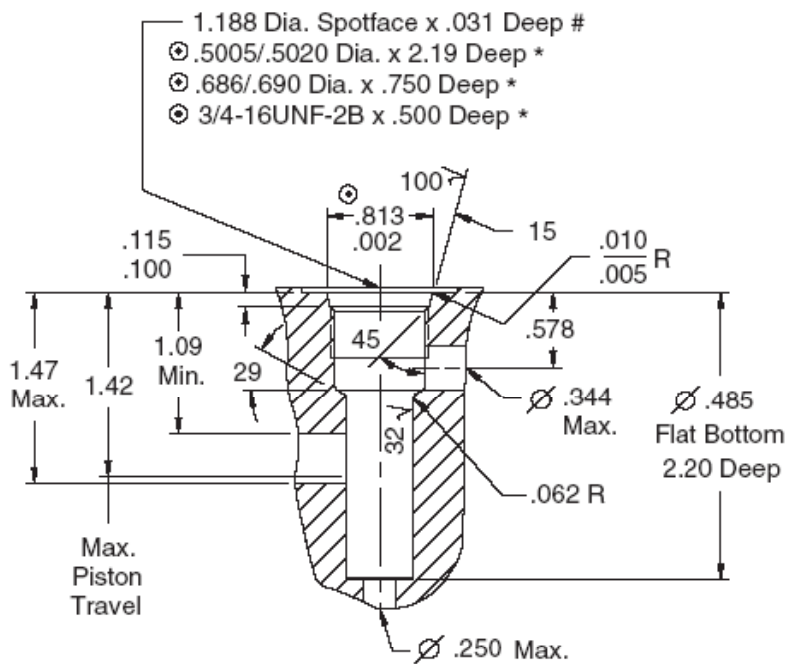


- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- ** - FEATURES OF VARIATION 'A' ARE ONLY REQUIRED IF NOTED ON A SPECIFIC PRODUCT CATALOG PAGE.



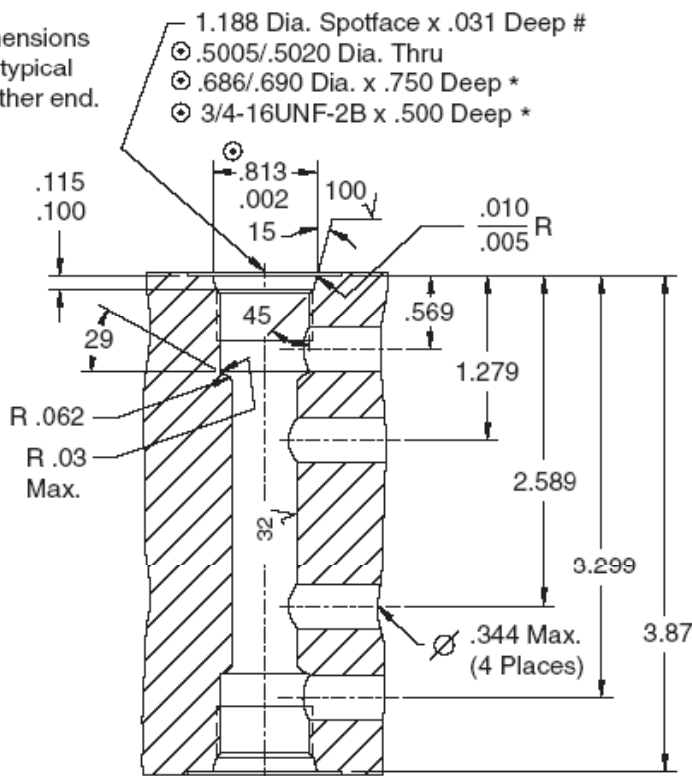
SERIES 08

VC08-PCV



VC08-DCV

Dimensions are typical of other end.



Notes:

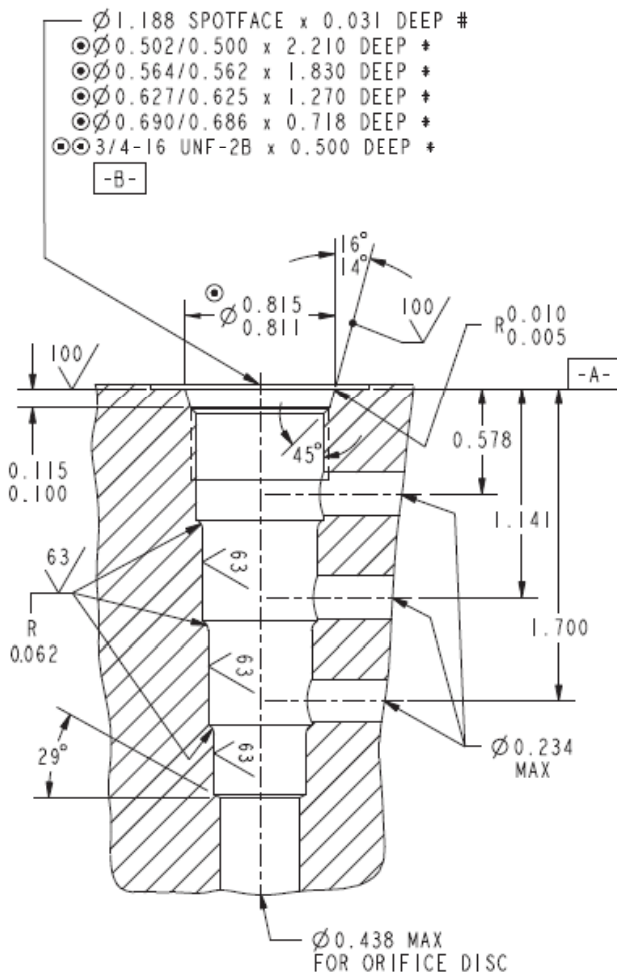
- Ⓞ 1. These Diameters to be Concentric within .002 T.I.R. and Perpendicular to Spotface within .001 T.I.R.
- * 2. Depths are from Spotface.
- 3. Unspecified Tolerances are .005.
- # 4. Unless Otherwise Specified on Machining Drawing
- 5. All Dimensions shown in inches unless otherwise noted.

Cavity features (except for pilot drill and cross drills) can be machined simultaneously using HydraForce form tools. Consult factory.

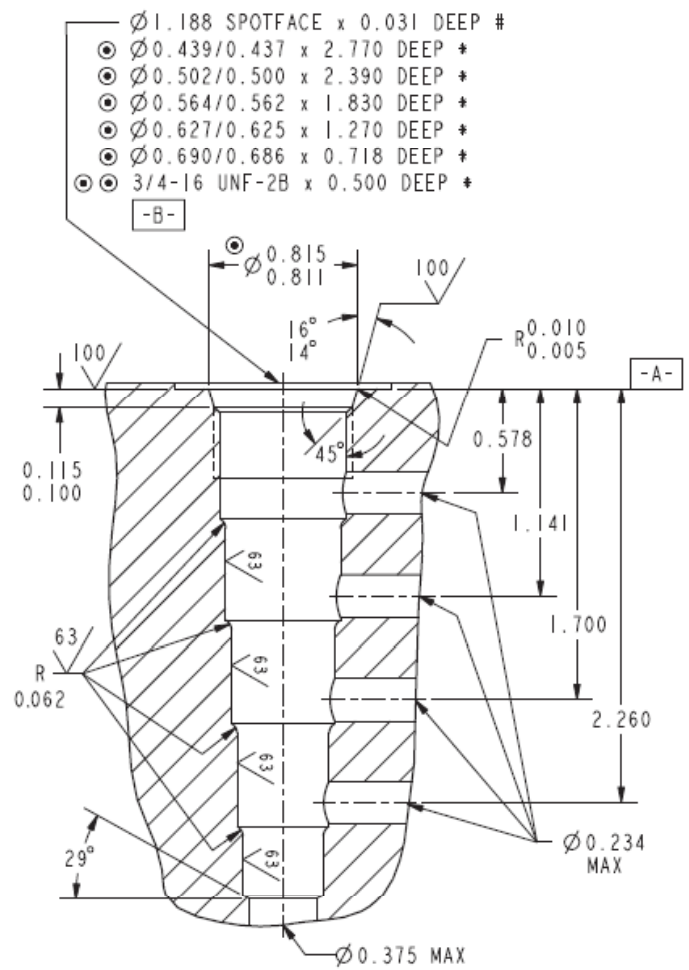


SERIES 08

VC08-4



VC08-5



NOTES:

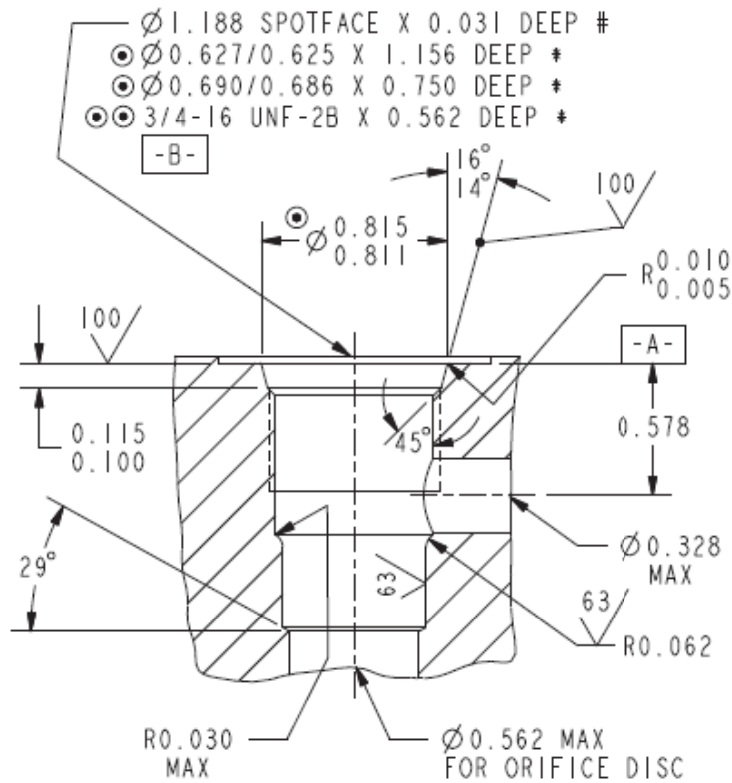
- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

\varnothing -	0.001	A	\varnothing -	0.001	A
		0.002		B	

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

SERIES 09

VC09-2



NOTES:

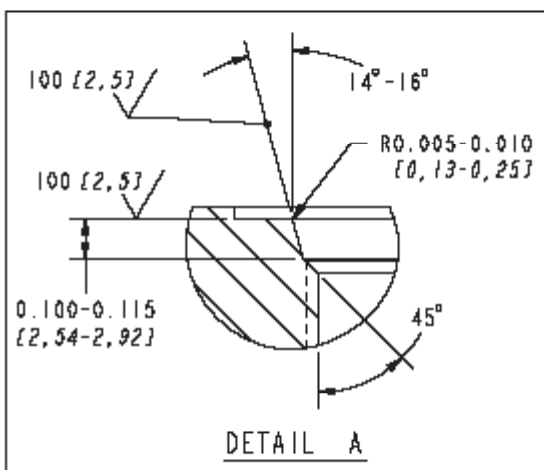
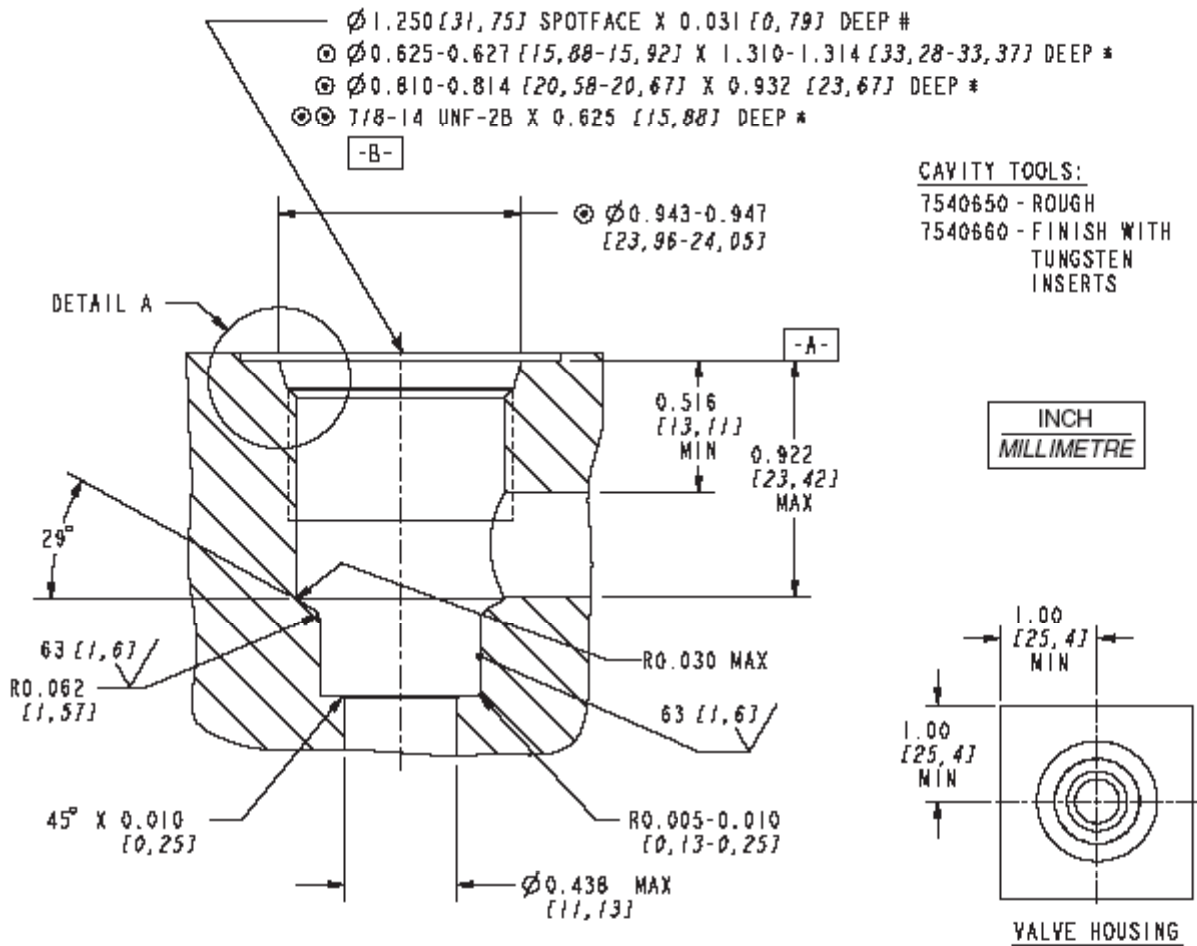
- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.



- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

SERIES 10

HVC10-2



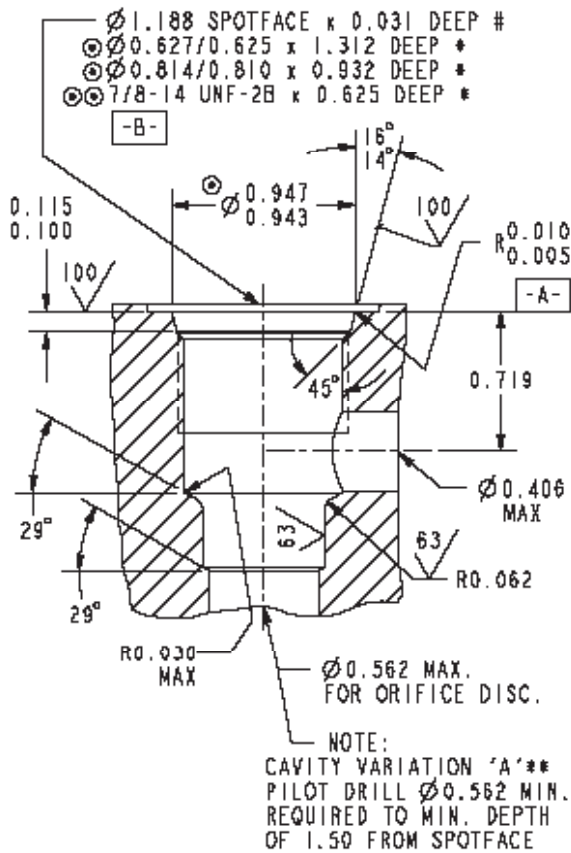
NOTES:-

$\textcircled{\circ}$ -	\square	0.001 [0,025]	A
	∇	0.002 [0,05]	B
$\textcircled{\circ}$ -	\square	0.001 [0,025]	A
	\bigcirc	0.0009 [0,023]	[PITCH DIA]

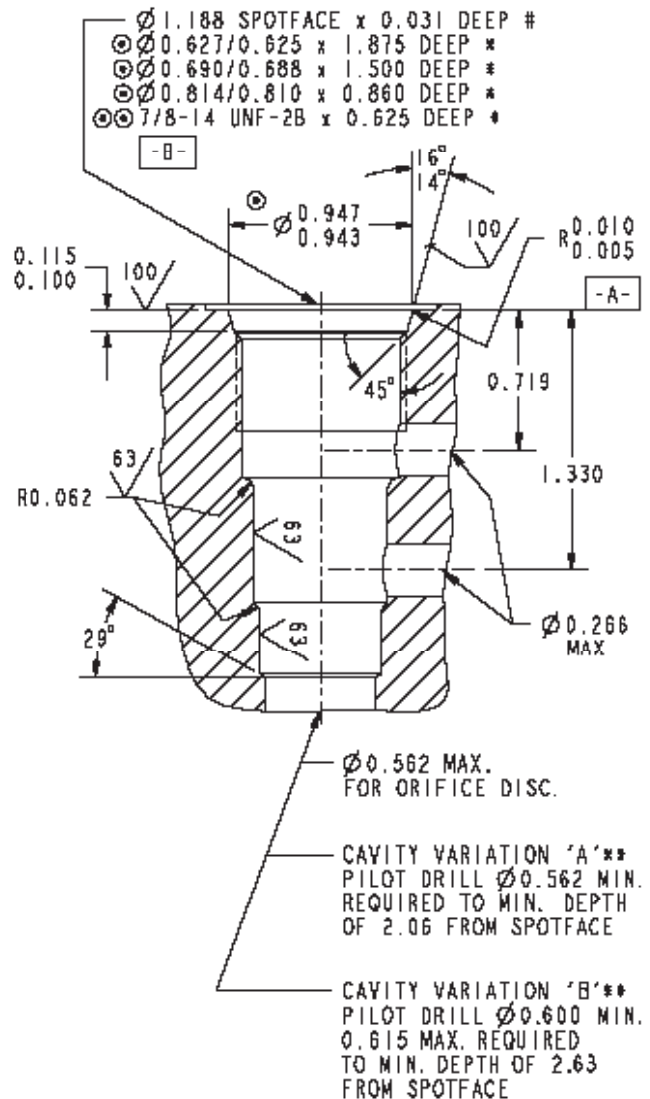
- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 [0,13].
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS].

SERIES 10

VC10-2



VC10-3



NOTES:

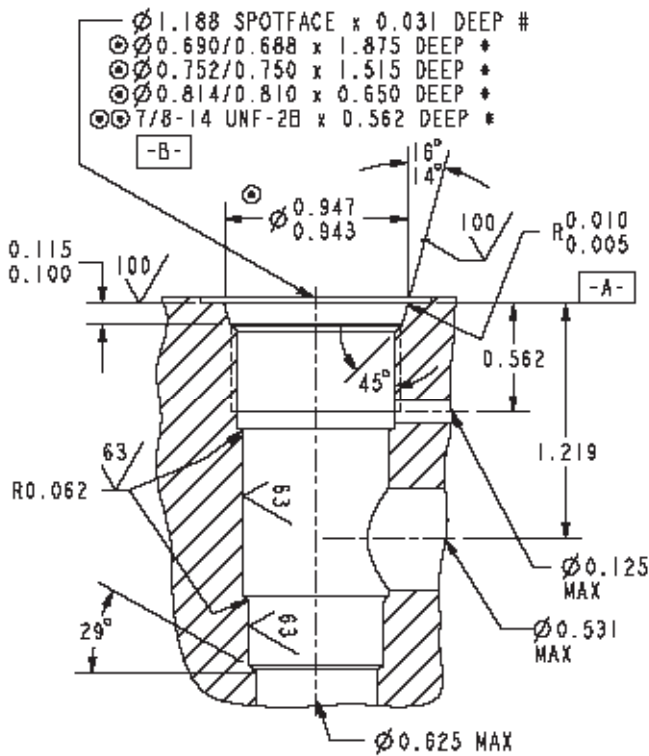
- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

⊗		0.001	A	⊗⊗		0.001	A
		\nearrow	0.002			B	⊙

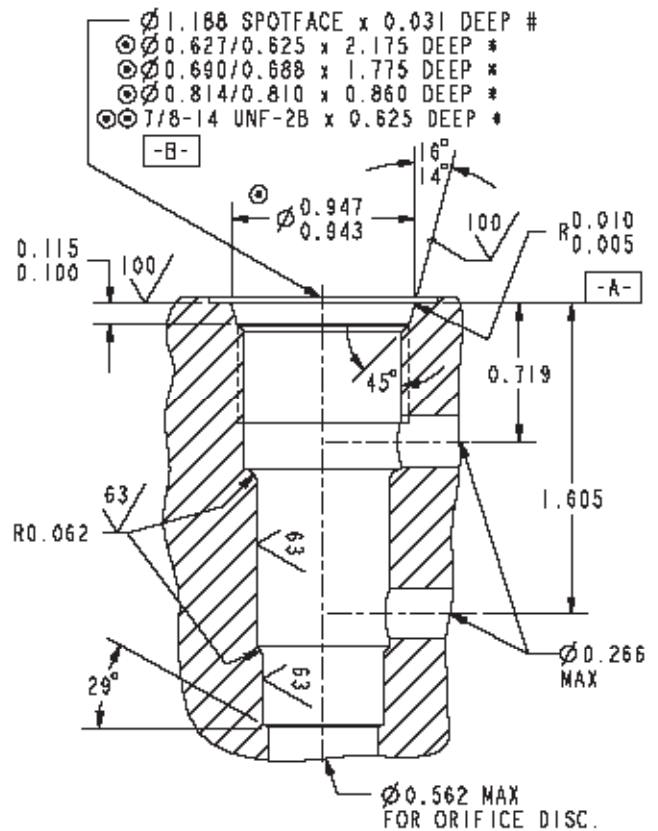
- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- ** - FEATURES OF VARIATIONS ARE ONLY REQUIRED IF NOTED ON A SPECIFIC PRODUCT CATALOG PAGE.

SERIES 10

VC10-S3



VC10-L3



NOTES:

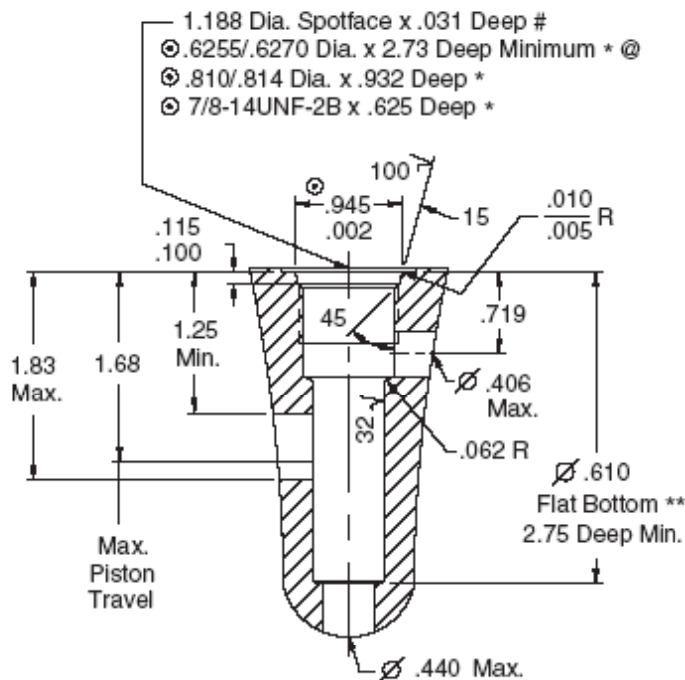
- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

⊙	0.001	A	⊙⊙	0.001	A
↗	0.002	B	○	0.0009	[PITCH DIA]

- * - DEPTHS ARE FROM DATUM -A- .
- ‡ - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ±0.005.
- UNSPECIFIED ANGULAR DIMENSIONS ±3°.

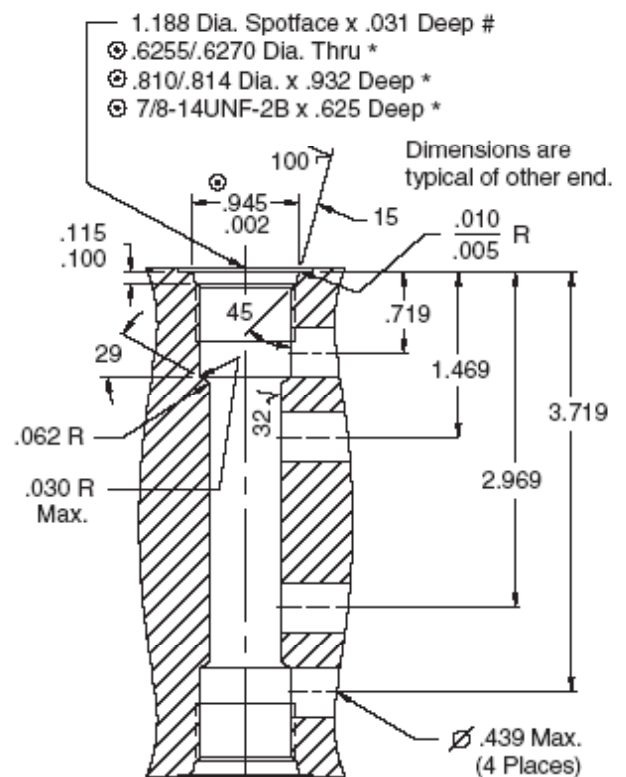
SERIES 10

VC10-PCV



** Flat Bottom Dia. is used as the PCV Piston stop.
 Alternate stop can be up to .025 inch deeper.

VC10-DCV

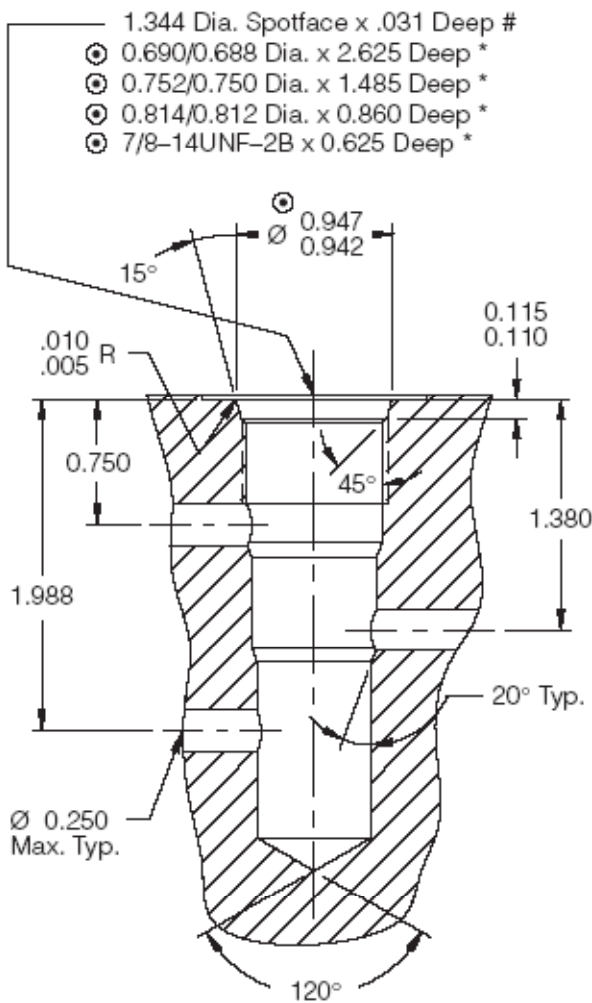


These features (except for pilot drill & cross drills) can be machined simultaneously with a form tool.

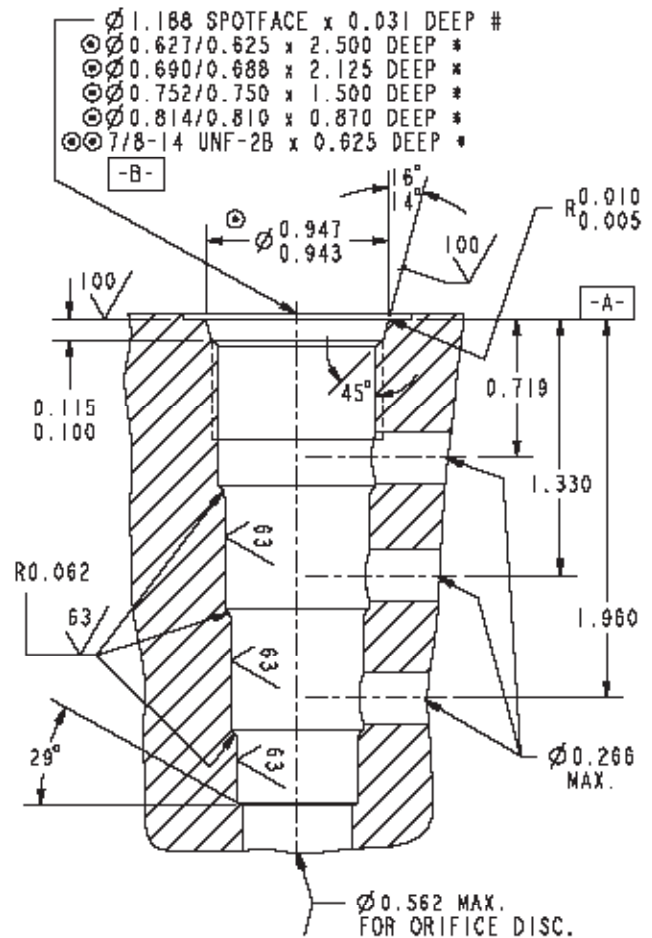
- Ⓞ — These diameters to be concentric within 0.002 T.I.R. and perpendicular to spotface within 0.001 T.I.R.
- * — Depths are from spotface.
- # — Unless otherwise specified on machining drawing
 Unspecified tolerances are ±0.005.
- Ⓞ — Flat bottom diameter is used as PCV piston stop.
 If alternate stop or if 0.626 diameter is deeper than min. shown above, then the piston stop must be within 0.025" max. of the depth of the 0.626 diameter.

SERIES 10

VC98-3



VC10-4



NOTE:
 CAVITY VARIATION 'A' **
 PILOT DRILL Ø 0.562 MAX.
 REQUIRED TO MIN. DEPTH
 OF 2.69 FROM SPOTFACE

The above features (except for pilot drill & cross drills) can be machined simultaneously with a form tool.

All machined cavity surfaces $46\sqrt{\text{r}}$ maximum.

- Ⓞ — These diameters to be concentric within 0.002 T.I.R. and perpendicular to spotface within 0.001 T.I.R.
 - * — Depths are from spotface.
 - # — Unless otherwise specified on machining drawing.
- Unspecified tolerances are ± 0.005 .

NOTES:

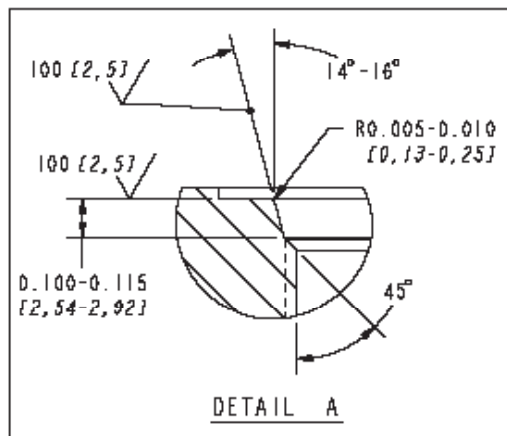
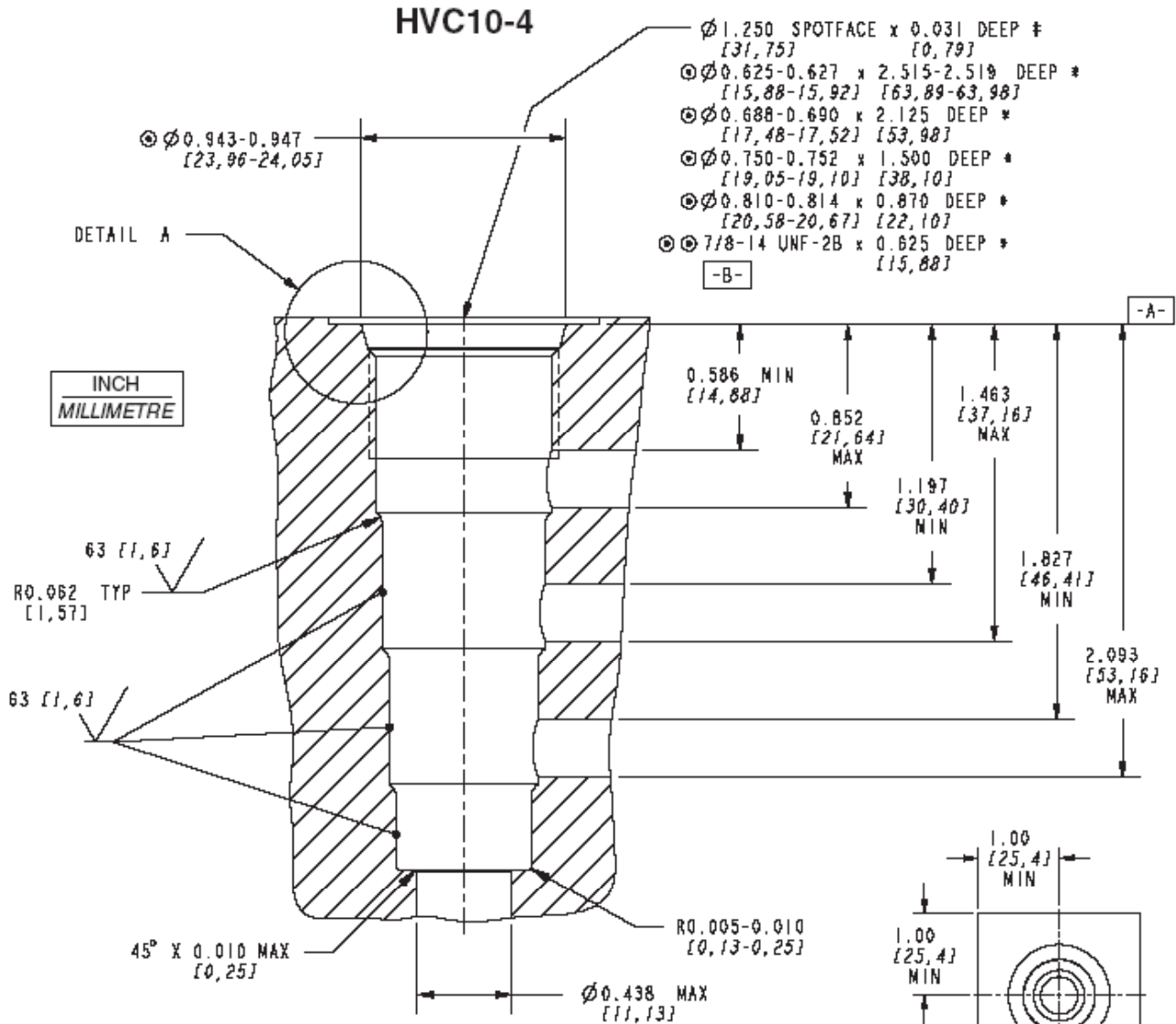
THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

Ⓞ	Ø.001	A	Ⓞ	Ø.001	A
	Ø.002	B		Ø.0009	(PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- ** - FEATURES OF VARIATION 'A' ARE ONLY REQUIRED IF NOTED ON A SPECIFIC PRODUCT CATALOG PAGE.



SERIES 10



NOTES:

- ① -

	0.001 [0,025]	A
/	0.002 [0,05]	B
- ② -

	0.001 [0,025]	A
○	0.0009 [0,023]	(PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ±0.005 [0,13].
- UNSPECIFIED ANGULAR DIMENSIONS ±3°.
- SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS].

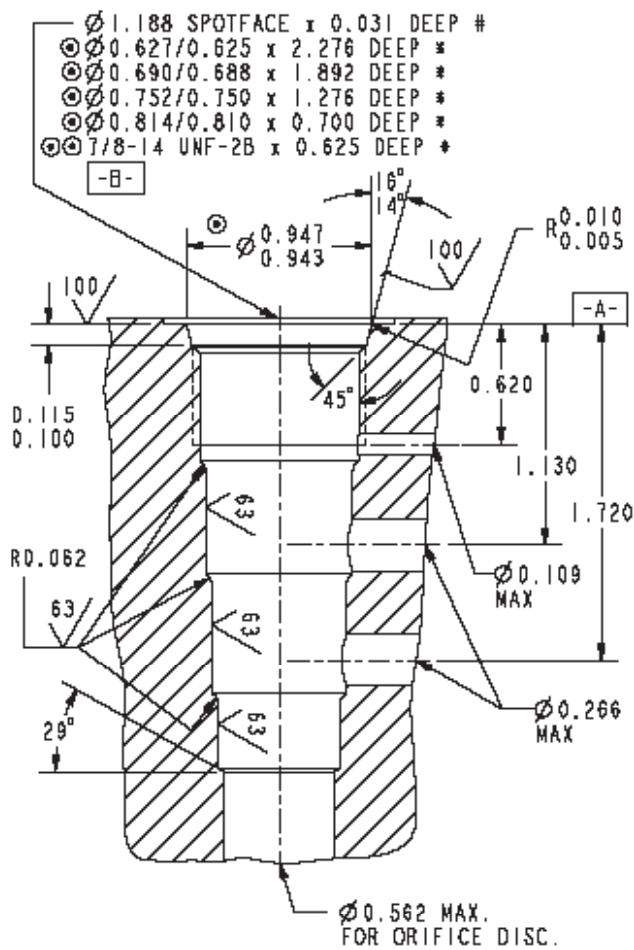
VALVE HOUSING

CAVITY TOOLS:

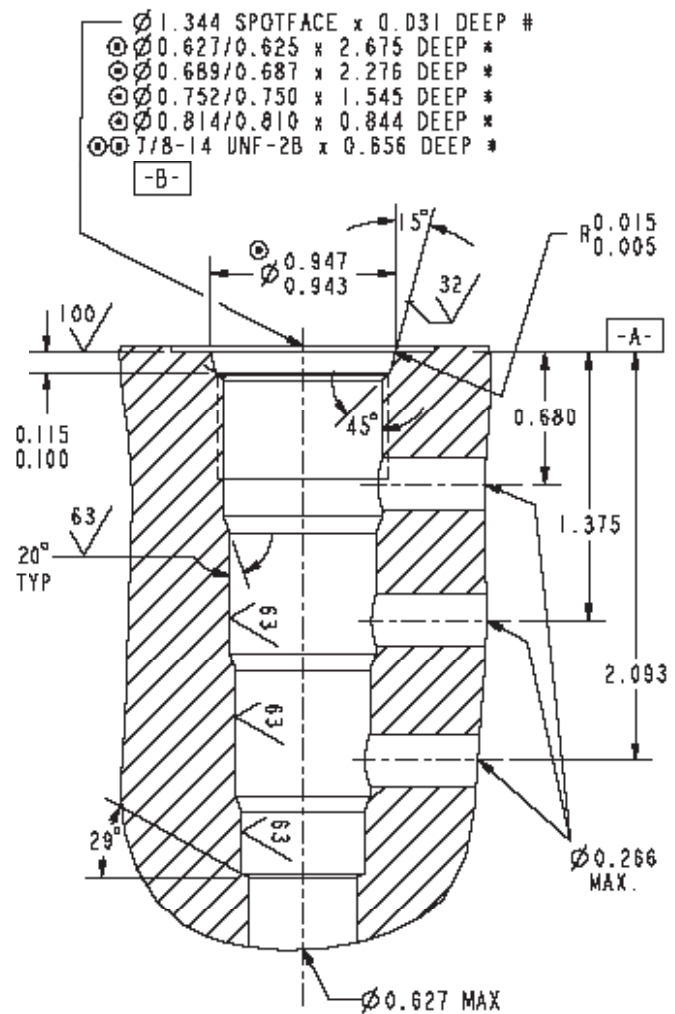
- 7540810 - ROUGH
- 7540820 - FINISH WITH TUNGSTEN INSERTS

SERIES 10

VC10-S4



VC10-L4



NOTES:

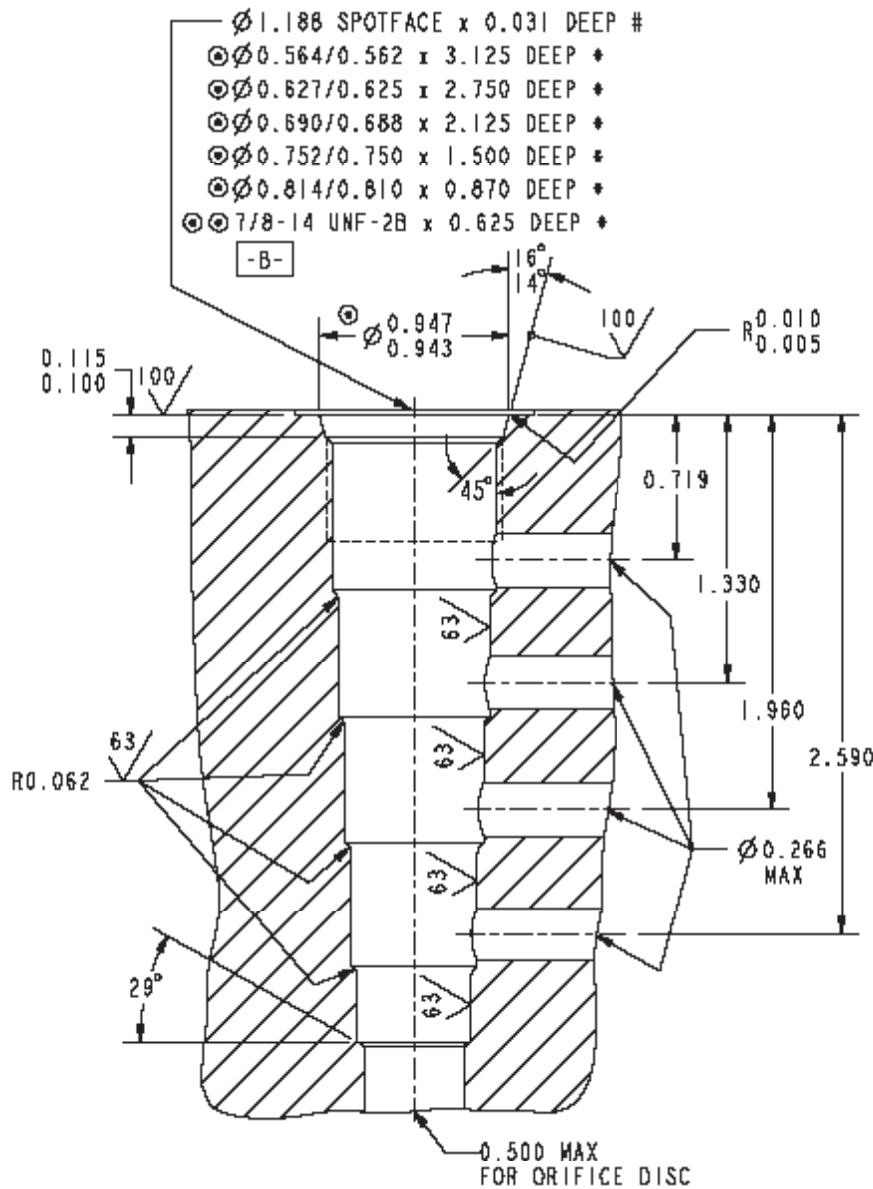
THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

⊕		0.001	A	⊕⊕		0.001	A
		0.002	B			0.0009	(PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

SERIES 10

VC10-5



NOTES: - THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

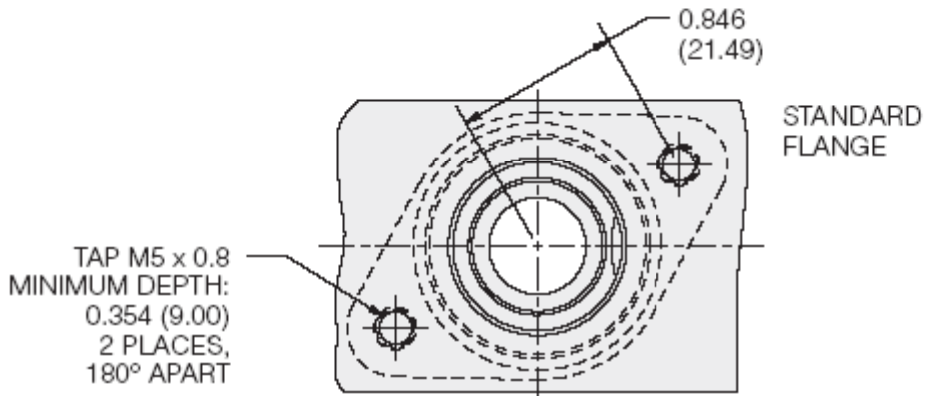
⊙	0.001	A	⊙⊙	0.001	A
⊙	0.002	B	⊙	0.0009	(PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ±0.005.
- UNSPECIFIED ANGULAR DIMENSIONS ±3°.

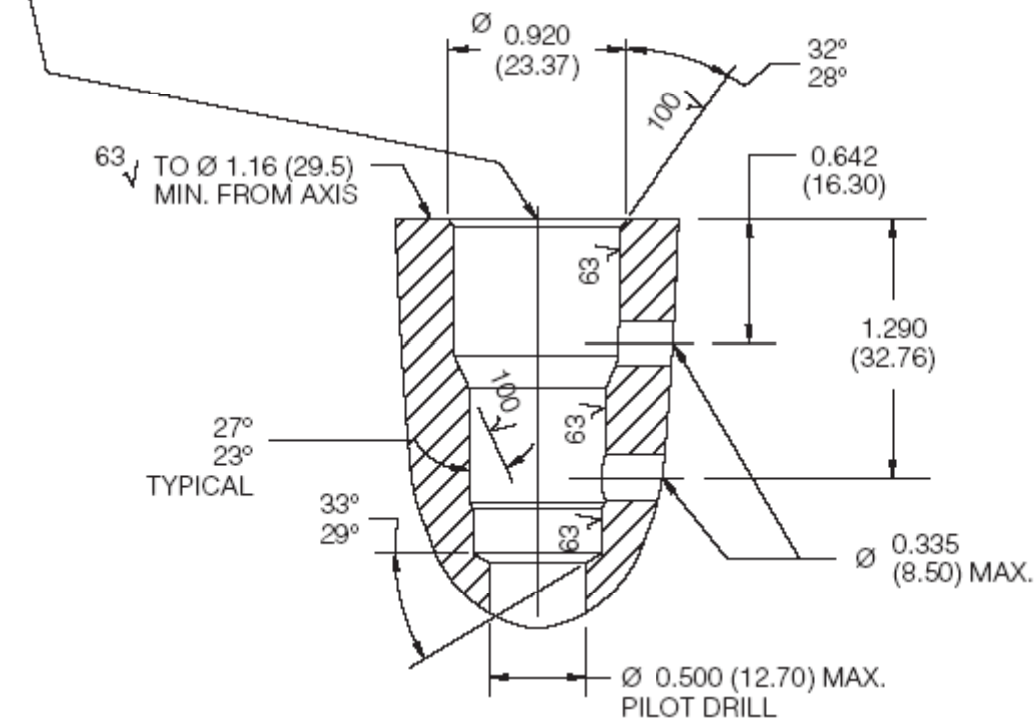


DROP-IN

VC-T001



Ø 0.672/0.670 in. (17.08/17.03 mm) Dia. x 1.730 in. (43.94 mm) Deep
 Ø 0.711/0.709 in. (18.06/18.01 mm) Dia. x 1.461 in. (37.11 mm) Deep
 Ø 0.871/0.869 in. (22.13/22.08 mm) Dia. x 0.705 in. (17.91 mm) Deep



INCH (MILLIMETER)

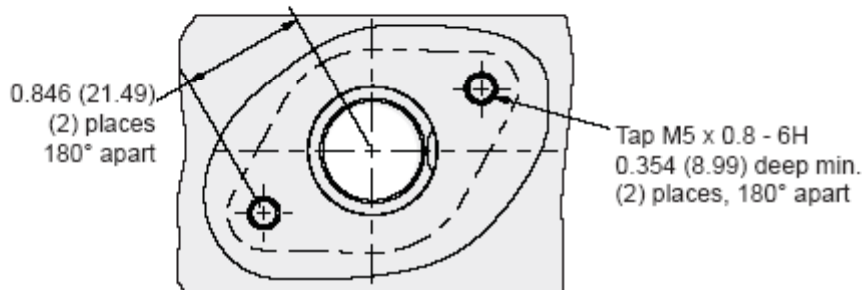
The above features (except for pilot drill & cross drills)
can be machined simultaneously with a form tool.

All diameters, with exception of 0.500 in. (12.7 mm) Pilot Drill
to be concentric within 0.002 in. (0.05 mm) T.I.R.
and perpendicular to face within 0.002 in. (0.05 mm) T.I.R.

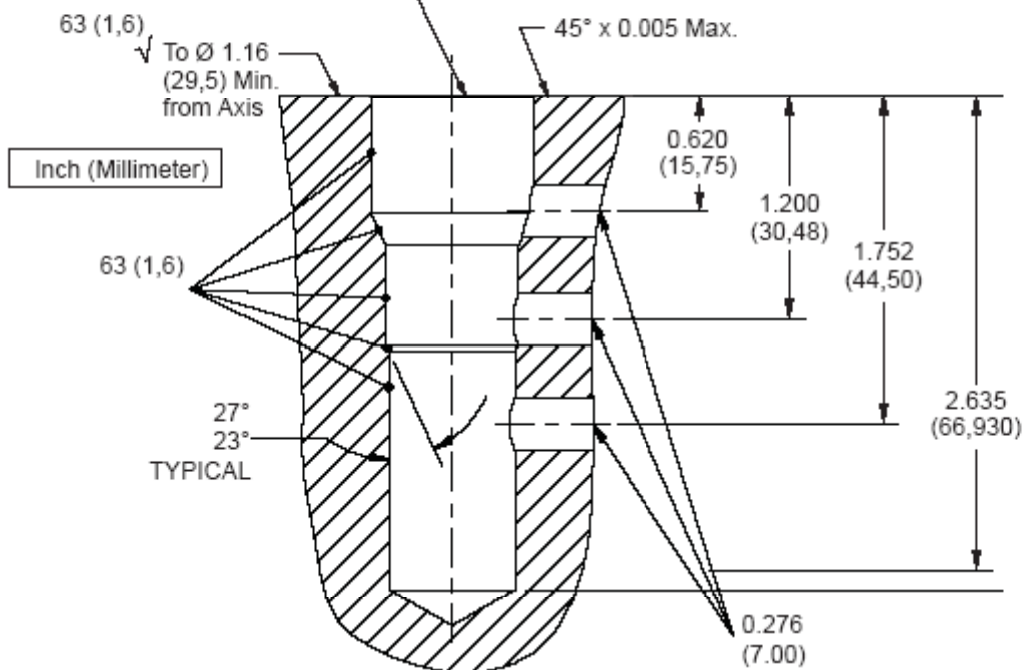
Unspecified tolerances are ±0.005 in. (0.13 mm).

DROP-IN

VC-T003



\varnothing 0.668/0.670 Dia. x 2.635 Deep (16.97/17.02 x 66.93 Deep)
 \varnothing 0.706/0.708 Dia. x 1.330 Deep (17.93/17.98 x 33.78 Deep)
 \varnothing 0.865/0.867 Dia. x 0.632 Deep (21.97/22.02 x 16.05 Deep)



The above features (except for pilot drill and cross drills) can be machined simultaneously with a form tool.

Cavity Tools: Rough: 7540210; Finish: 7540230;
Finish with Tungsten Carbide Inserts: 7540220

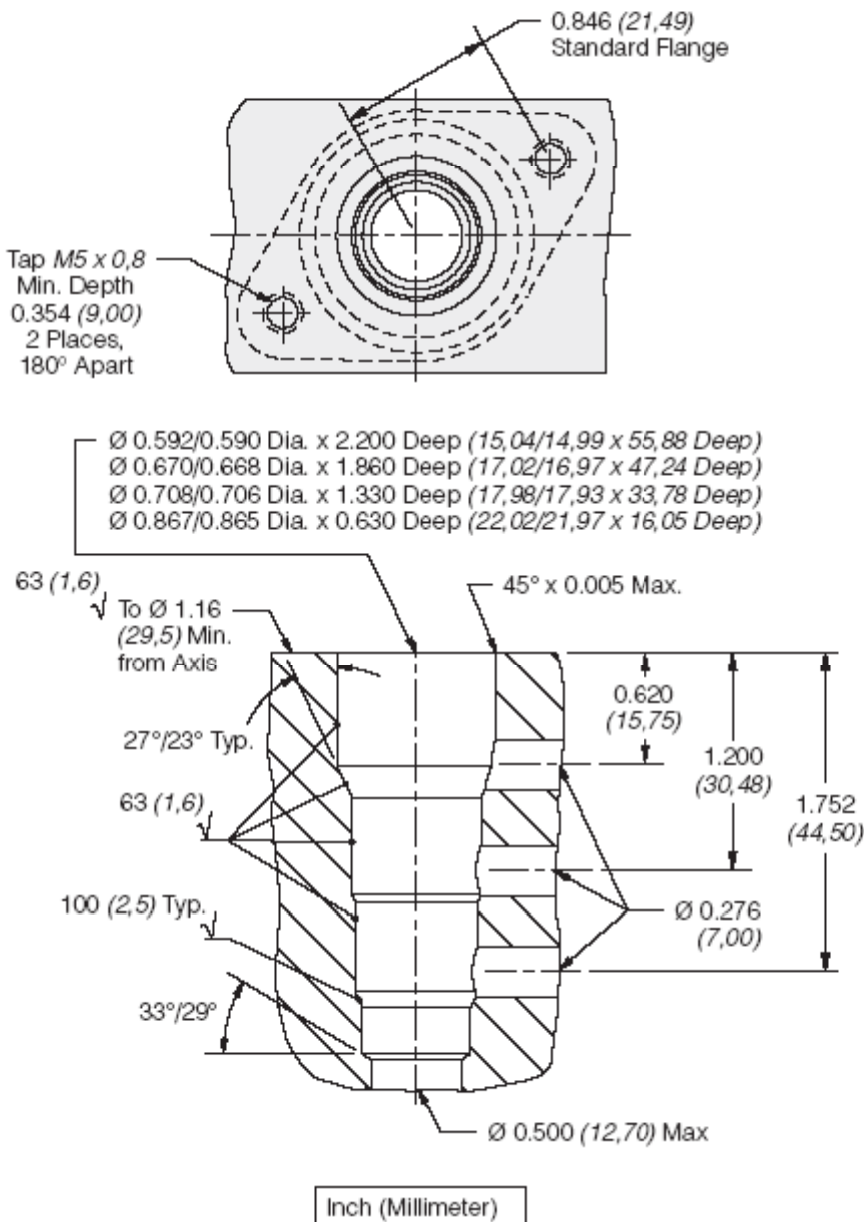
These diameters, with exception of \varnothing 0.500 (12,70) Pilot Drill, to be concentric within 0.002 (0,05) T.I.R. and perpendicular to spotface within 0.002 (0,05).

Unspecified tolerances are ± 0.005 (0,13).

Surface finish specifications are in Microinches (Micrometers).

DROP-IN

VC-T004



The above features (except for pilot drill and cross drills) can be machined simultaneously with a form tool.

Cavity Tools: Rough: 7540150; Finish: 7540170;
Finish with Tungsten Carbide Inserts: 7540160

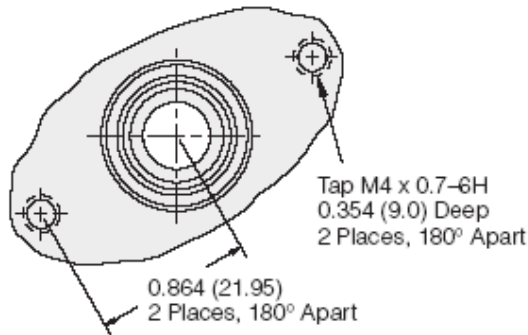
These diameters, with exception of \varnothing 0.500 (12,70) Pilot Drill, to be concentric within 0.002 (0,05) T.I.R. and perpendicular to spotface within 0.002 (0,05).

Unspecified tolerances are \pm 0.005 (0,13).

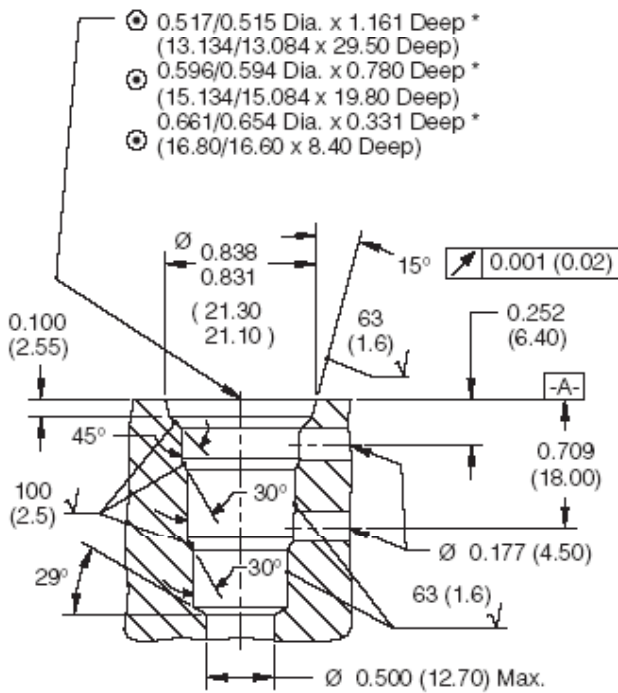
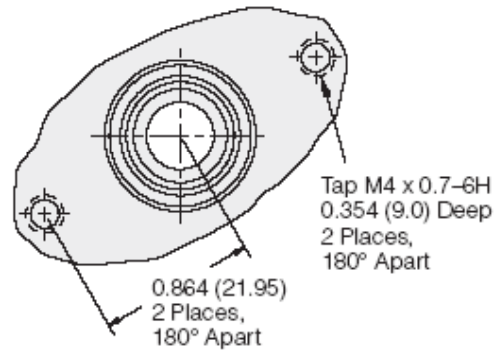
Surface finish specifications are in Micrometers (Micrometers).

DROP-IN

VC-T009



VC-T011



Inch (Millimeter)

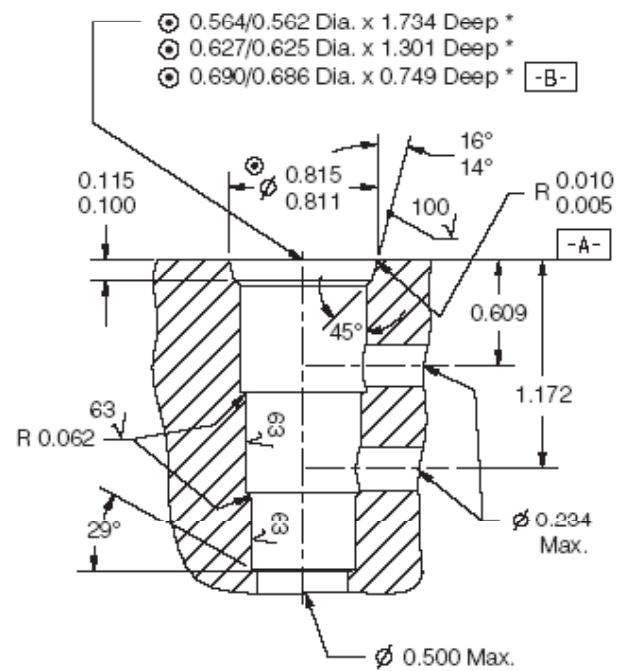
The above features (except for pilot drill and cross drills) can be machined simultaneously with a form tool.

Cavity Tools: Rough: 7540420; Finish: 7540430;
Finish with Tungsten Carbide Inserts: 7540435

Ⓞ — These diameters to be concentric within 0.002 T.I.R. and perpendicular to spotface within 0.001 T.I.R.

* — Depths are from datum -A-

Unspecified tolerances are ±0.005



Ⓞ	0.002	B
*	0.001	A

* — Depths are from datum -A-

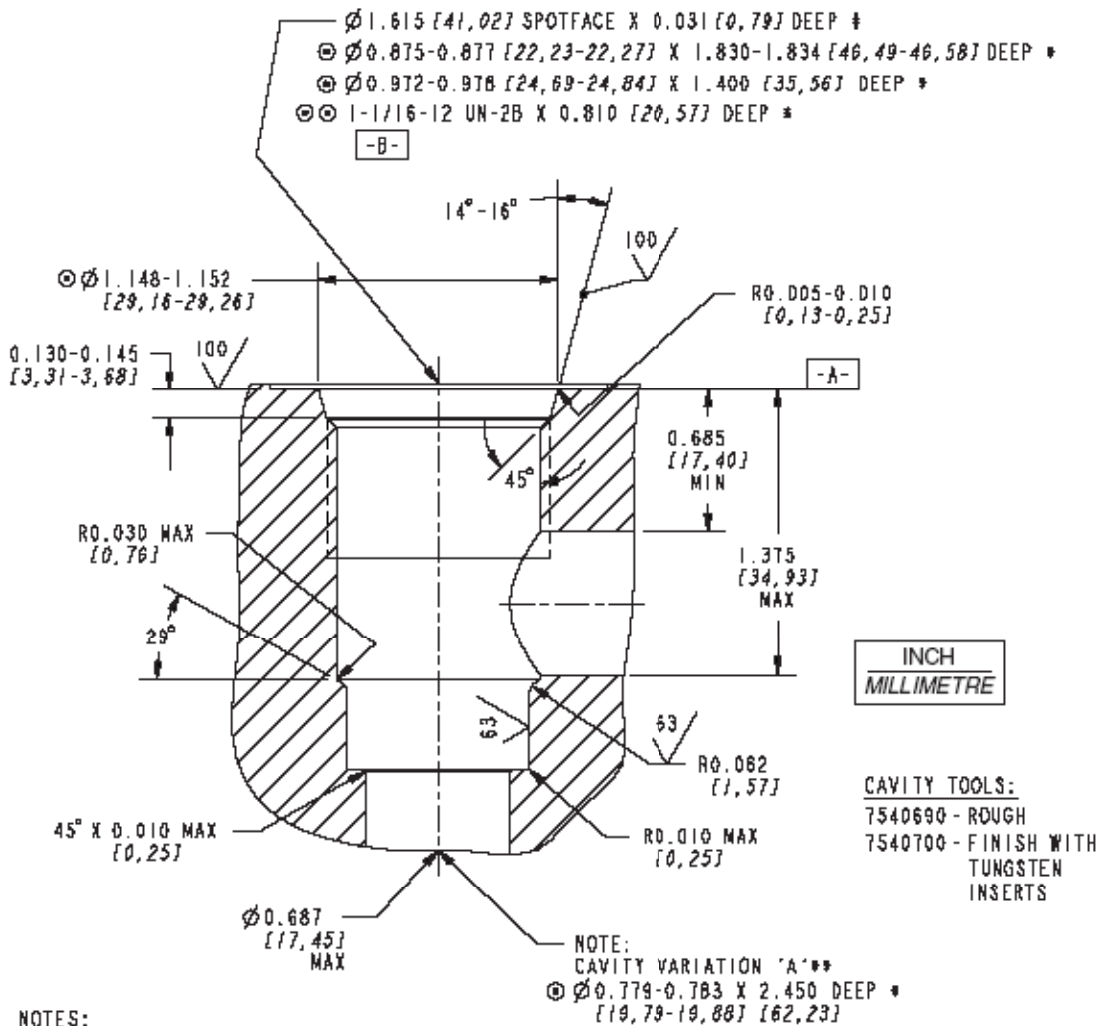
Unspecified tolerances are ±0.005

Unspecified angular dimensions are ±3°

Inch (Millimeter)

SERIES 12

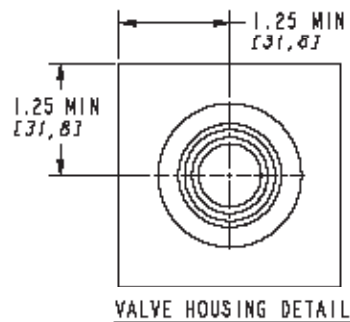
HVC12-2



NOTES:

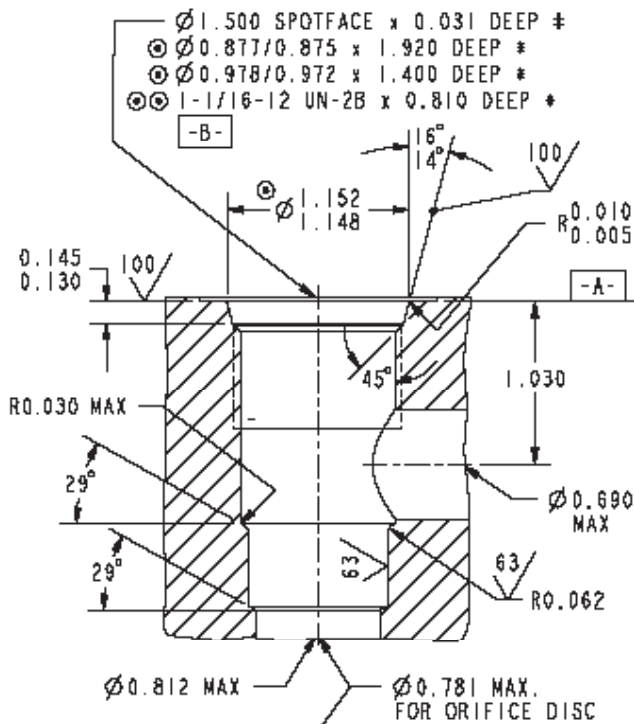
⊖		0.001 [0,025]	A
		∇ 0.002 [0,05]	B
⊖⊖		0.001 [0,025]	A
		⊙ 0.0009 [0,023]	[PITCH DIA]

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE $\pm 0.005 [0,13]$.
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS].



SERIES 12

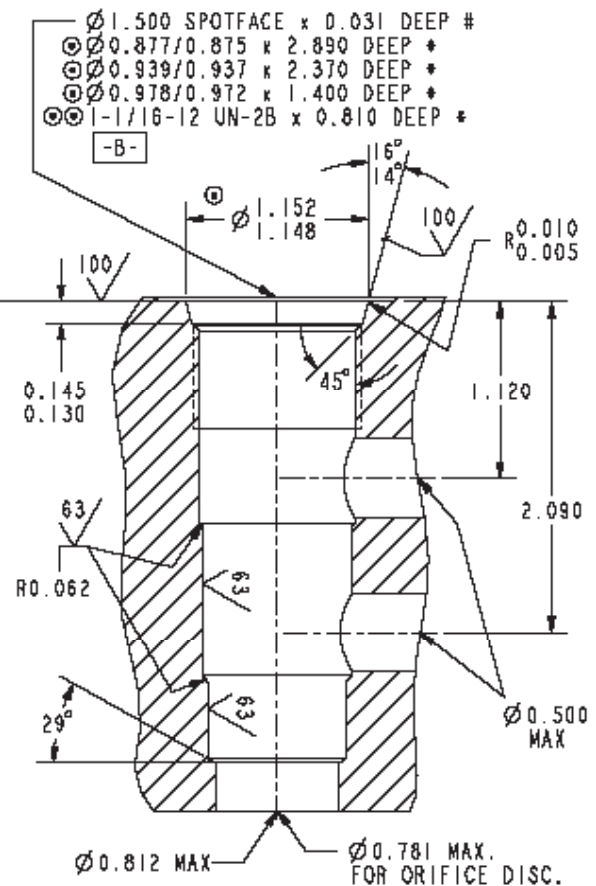
VC12-2



NOTE:
 CAVITY VARIATION 'A' **
 MIN. PILOT DRILL $\varnothing 0.750$
 REQUIRED TO MIN. DEPTH
 OF 2.14 FROM SPOTFACE

NOTE:
 CAVITY VARIATION 'B' **
 PILOT DRILL $\varnothing 0.812$
 REQUIRED TO MIN. DEPTH
 OF 2.45 FROM SPOTFACE

VC12-3



NOTES:

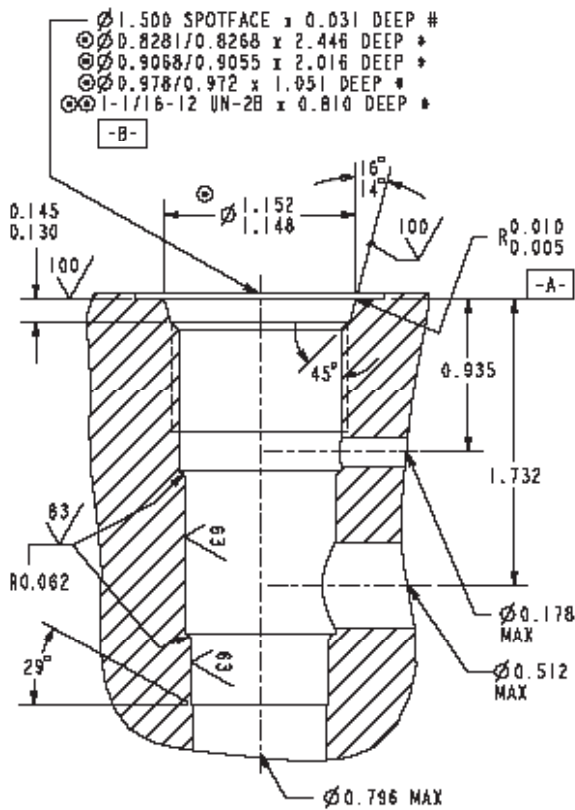
- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

⊕		0.001	A	⊕ ⊕		0.001	A
		0.002	B			0.0009	{ PITCH DIA }

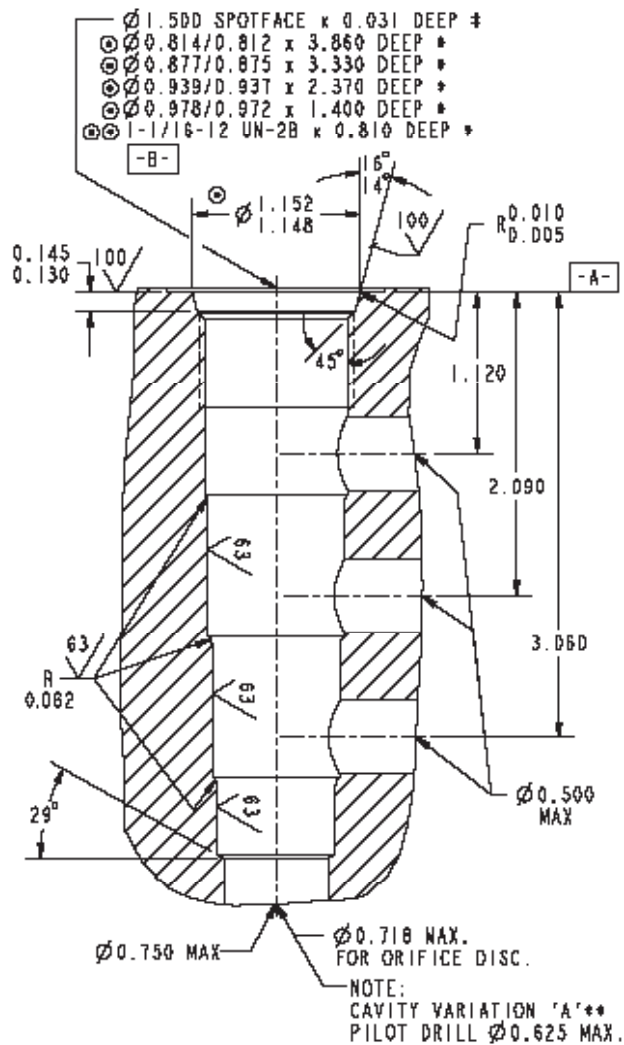
- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
 - UNSPECIFIED TOLERANCES ARE ± 0.005 .
 - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- ** - FEATURES OF VARIATION 'A' AND 'B' ARE ONLY REQUIRED IF NOTED ON A SPECIFIC PRODUCT CATALOG PAGE.

SERIES 12

VC12-S3



VC12-4



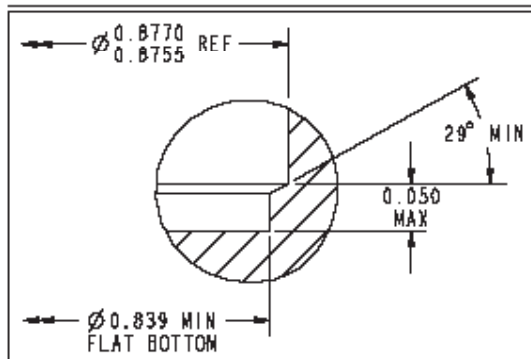
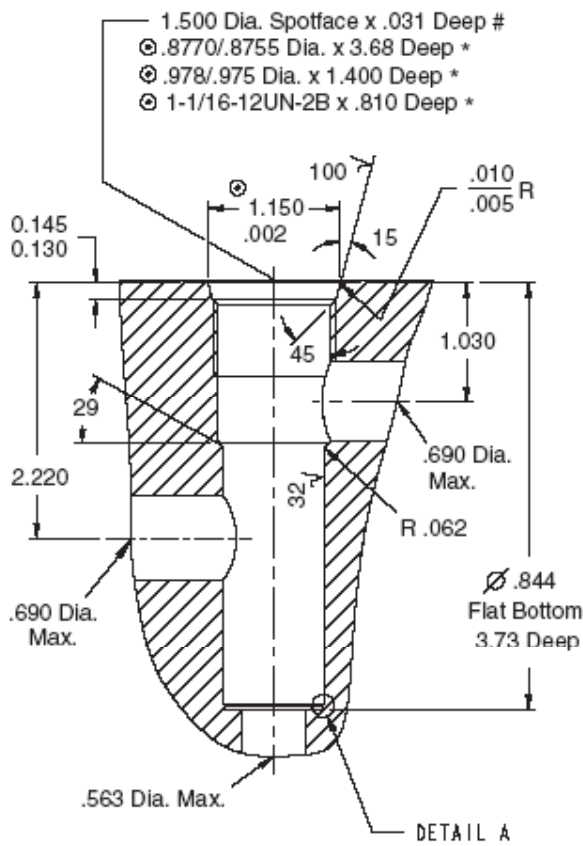
NOTES: - THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

⊙	0.001	A	⊙⊙	0.001	A
	0.002	B		0.0009	{ PITCH DIA }

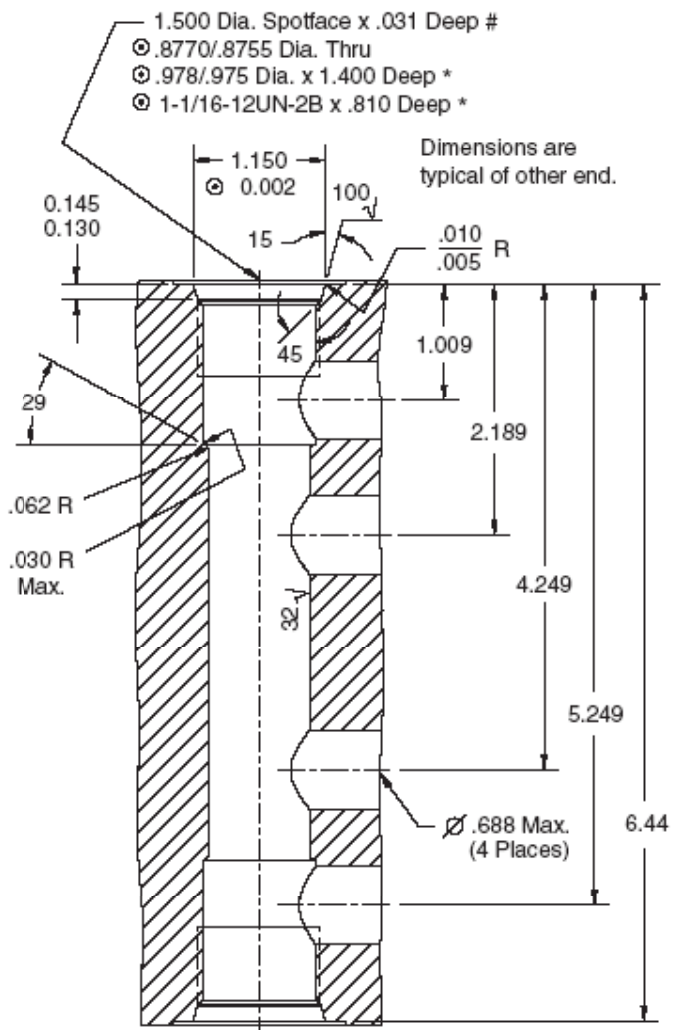
- * - DEPTHS ARE FROM DATUM -A-
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ±0.005. - UNSPECIFIED ANGULAR DIMENSIONS ±3°.
- ** - FEATURES OF VARIATION 'A' ARE ONLY REQUIRED IF NOTED ON A SPECIFIC PRODUCT CATALOG PAGE.

SERIES 12

VC12-PCV



VC12-DCV



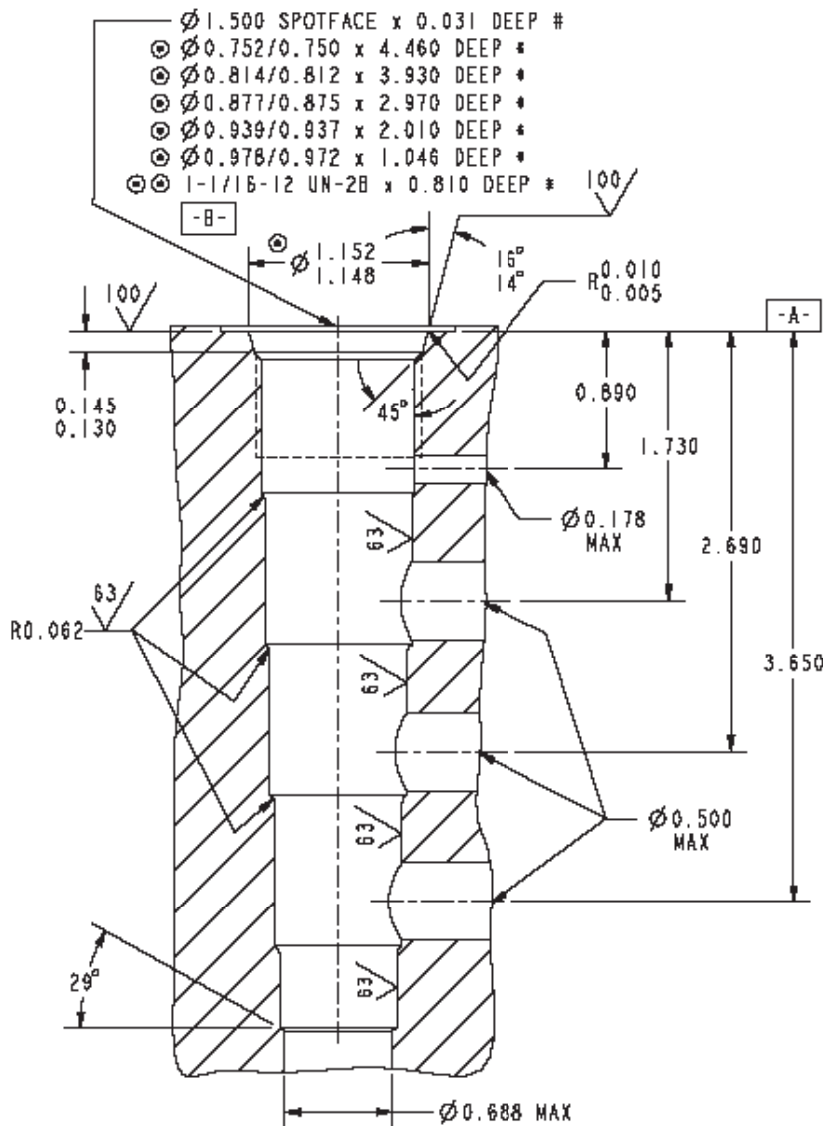
Notes:

- Ⓞ 1. These Diameters to be Concentric within .002 T.I.R. and Perpendicular to Spotface within .001 T.I.R.
- * 2. Depths are from Spotface.
- 3. Unspecified Tolerances are .005.
- # 4. Unless Otherwise Specified on Machining Drawing
- 5. All Dimensions shown in inches unless otherwise noted.

Cavity features (except for pilot drill and cross drills) can be machined simultaneously using HydraForce form tools. Consult factory.

SERIES 12

VC12-S5



NOTES: - THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

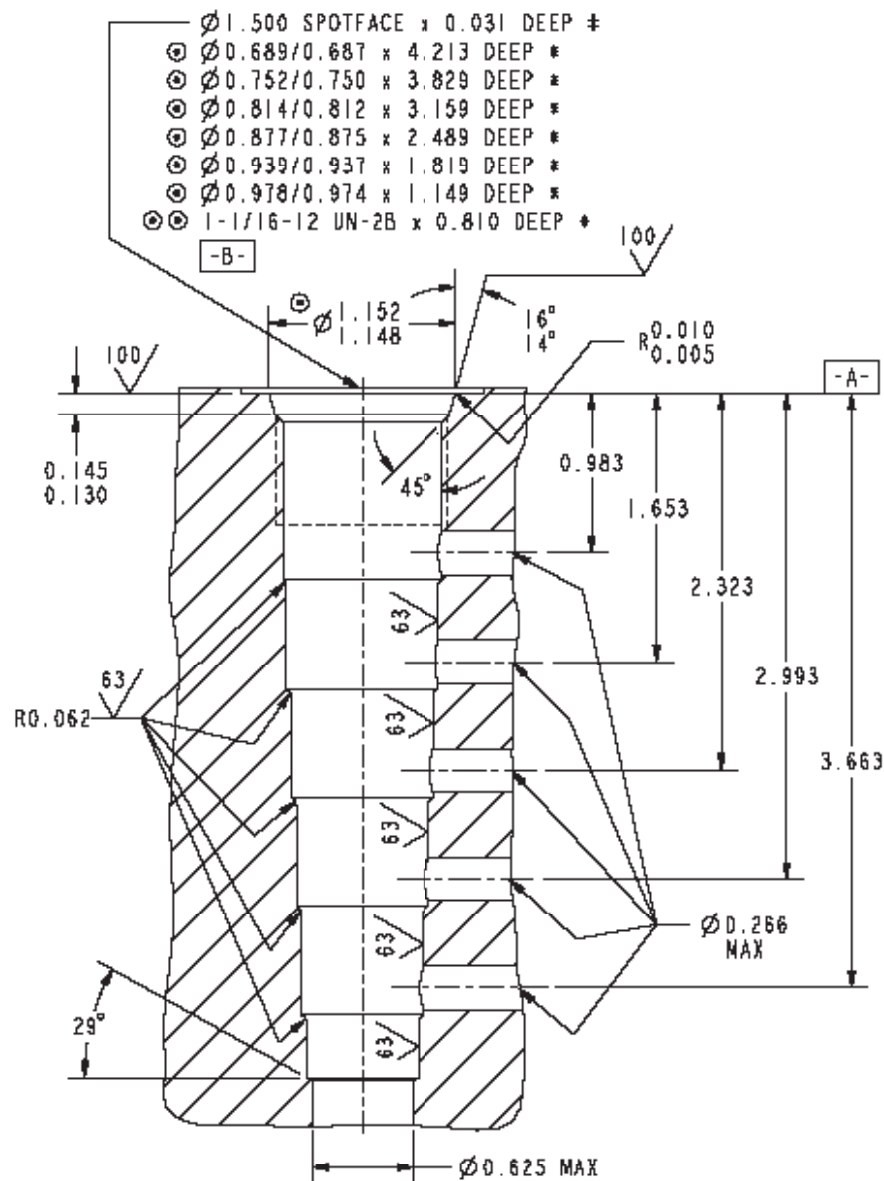
$\textcircled{\ast}$	$\frac{0.001}{0.002}$	A	$\textcircled{\ast}$	$\frac{0.001}{0.0009}$	A
		B			(PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A-
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 . - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.




SERIES 12

VC12-6




NOTES: - THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

$\textcircled{\ominus}$ -

	0.001	A
	0.002	B

 $\textcircled{\ominus\ominus}$ -

	0.001	A
	0.0009	(PITCH DIA)

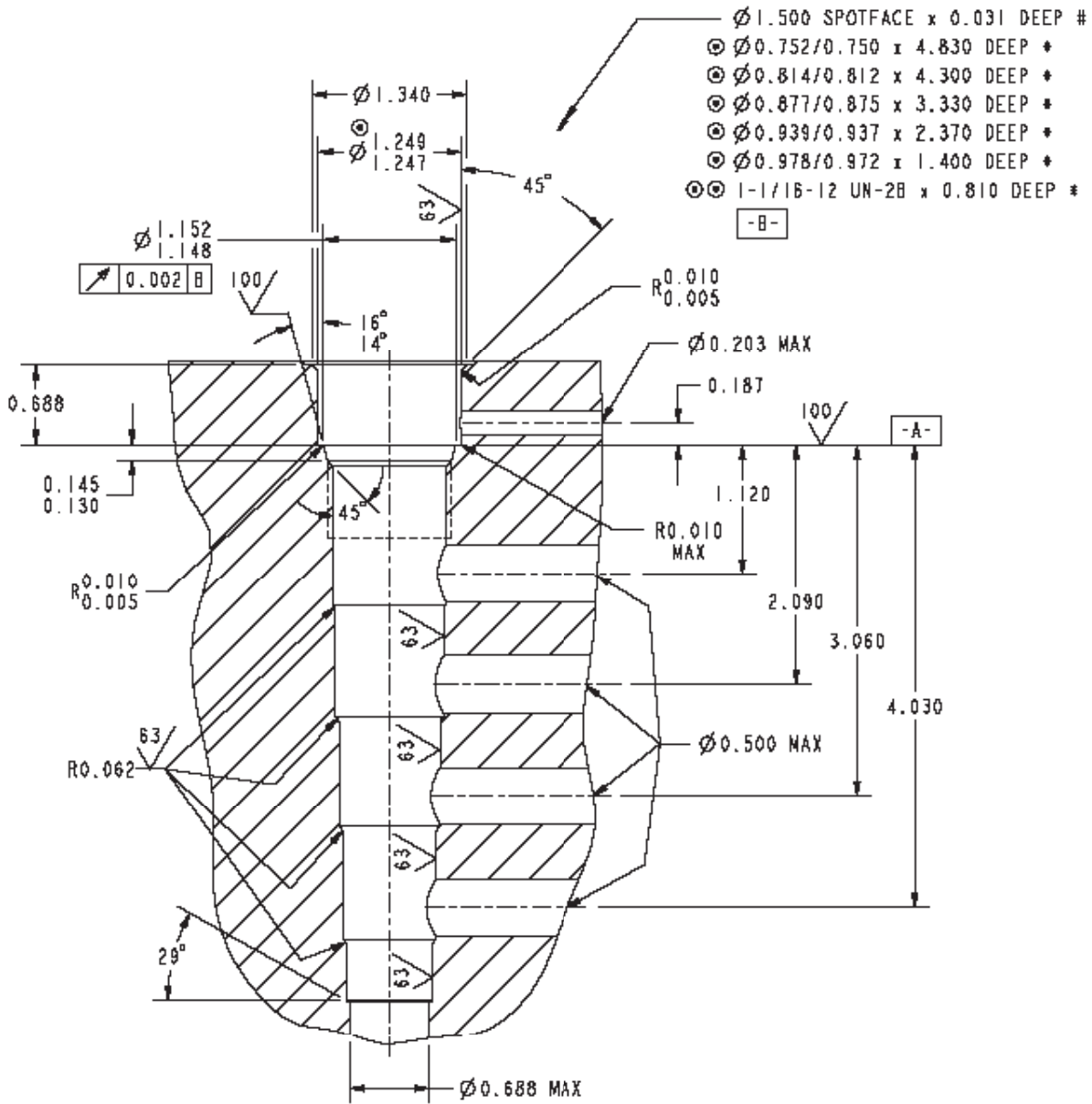
* - DEPTHS ARE FROM DATUM **-A-**.

- UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.

- UNSPECIFIED TOLERANCES ARE ± 0.005 . - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

SERIES 12

VC12-S6



NOTES: - THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

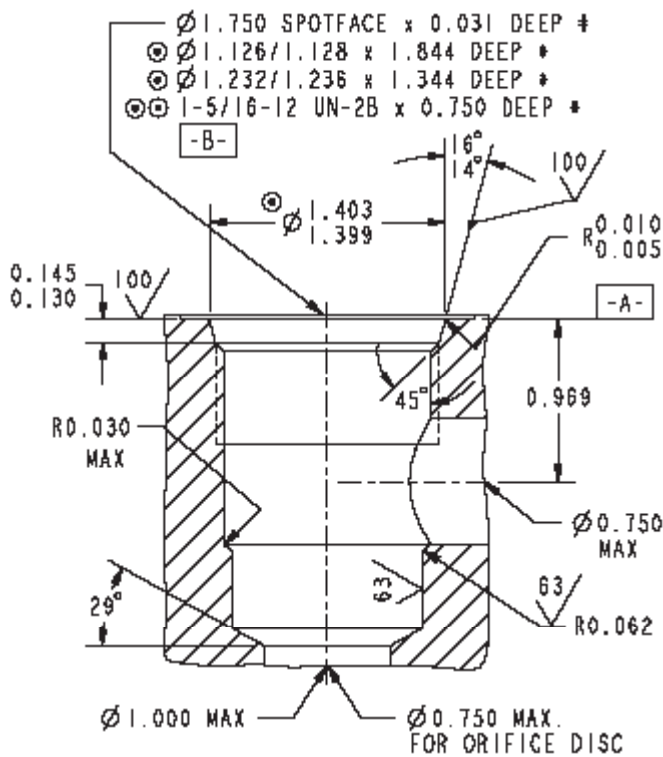
⊙ - $\sqrt{0.001}$ A $\sqrt{0.002}$ B ⊙⊙ - $\sqrt{0.001}$ A $\sqrt{0.0009}$ (PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A-
- † - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 . - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.



SERIES 16

VC16-2



NOTES:

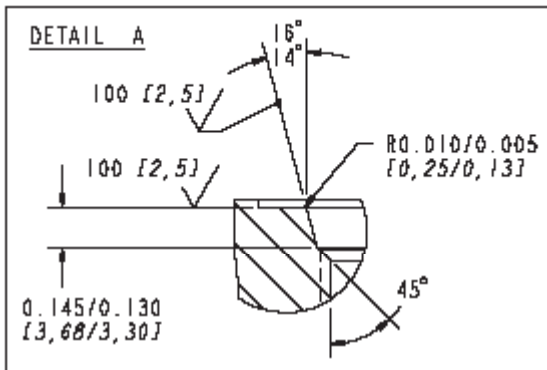
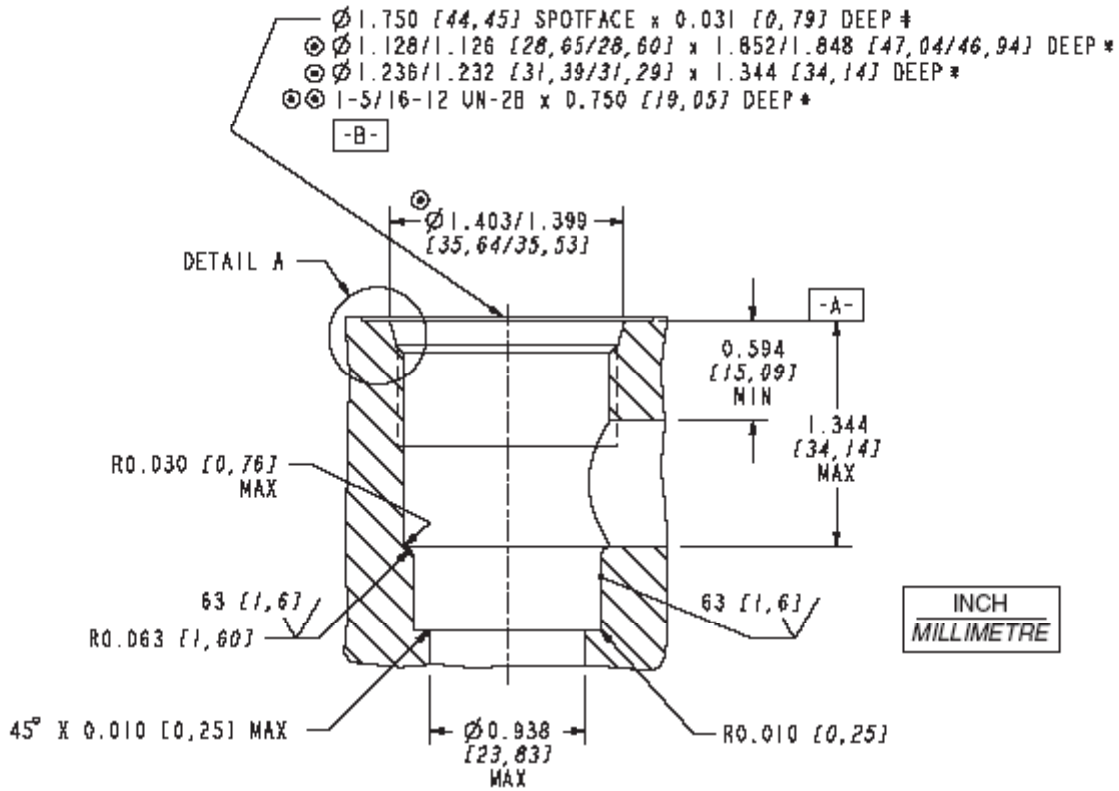
- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

⊕		0.001	A	⊕⊕		0.001	A
		\swarrow 0.002	B			⊙	0.0009

- * - DEPTHS ARE FROM DATUM -A- .
- ‡ - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

SERIES 16

HVC16-2



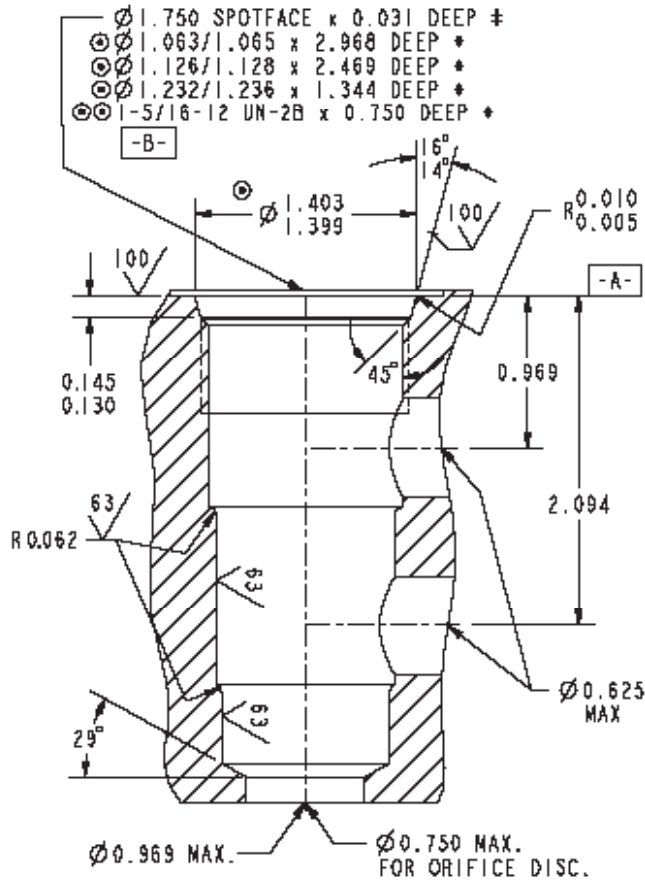
NOTES:

⊖	0.001 [0,025]	A
↗	0.002 [0,05]	B
⊖⊖	0.001 [0,025]	A
○	0.0009 [0,023]	{PITCH DIA}

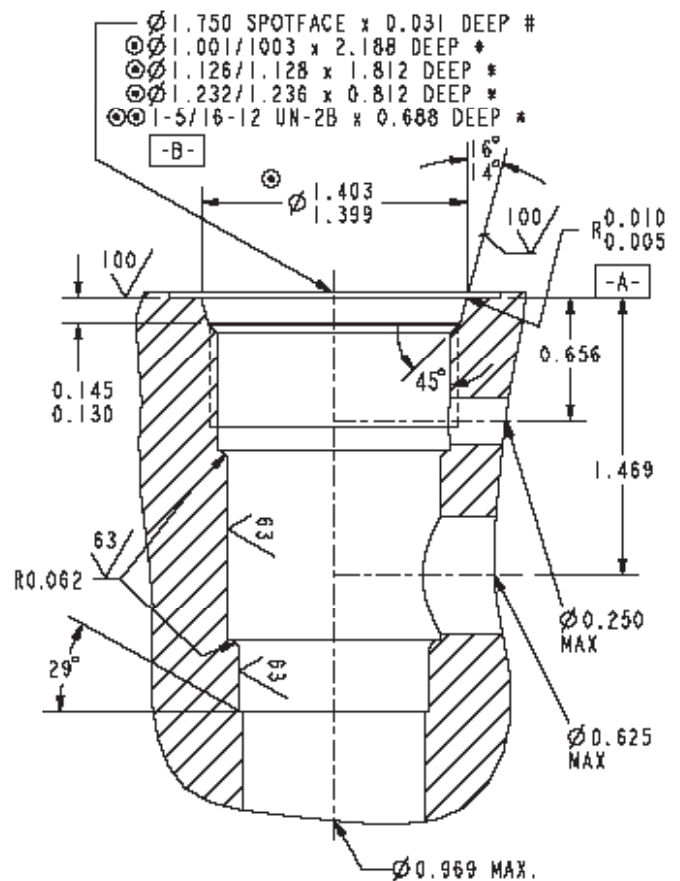
- * - DEPTHS ARE FROM DATUM -A- .
- † - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ±0.005 [0,13].
- UNSPECIFIED ANGULAR DIMENSIONS ±3°.
- SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS].

SERIES 16

VC16-3



VC16-S3



NOTES:

- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

⊕		0.001	A	⊕⊕		0.001	A
		0.002	B			⊕	0.0009

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

NOTES:

- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

⊕		0.001	A	⊕⊕		0.001	A
		0.002	B			⊕	0.0009

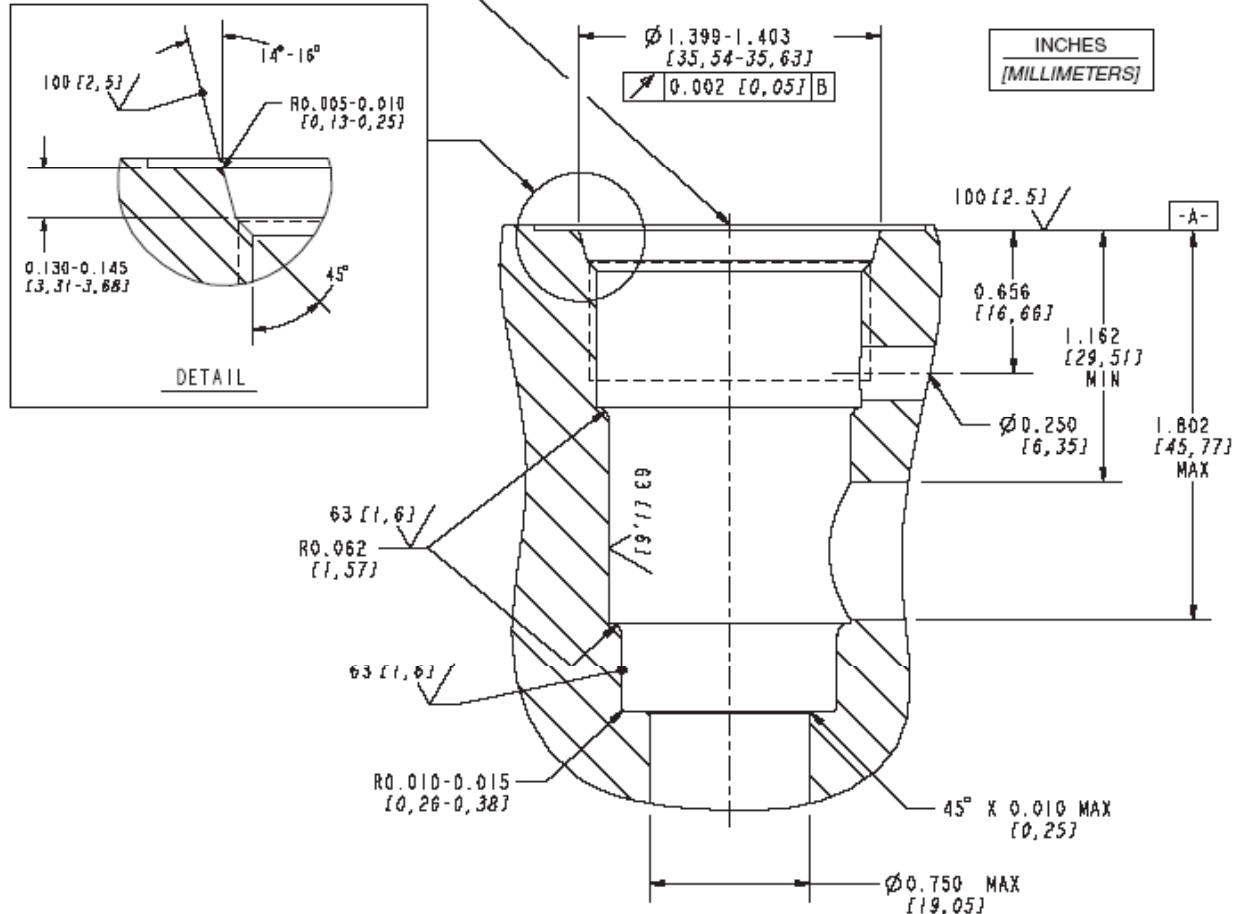
- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

SERIES 16

HVC16-S3

- ⊙ $\varnothing 1.820$ [46,23] SPOTFACE X 0.031 [0,79] DEEP #
- ⊙ $\varnothing 1.001-1.003$ [25,43-25,47] X $2.236-2.240$ [56,80-56,89] DEEP †
- ⊙ $\varnothing 1.126-1.128$ [28,61-28,65] X 1.812 [46,02] DEEP †
- ⊙ $\varnothing 1.232-1.236$ [31,30-31,39] X 0.812 [20,62] DEEP †
- ⊙⊙ 1-5/16-12 UN-2B X 0.688 [17,48] DEEP †

-B-



NOTES:

- ⊙ -

0.001	[0,025]	A
$\sqrt{0.002}$	[0,05]	B

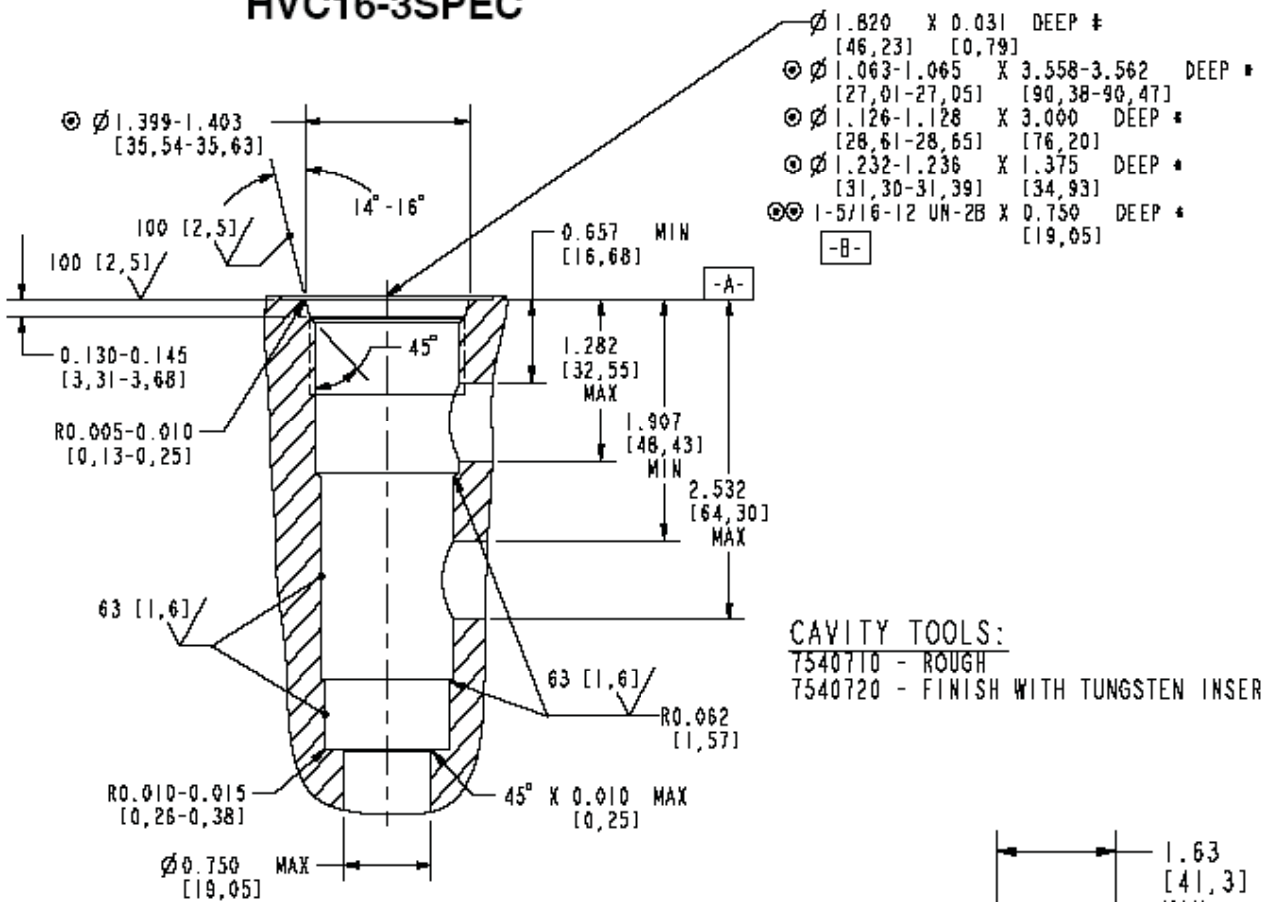
 ⊙⊙ -

0.001	[0,025]	A
\bigcirc	0.0009	[0,23] (PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A- .
- † - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
 - UNSPECIFIED TOLERANCES ARE ± 0.005 [0,13] .
 - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
 - SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS] .

SERIES 16

HVC16-3SPEC

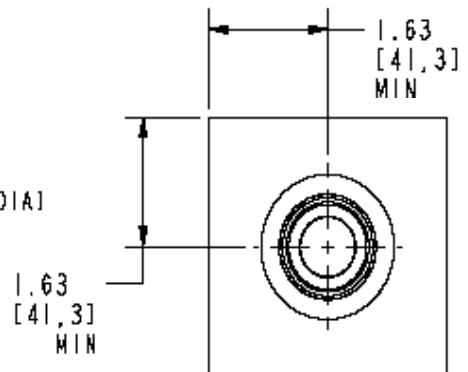


CAVITY TOOLS:
 7540710 - ROUGH
 7540720 - FINISH WITH TUNGSTEN INSERTS

NOTES:

\varnothing	\perp	0.001 [0,025]	A	\varnothing	\perp	0.001 [0,025]	A
	∇	0.002 [0,05]	B		\odot	0.0009 [0,023]	(PITCH DIA)

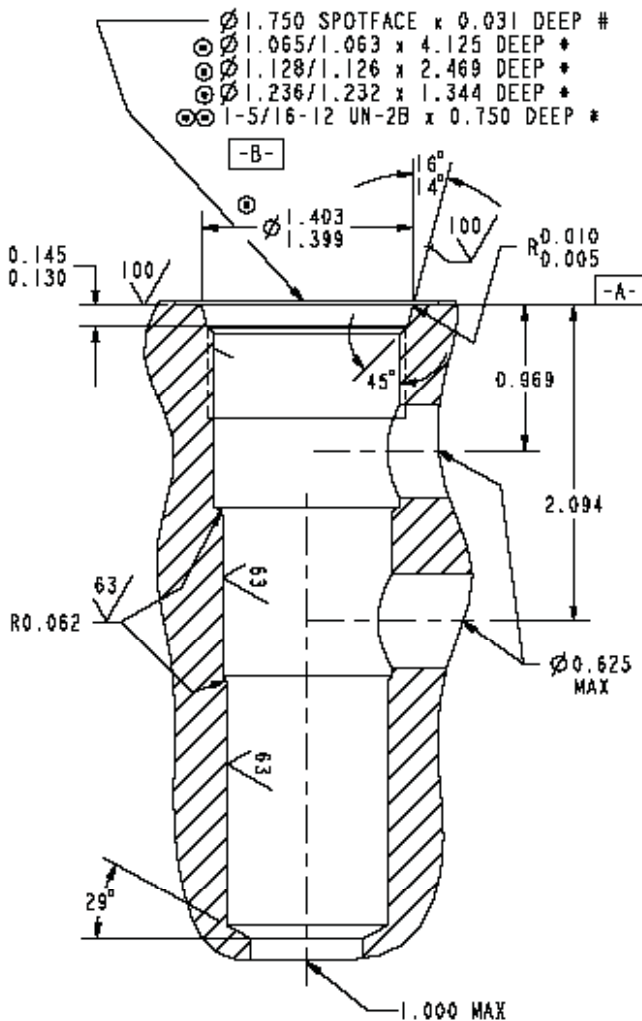
- * - DEPTHS ARE FROM DATUM **-A-**.
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 [0,13].
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS].



VALVE HOUSING DETAIL
 SCALE 1:2

SERIES 16

VC16-3SPCL



NOTES:

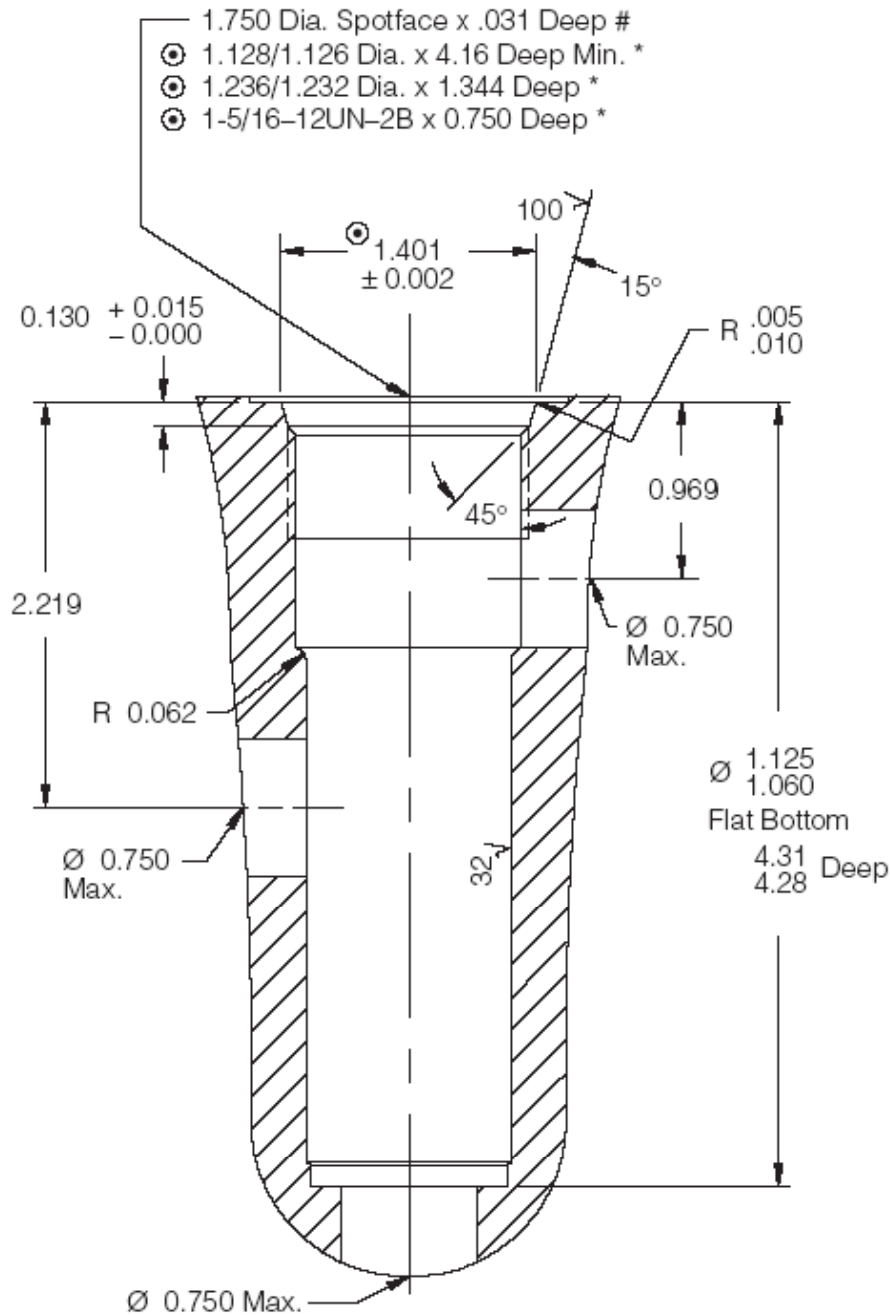
- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

\odot	0.001	A	$\odot\odot$	0.001	A
\varnothing	0.002	B	\odot	0.0009	(PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- CAVITY DIMENSIONS ARE EQUIVALENT TO VC16-3 EXCEPT FOR $\varnothing 1.065/1.063$ X 4.125 HOLE. VC16-3 TOOLING CAN BE USED WITH LONGER PREDRILL AND MATCHING DIAMETER.

SERIES 16

VC16-PCV



The above features (except for pilot drill & cross drills) can be machined simultaneously with a form tool.

Ⓞ — These diameters to be concentric within 0.002 T.I.R. and perpendicular to spotface within 0.001 T.I.R.

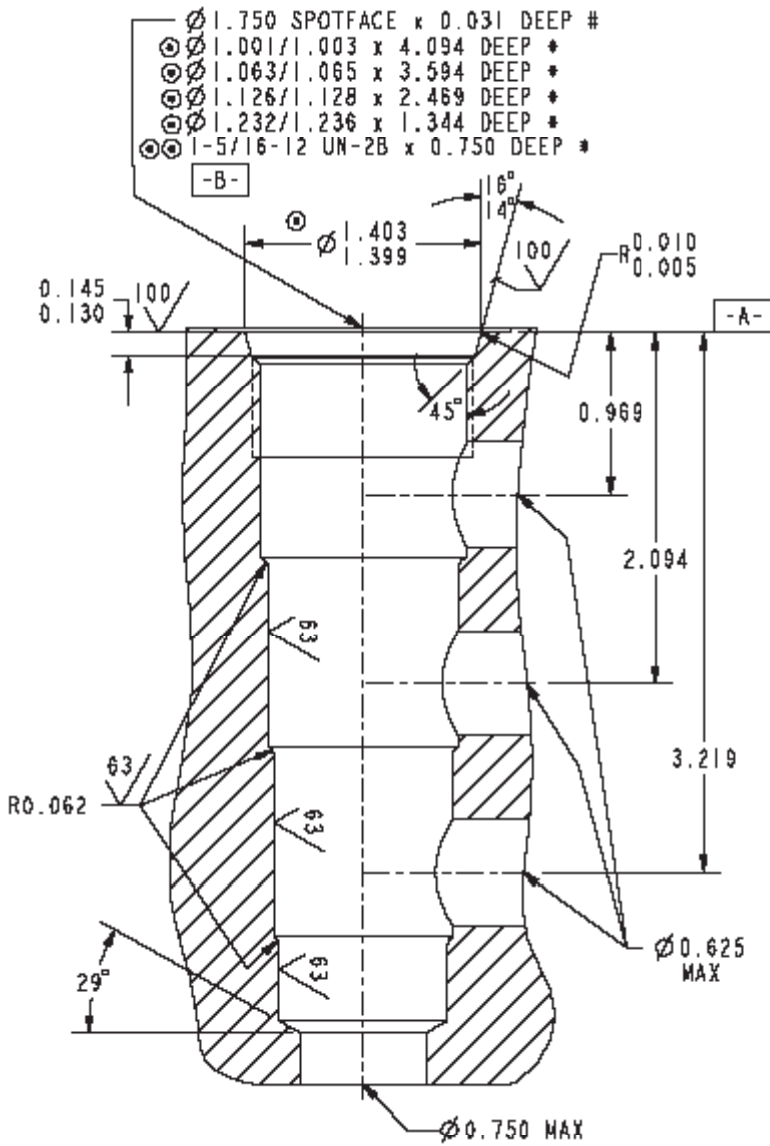
* — Depths are from spotface.

— Unless otherwise specified on machining drawing

Unspecified tolerances are ± 0.005 .




SERIES 16

VC16-4



NOTES:

- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

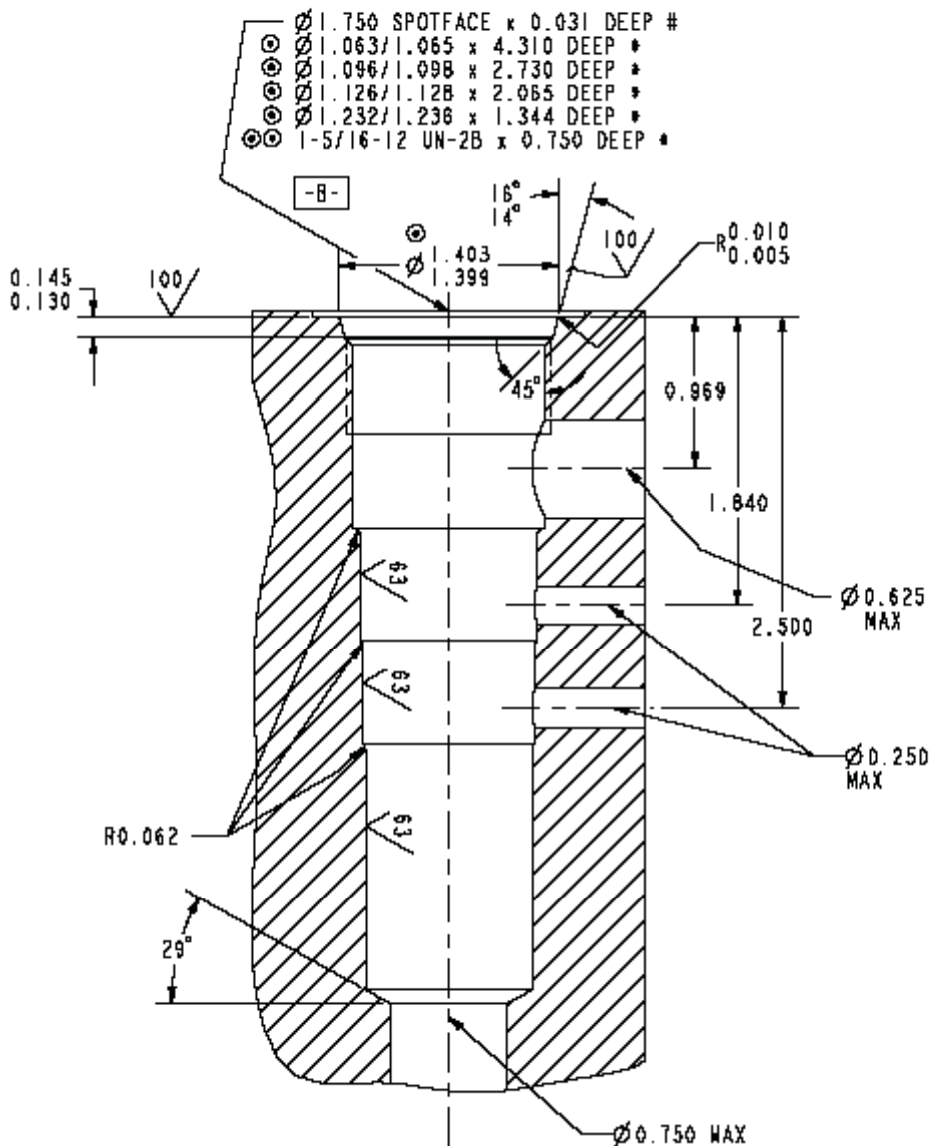
⊙		0.001	A	⊙⊙		0.001	A
		0.002	B			0.0009	(PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A-.
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.



SERIES 16

VC16-4SPCL



NOTES:

- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

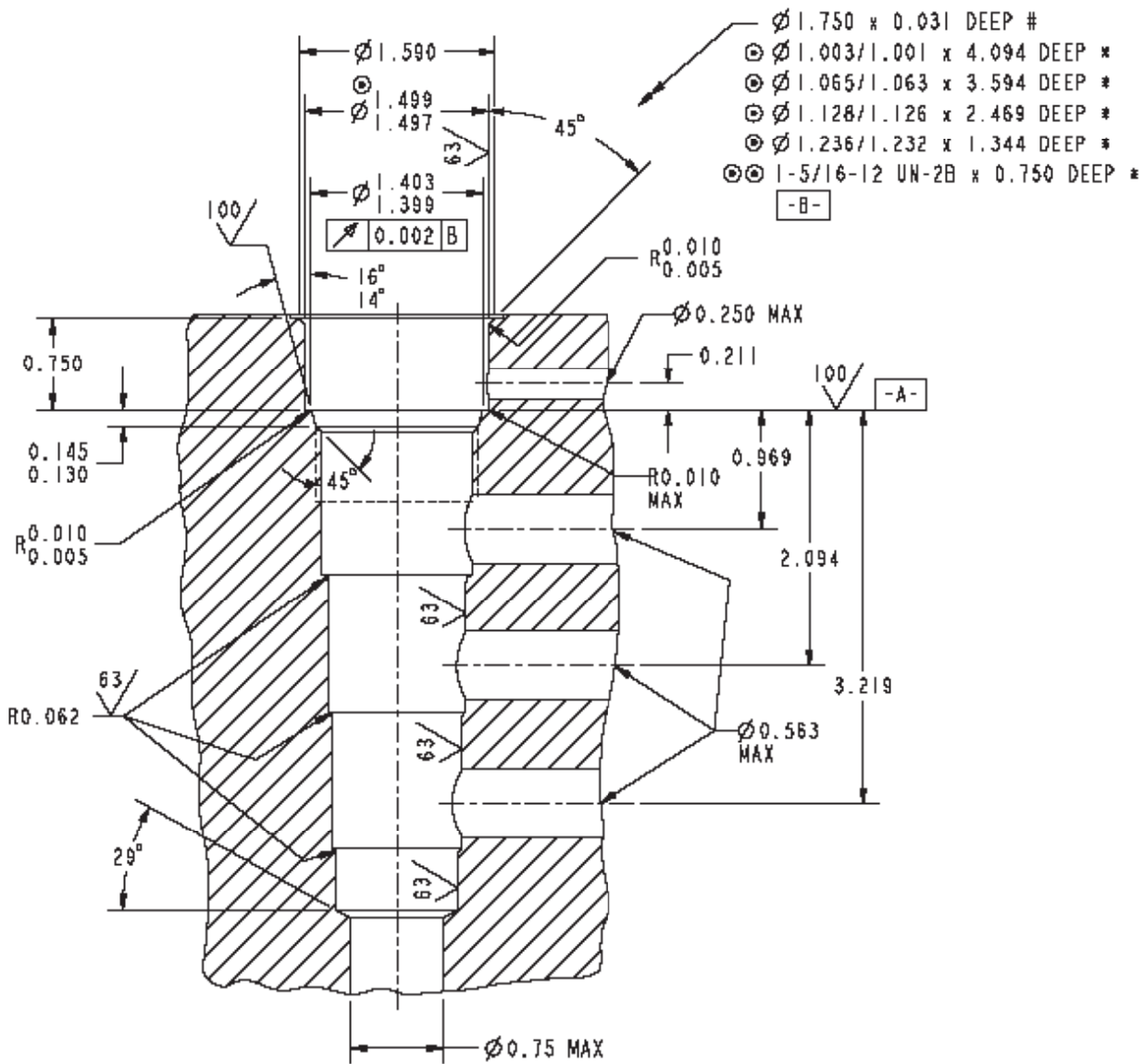
⊕	0.001	A	⊕⊕	0.001	A
	0.002	B		0.0009	(PITCH DIA)

- * - DEPTHS ARE FROM DATUM **-A-** .
- ‡ - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ±0.005.
- UNSPECIFIED ANGULAR DIMENSIONS ±3° .



SERIES 16

VC16-S5



NOTES: - THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

- ⊙ -

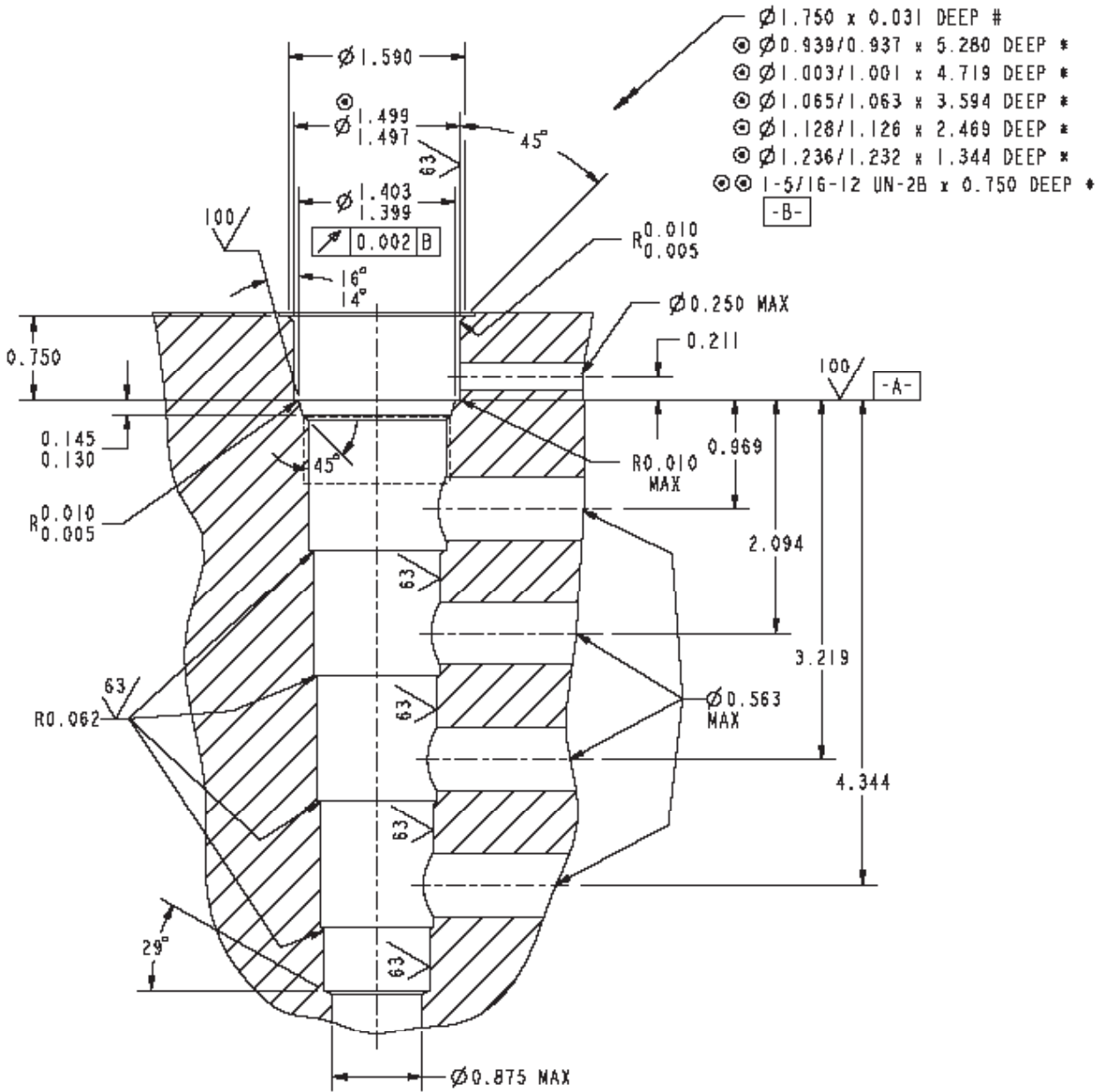
0.001	A
0.002	B
- ⊙⊙ -

0.001	A
0.0009	[PITCH DIA]

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ±0.005. - UNSPECIFIED ANGULAR DIMENSIONS ±3°.

SERIES 16

VC16-S6



NOTES: - THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

⊙ -

	0.001	A
	0.002	B

 ⊙⊙ -

	0.001	A
	0.0009	(PITCH DIA)

* - DEPTHS ARE FROM DATUM -A-

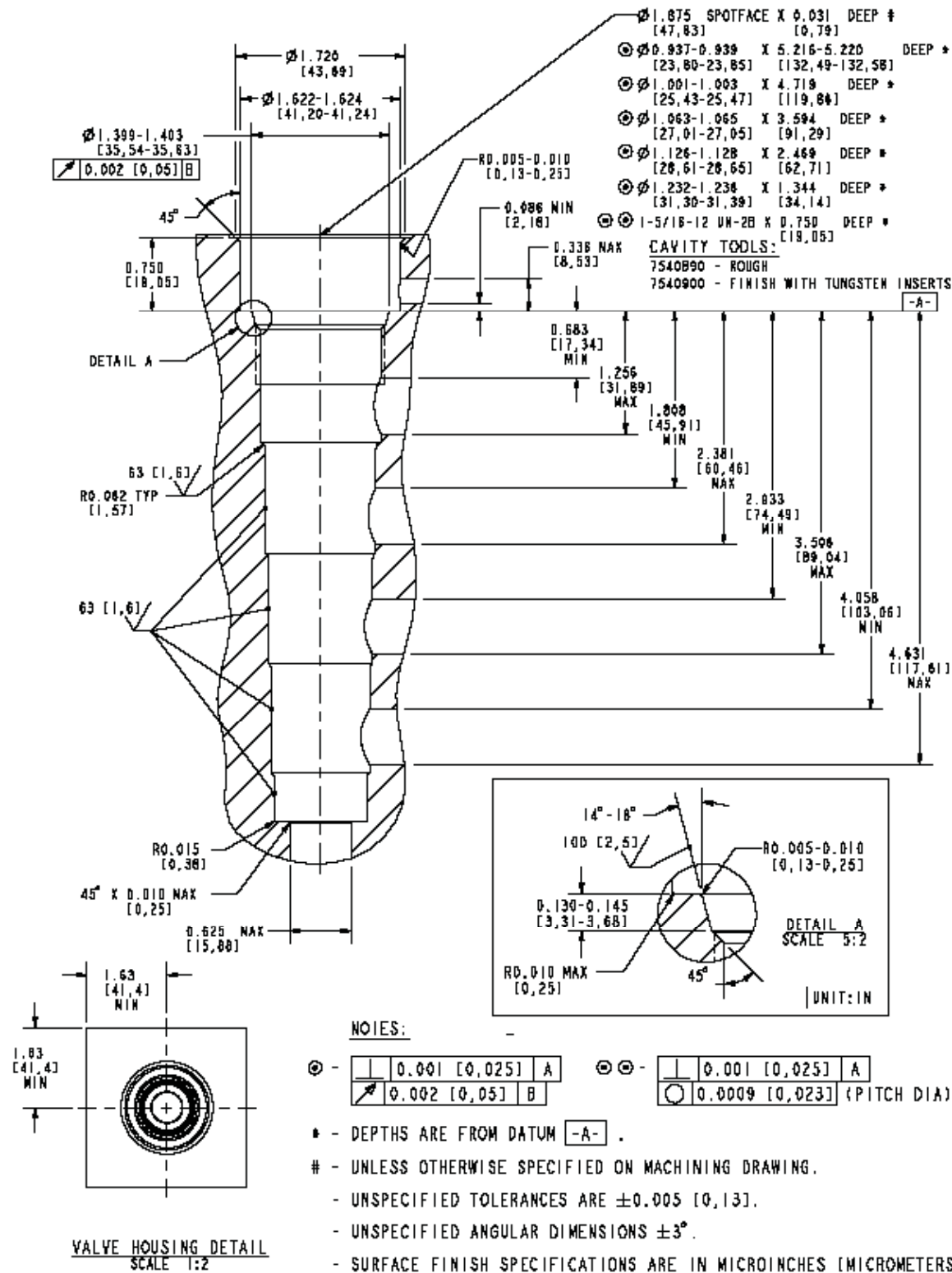
- UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.

- UNSPECIFIED TOLERANCES ARE ± 0.005 . - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.



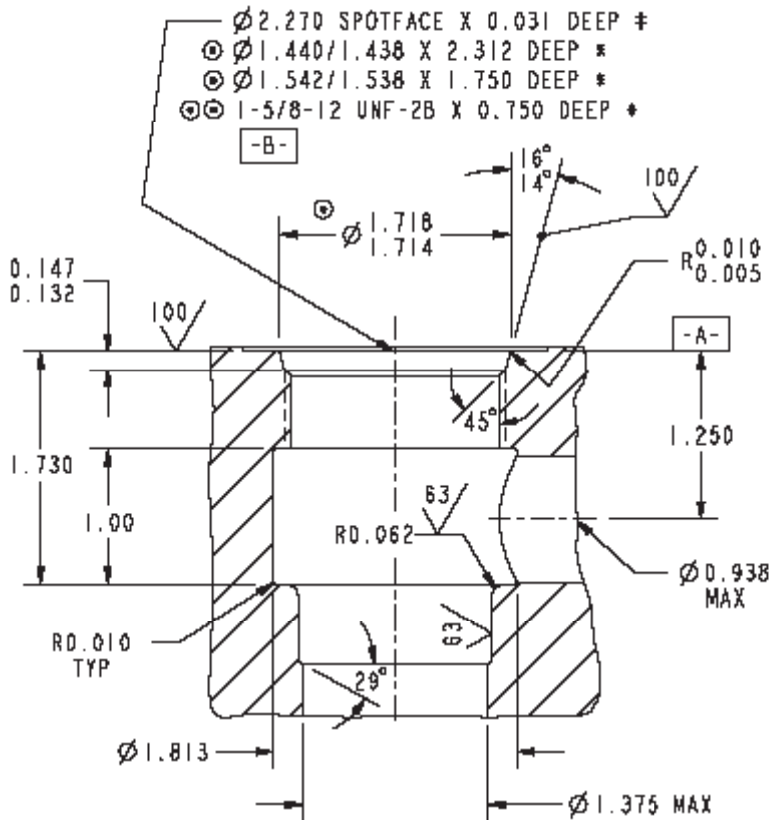
SERIES 16

HVC16-S6



SERIES 20

VC20-2



NOTES:

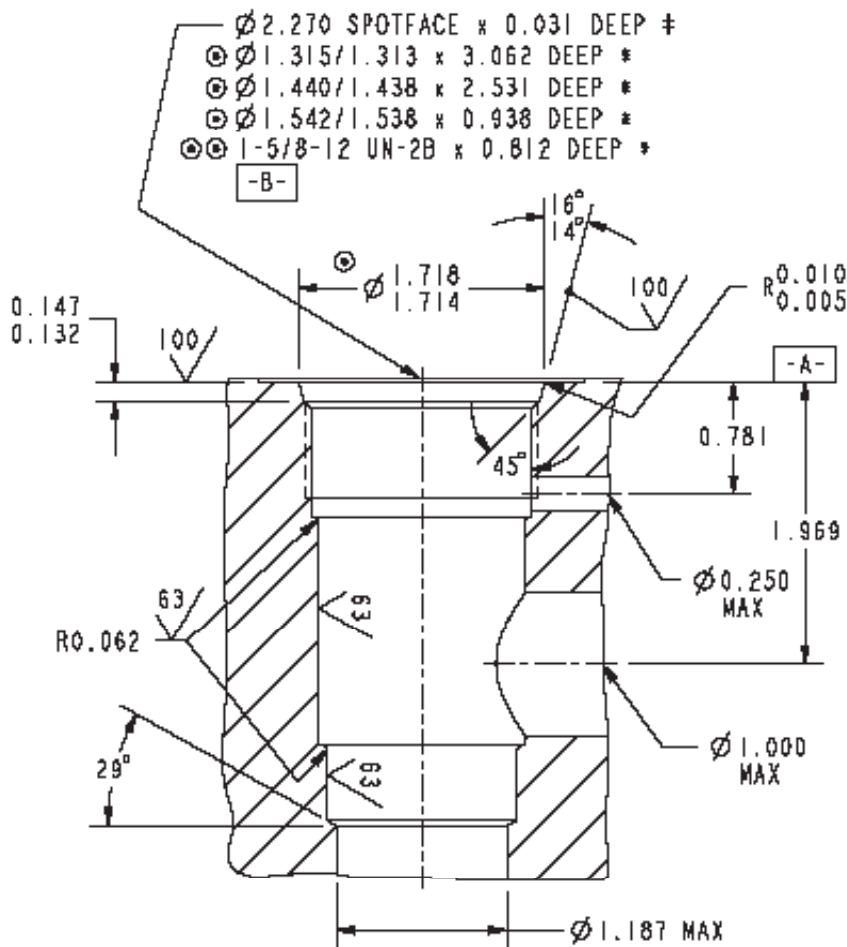
- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL, CROSS DRILLS AND $\varnothing 1.813$ UNDERCUT) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

$\textcircled{\ominus}$	$\frac{\perp}{\text{A}}$	0.001	A	$\textcircled{\omin�}$	$\frac{\perp}{\text{A}}$	0.001	A
	$\frac{\text{A}}{\text{B}}$	0.002	B		$\frac{\text{A}}{\text{A}}$	0.0009	(PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A- .
- ‡ - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
- ALL MACHINED SURFACES $\frac{125}{\sqrt{\quad}}$ UNLESS OTHERWISE SPECIFIED.

SERIES 20

VC20-S3



NOTES:

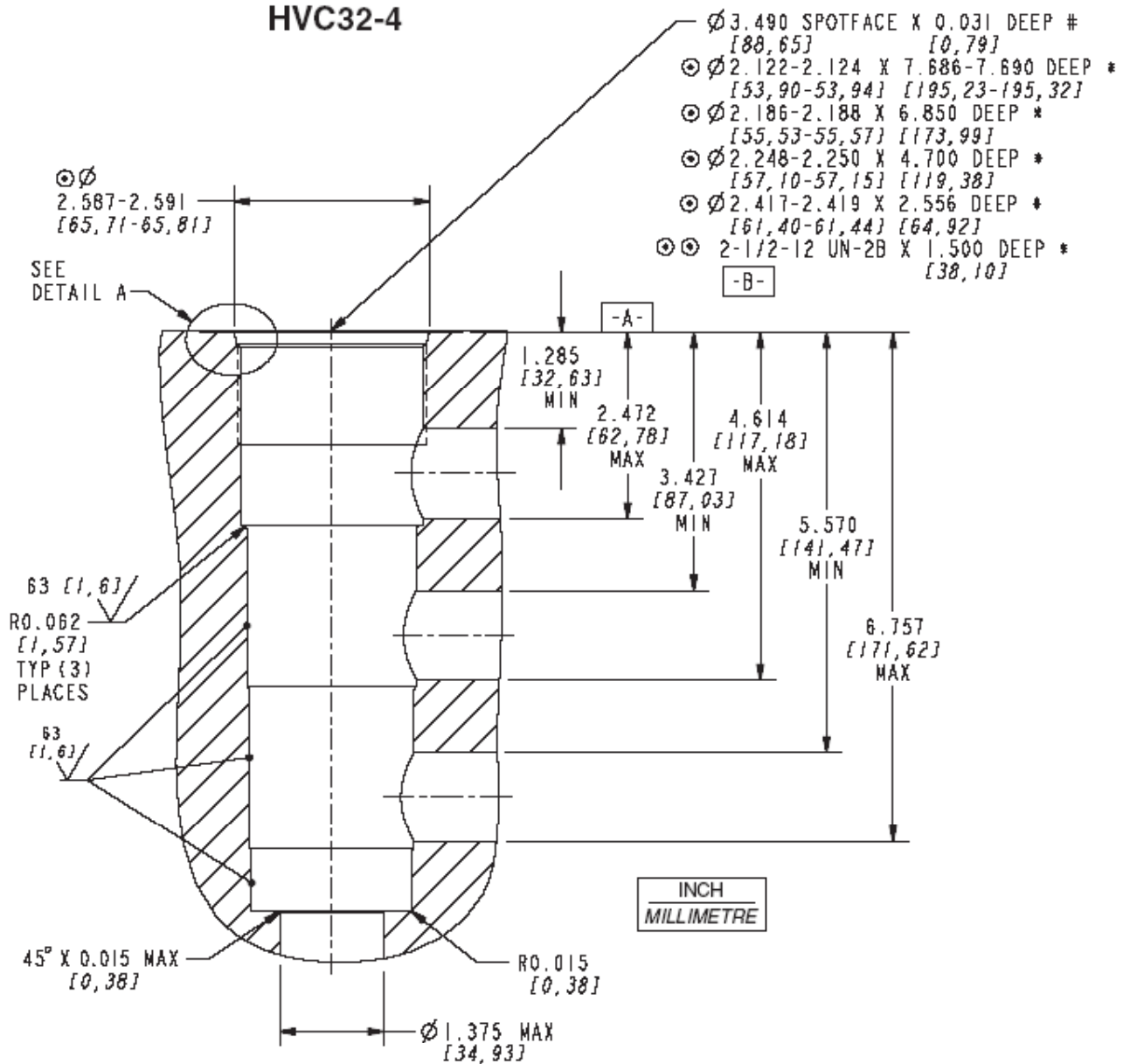
- THE ABOVE FEATURES (EXCEPT FOR PILOT DRILL AND CROSS DRILLS) CAN BE MACHINED SIMULTANEOUSLY USING HYDRAFORCE FORM TOOLS. CONSULT FACTORY.

$\textcircled{\circ}$	$\varnothing 0.001$	A	$\textcircled{\circ} \textcircled{\circ}$	$\varnothing 0.001$	A
	$\varnothing 0.002$	B		$\varnothing 0.0009$	(PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A- .
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
- UNSPECIFIED TOLERANCES ARE ± 0.005 .
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.

SERIES 32

HVC32-4



INCH
MILLIMETRE

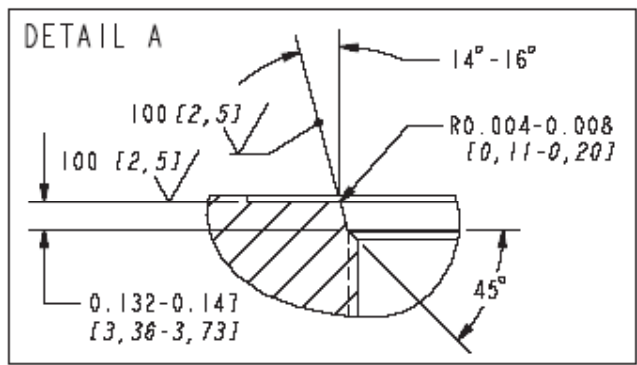
⊖ -

0.001	[0,025]	A
0.002	[0,05]	B

⊖⊖ -

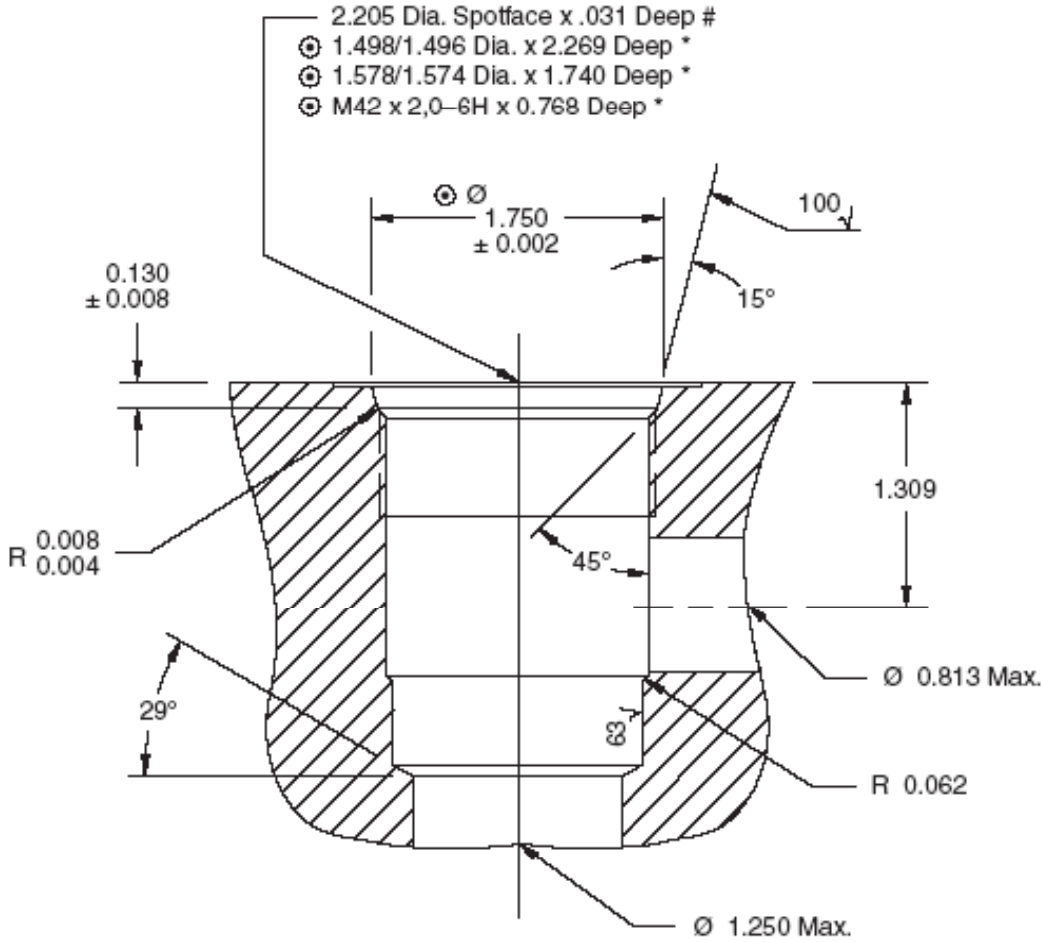
0.001	[0,025]	A
0.0009	[0,023]	[PITCH DIA]

- * - DEPTHS ARE FROM DATUM -A- .
- † - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
 - UNSPECIFIED TOLERANCES ARE ±0.005 [0,13].
 - UNSPECIFIED ANGULAR DIMENSIONS ±3°.
 - SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS].



SERIES 42

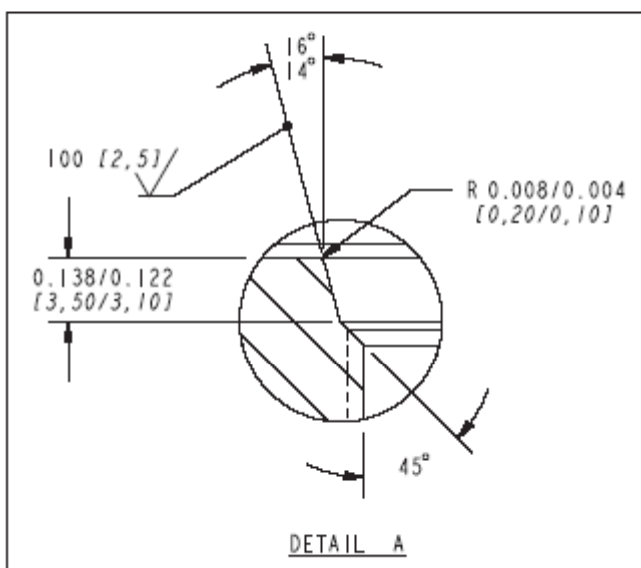
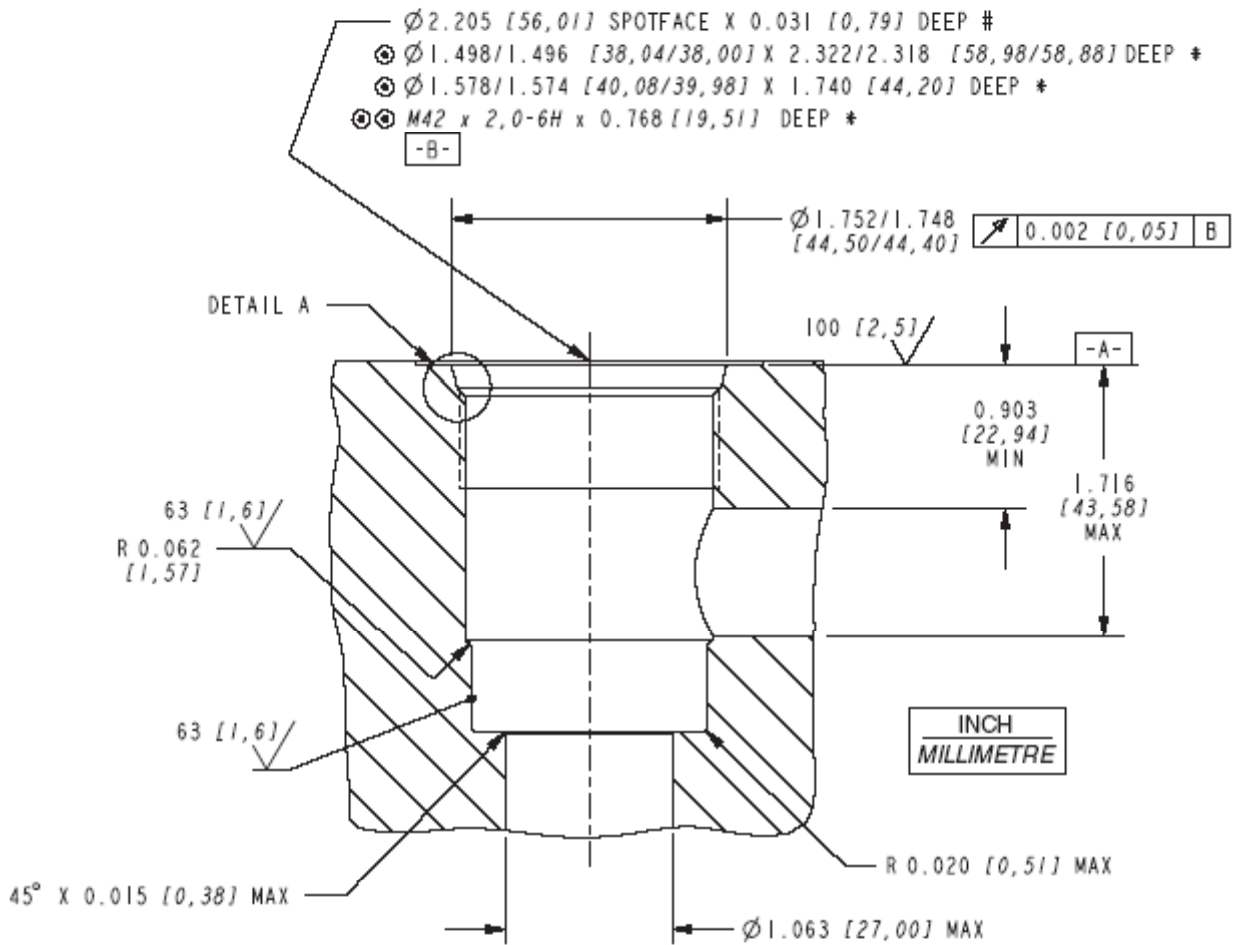
VC42-M2



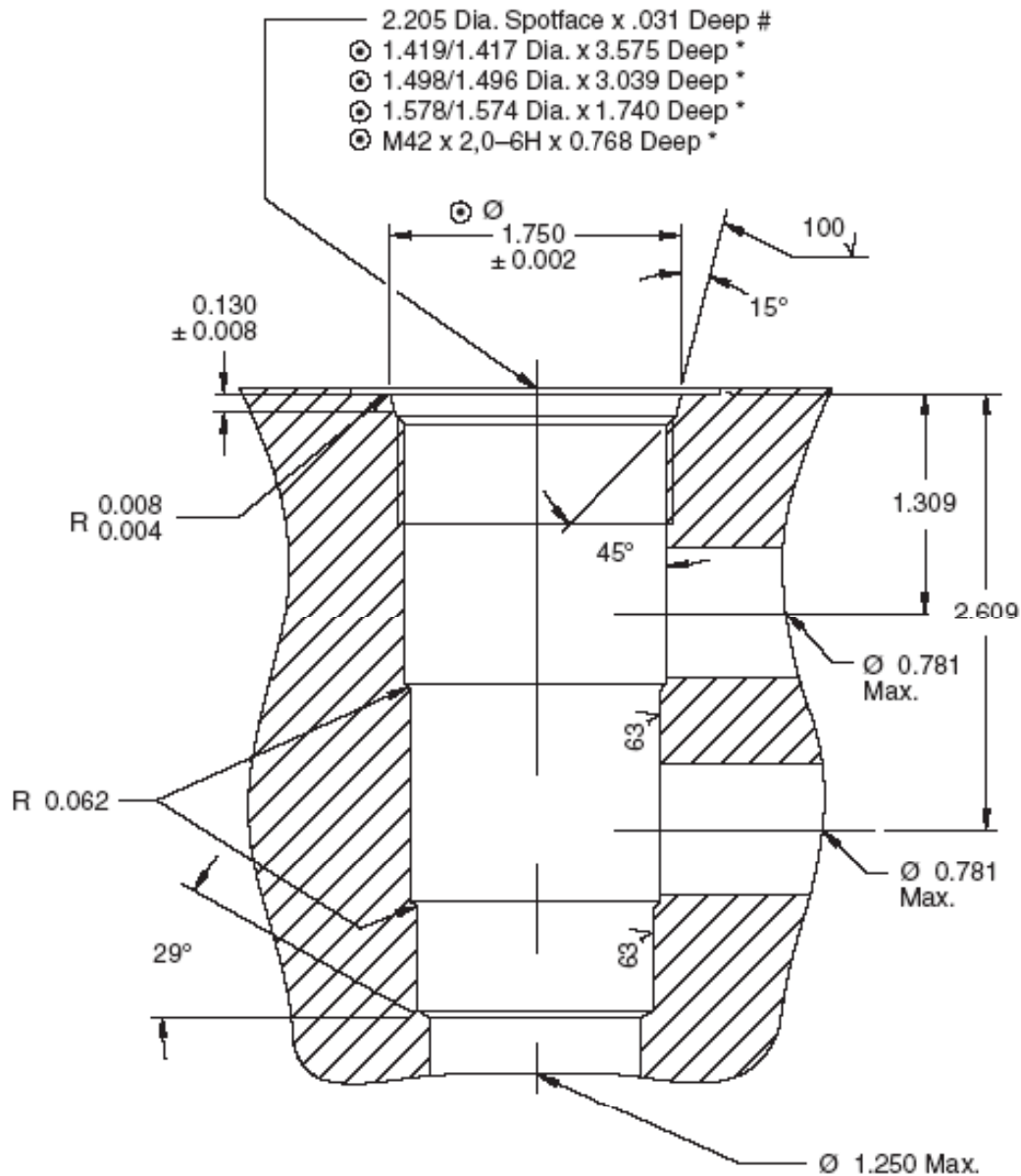
The above features (except for pilot drill & cross drills) can be machined simultaneously with a form tool.

- Ⓞ — These diameters to be concentric within 0.002 T.I.R. and perpendicular to spotface within 0.001 T.I.R.
- * — Depths are from spotface.
- # — Unless otherwise specified on machining drawing
 Unspecified tolerances are ±0.005.

HVC42-M2



- \odot - $\sqrt{\text{0.001 [0,025] A}}$
 $\sqrt{\text{0.002 [0,05] B}}$
- $\odot \odot$ - $\sqrt{\text{0.001 [0,025] A}}$
 $\bigcirc \text{0.0009 [0,023] (PITCH DIA)}$
- * - DEPTHS ARE FROM DATUM -A-
- ‡ - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING
- UNSPECIFIED TOLERANCES ARE ± 0.005 [0,13]
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$
- SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS]

SERIES 42
VC42-M3


The above features (except for pilot drill & cross drills) can be machined simultaneously with a form tool.

⊙ — These diameters to be concentric within 0.002 T.I.R. and perpendicular to spotface within 0.001 T.I.R.

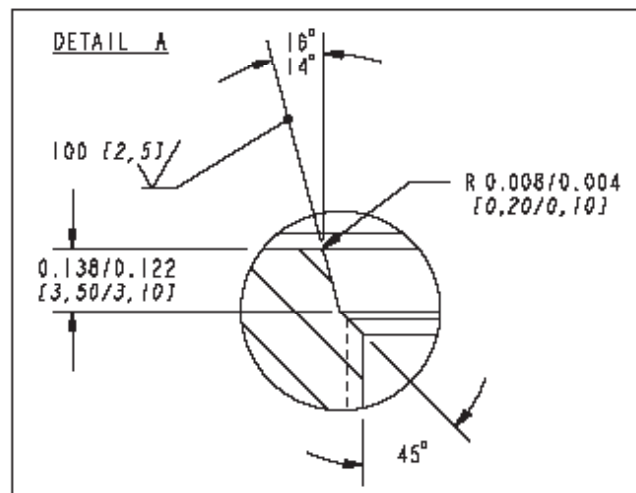
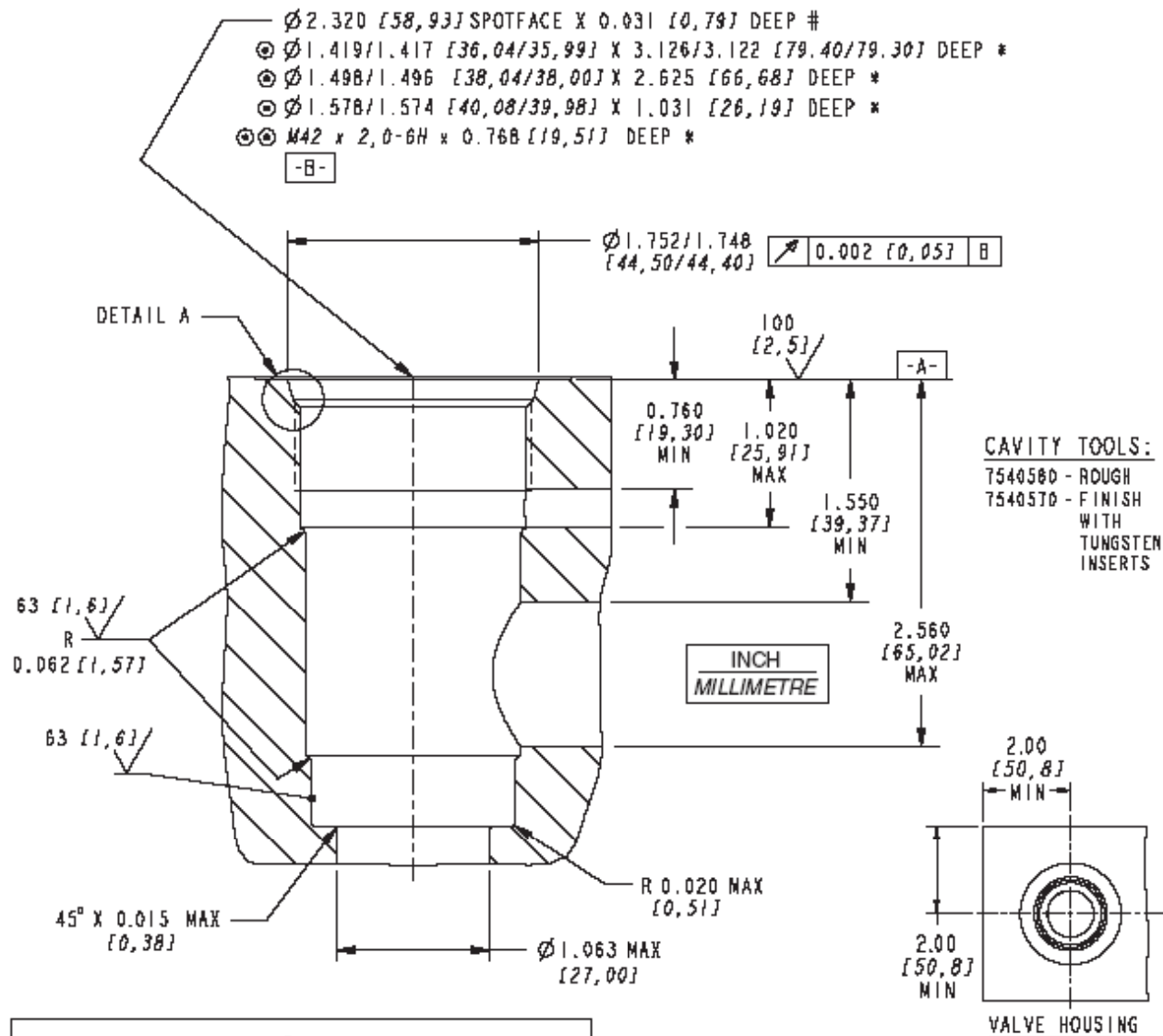
* — Depths are from spotface.

— Unless otherwise specified on machining drawing

Unspecified tolerances are ±0.005.

SERIES 42

HVC42-S3

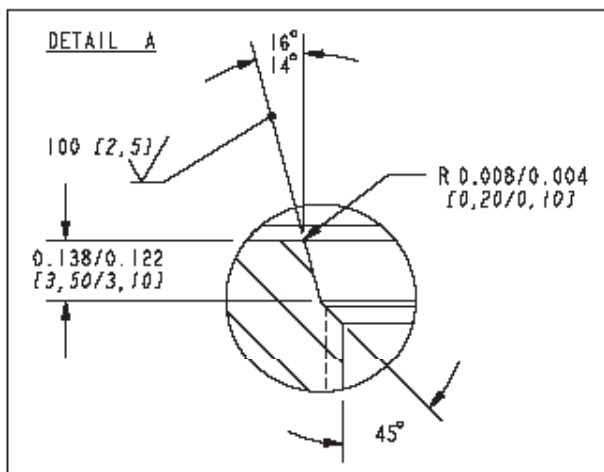
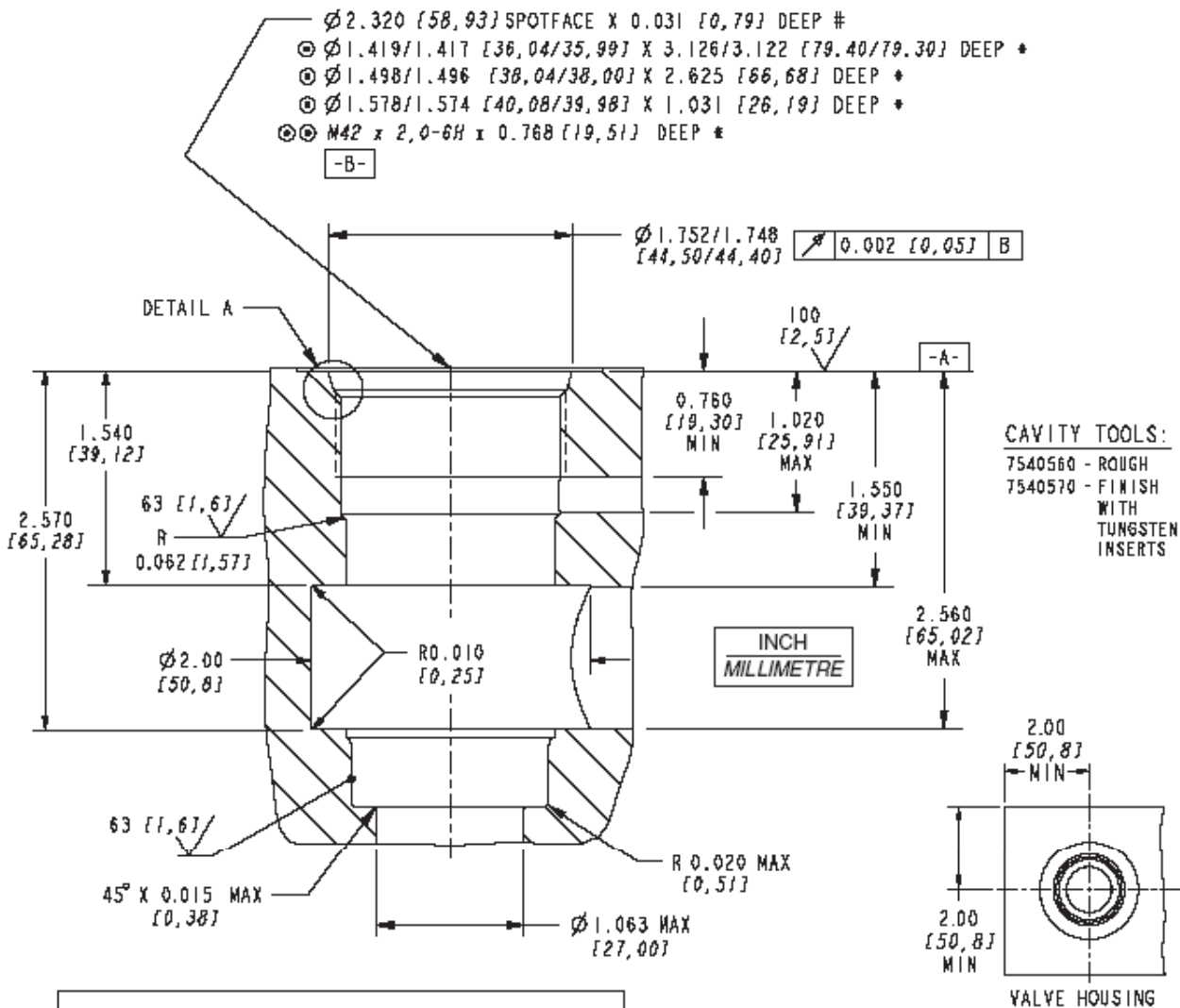


\odot	$\sqrt{0.001}$ [0,025] A
	$\sqrt{0.002}$ [0,05] B
$\odot \odot$	$\sqrt{0.001}$ [0,025] A
	$\varnothing 0.0009$ [0,023] (PITCH DIA)

- * - DEPTHS ARE FROM DATUM -A-
- ‡ - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING
- UNSPECIFIED TOLERANCES ARE ± 0.005 [0,13]
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$
- SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS]

SERIES 42

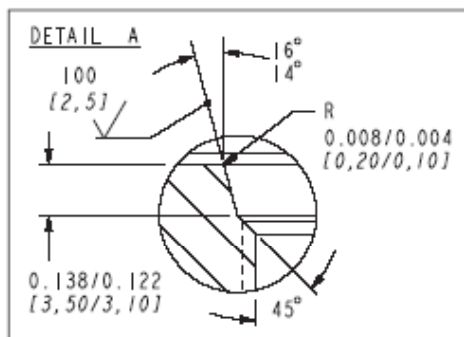
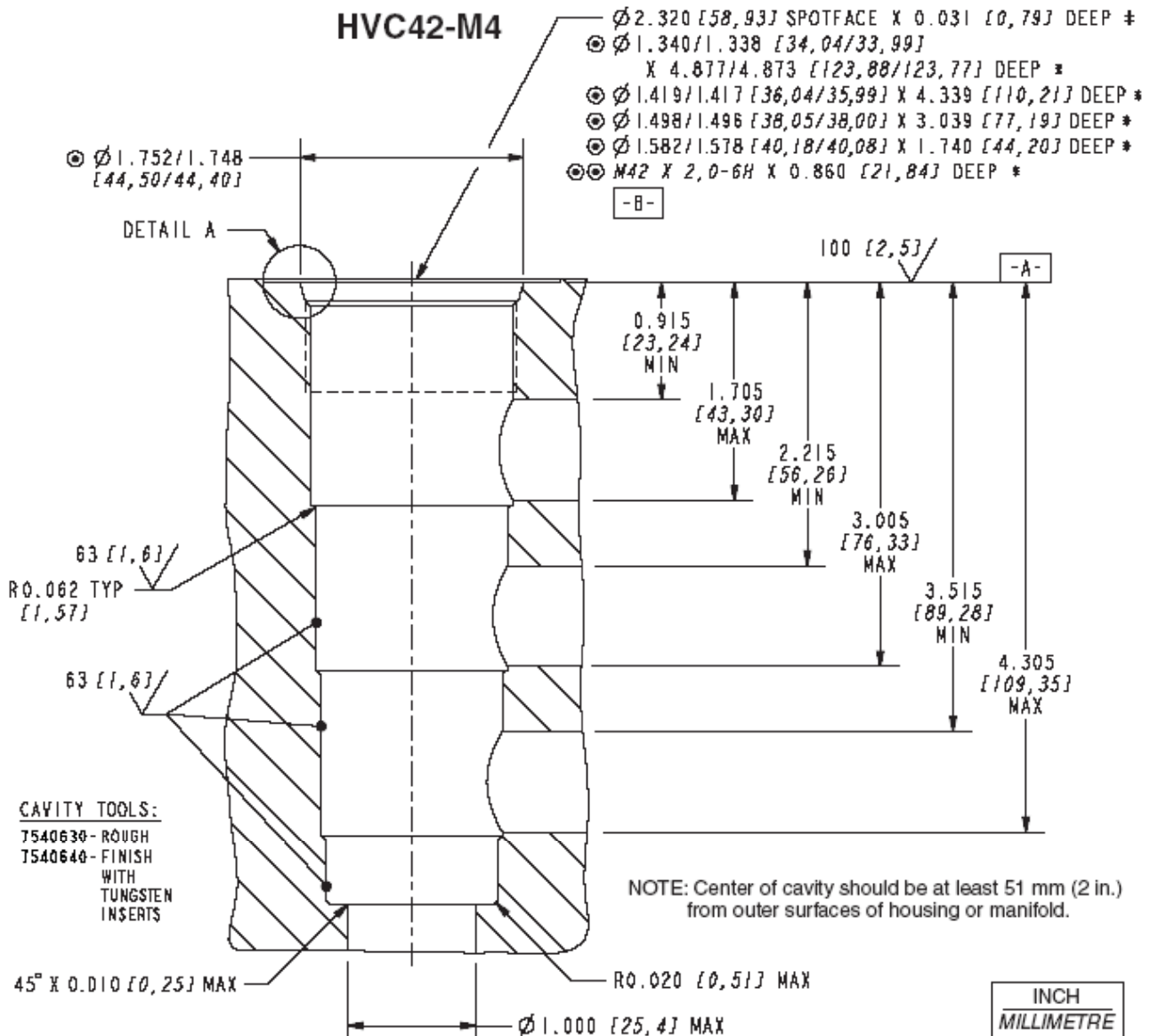
HVC42-S3A



\odot	$\sqrt{\text{0.001 [0,025] A}}$
	$\sqrt{\text{0.002 [0,05] B}}$
$\odot \odot$	$\sqrt{\text{0.001 [0,025] A}}$
	$\bigcirc \text{0.0009 [0,023] (PITCH DIA)}$

- * - DEPTHS ARE FROM DATUM -A-
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING
- UNSPECIFIED TOLERANCES ARE ± 0.005 [0,13]
- UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$
- SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS]

SERIES 42



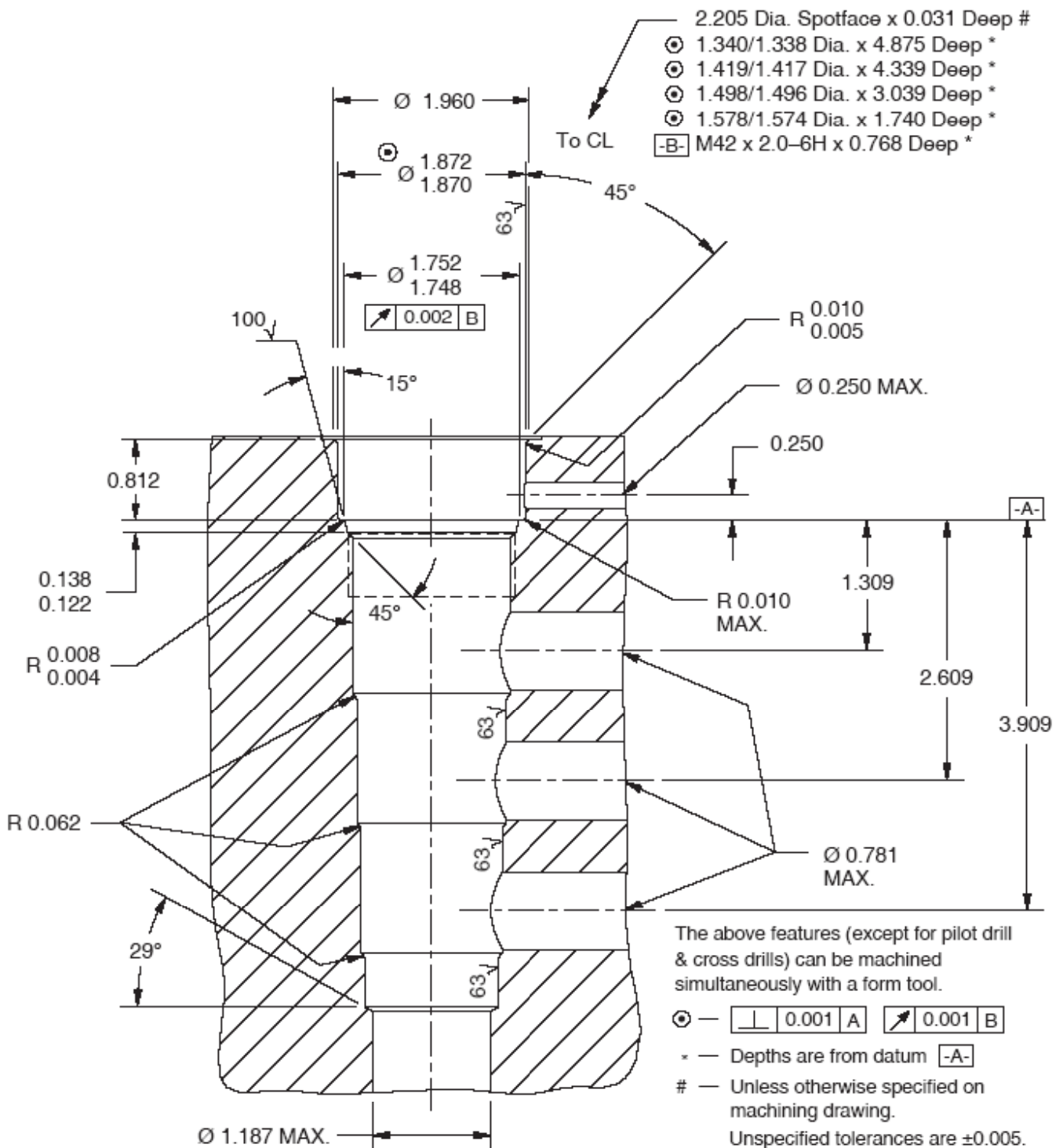
- $\textcircled{\circ}$ -

0.001	[0,025]	A
$\sqrt{\text{ }}$	0.002	[0,05] B

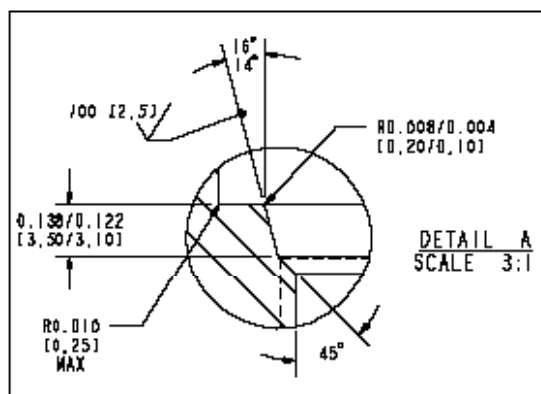
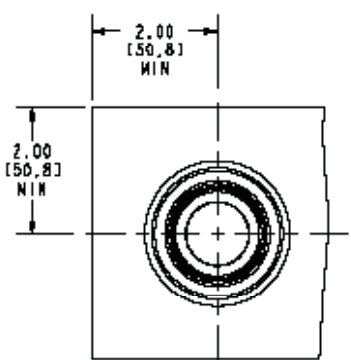
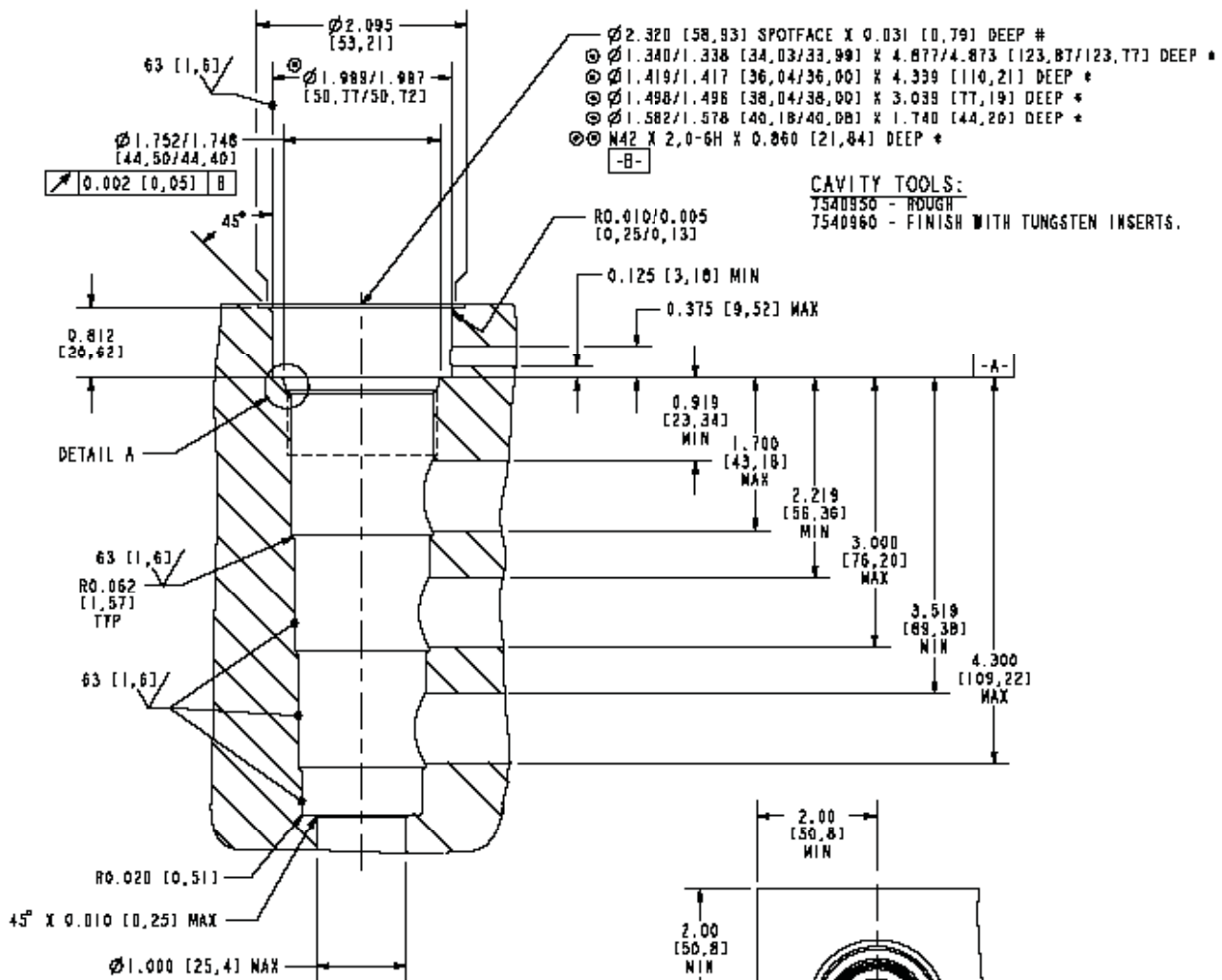
 $\textcircled{\circ}$ -

0.001	[0,025]	A
\bigcirc	0.0009	[0,023] (PITCH DIA)
- * - DEPTHS ARE FROM DATUM -A-
 # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING
 - UNSPECIFIED TOLERANCES ARE ± 0.005 [0,13]
 - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$
 - SURFACE FINISH SPECIFICATIONS ARE IN MICROINCHES [MICROMETERS]
 ** - CAVITY VARIATION 'A': PILOT DRILL $\varnothing 0.922$ [23,42] REQUIRED TO
 MINIMUM DEPTH OF 6.290 [159,77] FROM DATUM A ONLY IF NOTED
 ON SPECIFIC PRODUCT CATALOG PAGE.

VC42-S5



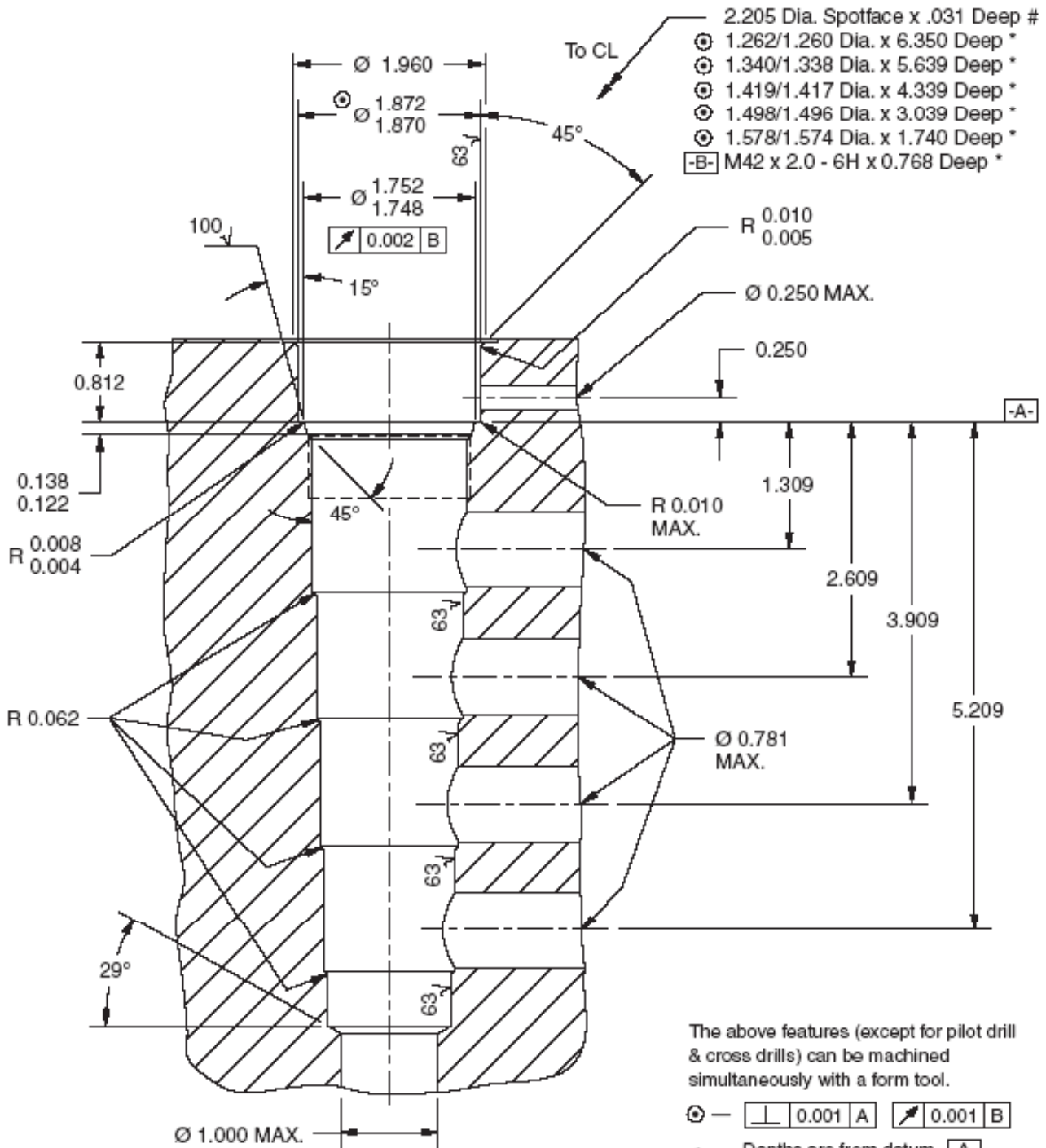
HVC42-S5



- NOTES:
- \varnothing - $\frac{0.001}{0.002}$ [0,025] A \varnothing - $\frac{0.001}{0.0008}$ [0,025] A
 $\frac{0.002}{0.002}$ [0,05] B \varnothing - $\frac{0.0008}{0.0008}$ [0,023] [PITCH DIA]
 - # - DEPTHS ARE FROM DATUM -A- .
 - # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING.
 - UNSPECIFIED TOLERANCES ARE ± 0.005 [0,13].
 - UNSPECIFIED ANGULAR DIMENSIONS $\pm 3^\circ$.
 - SURFACE FINISH SPECIFICATIONS ARE IN MICRONS [MICROMETERS].

SERIES 42

VC42-S6



The above features (except for pilot drill & cross drills) can be machined simultaneously with a form tool.

⊙ — \perp 0.001 A ∇ 0.001 B

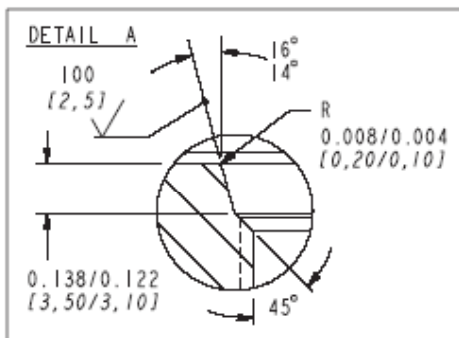
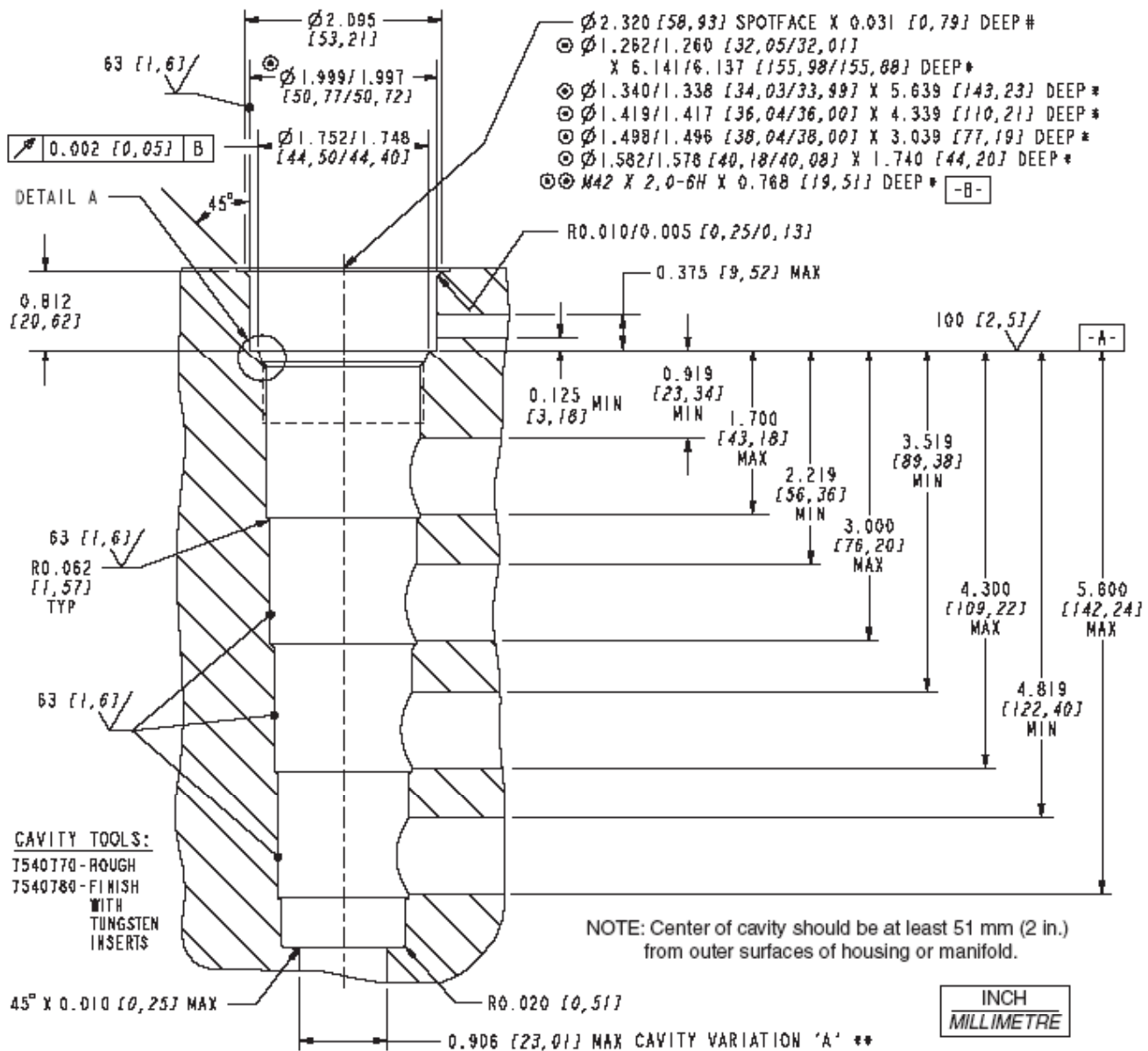
* — Depths are from datum -A-

— Unless otherwise specified on machining drawing.

Unspecified tolerances are ± 0.005 .

SERIES 42

HVC42-S6



- ⊙ - [0.001 [0,025] A] ⊙⊙ - [0.001 [0,025] A]
- ↗ [0.002 [0,05] B] ○ [0.0009 [0,023] (PITCH DIA)]

- * - DEPTHS ARE FROM DATUM -A-
- # - UNLESS OTHERWISE SPECIFIED ON MACHINING DRAWING
- UNSPECIFIED TOLERANCES ARE ±0.005 [0,13]
- UNSPECIFIED ANGULAR DIMENSIONS ±3°
- SURFACE FINISH SPECIFICATIONS ARE IN MICROMETERS
- ** - CAVITY VARIATION 'A': PILOT DRILL $\varnothing 0.922$ [23,42] REQUIRED TO MINIMUM DEPTH OF 6.290 [159,77] FROM DATUM A ONLY IF NOTED ON SPECIFIC PRODUCT CATALOG PAGE.