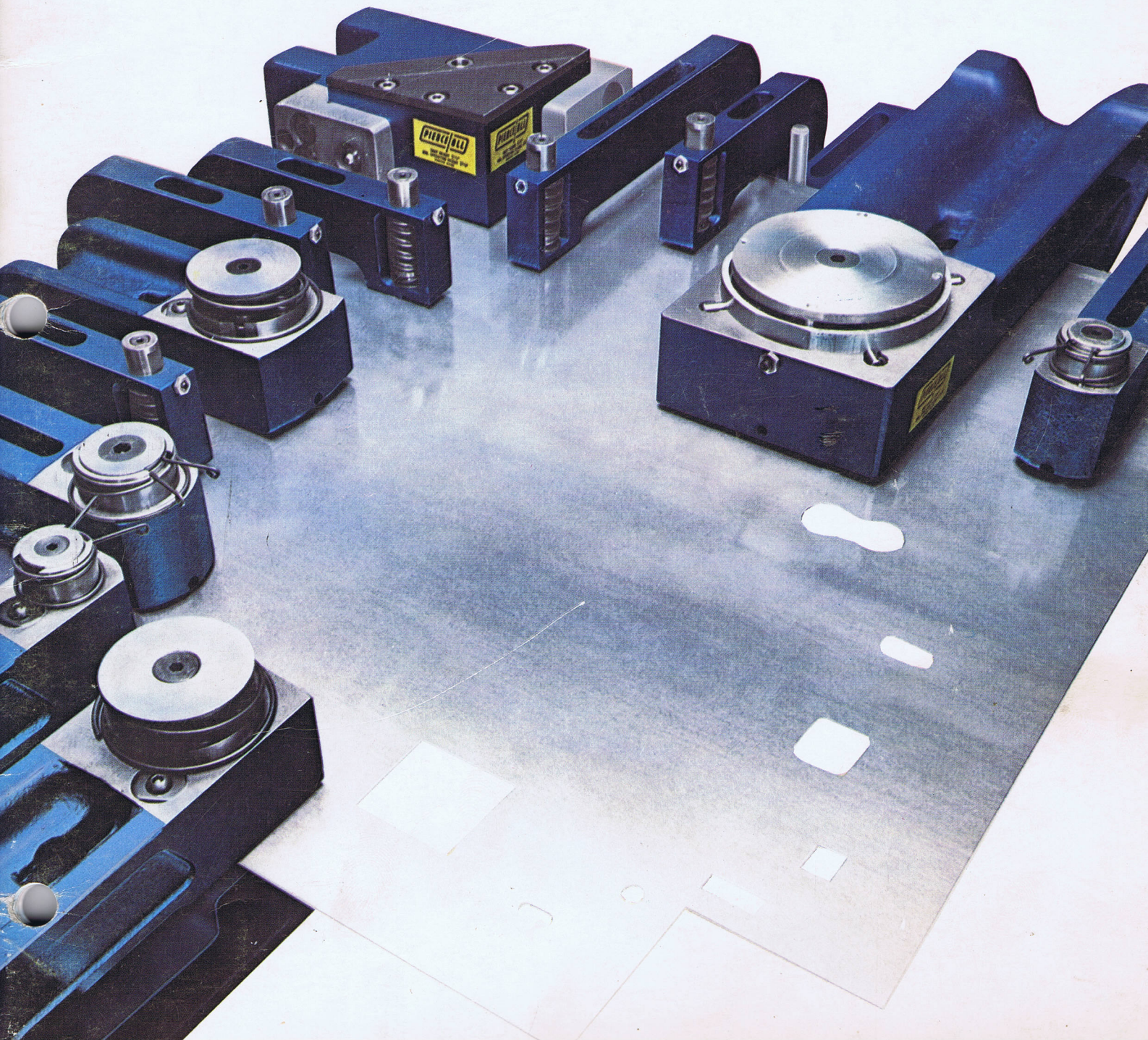














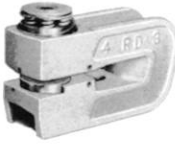

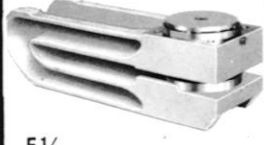
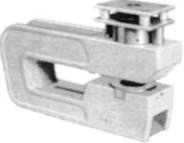


PIERCE-ALL
DIVISION OF PRODUCTO MACHINE COMPANY

**Unitized Hole Punching
and Notching Equipment**


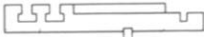



PICTURE PAGE FINDER

1/8" MATERIAL THICKNESS MILD STEEL				1/4" MATERIAL THICKNESS MILD STEEL				1/2" MATERIAL THICKNESS MILD STEEL			
REGULAR DUTY RD SERIES	MAX. PUNCH DIAM.	MIN. CENTER DIST.	PAGE NO.	HEAVY DUTY HD SERIES	MAX. PUNCH DIAM.	MIN. CENTER DIST.	PAGE NO.	HEAVY DUTY OT SERIES	MAX. PUNCH DIAM.	MIN. CENTER DIST.	
 3/4	.250	3/4"	2	 1	.4375	1"	10	OT Series discontinued — Replacement parts available — See Price Book.			
 1	.3125	1"	3	 1 1/4	.4375	1 1/4"	11	 1 1/2	.625	1 1/2"	
 1 1/4	.375	1 1/4"	4	 1 1/2	.625	1 1/2"	12	 2	.875	2"	
 1 3/4	.500	1 3/4"	5	 2	.875	2"	13	 2 1/2	1.500	2 1/2"	
 2 1/4	1.000	2 1/4"	6	 2 1/2	1.500	2 1/2"	14	 3	1.750	3"	
 3	2.000	3"	7	 3	1.750	3"	15	DESIGN FEATURES OF HEAVY DUTY UNITS — Page 9 Maintenance Hints and Sharpening Recommendations Page 17 Table of Special Shapes Inside Back Cover			
 5 1/2	3.500	5 1/2"	8	1/2" MATERIAL THICKNESS MILD STEEL							
				 3 1/2	2.000	3 1/2"	16				

Specifications subject to change without notice.

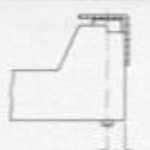
PICTURE PAGE FINDER

1/4" MATERIAL THICKNESS MILD STEEL				1/8" MATERIAL THICKNESS (RD) AND 1/4" MATERIAL THICKNESS (HD) MILD STEEL		
HEAVY DUTY HDA SERIES		MAX. PUNCH DIAM.	MIN. CENTER DIST.	PAGE NO.	3" x 3" CORNER NOTCHING Regular Duty	CORNER NOTCHING TO 5" x 5"
1 1/4		.4375	1 1/4	18		 RD and HD PAGES 30-31
1 1/2		.625	1 1/2	19		
2		.875	2	20		
DIE ADAPTERS TO REPLACE PEDESTAL DIES					1/8" (RD) and 1/4" (HD) MATERIAL THICKNESS EDGE NOTCHING MILD STEEL	90° VEE NOTCHING
1/4" MATERIAL THICKNESS MILD STEEL						 RD and HD PAGE 32
HEAVY DUTY HOTP SERIES		MAX. PUNCH DIAM.	MIN. CENTER DIST.	PAGE NO.		
2 1/8		.625	2 1/8	22		
3		.875	3	23		
3 1/4		1.500	3 1/4	24		
MOUNTING AND GAGING						
TEE-SLOTTED BOLSTERS PAGE 36		TEE-SLOTTED BED RAILS PAGE 37		TEMPLATES PAGE 38		
		 RAIL SPACERS PAGE 38				
LD SERIES (Light Duty) 1/8" MATERIAL THICKNESS MILD STEEL					<ul style="list-style-type: none">• See Tee-Slotted Bolster Set-up Procedures• Locator Pins  for Template Set-up• Tee-Bolt Nut and Washer Sets PAGE 35	
	MAX. PUNCH DIAM.	MIN. CENTER DIST.	PAGE NO.			
	.3125	3/4"	25			
CHANNEL PIERCE CP SERIES		.625	2"	26	 PAGE 39	
HORIZONTAL HOLE PUNCHING						
	.312	7/8	28			
	.437	1 1/4				
	.625	1 1/2				
	.875	2				
TUBE PIERCE TP SERIES		.375	2 1/4"	27	 PAGE 40	
FEED RAILS, RAM PLATES						
 Shear Charts and Formulas Table of Gauge Thickness — PAGE 40 Special Application Data on Punches and Dies — PAGE 34					 Information to Help You Order Table of Special Shapes Inside Back Cover	

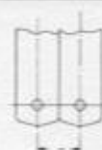
Specifications subject to change without notice.

.312 MAXIMUM PUNCH DIAMETER**.125 MAXIMUM METAL THICKNESS
MILD STEEL**

SERIES NO.	4RD-1	8RD-1
CAT. NO.	21010	21020
THROAT DEPTH	4½	8½
CENTER TO BACK	7	11
SHIP WT. LBS.	7.0	11.2



½"
LEG TO CENTER



1.000"
MIN. CENTER DIST.



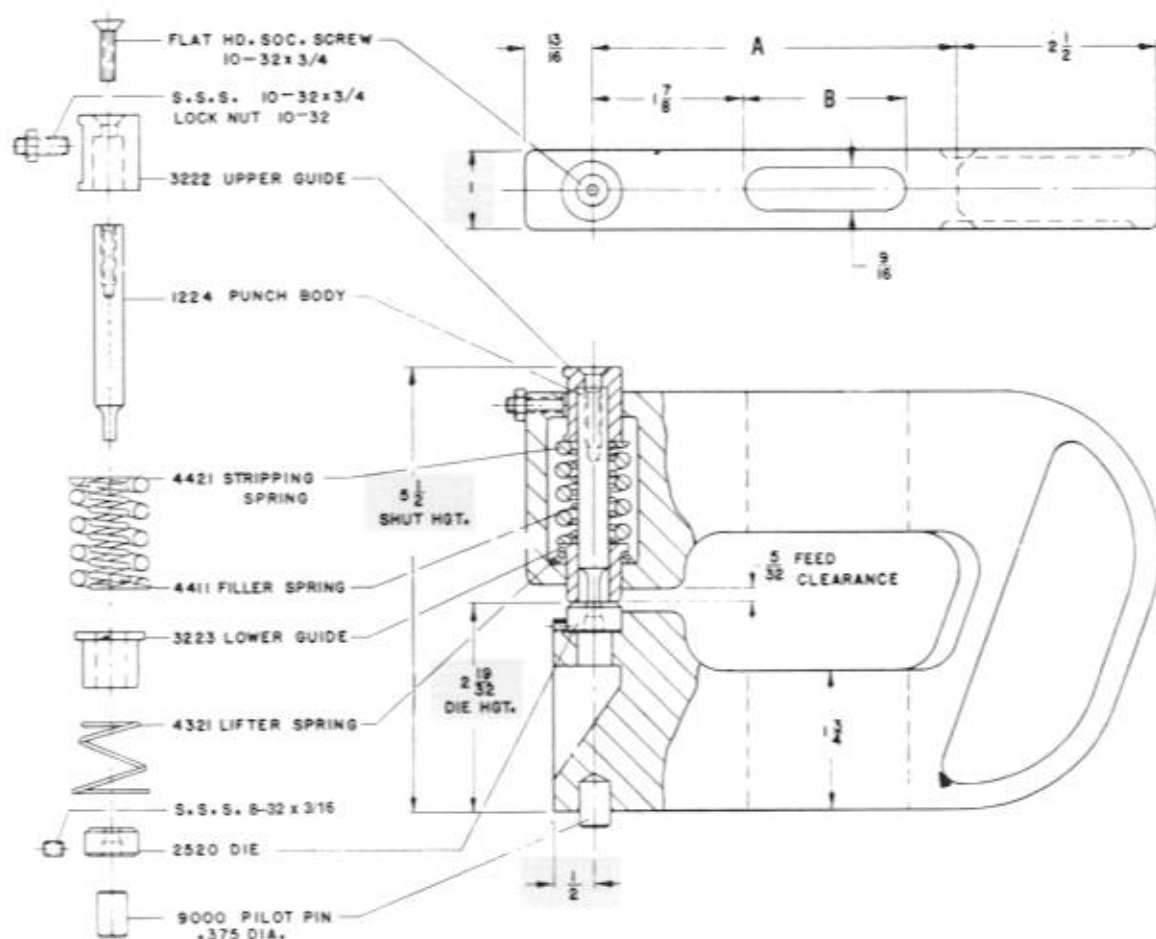
1"
HOLDER WIDTH

DUCTILE HOLDER



RD SERIES

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 4RD-1 21010 .125 .131 Round



SERIES NO.	A	B
4RD-1	4½	2
8RD-1	8½	5½

STOCKED PUNCH AND DIE SIZES.

.093	.098	.125	.128	.140	.156	.171	.187	.193	.203	.218	.250	.265	.281	.312	PUNCH SIZES
.100	.105	.131	.136	.147	.162	.178	.194	.200	.209	.224	.256	.271	.287	.318	DIE SIZES
.105	.110	.136	.140	.153	.168	.184	.200	.209	.215	.230	.262	.275	.293	.325	FOR MAT'L ½-⅝
															THICKNESS ⅝-⅞

.375 MAXIMUM PUNCH DIAMETER

.125 MAXIMUM METAL THICKNESS

MILD STEEL

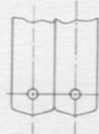
SEMI-STEEL HOLDER



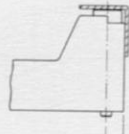
RD SERIES

1 1/4"

1.250"
HOLDER WIDTH



1.250"
MIN. CENTER DIST.



5/8"
LEG TO CENTER

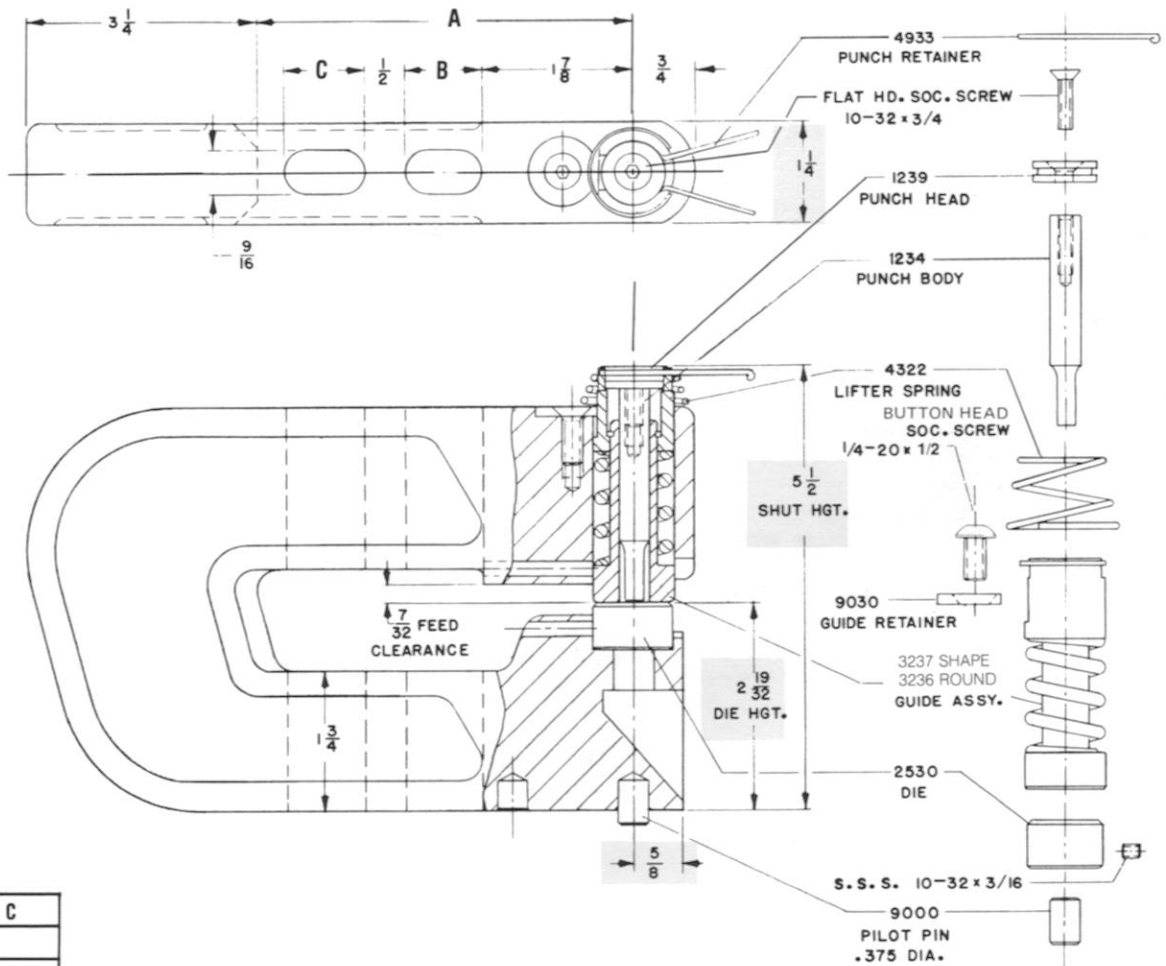
SERIES NO.	4RD-1 1/4	8RD-1 1/4	12RD-1 1/4	
CAT. NO.	21210	21220	21230	
THROAT DEPTH	4 1/2	8 1/2	12 1/2	
CENTER TO BACK	7 3/4	11 3/4	15 3/4	
SHIP WT. LBS.	8.9	11.4	13.3	

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

the "RD" to "RDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 4RD-1 1/4 21210 .125 .131 Round

RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.3674
.156	.3410
.187	.3250
.218	.3051
.250	.2795
MAX. SQUARE	.2651



Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

SERIES NO.	A	B	C
4RD-1 1/4	4 1/2	1 7/8	
8RD-1 1/4	8 1/2	5 7/8	
12RD-1 1/4	12 1/2	5 7/8	3 1/2

STOCKED PUNCH AND DIE SIZES.

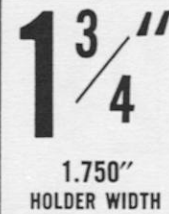
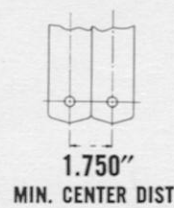
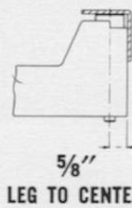
PUNCH SIZES		.093	.098	.125	.128	.140	.156	.171	.187	.193	.203	.218	.250	.265	.281	.312	.328	.343	.375
DIE SIZES																			
FOR MAT'L	1/32-1/8	.100	.105	.131	.136	.147	.162	.178	.194	.200	.209	.224	.256	.271	.287	.318	.334	.350	.381
THICKNESS	1/16-1/8	.105	.110	.136	.140	.153	.168	.184	.200	.209	.215	.230	.262	.275	.293	.325	.340	.357	.388

.500 MAXIMUM PUNCH DIAMETER

.125 MAXIMUM METAL THICKNESS

MILD STEEL

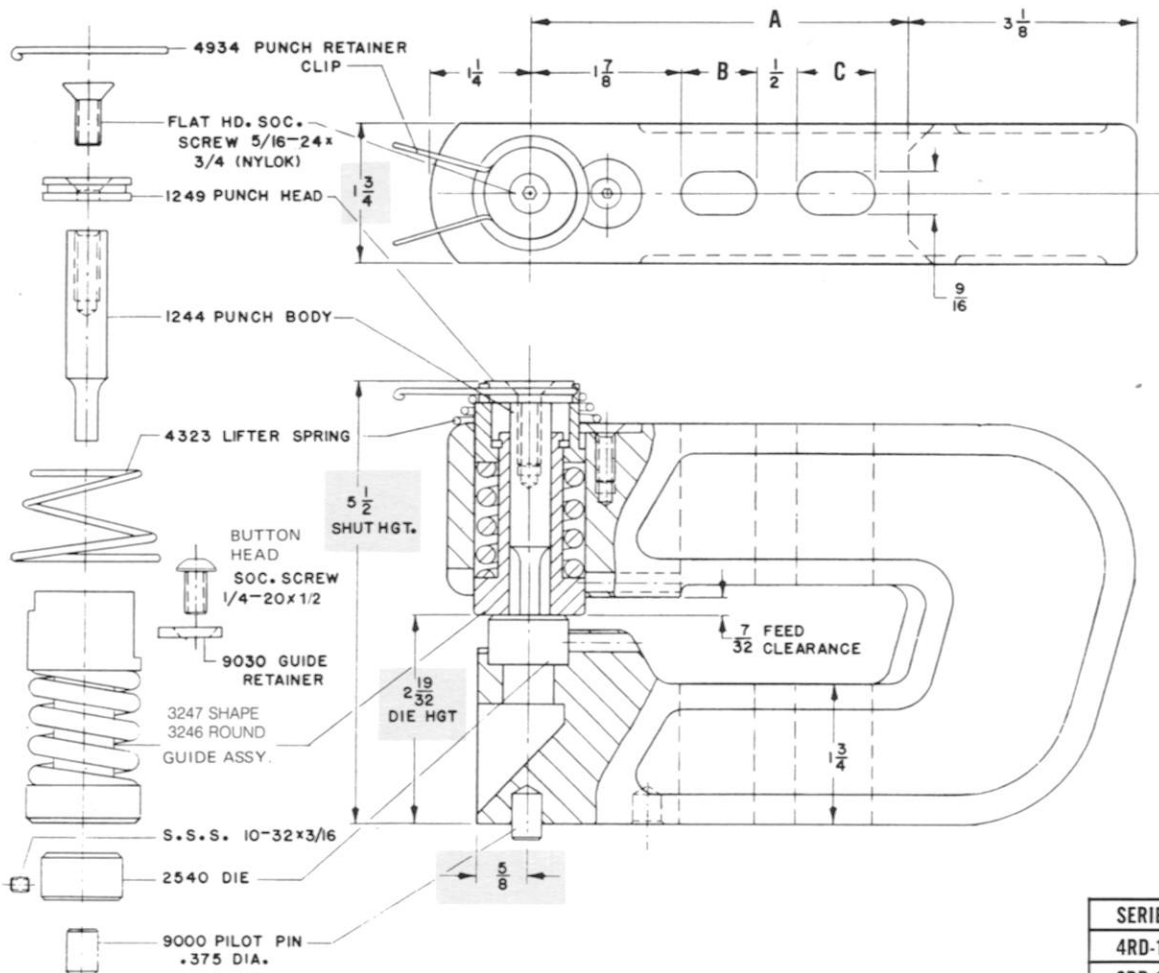
SERIES NO.	4RD-1¼	8RD-1¼	12RD-1¼	16RD-1¼
CAT. NO.	21610	21620	21630	21640
THROAT DEPTH	4½	8½	12½	16½
CENTER TO BACK	7¾	11¾	15¾	19¾
SHIP WT. LBS.	13.4	17.3	21.6	26.0



Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

the "RD" to "RDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 4RD-1¼ 21610 .125 .131 Round



RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.4840
.156	.4750
.187	.4636
.218	.4499
.250	.4330
.281	.4135
.312	.3907
.343	.3637
MAX. SQUARE	.3535

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

SERIES NO.	A	B	C
4RD-1¼	4½	1¾	
8RD-1¼	8½	5¾	
12RD-1¼	12½	5¾	3½
16RD-1¼	16½	5¾	5¾

STOCKED PUNCH AND DIE SIZES.

.099	.098	.125	.128	.140	.156	.171	.187	.193	.203	.218	.250	.265	.281	.312	.328	.343	.375	.390	.406	.437	.500	PUNCH SIZES
.100	.105	.131	.136	.147	.162	.178	.194	.200	.209	.224	.256	.271	.287	.318	.334	.350	.381	.396	.412	.444	.506	DIE SIZES
.05	.110	.136	.140	.153	.168	.184	.200	.209	.215	.230	.262	.275	.293	.325	.340	.357	.388	.402	.418	.450	.512	FOR MAT'L 1/2-1/16 THICKNESS 1/16-1/8

1.000 MAXIMUM PUNCH DIAMETER

.125 MAXIMUM METAL THICKNESS MILD STEEL

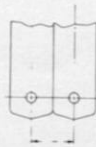
SEMI-STEEL HOLDER



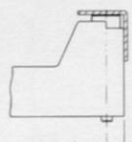
RD SERIES

2 1/4"

2.250"
HOLDER WIDTH



2.250"
MIN. CENTER DIST.



1"
LEG TO CENTER

SERIES NO.	4RD-2 1/4	8RD-2 1/4	12RD-2 1/4	16RD-2 1/4
CAT. NO.	22210	22220	22230	22240
THROAT DEPTH	4 1/2	8 1/2	12 1/2	16 1/2
CENTER TO BACK	7 5/8	11 5/8	15 5/8	19 5/8
SHIP WT. LBS.	18.5	24.5	28.6	37.1

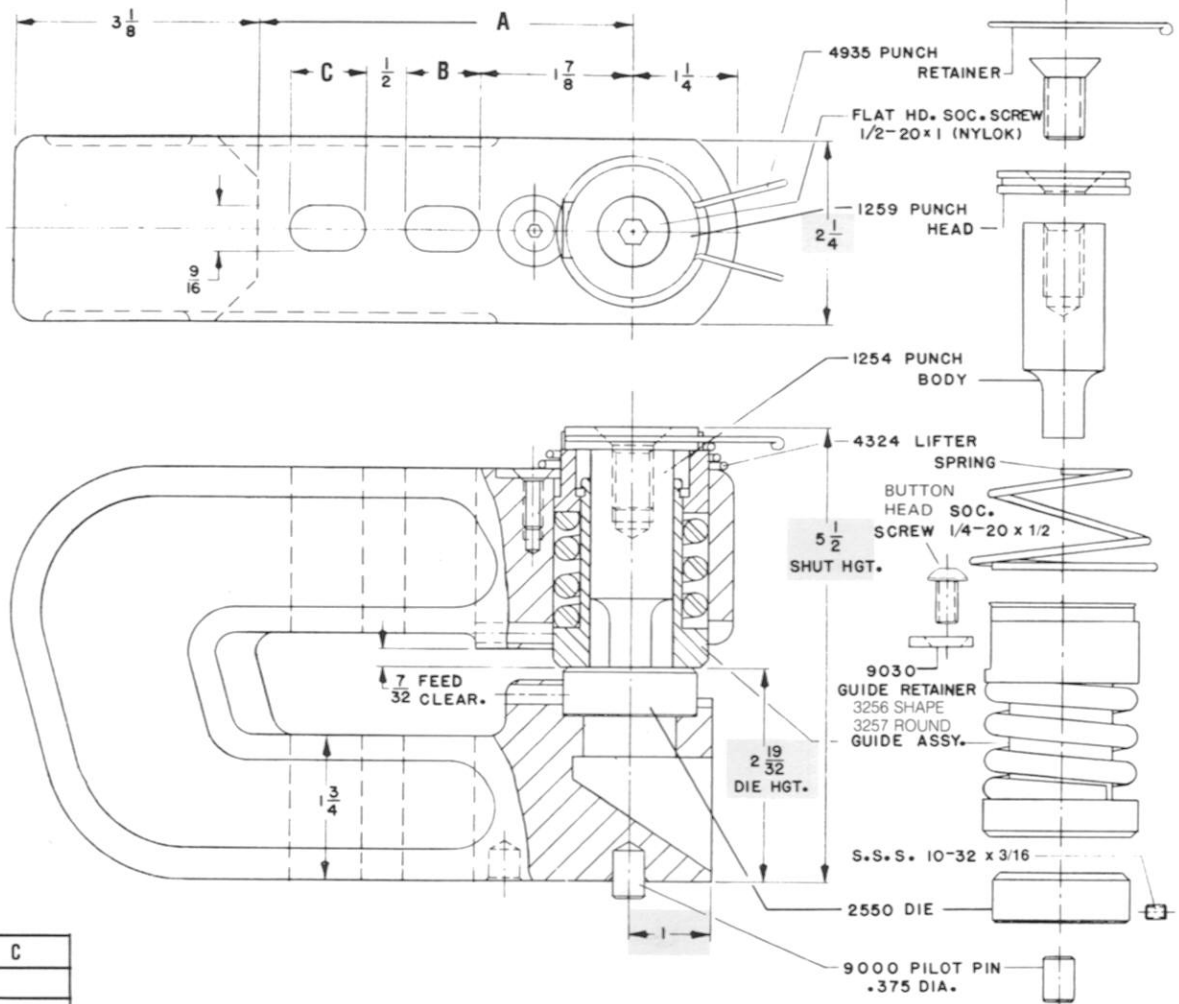
Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

the "RD" to "RDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 4RD-2 1/4 22210 .250 .262 Round

RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.9921
.156	.9877
.187	.9823
.218	.9759
.250	.9682
.281	.9596
.312	.9500
.343	.9393
.375	.9269
.406	.9138
.437	.8994
.500	.8660
.562	.8271
.625	.7804
.687	.7267
MAX. SQUARE	.7071

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.



SERIES NO.	A	B	C
4RD-2 1/4	4 1/2	1 7/8	
8RD-2 1/4	8 1/2	5 7/8	
12RD-2 1/4	12 1/2	5 7/8	3 1/2
16RD-2 1/4	16 1/2	5 7/8	5 7/8

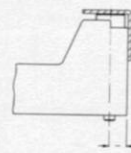
STOCKED PUNCH AND DIE SIZES.

PUNCH SIZES	.250	.265	.281	.312	.328	.343	.375	.390	.406	.437	.500	.531	.562	.593	.625	.656	.687	.750	.812	.875	.937	1.000	
DIE SIZES																							
FOR MAT'L	$\frac{1}{32}$ - $\frac{1}{16}$	.256	.271	.287	.318	.334	.350	.381	.396	.412	.444	.506	.537	.569	.600	.631	.662	.694	.756	.818	.881	.944	1.006
THICKNESS	$\frac{1}{16}$ - $\frac{1}{8}$	.262	.275	.293	.325	.340	.357	.388	.402	.418	.450	.512	.543	.575	.606	.637	.670	.700	.762	.824	.887	.950	1.013

2.000 MAXIMUM PUNCH DIAMETER

.125 MAXIMUM METAL THICKNESS MILD STEEL

SERIES NO.	4RD-3	8RD-3	12RD-3	16RD-3
CAT. NO.	23010	23020	23030	23040
THROAT DEPTH	4½	8½	12½	16½
CENTER TO BACK	7⅝	11⅝	15⅝	19⅝
SHIP WT. LBS.	22.5	30.1	37.9	46.2



1 5/8"
LEG TO CENTER



3.000"
MIN. CENTER DIST.

3"

3.000"
HOLDER WIDTH

SEMI-STEEL HOLDER

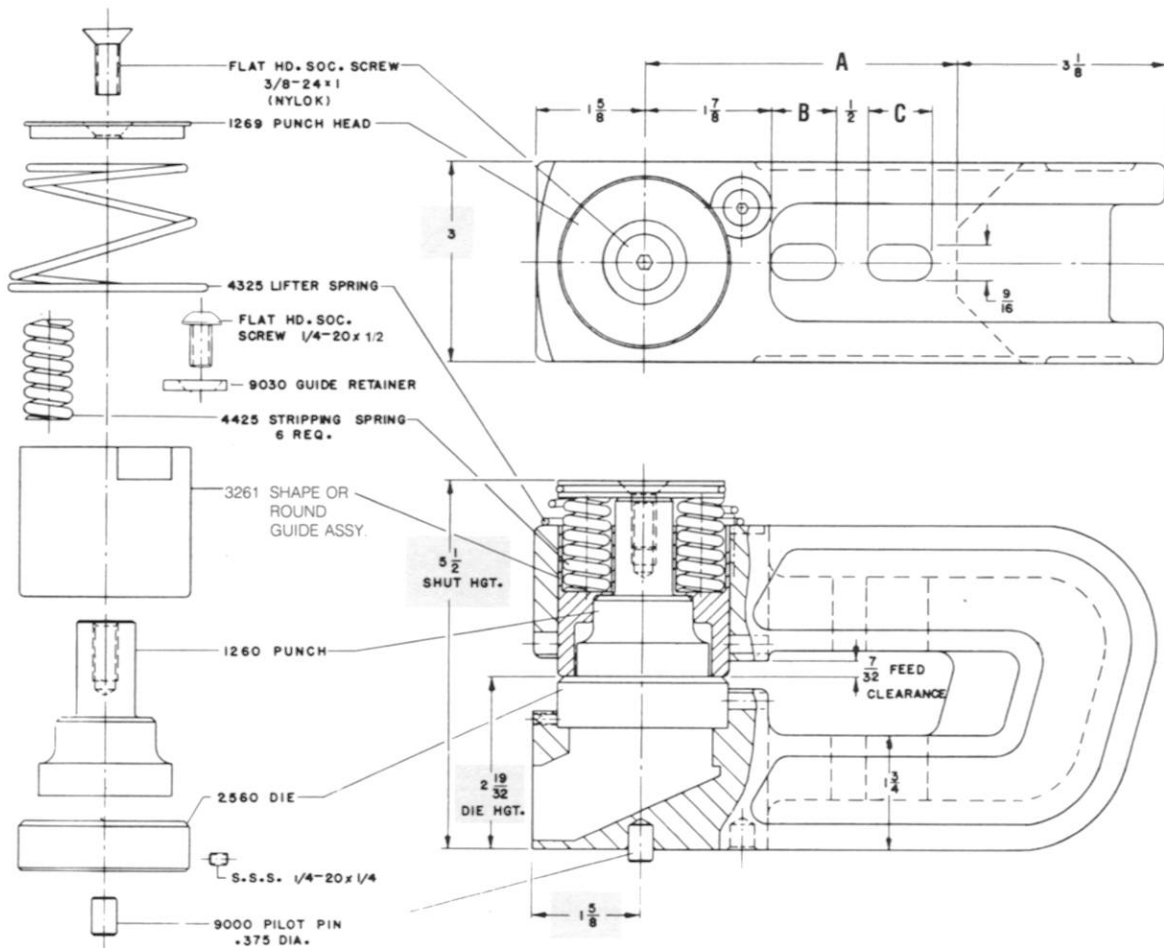


RD SERIES

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

the "RD" to "RDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 4RD-3 23010 1.500 1.515 Round



RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	1.9960
.156	1.9938
.187	1.9911
.218	1.9880
.250	1.9843
.281	1.9826
.312	1.9754
.343	1.9702
.375	1.9645
.406	1.9583
.437	1.9515
.500	1.9364
.562	1.9192
.625	1.8998
.687	1.8781
.750	1.8540
.812	1.8275
.875	1.7984
.937	1.7666
1.000	1.7320
1.062	1.6944
1.125	1.6535
1.187	1.6092
1.250	1.5612
1.312	1.5090
1.375	1.4523
1.406	1.4221
MAX. SQUARE	1.414

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

SERIES NO.	A	B	C
4RD-3	4½	1⅝	
8RD-3	8½	5⅝	
12RD-3	12½	5⅝	3½
16RD-3	16½	5⅝	5⅝

PUNCH AND DIE SIZES.

1.000 1.125 1.187 1.250 1.312 1.375 1.437 1.500 1.625 1.750 1.875 2.000 PUNCH SIZES

1.008 1.133 1.195 1.258 1.320 1.383 1.446 1.508 1.633 1.758 1.883 2.008
1.015 1.140 1.202 1.265 1.327 1.390 1.453 1.515 1.640 1.765 1.890 2.015

DIE SIZES
FOR MAT'L 1/32-1/16
THICKNESS 1/16-1/8

3.500 MAXIMUM PUNCH DIAMETER

.125 MAXIMUM METAL THICKNESS

MILD STEEL

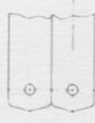
SEMI-STEEL HOLDER



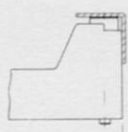
RD SERIES

5 1/2"

5.500"
HOLDER WIDTH



5.500"
MIN. CENTER DIST.



2 13/16"
LEG TO CENTER

SERIES NO.	12RD-5 1/2	16RD-5 1/2	
CAT. NO.	25530	25540	
THROAT DEPTH	12 1/2	16 1/2	
CENTER TO BACK	15 1/2	22 1/2	
SHIP WT. LBS.	70	100	

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

the "RD" to "RDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

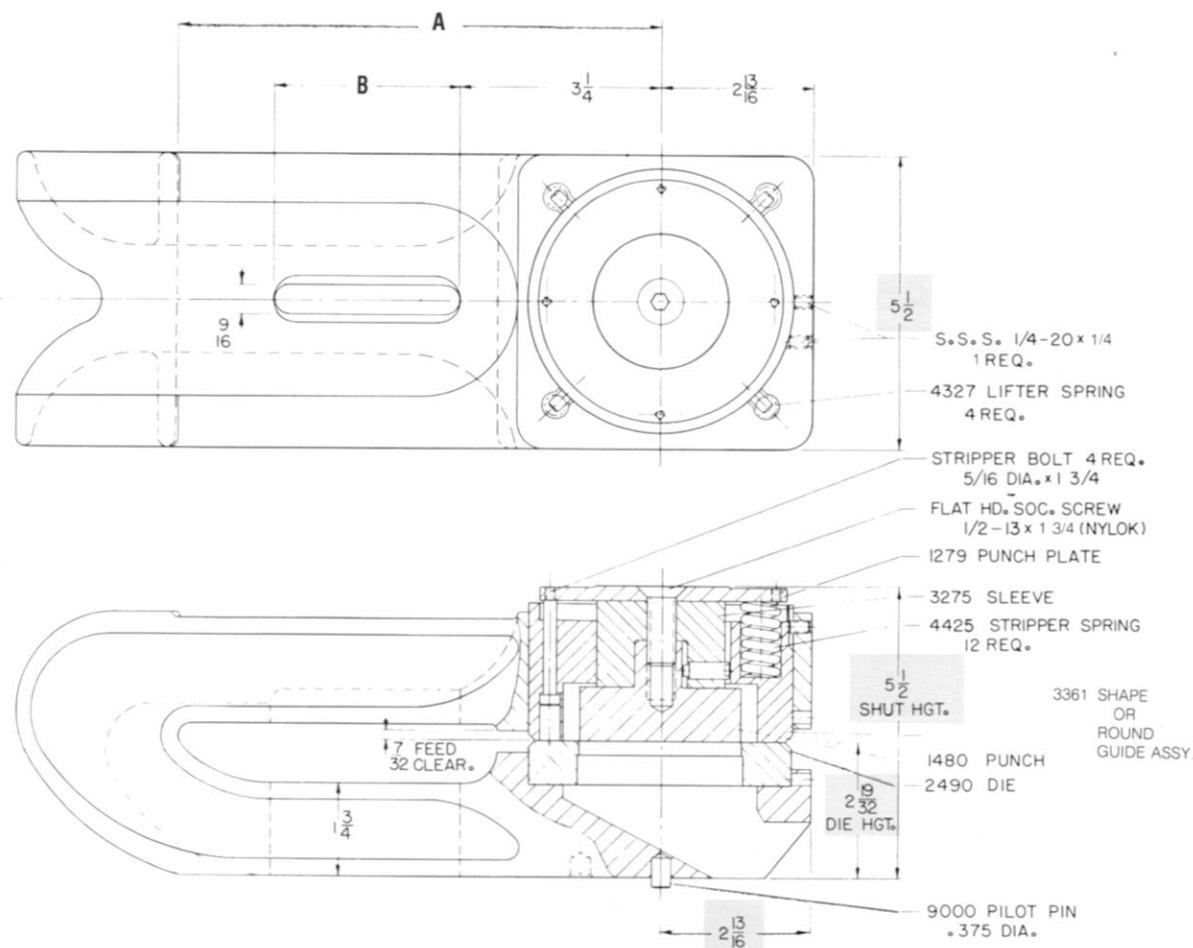
RECTANGULAR
POINT SIZE
LIMITATION

W	L
.125	3.4977
.156	3.4965
.187	3.4940
.218	3.4931
.250	3.4910
.281	3.4886
.312	3.4860
.343	3.4831
.375	3.4784
.406	3.4763
.437	3.4725
.500	3.4641
.562	3.4548
.625	3.4422
.687	3.4317
.750	3.4186
.812	3.4043
.875	3.3888
.937	3.3721
1.000	3.3541
1.062	3.3348
1.125	3.3142
1.187	3.2923
1.250	3.2690
1.312	3.2291
1.375	3.2185
1.406	3.2050
1.437	3.1911
1.500	3.1621
1.625	3.1010
1.750	3.0310
1.875	2.9553
2.000	2.8722
2.125	2.7810
2.250	2.6809
2.375	2.5708

MAX.
SQUARE 2.4748

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 12RD-5 1/2 25530 1.500 1.509 Round



PUNCH AND DIE SIZES.

PUNCH SIZES 1.500 1.625 1.750 1.875 2.000 2.125 2.250 2.375 2.500 2.625 2.750 2.875 3.000 3.125 3.250 3.375 3.500

DIE SIZES FOR MAT'L	1/2-1/6	1.509	1.634	1.759	1.884	2.009	2.134	2.259	2.384	2.509	2.634	2.759	2.884	3.009	3.134	3.259	3.384	3.509
THICKNESS	1/6-1/6	1.516	1.641	1.766	1.891	2.016	2.141	2.266	2.391	2.516	2.641	2.766	2.891	3.016	3.141	3.266	3.391	3.516

PIERCE-ALL HEAVY DUTY UNIT BONUS BENEFITS

The **HEAVY-DUTY** series of units are designed to perforate mild steel up to $\frac{1}{4}$ " thick in a range of round hole sizes from .093 to 2.000". An unlimited range of shaped holes can also be punched with the maximum size of shape restricted only by the body diameter of the punch in any given unit.

"SKNHRD" **GUIDE HOLES** are tougher and resist wear longer providing greater accuracy and efficiency.

SEMI STEEL or **DUCTILE IRON HOLDERS** for strength, long life and ruggedness plus **FLAT, SQUARE MOUNTING SURFACE** for accurate hole placement.

CRUSH-PROOF DIE SEAT results from a **DUCTILE** casting being used and prevents die tipping, canting, breakouts, loss of concentricity.

FRONT SERVICING permits fast hole size changeover without removing unit from set-up. Maintenance and down time savings are also provided.

PUNCHES AND DIES are made from high quality tool steel to precision tolerances, insuring long life and 100% interchangeability. A wide variety of hole sizes including shapes can be pierced with each unit increasing versatility and keeping the units in production and not on the shelf.

PILOT PIN MOUNTING

ALL PIERCE-ALL units are equipped with Pilot Pins accurately aligned with die and punch centers. When units are set up with **TEMPLATE MOUNTING**, accurate location of the most complex hole patterns is insured.

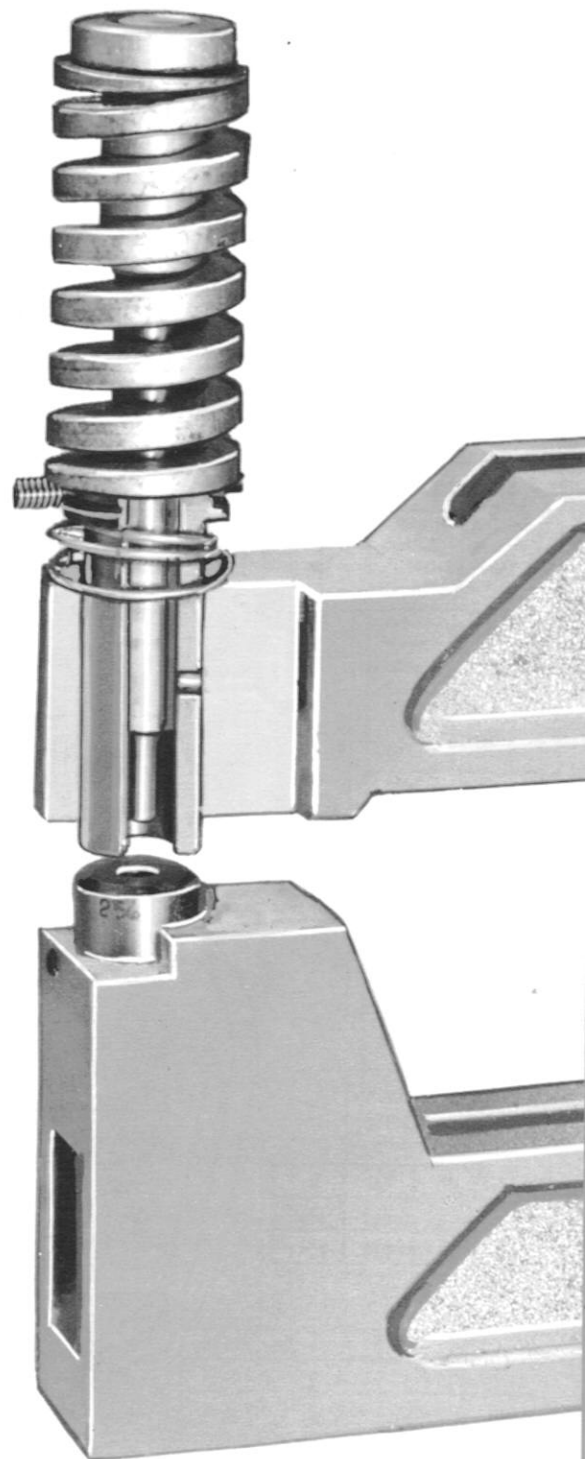
ADVANCED DESIGN shaped hole units are effectively **SIMPLE**. There are no unnecessary parts, nor special expensive extras. Standard dowels, inserted in the holder, serve as keys for punch-guide and die positioning, when perforating shaped holes.

ADVANCED DESIGN is **ECONOMICAL**. One shaped hole punch-guide will accommodate **ALL** shaped punches within size specifications of the unit. Broached keyways in punch-guide enable 90° rotation of shaped punches.

Punches and dies can be changed rapidly and efficiently without removing unit from set-up, or changing punch-guide.

ADVANCED DESIGN is **ACCURATE**. Concentricity of hole and pilot pin—accurate line-up of shaped punch and die—clean-cut perforations; these are the result of the built-in craftsmanship, that are an integral part of every unit.

Heavy Duty Series Units in the larger sizes, embody the same efficient **ADVANCED DESIGN** features with modifications in keying.



.437 MAXIMUM PUNCH DIAMETER

.250 MAXIMUM METAL THICKNESS MILD STEEL

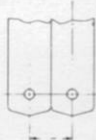
DUCTILE HOLDER



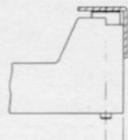
HD SERIES

1"

1.000"
HOLDER WIDTH



1.000"
MIN. CENTER DIST.



19/32"
LEG TO CENTER

SERIES NO.	4HD-1	8HD-1
CAT. NO.	31010	31020
THROAT DEPTH	4 1/2	8 1/2
CENTER TO BACK	7 3/4	11 3/4
SHIP WT. LBS.	9.5	10.1

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

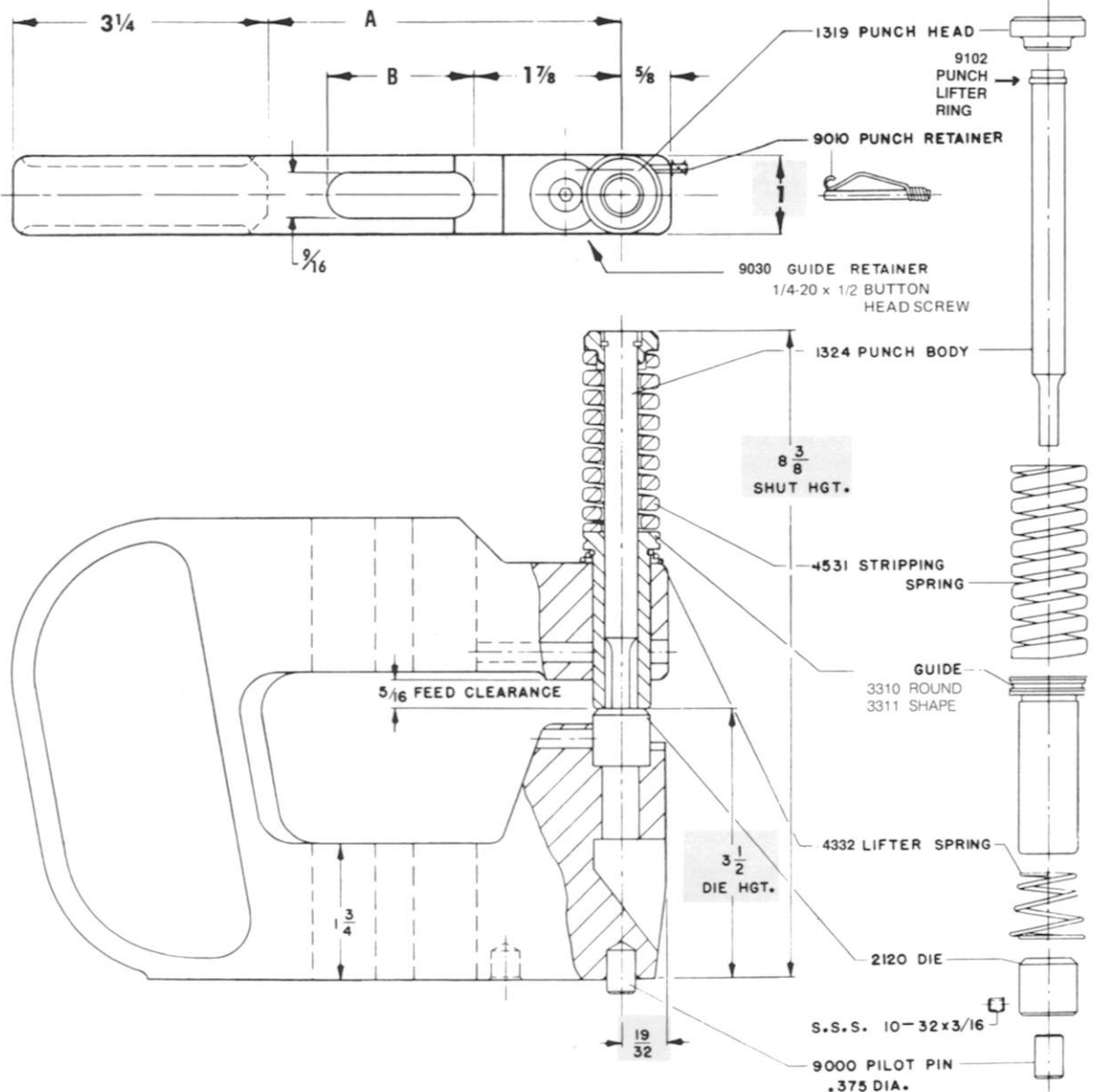
the "HD" to "HDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 4HD-1 31010 .125 .131 Round

RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.419
.156	.406
.187	.395
.218	.377
.250	.359
.281	.332
MAX. SQUARE	.309

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

SERIES NO.	A	B
4HD-1	4 1/2	1 7/8
8HD-1	8 1/2	5 7/8

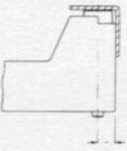
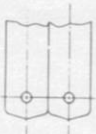



STOCKED PUNCH AND DIE SIZES.

PUNCH SIZES	.093	.125	.156	.187	.193	.203	.218	.250	.265	.281	.312	.343	.375	.406	.437
DIE SIZES 1/32-1/16	.100	.131	.162	.194	.200	.209	.224	.256	.271	.287	.318	.350	.381	.412	.444
FOR MAT'L 1/16-3/16	.105	.136	.168	.200	.209	.215	.230	.262	.277	.293	.325	.357	.388	.418	.450
THICKNESS 3/16-1/2			.181	.215	.219	.230	.244	.277	.293	.306	.338	.369	.402	.431	.463
				.230	.239	.248	.262	.293	.310	.325	.357	.388	.418	.450	.483

.437 MAXIMUM PUNCH DIAMETER

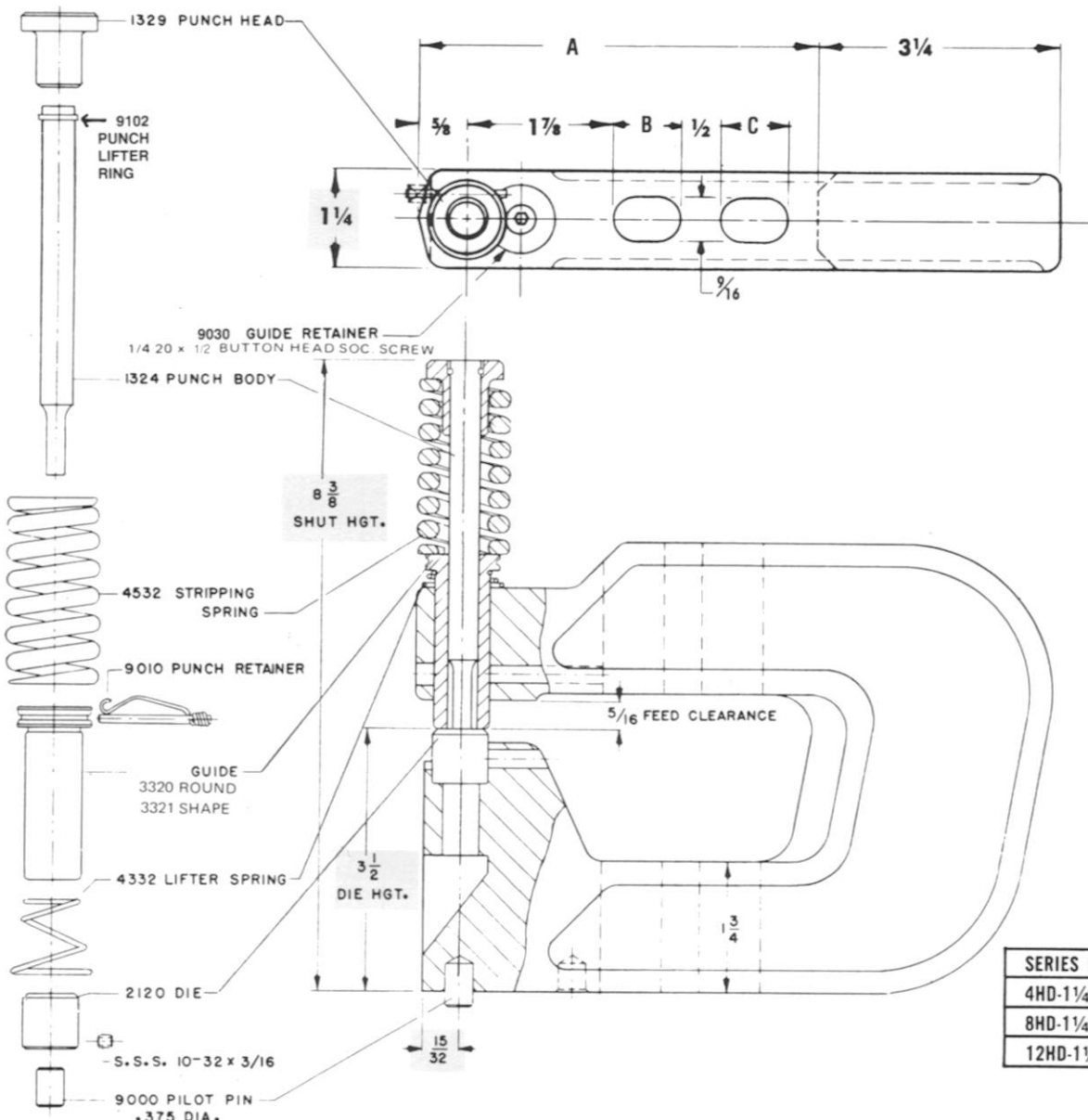
.250 MAXIMUM METAL THICKNESS MILD STEEL

SERIES NO.	4HD-1¼	8HD-1¼	12HD-1¼	 $\frac{15}{32}$ " LEG TO CENTER	 1.250" MIN. CENTER DIST.	$1\frac{1}{4}$ " HOLDER WIDTH	DUCTILE HOLDER  HD SERIES
CAT. NO.	31210	31220	31230				
THROAT DEPTH	4½	8½	12½				
CENTER TO BACK	7¾	11¾	15¾				
SHIP WT. LBS.	10.8	13.4	15.4				

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

the "HD" to "HDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
 EXAMPLE: 2 4HD-1¼ 31210 .125 .131 Round



L W RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.419
.156	.406
.187	.395
.218	.377
.250	.359
.281	.332
MAX. SQUARE	.309

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

SERIES NO.	A	B	C
4HD-1¼	4½	1 7/8	
8HD-1¼	8½	5 7/8	
12HD-1¼	12½	5 7/8	3 1/2

STOCKED PUNCH AND DIE SIZES.

	.093	.125	.156	.187	.193	.203	.218	.250	.265	.281	.312	.343	.375	.406	.437	PUNCH SIZES
	.100	.131	.162	.194	.200	.209	.224	.256	.271	.287	.318	.350	.381	.412	.444	DIE SIZES $\frac{1}{32}$ - $\frac{1}{16}$
	.105	.136	.168	.200	.209	.215	.230	.262	.277	.293	.325	.357	.388	.418	.450	FOR MAT'L $\frac{1}{16}$ - $\frac{1}{8}$
			.181	.215	.219	.230	.244	.277	.293	.306	.338	.369	.402	.431	.463	THICKNESS $\frac{1}{8}$ - $\frac{3}{16}$
			.230	.239	.248	.262	.293	.310	.325	.357	.388	.418	.450	.483		$\frac{3}{16}$ - $\frac{1}{4}$

.250 MAXIMUM METAL THICKNESS
MILD STEEL

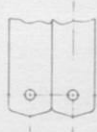
.250 MAXIMUM METAL THICKNESS
MILD STEEL

DUCTILE HOLDER

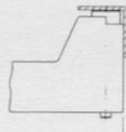


1 1/2"

1.500"
HOLDER WIDTH



1.500"
MIN. CENTER DIST.




5/8"
LEG TO CENTER

SERIES NO.	4HD-1½	8HD-1½	12HD-1½	16HD-1½
CAT. NO.	31410	31420	31430	31440
THROAT DEPTH	4½	8½	12½	16½
CENTER TO BACK	7¾	11¾	15¾	19¾
SHIP WT. LBS.	14.5	17.3	20.5	23.9

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

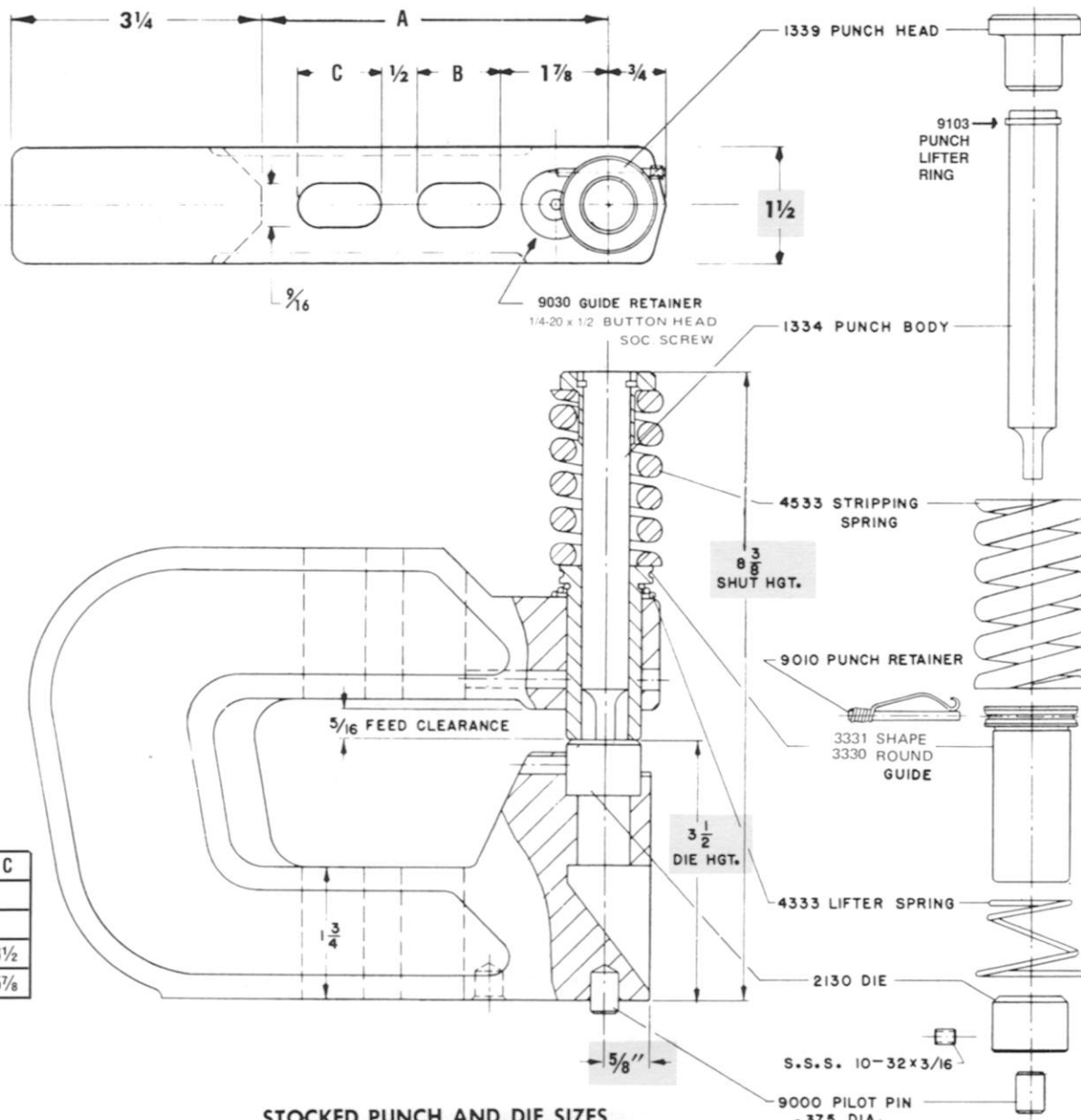
the "HD" to "HDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY:	QUANTITY	SERIES NO.	CATALOG NUMBER	PUNCH SIZE	DIE SIZE	SHAPE
EXAMPLE:	2	4HD-1½	31410	.125	.131	Round

	
RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.612
.156	.605
.187	.596
.218	.585
.250	.572
.281	.558
.312	.541
.343	.522
.375	.500
.406	.475
.437	.446
MAX. SQUARE	.442

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

SERIES NO.	A	B	C
4HD-1½	4½	1⅞	
8HD-1½	8½	5⅞	
12HD-1½	12½	5⅞	3½
16HD-1½	16½	5⅞	5⅞

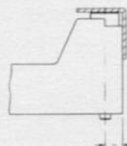
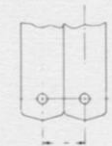



STOCKED PUNCH AND DIE SIZES.

PUNCH SIZES		.125	.156	.187	.218	.250	.265	.281	.312	.343	.375	.390	.406	.437	.468	.500	.531	.562	.593	.625
DIE SIZES	$\frac{1}{32}$ - $\frac{1}{16}$	.131	.162	.194	.224	.256	.271	.287	.318	.350	.381	.396	.412	.444	.474	.506	.537	.569	.600	.631
FOR MAT'L	$\frac{1}{16}$ - $\frac{1}{8}$	.136	.168	.200	.230	.262	.277	.293	.325	.357	.388	.402	.418	.450	.480	.512	.543	.575	.606	.637
THICKNESS	$\frac{1}{8}$ - $\frac{3}{16}$		.181	.215	.244	.277	.293	.306	.338	.369	.402	.418	.431	.463	.493	.525	.556	.588	.619	.650
	$\frac{3}{16}$ - $\frac{1}{4}$			.230	.262	.293	.310	.325	.357	.388	.418	.435	.450	.480	.512	.543	.575	.606	.637	.668

.875 MAXIMUM PUNCH DIAMETER

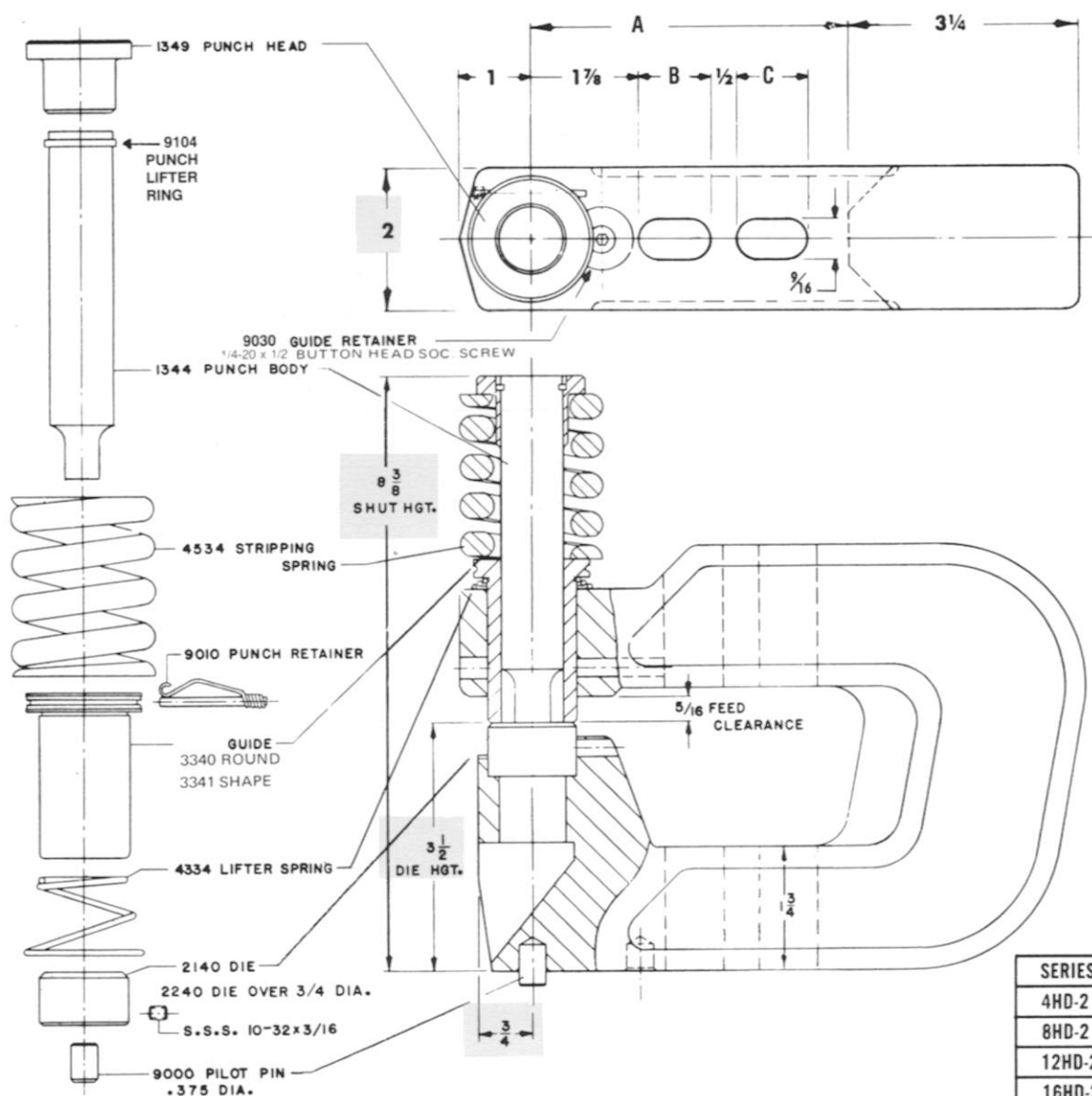
.250 MAXIMUM METAL THICKNESS MILD STEEL

SERIES NO.	4HD-2	8HD-2	12HD-2	16HD-2			2" 2.000" HOLDER WIDTH	DUCTILE HOLDER 
CAT. NO.	32010	32020	32030	32040				
THROAT DEPTH	4½	8½	12½	16½				
CENTER TO BACK	7¾	11¾	15¾	19¾				
SHIP WT. LBS.	18.5	23.7	29.8	33.5	¾" LEG TO CENTER	2.000" MIN. CENTER DIST.		HD SERIES

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

the "HD" to "HDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 4HD-2 32010 .312 .325 Round



RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.866
.156	.860
.187	.854
.218	.847
.250	.837
.281	.828
.312	.817
.343	.805
.375	.790
.406	.775
.437	.757
.500	.718
.562	.670
MAX. SQUARE	.618

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

SERIES NO.	A	B	C
4HD-2	4½	17/8	
8HD-2	8½	57/8	
12HD-2	12½	57/8	3½
16HD-2	16½	57/8	57/8

STOCKED PUNCH AND DIE SIZES.

.312 .375 .406 .437 .500 .531 .562 .593 .625 .656 .687 .750 .812 .875 PUNCH SIZES

.318	.381	.412	.444	.506	.537	.569	.600	.631	.662	.694	.756	.818	.881	DIE SIZES	1/32-1/16
.325	.388	.418	.450	.512	.543	.575	.606	.637	.668	.700	.762	.824	.887	FOR MAT'L	1/16-1/8
.338	.402	.431	.463	.525	.556	.588	.619	.650	.681	.713	.775	.838	.900	THICKNESS	1/8-3/16
.357	.418	.450	.480	.543	.575	.606	.637	.668	.700	.733	.795	.858	.920		3/16-1/4

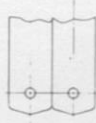
.250 MAXIMUM METAL THICKNESS
MILD STEEL



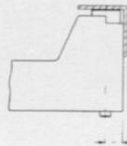
2¹/₂"

2.500"
HOLDER WIDTH

HOLDER WIDTH



2.500''
MIN. CENTER DIST.



LEG TO CENTER

SERIES NO.	8HD-2½	12HD-2½	16HD-2½	
CAT. NO.	32420	32430	32440	
THROAT DEPTH	8½	12½	16½	
CENTER TO BACK	11¾	15¾	19¾	
SHIP WT. LBS.	35.4	42.4	50.9	

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

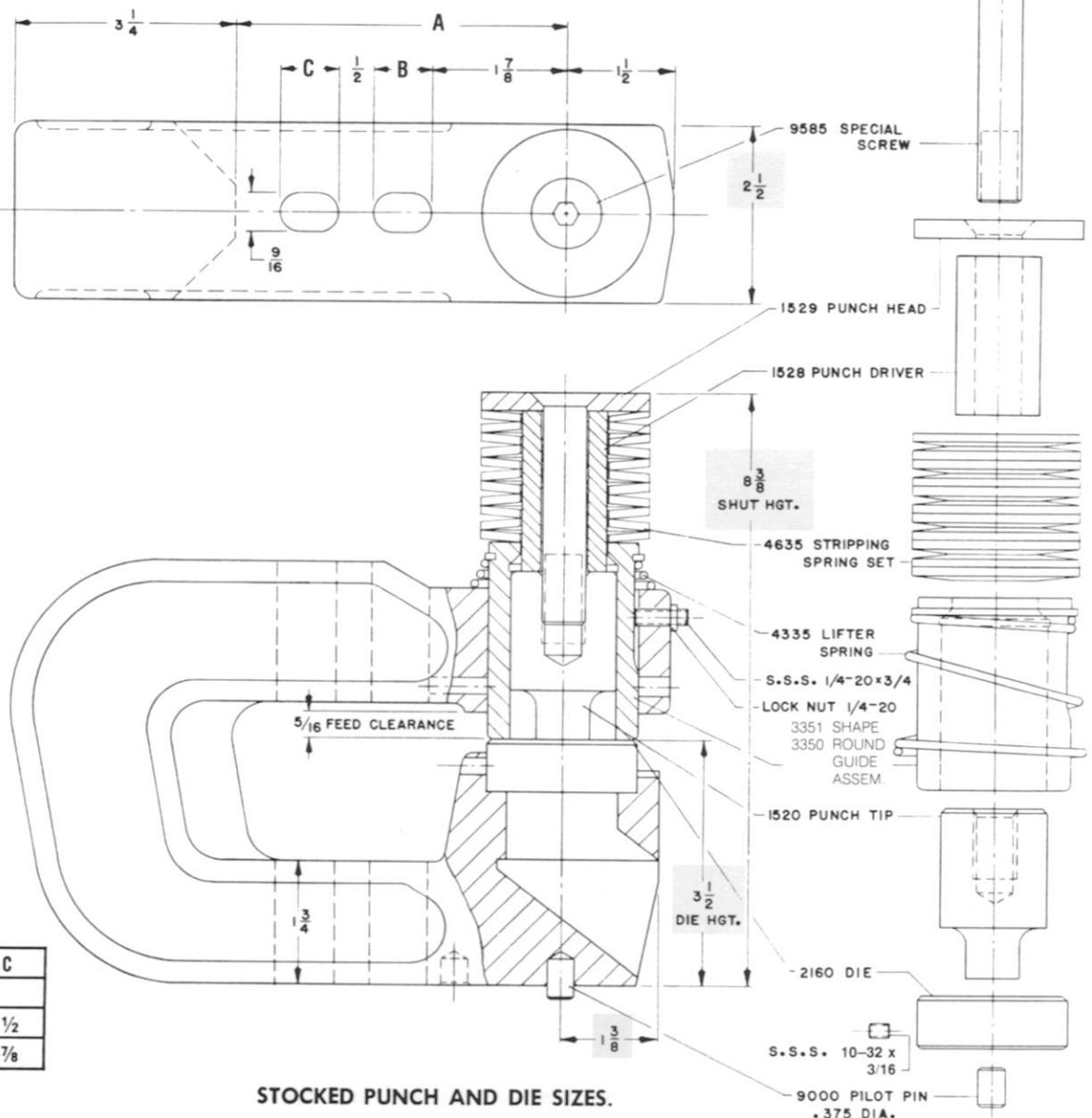
the "HD" to "HDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY:	QUANTITY	SERIES NO.	CATALOG NUMBER	PUNCH SIZE	DIE SIZE	SHAPE
EXAMPLE:	2	8HD-2½	32420	1.000	1.012	Round

<div style="text-align: center;">L</div> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 10px;">W</div> <div style="border: 1px solid black; width: 100px; height: 40px;"></div> </div> <div style="text-align: center;">RECTANGULAR POINT SIZE LIMITATION</div>	
W	L
.125	1.494
.187	1.489
.250	1.475
.312	1.466
.375	1.452
.437	1.434
.500	1.414
.562	1.389
.625	1.363
.687	1.333
.750	1.299
.8125	1.260
.875	1.218
.937	1.170
1.000	1.118
MAX. SQUARE	1.062

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

SERIES NO.	A	B	C
8HD-2½	8½	5⅞	
12HD-2½	12½	5⅞	3½
16HD-2½	16½	5⅞	5⅞



STOCKED PUNCH AND DIE SIZES.

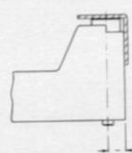
PUNCH SIZES		.937	1.000	1.062	1.125	1.187	1.250	1.375	1.437	1.500
DIE SIZES	$\frac{1}{32}$ - $\frac{1}{16}$	.944	1.006	1.070	1.133	1.195	1.258	1.383	1.446	1.508
FOR MAT'L	$\frac{1}{16}$ - $\frac{3}{16}$	.950	1.012	1.077	1.140	1.202	1.265	1.390	1.453	1.515
THICKNESS	$\frac{3}{16}$ - $\frac{1}{2}$	.963	1.025	1.088	1.150	1.213	1.275	1.400	1.463	1.525
	$\frac{3}{8}$ - $\frac{1}{4}$	.983	1.045	1.107	1.170	1.233	1.295	1.420	1.483	1.545

1.750 MAXIMUM PUNCH DIAMETER

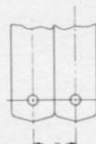
.250 MAXIMUM METAL THICKNESS

MILD STEEL

SERIES NO.	8HD-3	12HD-3	16HD-3
CAT. NO.	33020	33030	33040
THROAT DEPTH	8½	12½	16½
CENTER TO BACK	11¾	15¾	19¾
SHIP WT. LBS.	46.8	53.8	65.3



1 3/4"
LEG TO CENTER



3.000"
MIN. CENTER DIST.

3"

3.000"
HOLDER WIDTH

DUCTILE HOLDER

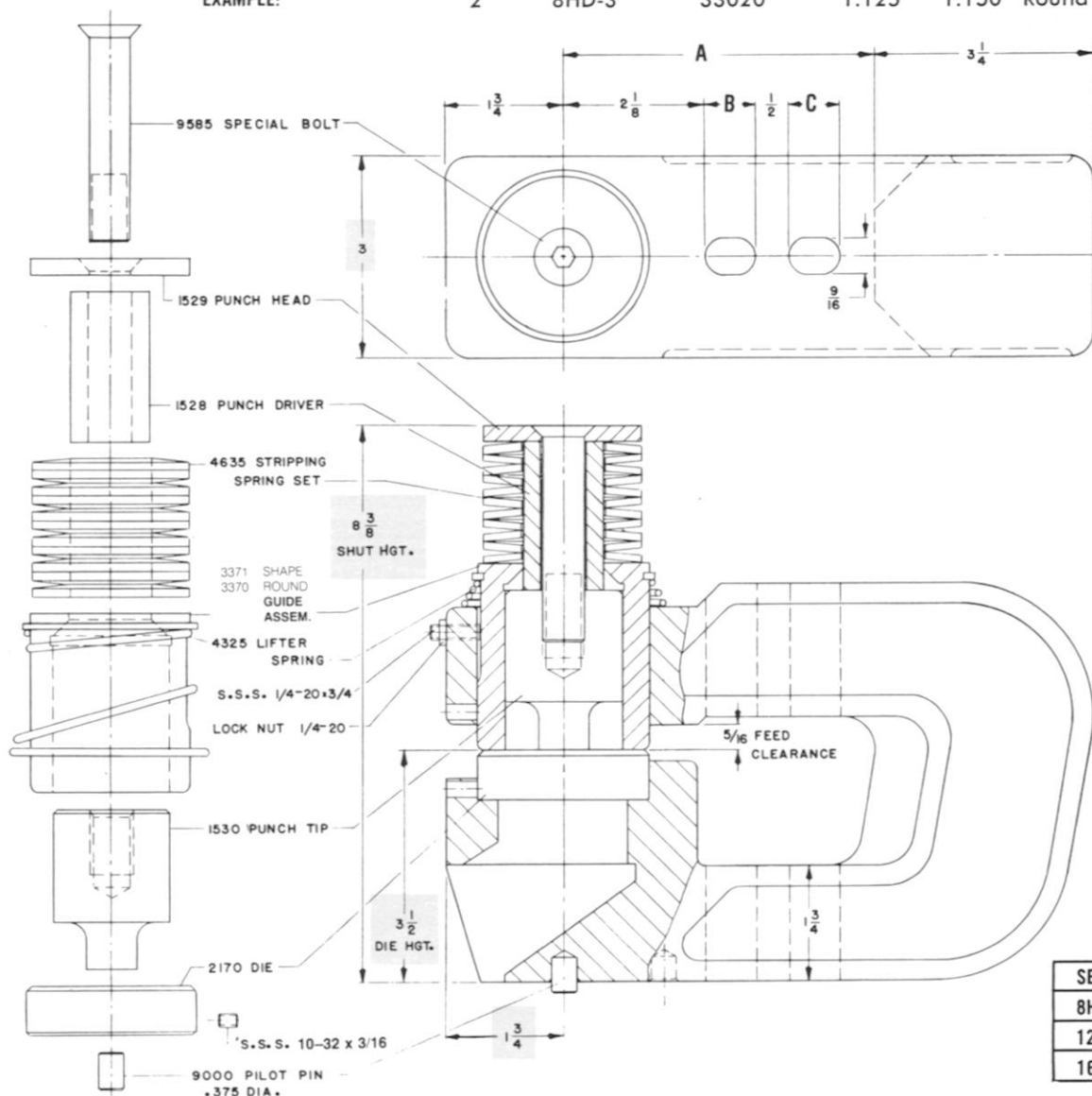


HD SERIES

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

the "HD" to "HDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 8HD-3 33020 1.125 1.150 Round



RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	1.744
.187	1.739
.250	1.731
.312	1.721
.375	1.709
.437	1.694
.500	1.677
.562	1.660
.625	1.633
.687	1.609
.750	1.581
.8125	1.549
.875	1.515
.937	1.477
1.000	1.436
1.062	1.390
1.125	1.340
1.187	1.285
MAX. SQUARE	1.234

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

SERIES NO.	A	B	C
8HD-3	8½	5¾	
12HD-3	12½	5¾	3½
16HD-3	16½	5¾	5¾

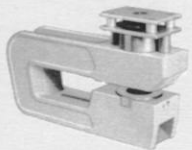
PUNCH AND DIE SIZES.

	1.000	1.125	1.250	1.375	1.500	1.625	1.750	PUNCH SIZES
	1.006	1.133	1.258	1.383	1.508	1.633	1.758	DIE SIZES 1/32-1/16
	1.012	1.140	1.265	1.390	1.515	1.640	1.765	FOR MAT'L 1/16-1/8
	1.025	1.150	1.275	1.400	1.525	1.650	1.775	THICKNESS 1/8-3/16
	1.045	1.170	1.295	1.420	1.545	1.670	1.795	3/16-1/4

2.000 MAXIMUM PUNCH DIAMETER

.500 MAXIMUM METAL THICKNESS MILD STEEL

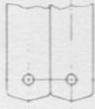
DUCTILE HOLDER



HD SERIES

3 1/2"

3.500"
HOLDER WIDTH



3.500"
MIN. CENTER DIST.



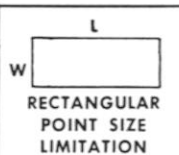
2 1/2"
LEG TO CENTER

SERIES NO.	8HD-3 1/2	12HD-3 1/2	16HD-3 1/2	
CAT. NO.	33420	33430	33440	
THROAT DEPTH	8 1/2	12 1/2	16 1/2	
CENTER TO BACK	12	16	20	
SHIP WT. LBS.	65.0	75.5	86.0	

NOTE: THESE UNITS CAN PUNCH HOLES IN MATERIAL TO 1/2" THICK MILD STEEL. SEE (*) IN PUNCH SIZE TABLE.

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change

the "HD" to "HDS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.



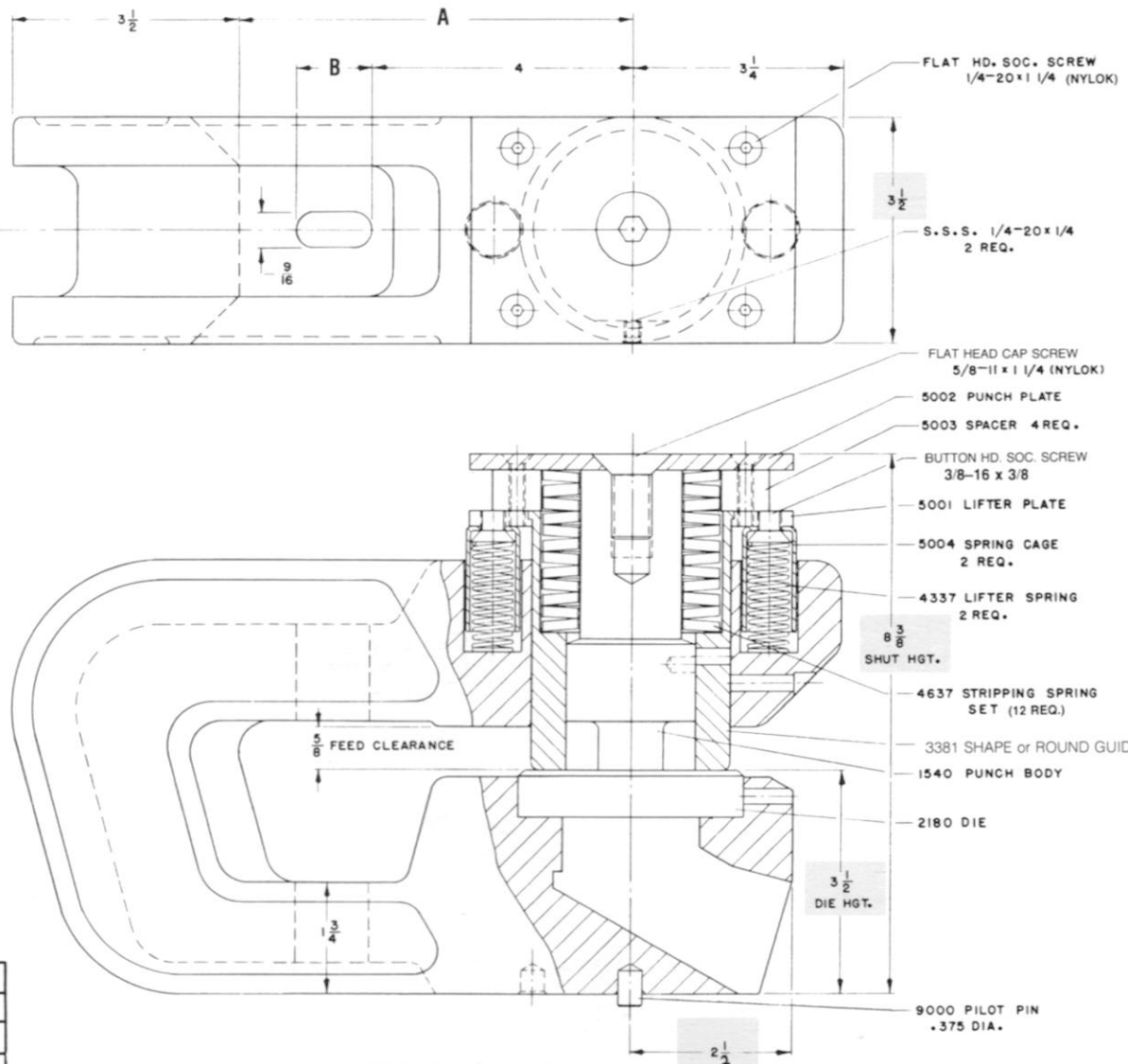
RECTANGULAR
POINT SIZE
LIMITATION

W	L
.125	1.9960
.156	1.9938
.187	1.9911
.218	1.9880
.250	1.9843
.281	1.9826
.312	1.9754
.343	1.9702
.375	1.9645
.406	1.9583
.437	1.9515
.500	1.9364
.562	1.9192
.625	1.8998
.687	1.8781
.750	1.8540
.812	1.8275
.875	1.7984
.937	1.7666
1.000	1.7320
1.062	1.6944
1.125	1.6535
1.187	1.6092
1.250	1.5612
1.312	1.5090
1.375	1.4523
1.406	1.4221

MAX.
SQUARE 1.414

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 8HD-3 1/2 33420 1.125 1.170 Round



PUNCH AND DIE SIZES.

PUNCH SIZES

DIE SIZES 1/32-1/16
FOR MAT'L 1/16-3/8
THICKNESS 1/8-3/4

1.000 1.125 1.250 1.375 1.500 1.625 1.750 1.875 2.000

1.006	1.133	1.258	1.385	1.508	1.633	1.758	1.883	2.008
1.013	1.140	1.265	1.390	1.515	1.640	1.765	1.890	2.015
1.045	1.170	1.295	1.420	1.545	1.670	1.795	1.920	2.045
1.070	1.195	1.320	1.445	1.570	1.695	*		
1.100	1.225	1.350	1.475	1.600	1.725			

MAINTENANCE OF UNIT TOOLING

DO NOT GRIND PUNCHES AND DIES BEYOND MINIMUM SHUT HEIGHT

RD units—5¼"

HD units—8"

Although Pierce-All perforating and notching units are designed and built for rugged production, they are also precision tools with precise relationships between punch, die, pilot pin and holder dimensions. These permit interchangeability of parts, close hole-to-hole location tolerances, and burr-free holes.

With normal maintenance, Pierce-All's tooling will give continuous and satisfactory performance in fabrication of uniform holes and notches. The highlights of a good maintenance program are listed below.

OILING

Pierce-All's units should be lubricated frequently during operation by liberally squirting (or brushing) oil on punch, guide and holder guide areas. Use number S.A.E. 10 or equivalent light machine oil for R.D. (Regular Duty) and S.A.E. 30 for H.D. (Heavy Duty) units.

The amount and frequency of oiling depends on the condition of the work pieces. When perforating dirty, scaly sheets, the scale tends to loosen during punching operation and wedge between punch and guide, causing the punch to stick in the guide. Liberal brushing of oil on the punch and guide will flush the dirt from the unit. When punching scaly material, a light grade of machine oil is recommended to increase the flow of oil. The flushing action will keep dirt or loose scale from working between the moving parts eliminating galling, binding and other operating malfunctions that cause loss of production.

Oiling of the work piece is sometimes necessary to facilitate punching and to prolong punch life. On soft metals such as aluminum, it has been found that cutting oil on the work piece tends to reduce pickup on the punch, thereby increasing punch life and aiding in stripping punch from work. There is a variety of cutting oils developed for this work. Contact your local cutting oil supplier for recommendations.

SHARPENING PUNCHES AND DIES

Punch and die life can be extended as much as 300% by judicious sharpening at the ideal time. The number of holes produced between sharpenings will vary according to the material thickness from perhaps 400 on very heavy material to about 50,000 on light material. But as a sort of guide, expect to punch about 15,000 holes in $\frac{3}{16}$ " and about 25,000 in 14 gage. In heavier gages the quantities drop off sharply. Punches require more frequent sharpening than die buttons.

Looking at a sharpened punch or die button, the shearing edges should be square and sharp. These edges are rather fragile considering that they must withstand the impact and tonnage required to fracture the material being punched. After considerable punching, an observation of this edge will show it to be rounded off slightly and will have a frosted appearance. This indicates that the metal in the immediate vicinity is fatigued and has crystallized. When this happens, considerably more tonnage is required to make the material fracture. If the punch or button is sharpened at this stage, a new edge can be produced by removing only about .015" material. At this rate a new punch could be sharpened 13 times and could produce about 200,000 holes in $\frac{3}{16}$ " material. The same is true of die buttons.

If sharpening is not done at the proper time, the extra tonnage required by the already frosted edge causes further and more widespread frosting very quickly. Usually the punch will begin to gall up the sides which makes the punch wear undersize in diameter.

After the first edge frosting occurs sometimes another hundred strokes or so causes the edge to break down to the point that as much as a $\frac{1}{16}$ " of an inch must be removed to sharpen. This, then, shortens punch life to 3 grinds representing only 60,000 holes, instead of 13 grinds and 200,000 holes. So frequent sharpening and minimum stock removal is by far the least expensive and produces the highest quality.

The punches and dies can be sharpened by a variety of methods, depending on the shop facilities available. A surface grinder, abrasive belt grinder, or pedestal grinder will be satisfactory providing the following points are considered:

- (1) A steady rest, preferably a vee block, should support punches during grinding so that a clean straight surface can be ground.
- (2) Dies must be ground parallel to bottom face so that work piece will not be marked during operation of unit.
- (3) Do not grind punches and dies below the minimum recommendations.

DO NOT GRIND PUNCHES AND DIES BEYOND MINIMUM SHUT HEIGHT

RD units—5¼"

HD units—8"

.437 MAXIMUM PUNCH DIAMETER

.250 MAXIMUM METAL THICKNESS MILD STEEL

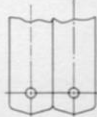
DUCTILE HOLDER



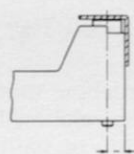
HDA SERIES

1 1/4"

1.250"
HOLDER WIDTH



1.250"
MIN. CENTER DIST.



1/2"
LEG TO CENTER

SERIES NO.	4HDA-1 1/4	8HDA-1 1/4	12HDA-1 1/4
CAT. NO.	36110	36120	36130
THROAT DEPTH	4 1/2	8 1/2	12 1/2
CENTER TO BACK	7 3/4	11 3/4	15 3/4
SHIP WT. LBS.	10.8	13.4	15.4

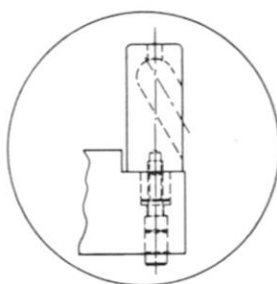
Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change the

"HDA" to "HDAS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

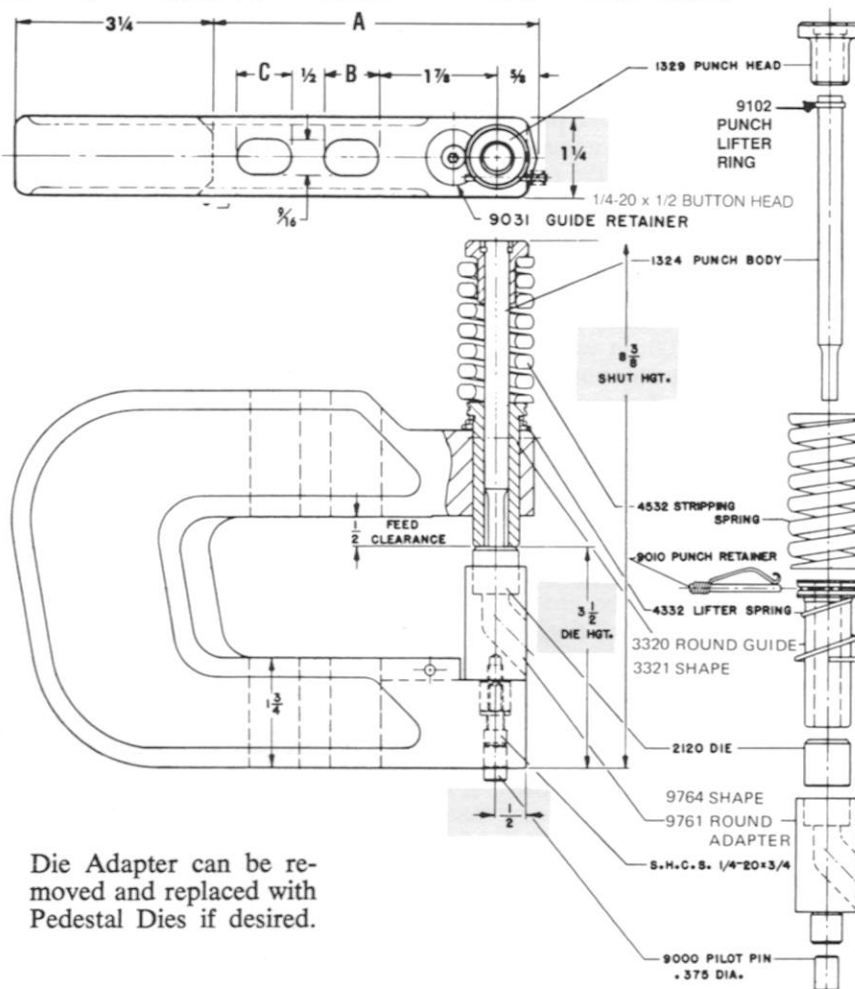
WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 4HDA-1 1/4 36110 .125 .131 Round

RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.419
.156	.406
.187	.395
.218	.377
.250	.359
.281	.332
MAX. SQUARE	.309

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.



SERIES NO.	A	B	C
4HDA-1 1/4	4 1/2	1 7/8	
8HDA-1 1/4	8 1/2	5 7/8	
12HDA-1 1/4	12 1/2	5 7/8	3 1/2



DIE ADAPTER UNITS permit punching round or SHAPED holes close to the inside leg of angle iron.

Punches and dies are interchangeable with our HD-1 1/4 units on page 11.

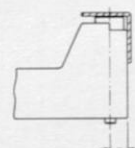
STOCKED PUNCH AND DIE SIZES.

PUNCH SIZES		.093	.125	.156	.187	.193	.203	.218	.250	.265	.281	.312	.343	.375	.406	.437
DIE SIZES	1/32-1/16	.100	.131	.162	.194	.200	.209	.224	.256	.271	.287	.318	.350	.381	.412	.444
FOR MAT'L	1/16-1/8	.105	.136	.168	.200	.209	.215	.230	.262	.277	.293	.325	.357	.388	.418	.450
THICKNESS	1/8-3/16			.181	.215	.219	.230	.244	.277	.293	.306	.338	.369	.402	.431	.463
	3/16-1/4				.230	.239	.248	.262	.293	.310	.325	.357	.388	.418	.450	.483

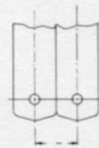
.625 MAXIMUM PUNCH DIAMETER

.250 MAXIMUM METAL THICKNESS MILD STEEL

SERIES NO.	4HDA-1½	8HDA-1½	12HDA-1½	16HDA-1½
CAT. NO.	36210	36220	36230	36240
THROAT DEPTH	4½	8½	12½	16½
CENTER TO BACK	7¾	11¾	15¾	19¾
SHIP WT. LBS.	14.5	17.3	20.5	23.9



5/8"
LEG TO CENTER



1.500"
MIN. CENTER DIST.

1 1/2"

1.500"
HOLDER WIDTH

DUCTILE HOLDER

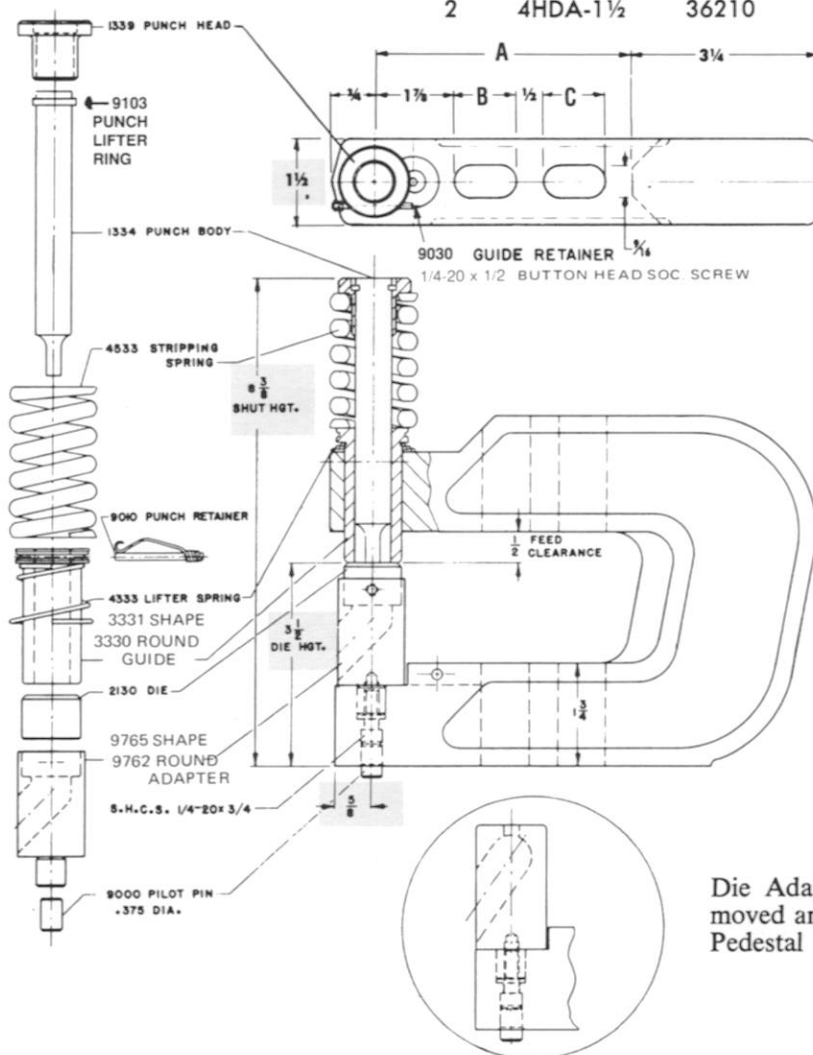


HDA SERIES

Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change the

"HDA" to "HDAS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
2 4HDA-1½ 36210 .125 .131 Round



RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.612
.156	.605
.187	.596
.218	.585
.250	.572
.281	.558
.312	.541
.343	.522
.375	.500
.406	.475
.437	.446
MAX. SQUARE	.442

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.

Die Adapter can be removed and replaced with Pedestal Dies if desired.

SERIES NO.	A	B	C
4HDA-1½	4½	1 7/8	
8HDA-1½	8½	5 7/8	
12HDA-1½	12½	5 7/8	3 1/2
16HDA-1½	16½	5 7/8	5 7/8

DIE ADAPTER UNITS permit punching round or SHAPED holes close to the inside leg of angle iron.

Punches and dies are interchangeable with our HD-1½ units on page 12.

STOCKED PUNCH AND DIE SIZES.

.125	.156	.187	.218	.250	.265	.281	.312	.343	.375	.390	.406	.437	.468	.500	.531	.562	.593	.625	PUNCH SIZES
.131	.162	.194	.224	.256	.271	.287	.318	.350	.381	.396	.412	.444	.474	.506	.537	.569	.600	.631	DIE SIZES 1/32-1/16
.136	.168	.200	.230	.262	.277	.293	.325	.357	.388	.402	.418	.450	.480	.512	.543	.575	.606	.637	FOR MAT'L 1/16-1/8
.181	.215	.244	.277	.293	.306	.338	.369	.402	.418	.431	.463	.493	.525	.556	.588	.619	.650		THICKNESS 1/16-3/16
.230	.262	.293	.310	.325	.357	.388	.418	.435	.450	.480	.512	.543	.575	.606	.637	.668			3/16-1/4

.875 MAXIMUM PUNCH DIAMETER

.250 MAXIMUM METAL THICKNESS MILD STEEL

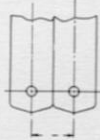
DUCTILE HOLDER



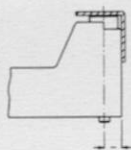
HDA SERIES

2"

2.000"
HOLDER WIDTH



2.000"
MIN. CENTER DIST.



3/4"
LEG TO CENTER

SERIES NO.	4HDA-2	8HDA-2	12HDA-2	16HDA-2
CAT. NO.	36310	36320	36330	36340
THROAT DEPTH	4 1/2	8 1/2	12 1/2	16 1/2
CENTER TO BACK	7 3/4	11 3/4	15 3/4	19 3/4
SHIP WT. LBS.	18	23	29	33

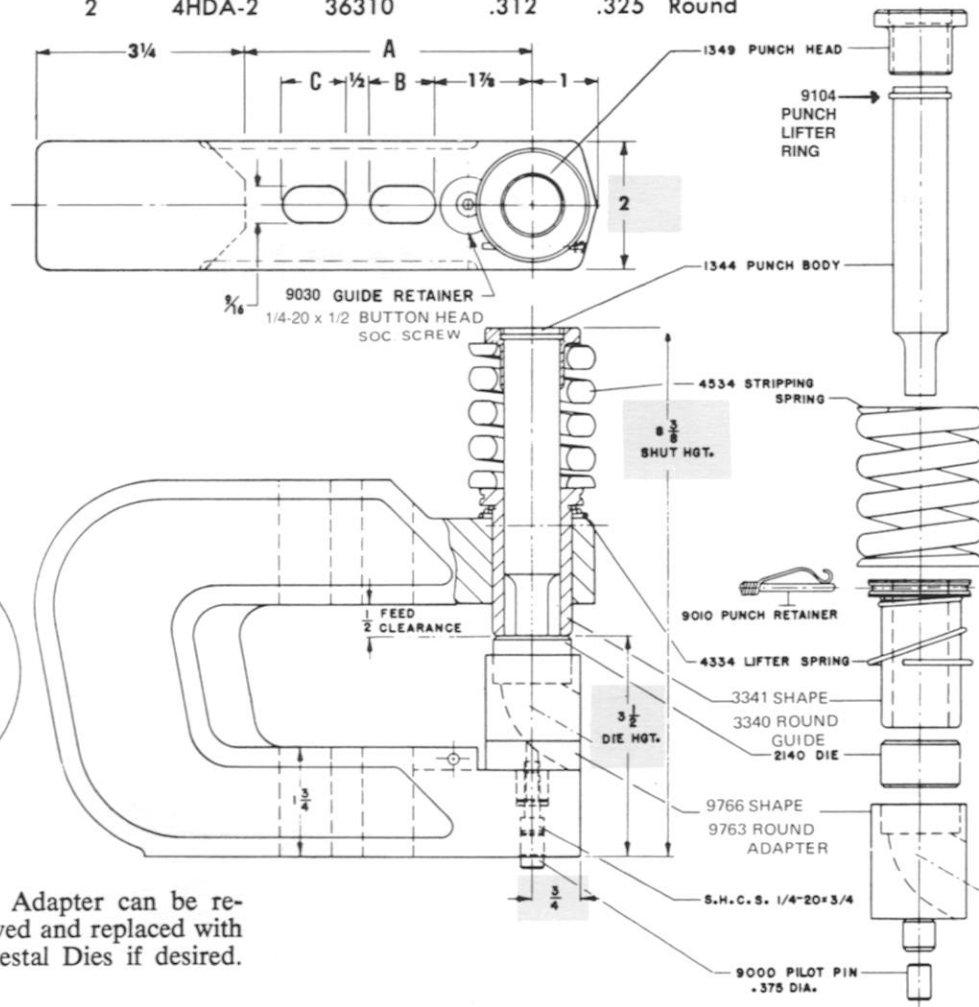
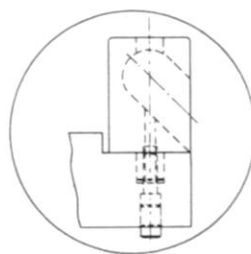
Before you order, be sure to read the information on the inside back cover. If you order SHAPED hole units, change the

"HDA" to "HDAS" in the Series Number. See Price Book for catalog numbers of shaped units and punches and dies.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 4HDA-2 36310 .312 .325 Round

RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.866
.156	.860
.187	.854
.218	.847
.250	.837
.281	.828
.312	.817
.343	.805
.375	.790
.406	.775
.437	.757
.500	.718
.562	.670
MAX. SQUARE	.618

Round holders are keyed and can be converted to shaped hole punching with a low-cost kit. See inside back cover for complete details.



Die Adapter can be removed and replaced with Pedestal Dies if desired.

SERIES NO.	A	B	C
4HDA-2	4 1/2	1 1/4	
8HDA-2	8 1/2	5 1/4	
12HDA-2	12 1/2	5 1/4	3 1/2
16HDA-2	16 1/2	5 1/4	5 1/4

DIE ADAPTER UNITS permit punching round or SHAPED holes close to the inside leg of angle iron.

Punches and dies are interchangeable with our HD-2 units on page 13.

STOCKED PUNCH AND DIE SIZES.

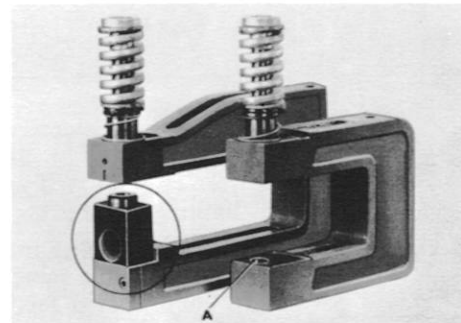
PUNCH SIZES	.312	.375	.406	.437	.500	.531	.562	.593	.625	.656	.687	.750	.812	.875
DIE SIZES 1/2-3/8	.318	.381	.412	.444	.506	.537	.569	.600	.631	.662	.694	.756	.818	.881
FOR MAT'L 1/8-3/8	.325	.388	.418	.450	.512	.543	.575	.606	.637	.668	.700	.762	.824	.887
THICKNESS 3/8-3/4	.338	.402	.431	.463	.525	.556	.588	.619	.650	.681	.713	.775	.838	.900
3/4-1	.357	.418	.450	.480	.543	.575	.606	.637	.668	.700	.733	.795	.858	.920

DIE ADAPTERS TO REPLACE PEDESTAL DIE UNITS

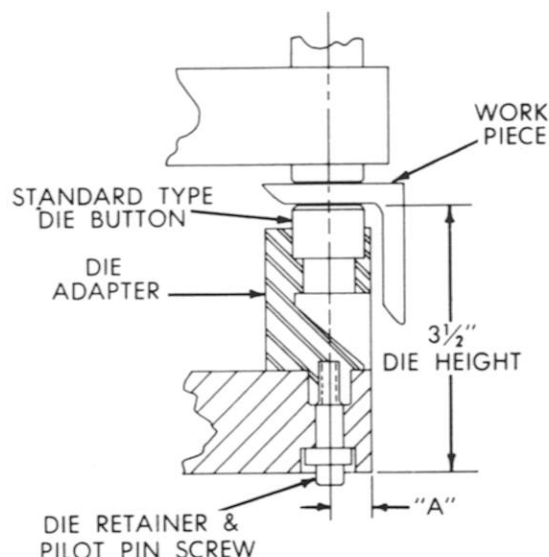
If you are using pedestal die units and the seats are damaged from the dies penetrating them, don't throw them away! You can salvage them quickly and economically with PIERCE-ALL round or shaped hole die adapters.

Pierce-All adapters are made of tool steel, hardened to Rockwell "C" 30-35 and precision ground to exacting tolerance to maintain concentricity between pilot pin, die and punch assembly. Inexpensive die buttons are used which can be changed without removing the adapter from the holder. Simply loosen the lock screw and lift the die out.

The wider area at the base (full width of the holder) prevents penetration of the adapter, which is held in position by the same pilot screw used to hold the pedestal die. Shaped hole adapters are also available and keyed so the shaped hole die buttons can be turned 90° to suit the application. Low cost die buttons are available from stock to punch round or shaped holes in the maximum size hole for each unit width up to 1/4" metal thickness.



Competitor's Pedestal Die Units are shown. Left (circled) Pierce-All Adapter, plain or keyed for shaped dies. Right (A) — Pedestal die has penetrated into seat causing misalignment. Reworking holder permits salvaging unit with our adapters, plain or keyed for shapes.

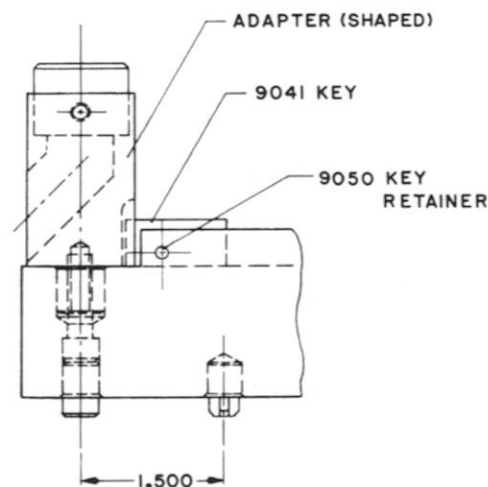


ROUND HOLE DIE ADAPTER

PIERCE-ALL ADAPTER CAT. NO.	STYLE OF UNIT TO BE USED WITH		PIERCE-ALL DIE BUTTON NO.	DIM. "A" DWG. ABOUT
	Unipunch	Strippit®		
9761	AJ 1 1/4	CJ 1 1/8	2120	1 1/32
9762	AJ 1 1/2	CJ 1 1/8	2130	5/8
9763	AJ 2	CJ 2	2140	3/4

These round die adapters are standard on Pierce-All HDA series units and fit other units as indicated above.

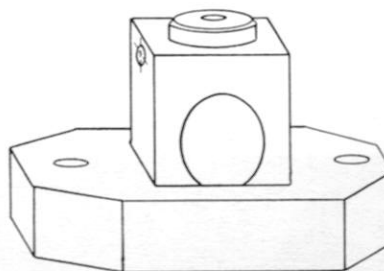
To order adapter for other makes, specify:
Quantity, Catalog Number, Unit Series Number
Purchase key and retainer once, only, if not already in unit.



SHAPED HOLE DIE ADAPTER

PIERCE-ALL ADAPTER CAT. NO.	STYLE OF UNIT TO BE USED WITH		PIERCE-ALL DIE BUTTON NO.	DIM. "A" DWG. ABOUT
	Unipunch	Strippit®		
9764	SAJ 1 1/4	CJ 1 1/8	Obr. 2121 Rect. 2122	1 1/32
9765	SAJ 1 1/2	CJ 1 1/8	Obr. 2131 Rect. 2132	5/8
9766	SAJ 2	CJ 2	Obr. 2141 Rect. 2142	3/4

These Shaped die adapters fit Pierce-All and other units shown above, to use on Pierce-All units, purchase one 9041 key and one 9050 key retainer for each unit. (First use purchase only.)



Here's an idea! Adapters can be put on 1 3/8" plates and used with punch holder of HDTP units where clearance is required for punching in channel or angle iron.

.625 MAXIMUM PUNCH DIAMETER

.250 MAXIMUM METAL THICKNESS MILD STEEL

DUCTILE HOLDER



**HOTP 2 1/8
SERIES**

SHOULD YOU ORDER UNITS FOR ROUND OR SHAPED HOLE PUNCHING? *

Before you order, be sure to read the helpful information on the inside back cover of this catalog.

ROUNDS: Series HDTP-2 1/8 Cat. No. 52100.

SHAPES: Series HDTPS-2 1/8.

CAT. NO. (Obround) 52101.

CAT. NO. (Square or rectangle) 52102.

WHEN ORDERING, SPECIFY:	QUANTITY	SERIES NO.	CATALOG NUMBER	PUNCH SIZE	DIE SIZE	SHAPE	SHIP. WT.
EXAMPLE:	2	HDTP-2 1/8	52100	.125	.131	Round	11 Lbs.

Heavy Duty Two Piece units provide for punching holes (round or shaped) at practically any center-to-center distance over large as well as small sheets of material. The only limiting factor is the size of the die set or press.

Punch and die assemblies are mounted in die sets and operate in the press the same way as conventional dies, permitting unobstructed feeding, or mounted on templates which are then mounted into die sets.

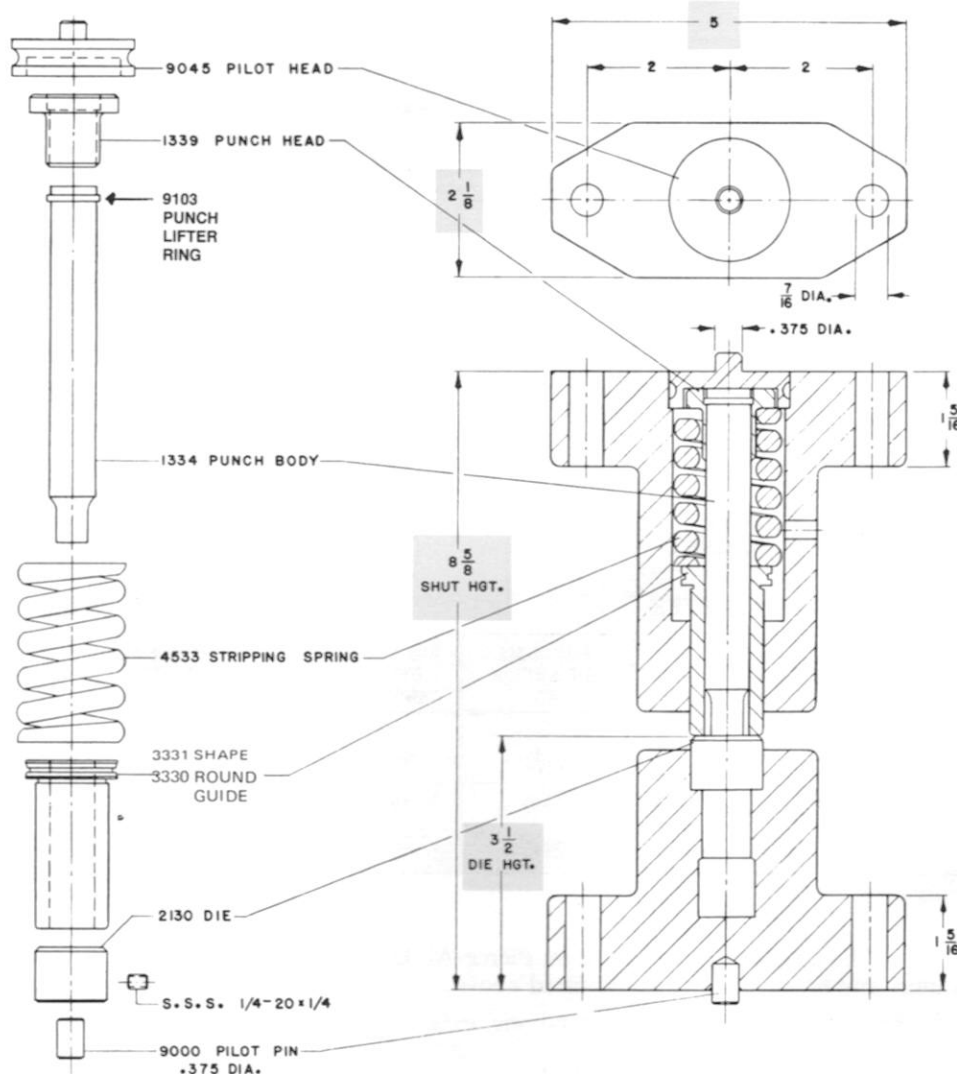
Each punch assembly and die assembly is an independ-

ent and self-contained unit. The punch assembly consists of holder, punch, stripping spring, punch guide and pilot head. The die assembly consists of holder, die and pilot pin.

The components, other than the punch and die holders, are the same parts as used in the H.D. (Heavy Duty) Series of self-contained perforating units and these units also feature our "Built-In Lubrication System."

L W RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.612
.156	.605
.187	.596
.218	.585
.250	.572
.281	.558
.312	.541
.343	.522
.375	.500
.406	.475
.437	.446
MAX. SQUARE	.442

* NOTE: Units keyed for SHAPES can be used for ROUND hole punching. HOWEVER, ROUND hole units CANNOT be converted for SHAPED hole punching. Consider future needs when ordering.



STOCKED PUNCH AND DIE SIZES.

PUNCH SIZES		.125	.156	.187	.218	.250	.265	.281	.312	.343	.375	.390	.406	.437	.468	.500	.531	.562	.593	.625
DIE SIZES	$\frac{1}{32}$ - $\frac{1}{16}$	.131	.162	.194	.224	.256	.271	.287	.318	.350	.381	.396	.412	.444	.474	.506	.537	.569	.600	.631
FOR MET'L	$\frac{1}{16}$ - $\frac{1}{8}$	.136	.168	.200	.230	.262	.277	.293	.325	.357	.388	.402	.418	.450	.480	.512	.543	.575	.606	.637
THICKNESS	$\frac{1}{8}$ - $\frac{3}{16}$		.181	.215	.244	.277	.293	.306	.338	.369	.402	.418	.431	.463	.493	.525	.556	.588	.619	.650
	$\frac{3}{16}$ - $\frac{1}{4}$			.230	.262	.293	.310	.325	.357	.388	.418	.435	.450	.480	.512	.543	.575	.606	.637	.668

.875 MAXIMUM PUNCH DIAMETER

.250 MAXIMUM METAL THICKNESS MILD STEEL

SHOULD YOU ORDER UNITS FOR ROUND OR SHAPED HOLE PUNCHING? *

Before you order, be sure to read the helpful information on the inside back cover of this catalog.

ROUNDS: Series HDTP-3 Cat. No. 53000.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE SHIP. WT.
EXAMPLE: 2 HDTP-3 53000 .500 .506 Round 17 Lbs.

SHAPES: Series HDTPS.

CAT. NO. (Obround) 53001.

CAT. NO. (Square or Rectangle) 53002.

Heavy Duty Two Piece units provide for punching holes (round or shaped) at practically any center-to-center distance over large as well as small sheets of material. The only limiting factor is the size of the die set or press.

Punch and die assemblies are mounted in die sets and operate in the press the same way as conventional dies, permitting unobstructed feeding, or mounted on templates which are then mounted into die sets.

Each punch assembly and die assembly is an independ-

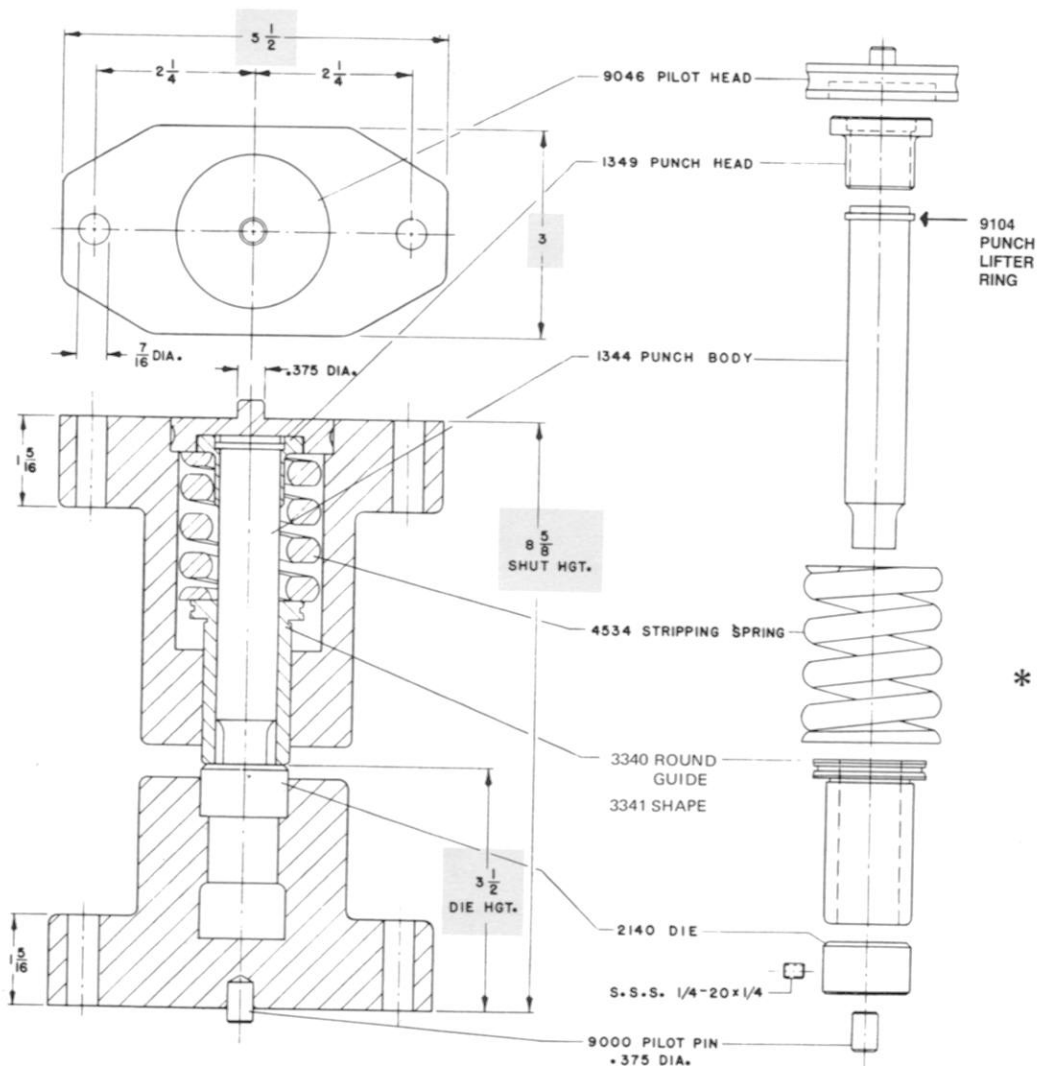
ent and self-contained unit. The punch assembly consists of holder, punch, stripping spring, punch guide and pilot head. The die assembly consists of holder, die and pilot pin.

The components, other than the punch and die holders, are the same parts as used in the H.D. (Heavy Duty) Series of self-contained perforating units and these units also feature our "Built-In Lubrication System."

DUCTILE HOLDER



HDTP 3 SERIES



L	
W	
RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	.866
.156	.860
.187	.854
.218	.847
.250	.837
.281	.828
.312	.817
.343	.805
.375	.790
.406	.775
.437	.757
.500	.718
.562	.670
MAX. SQUARE	.618

* NOTE: Units keyed for SHAPES can be used for ROUND hole punching. HOWEVER, ROUND hole units CANNOT be converted for SHAPED hole punching. Consider future needs when ordering.

STOCKED PUNCH AND DIE SIZES.

.312	.375	.406	.437	.500	.531	.562	.593	.625	.656	.687	.750	.812	.875	PUNCH SIZES
.318	.381	.412	.444	.506	.537	.569	.600	.631	.662	.694	.756	.818	.881	DIE SIZES
.325	.388	.418	.450	.512	.543	.575	.606	.637	.668	.700	.762	.824	.887	FOR MAT'L
.338	.402	.431	.463	.525	.556	.588	.619	.650	.681	.713	.775	.838	.900	THICKNESS
.357	.418	.450	.480	.543	.575	.606	.637	.668	.700	.733	.795	.858	.920	3/16-1/4

1.500 MAXIMUM PUNCH DIAMETER

.250 MAXIMUM METAL THICKNESS MILD STEEL

DUCTILE HOLDER



HOTP 3/4 SERIES

SHOULD YOU ORDER UNITS FOR ROUND OR SHAPED HOLE PUNCHING? *

Before you order, be sure to read the helpful information on the inside back cover of this catalog.

ROUNDS: Series HDTP-3/4. Cat. No. 53200.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE SHIP. WT.
EXAMPLE: 2 HDTP-3/4 53200 1.000 1.012 Round 23 Lbs.

SHAPES: Series HDTPS-3/4.

CAT. NO. (Obrounds) 53201.

CAT. NO. (Square or Rectangle) 53202.

Heavy Duty Two Piece units provide for punching holes (round or shaped) at practically any center-to-center distance over large as well as small sheets of material. The only limiting factor is the size of the die set or press.

Punch and die assemblies are mounted in die sets and operate in the press the same way as conventional dies, permitting unobstructed feeding, or mounted on templates which are then mounted into die sets.

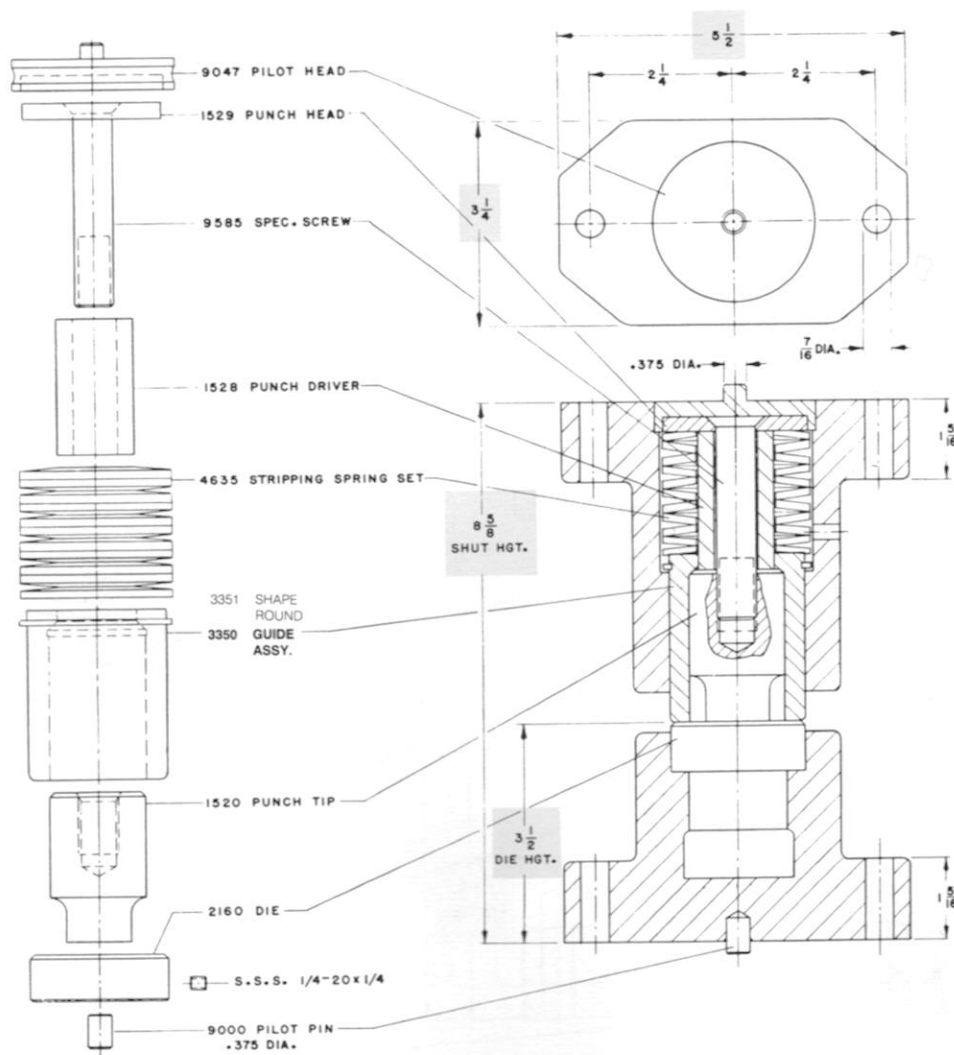
Each punch assembly and die assembly is an independ-

ent and self-contained unit. The punch assembly consists of holder, punch, stripping spring, punch guide and pilot head. The die assembly consists of holder, die and pilot pin.

The components, other than the punch and die holder, are the same parts as used in the H.D. (Heavy Duty) Series of self-contained perforating units and these units also feature our "Built-In Lubrication System."

RECTANGULAR POINT SIZE LIMITATION	
W	L
.125	1.494
.187	1.489
.250	1.475
.312	1.466
.375	1.452
.437	1.434
.500	1.414
.562	1.389
.625	1.363
.687	1.333
.750	1.299
.8125	1.260
.875	1.218
.937	1.170
1.000	1.118
MAX. SQUARE	
1.062	

* NOTE: Units keyed for SHAPES can be used for ROUND hole punching. HOWEVER, ROUND hole units CANNOT be converted for SHAPED hole punching. Consider future needs when ordering.

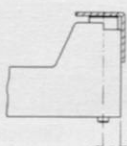
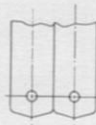




PUNCH AND DIE SIZES.

PUNCH SIZES	.937	1.000	1.062	1.125	1.187	1.250	1.375	1.437	1.500
DIE SIZES 1/32-1/16	.944	1.006	1.070	1.133	1.195	1.258	1.383	1.446	1.508
FOR MAT'L 1/16-3/16	.950	1.012	1.077	1.140	1.202	1.265	1.390	1.453	1.515
THICKNESS 3/16-7/16	.963	1.025	1.088	1.150	1.213	1.275	1.400	1.463	1.525
7/16-1/2	.983	1.045	1.107	1.170	1.233	1.295	1.420	1.483	1.545

.312 MAXIMUM PUNCH DIAMETER

.125 MAXIMUM METAL THICKNESS MILD STEEL

SERIES NO.	LD-¾	FOR PUNCHING ROUND HOLES IN ANGLES CHANNELS EXTRUSIONS FLAT WORK	 LEG TO CENTER	 .750 MIN. CENTER DIST.	 3/4 .750 HOLDER WIDTH	DUCTILE HOLDER  LD SERIES
CAT. NO.	10640					
THROAT DEPTH	3 7/8"					
CENTER TO BACK	5 13/16"					
SHIP WT. LBS.	4.5					

LD series (light duty) units are ideal for holes close to the edges of angles, extrusions, channels and light gauge flat sheets up to 1/8" thick mild steel.

These units are made to the industry standard of 7 7/16" shut height and 3 3/8" die height. Notice that the die height permits fairly deep or high pieces to clear the unit in front. The 3/4" width of the unit also permits close center-to-center spacing. Die buttons in ductile holder provide economy and rigidity.

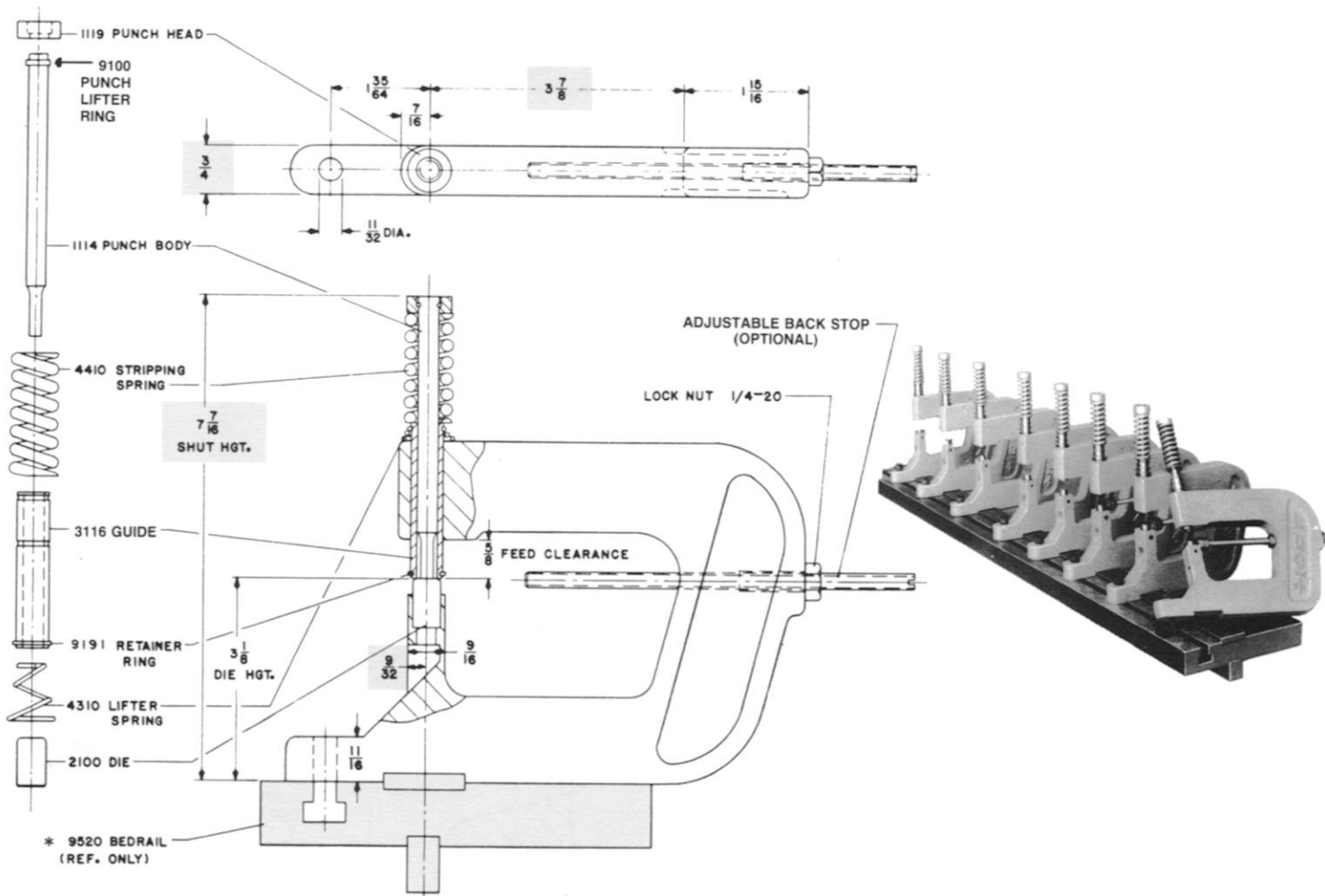
The photo and drawing illustrate Bed Rail Mounting*, with the built-in key permitting fast positioning of the

units in a straight line. The tee-bolt slot has been added for ease of locking the units in place and to permit adjustment left-to-right from the front of the set-up. When closely spaced, or butted together, reaching inside the units to bolt them down would be difficult, if not impossible.

Gage rods, shown in the photo, are available for quick front to back adjustment of the workpiece location though other, more permanent stops may be used.

LD units can also be provided with pilot pins for quick template mounting for repeat type applications.

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER PUNCH SIZE DIE SIZE SHAPE
EXAMPLE: 2 LD-¾ 10640 .125 .131 Round



STOCKED PUNCH AND DIE SIZES

.093 .098 .125 .128 .140 .156 .187 .203 .218 .250 .251 .311 PUNCH SIZES

.100 .105 .131 .136 .147 .162 .194 .209 .224 .256 .287 .318
.105 .110 .136 .140 .153 .168 .200 .215 .230 .262 .293 .327


DIE SIZES 1/32-1/16
FOR MAT'L 1/16-1/8
THICKNESS

ROUND OR SHAPED HOLES



CAT. NO. (SHAPES) CPS-2

Also advise: type and weight of channel plus sketch hole location from inside leg of angle to center line hole as unit is machined in front of die holder to act gaging surface.

W	L	
		
RECTANGULAR POINT SIZE LIMITATION		
	W	L
	.125	.612
	.156	.605
	.187	.596
	.218	.585
	.250	.572
	.281	.558
	.312	.541
	.343	.522
	.375	.500
	.406	.475
	.437	.446
	MAX. SQUARE	.442

Technical drawing showing the exploded view of a stocked punch and die assembly. The drawing includes the following components and dimensions:

- 9031 GUIDE RETAINER**: 1/4-20 x 3/4 BUTTON HEAD. Dimensions: 6 1/8 (total length), 4 1/8 (length to center of punch head), 1 (length of punch head).
- 1349 PUNCH HEAD**: Dimensions: 2 (width).
- 1344 PUNCH BODY**: Dimensions: 10 3/8 SHUT HGT. (height).
- 4534 STRIPPING SPRING**: Dimensions: 5 1/2 DIE HGT. (height).
- 9010 PUNCH RETAINER**: Dimensions: 1 5/8 (length), 9/16 (width).
- 3340 ROUND GUIDE**: Dimensions: 3/4 (width).
- 3341 SHAPE**: Dimensions: 1 3/4 (width).
- 4334 LIFTER SPRING**: Dimensions: 1 3/4 (width).
- 2800 DIE OR 2130 DIE**: Dimensions: 1 3/4 (width).
- S.S.S. 1/4-20 x 1/4**: Dimensions: 1 3/4 (width).
- 9000 PILOT PIN**: .375 DIA. (diameter).

STOCKED PUNCH AND DIE SIZES.

STOCKED PUNCH AND DIE SIZES.

PUNCH SIZES	.125	.156	.187	.218	.250	.265	.281	.312	.343	.375	.390	.406	.437	.468	.500	.531	.562	.593	.625	
DIE SIZES	$\frac{1}{32}$ - $\frac{1}{16}$	.131	.162	.194	.224	.256	.271	.287	.318	.350	.381	.396	.412	.444	.474	.506	.537	.569	.600	.631
FOR MAT'L	$\frac{1}{16}$ - $\frac{1}{8}$	.136	.168	.200	.230	.262	.277	.293	.325	.357	.388	.402	.418	.450	.480	.512	.543	.575	.606	.637
THICKNESS	$\frac{1}{8}$ - $\frac{3}{16}$		.181	.215	.244	.277	.293	.306	.338	.369	.402	.418	.431	.463	.493	.525	.556	.588	.619	.650
	$\frac{3}{16}$			.225	.262	.293	.310	.325	.357	.388	.418	.435	.450	.480	.512	.543	.575	.606	.637	.668

LOW-COST, HIGH PRODUCTION TUBE-PIERCING

1/4" MINIMUM TUBE O.D.
1 1/8" MAXIMUM TUBE O.D.

3/8" MAXIMUM HOLE SIZE

OPEN HEIGHT—10 3/8"

SHIPPING WT. 22 LBS.

FASTER, MORE EFFICIENT TUBE PIERCING

This new development in piercing units permits punching round, single or opposed holes in tubes *without the use of mandrels and with the minimum of distortion.*

The exclusive shaped retainers completely enclose the tube, supporting the walls as the punches pierce through the material and also act as strippers.

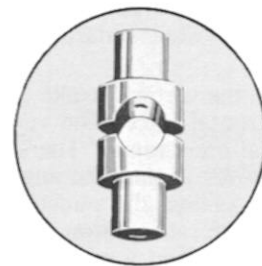
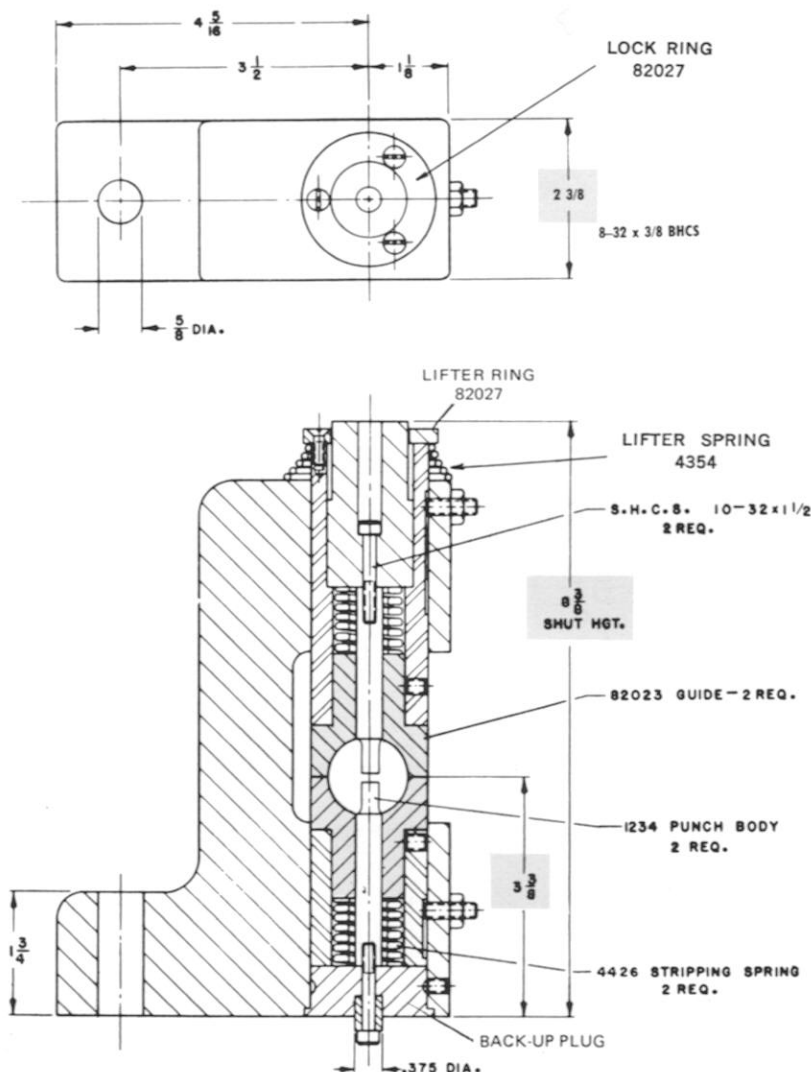
MULTI-PRODUCTION UNITS

Pierce-All Tube-Piercing Units are ideally suited for

multiple punching of tubing, either in straight lengths or after forming. The units are quickly and easily set up on bed rails for straight line piercing; on T-slotted plates from a preformed part, or mounted on an engineered mounting template.

MULTI-PURPOSE APPLICATION

After the production has been completed, the same group of units may be re-arranged or remounted for piercing other tubing having the same diameter, or the tube retainers quickly changed to cover another size of tubing.



Tube collapses slightly around the hole. The amount of distortion varies with the outside diameter of the tube, diameter of pierced hole and the thickness and hardness of the material.



TO ORDER, SPECIFY:

Hole Diameter to be Pierced • Tube Diameter • Wall Thickness • Tube Material • Press Specifications

TO INSURE EXACT FIT AND MAXIMUM TUBE PIERCING PERFORMANCE

Submit sample of tubing, specifications as to hole diameter and position, plus purchase order to cover engineering, boring tube wall guides to exactly match submitted

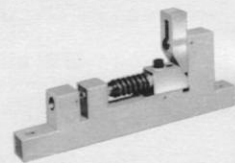
sample, rework of punches to meet customer requirements, assembly and try-out. This will enable you to evaluate the hole quality and hole distortion.

The sample charge will be credited to the purchase price of the first unit ordered to these specifications.

HORIZONTAL HOLE PUNCHING UNITS

HOLDER WIDTH	SERIES NUMBER	CAT. NO.	MAXIMUM PUNCH DIAM.	SHUT HEIGHT	THROAT DEPTH	LEG TO CENTER	SHIP. WT. LBS.
7/8 *	HHP- 7/8	61000	.312	4 3/8	1 1/16	5/16	5
1 1/4 **	HHP-1 1/4	61200	.437	6 1/2	1 1/16	9/16	18
1 1/2 **	HHP-1 1/2	61400	.625	6 1/2	1 1/16	1 1/16	22
2 **	HHP-2	62000	.875	6 1/2	1 1/16	7/8	30

STEEL HOLDER



HHP SERIES

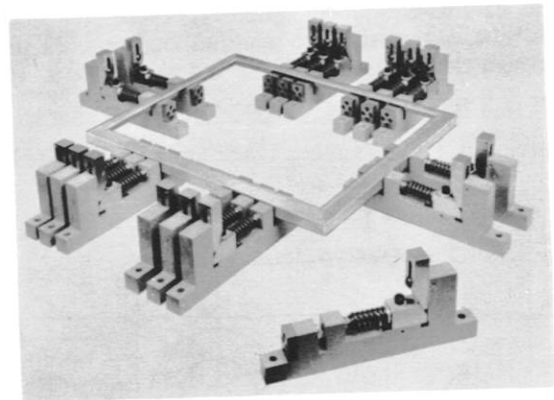
* Uses same parts as LD Series (Dies are 2510-RD 3/4).

** Uses same parts as HD Series of same width. *

HORIZONTAL unit tooling simplifies set-up and makes possible ONE-HIT operation for all sides of formed parts. These units can be used to punch ROUND or SHAPED holes. HHP units are available in holder widths of 1", 1 1/4" and 2" for mild steel material to 1/4" thick and in 7/8" width for mild steel material to 1/8" thick. While the holders are special, the punches, dies and stripping guides are standard. The holders are made of steel.

With these units, the vertical stroke of the press is transferred to a horizontal force. The vertical wedge blocks act as "horizontal press rams." The angular plane of the vertical block moves against the angle of the horizontal block pushing it against the punch head and stripping guide to provide the same action as in a standard vertical unit. The photo shows a typical set-up of HHP units working on four sides of a frame formed from an aluminum extrusion.

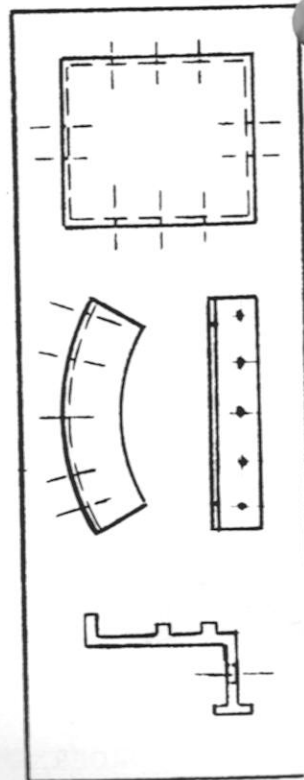
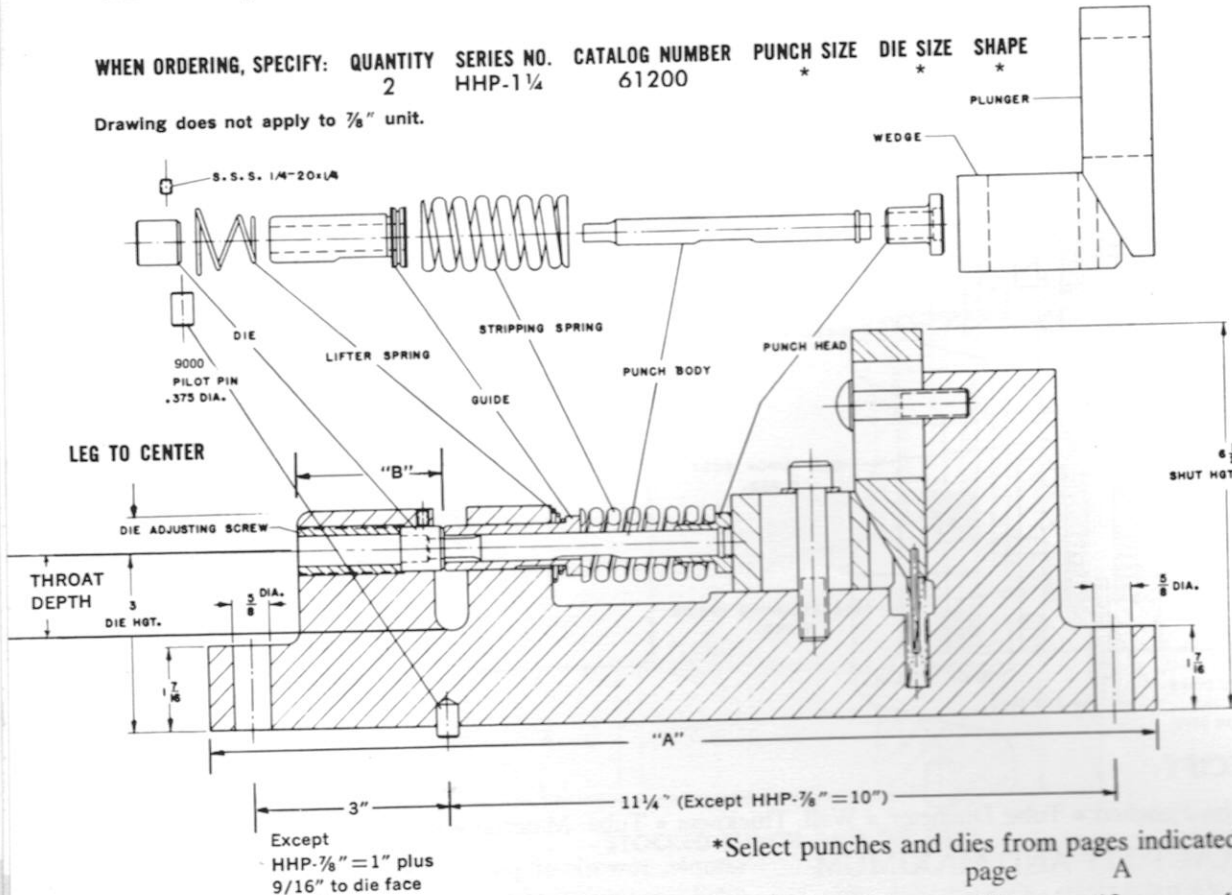
A die adjustment screw is used to back up the die button and make adjustments after sharpening.



Holders are equipped with pilot pins for accurate mounting on templates or other types of mounting accessories. As a result, quick set-ups and repeatability are assured.

WHEN ORDERING, SPECIFY: QUANTITY 2 SERIES NO. HHP-1 1/4 CATALOG NUMBER 61200 PUNCH SIZE * DIE SIZE * SHAPE *

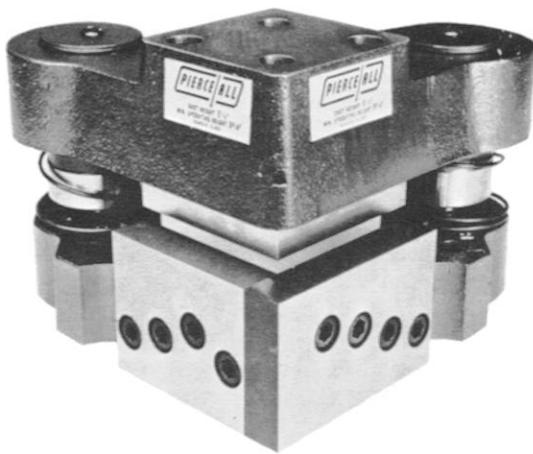
Drawing does not apply to 7/8" unit.



*Select punches and dies from pages indicated below.

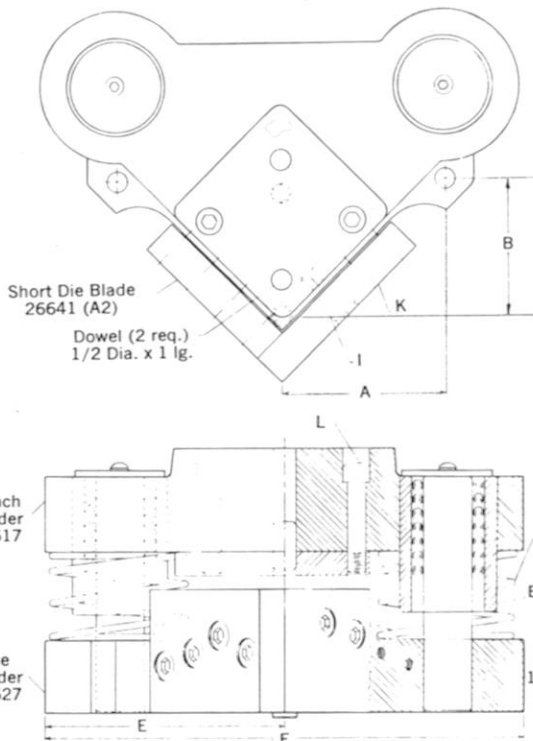
	page	A	B
HHP- 7/8 *	25	12	1 1/8
HHP-1 1/4	11	15 3/4	2 3/16
HHP-1 1/2	12	15 3/4	2 3/16
HHP-2	13	15 3/4	2 3/16

3x3 CORNER NOTCHING UNIT



This Multi-Purpose Unit will corner-notch a 3 x 3 corner in flat sheet, "Vee" notch flat sheet, crop one leg of a piece of angle iron up to 2 1/8 in from the end and Vee notch into the leg of angle iron.

Quality features of this unit are: gray iron cast punch and die holders; No-Groove ball bearing bushings; precision Master guide pins and A2 tool steel for long punch and die blade life.



All dimensions shown are nominal

A	3-13/32
B	3-1/8
C	1-13/32
D	7-49/64
E	5-1/32
F	10-1/16
G	RETAINER PLATE 26636
H	BUTTON HD CAP SCR. 1/4-20x1/2 LG
I	SHCS 3/8-16x3/4
J	LIFTER SPRING 4326
K	LONG DIE BLADE 26642
L	SHCS 3/8-16x1-1/2
M	ROUND PILOT PIN 9002
N	DIAMOND PILOT PIN 9003

Specifications

For maximum 1/8" thick mild steel

Shut Height - 5-1/2"

Die Height - 2-19/32"

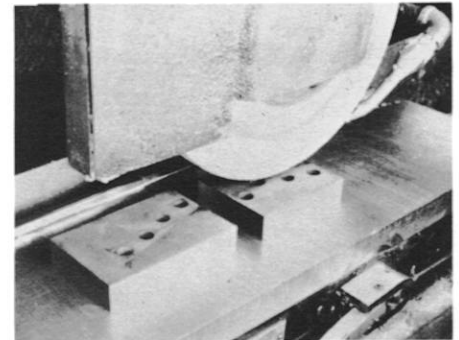
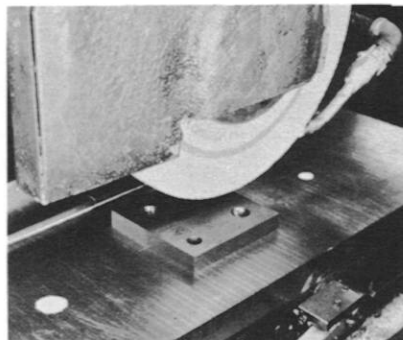
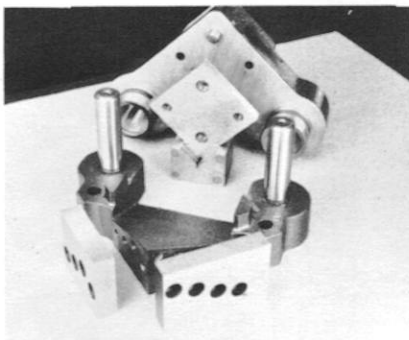
Catalog No. 26610

Ship. Wt. - 47 lbs. Approx.

To order, Specify:
Quantity, Type Unit,
Catalog Number

Example:
(1) RD 3x3 - 26610

How to Sharpen Corner Notch Unit



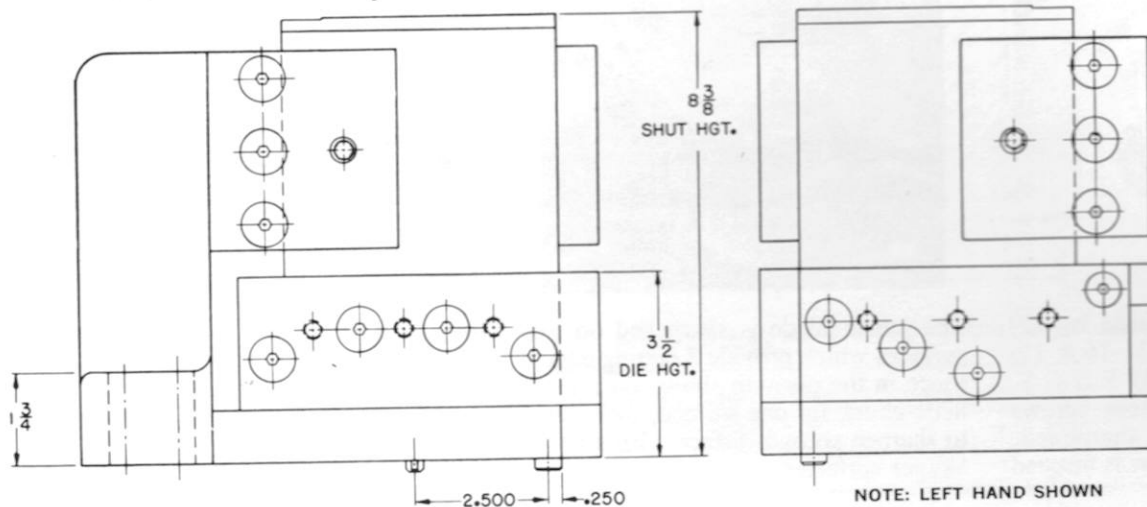
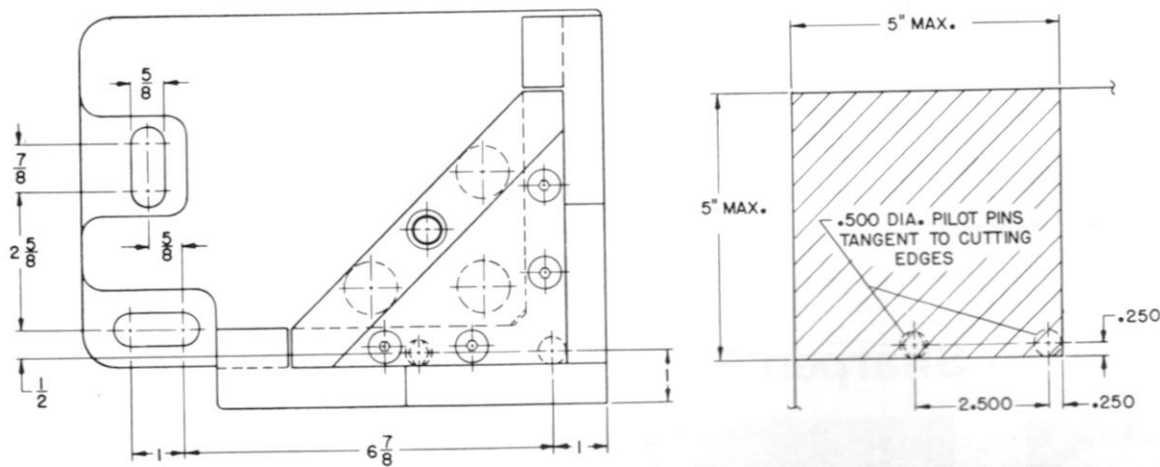
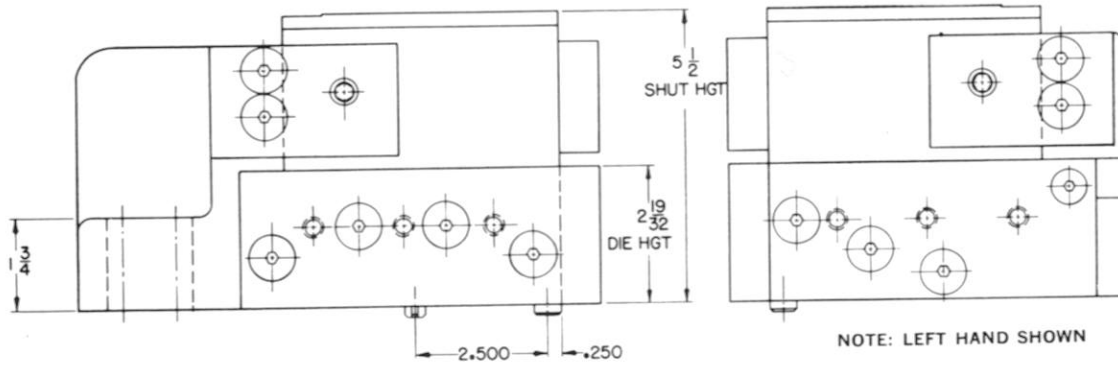
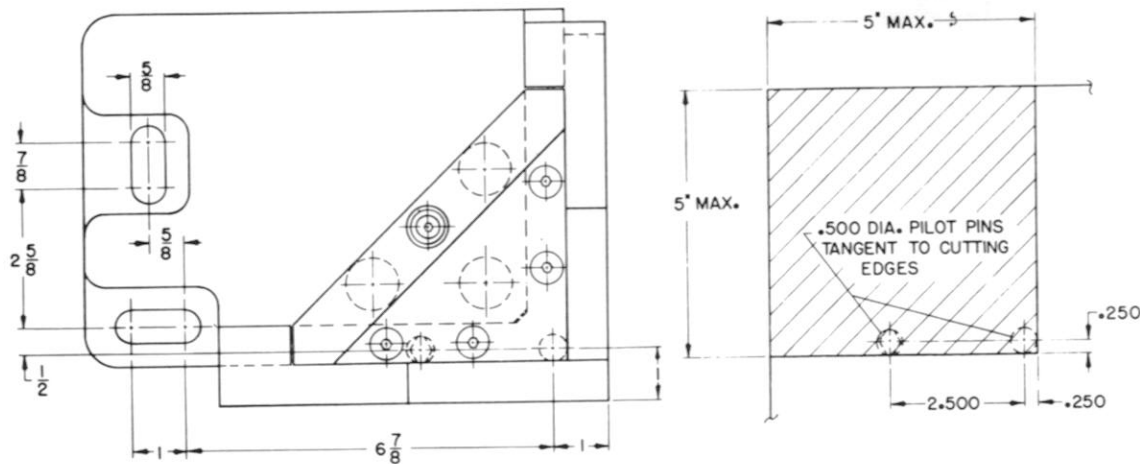
The punch blade is secured by (2) Socket Head Cap Screws 3/8-16 x 1 1/2 and each die blade by (4) S.H.C.S. 3/8-16 x 3/4. Removing these screws allows each blade to be sharpened. Upon reassembly each screw is torqued down 60 inch pounds.

The punch blade is sharpened on two surfaces which provide 8 cutting edges. Place in the position shown on a magnetic chuck for one surface, then rotate to sharpen second surface. Grind life is 1/8" per surface.

To sharpen each die blade remove screws and place inside face up on magnetic chuck (counterbored hole side down). Grind life is 1/8" per blade.

CORNER NOTCHING UNITS

5" x 5"



TO 1/8" THICK

MILD STEEL

Shut Height 5 1/2"

Die Height 2 19/32"

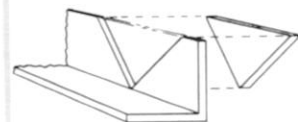
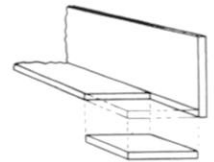
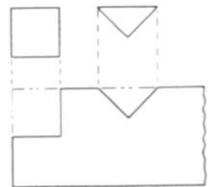
REGULAR DUTY

SERIES RD 5 x 5

Catalog Number:
Right Hand 26510
Left Hand 26520
Ship Wt. 60 lbs.

To order, Specify:
Quantity, Series Number,
Catalog Number (left or
right hand).

Typical Corner and Vee
Notching Operations



TO 1/4" THICK

MILD STEEL

Shut Height 8 3/8"

Die Height 3 1/2"

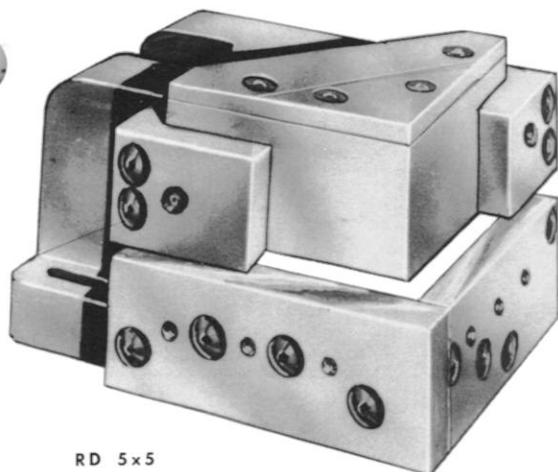
HEAVY DUTY

SERIES HD 5 x 5

Catalog Number:
Right Hand 36510
Left Hand 36520
Ship Wt. 100 lbs.

To order, Specify:
Quantity, Series Number,
Catalog Number (left or
right hand).

ALSO FOR ANGLE CROPPING AND 90° VEE NOTCHING



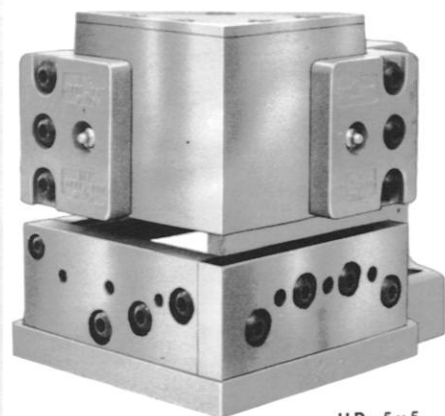
RD 5x5

5" x 5" CORNER NOTCHING UNITS (RD AND HD SERIES)

This Multi-Purpose Unit will corner-notch a 5" x 5" corner in flat sheet, "Vee" notch flat sheet, crop one leg of a piece of angle iron up to 3" in from the end and Vee notch into the leg of angle iron.

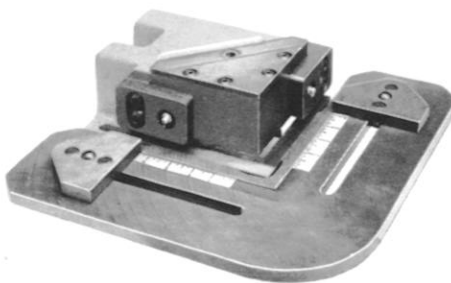
The open face construction of Pierce-All's corner notching unit permits closer positioning to hole punching units and allows front feeding to catch all four corners of a work piece in one hit.

Pierce-All's 5" x 5" corner notching unit has a one-piece cast tool steel punch. This rugged construction stands up longer, especially when notching the heavier gauges of material or cropping angle iron.



HD 5x5

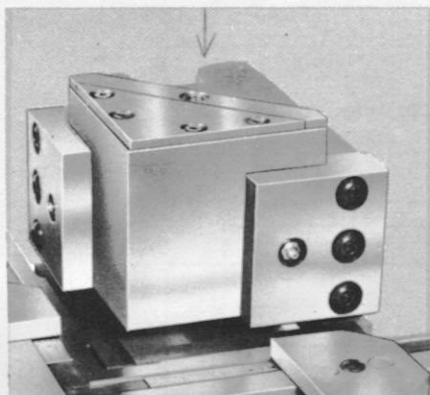
DO NOT SHARPEN PUNCH
UNDER 5¼" MINIMUM
SHUT HEIGHT ON RD-5 x 5



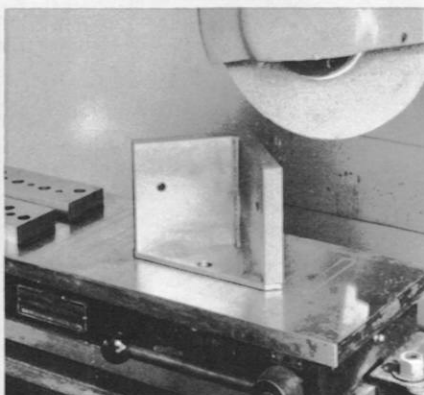
Side gauges which mount on unit or gauge plates with built-in scales (see photo) also available.

DO NOT SHARPEN PUNCH
UNDER 8⅛" MINIMUM
SHUT HEIGHT ON HD-5 x 5

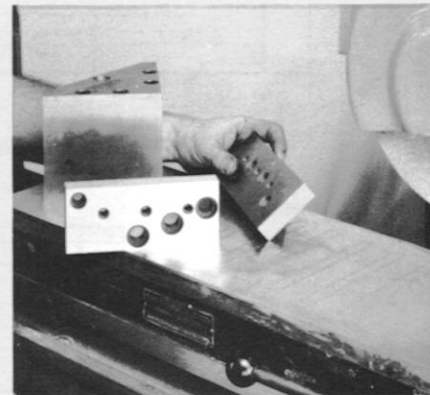
How to Sharpen Corner Notch Units



The punch and punch plate assembly is secured to the holder casting by a 5/16" x 1¼" stripper bolt that fits into a retainer No. 26570 (arrow). By removing the stripper bolt, the complete punch assembly can be removed and is then ready for sharpening.



The punch is turned upside down and placed on a magnetic chuck in this position in order to sharpen it.



To sharpen the die steels (rectangular blocks), they should be placed with the inside face up (the counterbored hole side down).

SEMI-STANDARD AND SPECIAL "VEE" OR EDGE NOTCH UNITS

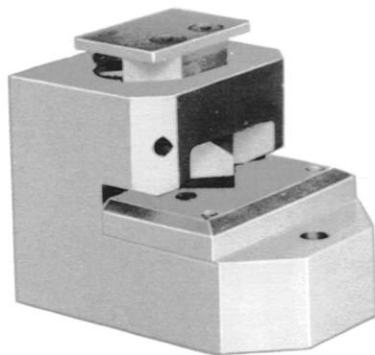
The punch is sharpened in the same manner as the standard unit as shown in Photo No. 2. The die steels are placed on the magnetic chuck in the same upright position as when assembled into the unit. The top is then ground

and a shim equivalent to the stock removed is placed underneath when re-assembling to maintain the correct height (2 19/32" for the RD series, 3½" for the HD series).

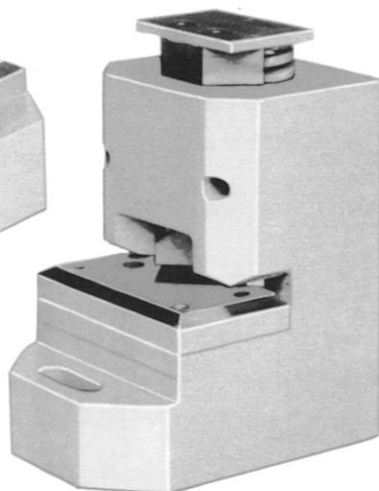
90° VEE NOTCHING UNITS

FOR SHEET AND ANGLE

WHEN ORDERING, SPECIFY: QUANTITY SERIES NO. CATALOG NUMBER
EXAMPLE 4 RD VEE-NOTCH 27140



RD UNIT

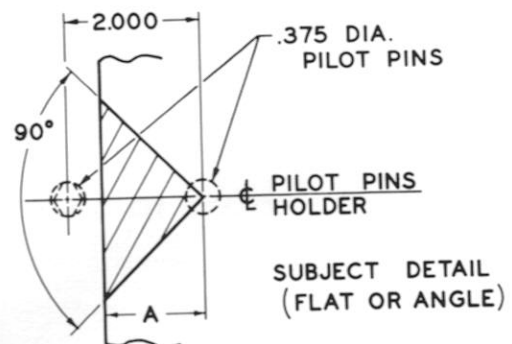
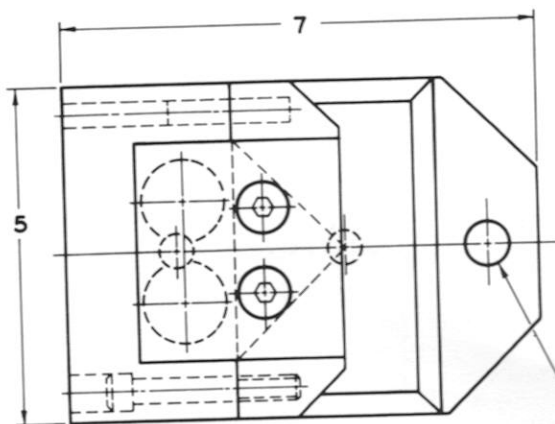


HD UNIT

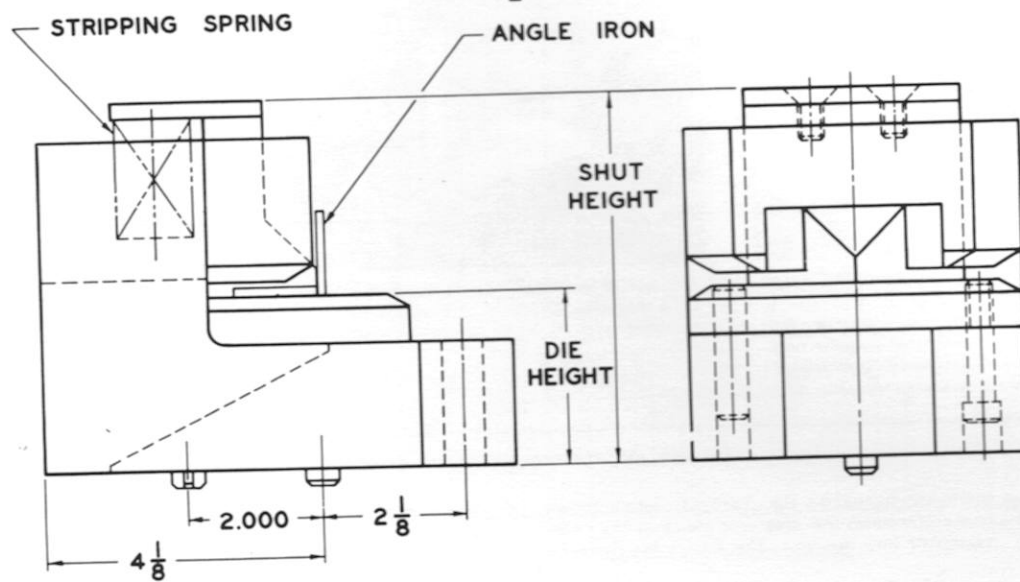
	RD SERIES	HD SERIES
MAXIMUM METAL THICKNESS } MILD STEEL	.125	.250
DEPTH OF NOTCH "A"	1½"	1½"
SHUT HEIGHT	5½"	8¾"
DIE HEIGHT	2½ ³² "	3½"
CATALOG NUMBER	27140	37140

PIERCE-ALL standard 90° Vee Notching units conform to all unit tooling industry standards and can be adapted to a multitude of operations in the metal fabricating industry.

In addition to Vee-Notching sheet and angle (note closeness to leg of angle provided by wide open design), they can be used as corner notching units to provide a 2" square notch. Exact manufacturing standards assure low-cost, low maintenance and high productivity.

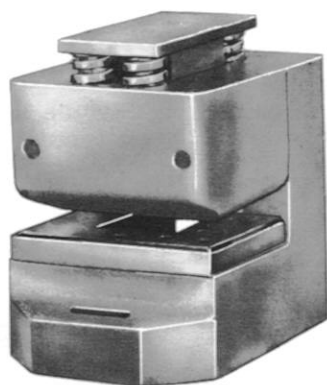


½ DIA. BOLT HOLD DOWN HOLE

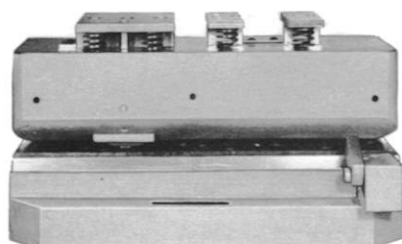


EDGE NOTCHING UNITS

RECTANGULAR OR SHAPED NOTCHING



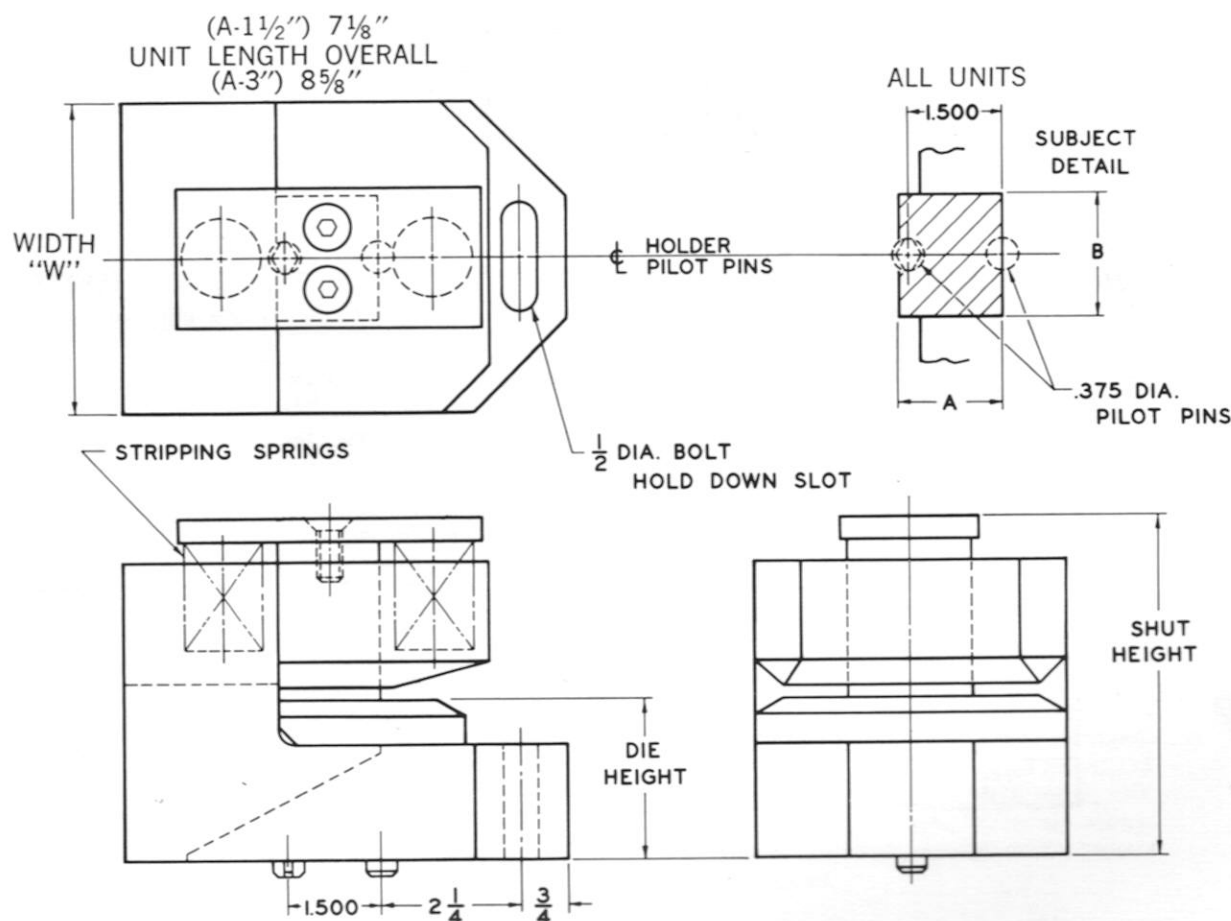
STANDARD EDGE NOTCH



Modified notch for shaped edge and pierce operation.

MILD STEEL	RD SERIES		RD & HD UNIT WIDTH "W" EQUALS "B" PLUS	HD SERIES	
MAX. METAL THICKNESS	.125			.250	
SHUT HEIGHT	5½			8¾	
DIE HEIGHT	2 ¹⁹ / ₃₂			3½	
WIDTH OF NOTCH "B"	Notch "A" Depth & Cat. No.			Notch "A" Depth & Cat. No.	
	1½"	3"		1½"	3"
1"	28110	28310	4 "	38110	38310
2"	28120	28320	3 "	38120	38320
3"	28130	28330	3 "	38130	38330
4"	28140	28340	3 "	38140	38340
5"	28150	28350	4½"	38150	38350
6"	28160	28360	4½"	38160	38360
7"	28170	28370	4½"	38170	38370
8"	28180	28380	4½"	38180	38380
9"	28190	28390	4½"	38190	38390
10"	28100	28300	4½"	38100	38300

Edge notching units should be specified by catalog number for standard sizes and material thickness given. Intermediate sizes are made using next larger size. Specify A and B dimensions and material thickness. Irregular shape units or units with perforating punches built in are made to order. Send sketch for quotation. RD and HD Series are compatible with respective series of perforating and corner and Vee notching units.

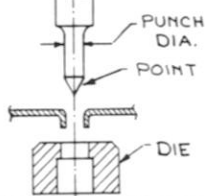


SPECIAL APPLICATION PUNCH AND DIE DATA

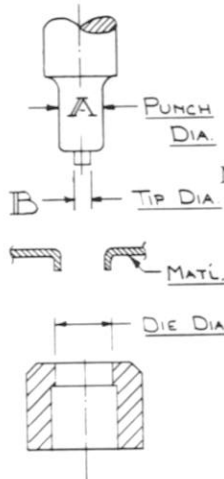
EXTRUDED HOLES FOR SCREWS

STANDARD UNITS may be equipped with SPECIAL PUNCHES and OVERSIZE DIES to produce extruded holes to provide additional material to accept SHEET METAL SCREWS and, in thicker materials, permit tapping to receive MACHINE SCREWS.

No. 6 SHEET METAL or MACHINE SCREWS Punch Diameter "A", .106" Grind Punch-tip to POINT	METAL THICKNESS	DIE DIA.	CAN BE TAPPED FOR MACH. SCREWS
	24 Ga. .0239	.169	No
	22 Ga. .0299	.181	No
	20 Ga. .0359	.193	No
	18 Ga. .0478	.217	Yes
	16 Ga. .0598	.241	Yes



No. 8 SHEET METAL or MACHINE SCREWS Punch Diameter "A", .136" Tip Diameter "B", .075"	METAL THICKNESS	DIE DIA.	CAN BE TAPPED FOR MACH. SCREWS
	24 Ga. .0239	.199	No
	22 Ga. .0299	.211	No
	20 Ga. .0359	.223	No
	18 Ga. .0478	.247	Yes
	16 Ga. .0598	.271	Yes

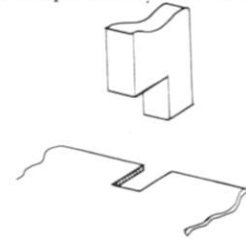


No. 10 SHEET METAL or MACHINE SCREWS
Punch Diameter "A", .157"
Tip Diameter "B", .090"

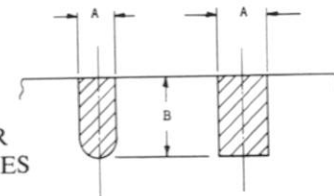
24 Ga. .0239	.220	No
22 Ga. .0299	.232	No
20 Ga. .0359	.244	No
18 Ga. .0478	.268	Yes
16 Ga. .0598	.292	Yes

HEELED PUNCHES

Heeled punches, as shown in Sketch "A", are used for notching the edge of a sheet and are available in all Regular Duty and Heavy Duty Shaped Units. The heel of the punch projects into the die to stabilize the punch. When the size and shape of the notch permits its use, it provides an economical method. Notches beyond the range of heeled punches require special notch units.



When requesting quote, draw a sketch of the required notch, similar to one shown, giving shape and dimensions A and B.



RADIUS-CORNER SHAPED PUNCHES AND DIES

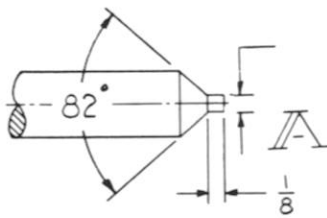
Radius-corner punches and dies are made SPECIAL as matching sets and can be obtained for all Regular Duty and Heavy Duty Units (RDS and HDS).

Punches with Radii — Increase in price over standard shaped punches and dies.

THIN-SECTION SHAPED PUNCHES

If one dimension of an obround or rectangular punch is less than 1/8", there is an extra charge because of manufacturing difficulty. Thin-Section punches can be obtained for all "RDS" and "HDS" units.

COUNTERSUNK HOLES FOR FLAT HEAD SCREWS



SCREW SIZE	NO. 6		NO. 8		NO. 10		1/4"		3/8"		1/2"	
RD UNIT	RD-1 1/4	RD-1 1/4	RD-1 1/4	RD-1 1/4	RD-1 1/4	RD-1 1/4	RD-1 1/4	RD-1 1/4	RD-2 1/4	RD-2 1/4	RD-2 1/4	RD-2 1/4
HD UNIT	HD-1 1/4	HD-1 1/4	HD-1 1/4	HD-1 1/4	HD-1 1/2	HD-1 1/2	HD-1 1/2	HD-1 1/2	HD-2	HD-2	HD-2	HD-2
METAL THICKNESS	Punch "A" Dia.	Die Dia.	Punch "A" Dia.	Die Dia.	Punch "A" Dia.	Die Dia.	Punch "A" Dia.	Die Dia.	Punch "A" Dia.	Die Dia.	Punch "A" Dia.	Die Dia.
24 ga. .0239	.120	.296	.146	.352	.157	.405	.183	.530	.213	.660	.238	.789
22 ga. .0299	.125	.306	.153	.357	.165	.410	.190	.535	.219	.666	.245	.794
20 ga. .0359	.142	.313	.167	.369	.171	.416	.197	.541	.226	.671	.252	.800
18 ga. .0478	.148	.318	.174	.373	.185	.427	.211	.552	.240	.682	.266	.810
16 ga. .0598	.157	.329	.188	.385	.200	.438	.227	.563	.253	.693	.281	.822
14 ga. .0747	.165	.343	.206	.398	.217	.452	.239	.570	.270	.707	.292	.835
12 ga. .1046	.144	.360	.175	.426	.200	.480	.278	.604	.304	.734	.332	.863
10 ga. .1345	.150	.397	.200	.454	.200	.507	.288	.625	.341	.761	.369	.890

ELECTRICAL CONDUIT SLIP HOLE PUNCHES

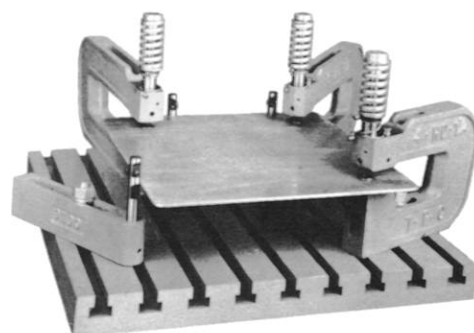
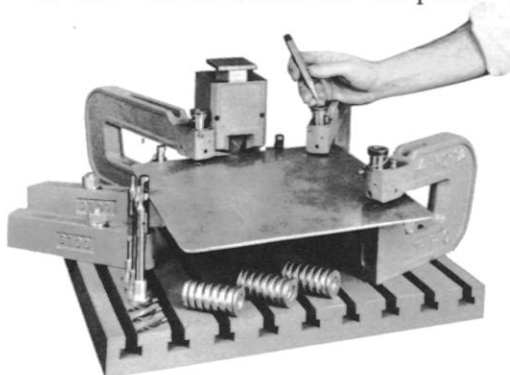
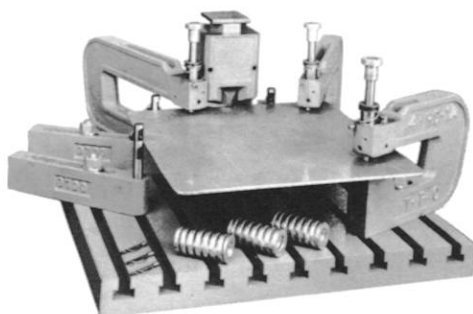
Conduit Size	Punch Size for Slip Hole	
3/8	1 1/8	Use Standard Units
1/2	7/8	
3/4	1 1/8	
1	1 3/8	
1 1/4	1 3/4	
1 1/2	2	Requires Special Units
2	2 1/2	
2 1/2	3	No Units Available
3	3 3/8	
3 1/2	4 1/8	Requires Die Set
4	4 3/8	
5	5 1/8	
6	6 3/4	

QUICK TEMPLATE SET-UPS FOR TEE-SLOTTED BOLSTER PLATES

TEE-SLOTTED PLATES provide for fast economical set-up of unit tooling for short and medium production runs.

Three basic systems are used:

1. The "saved part" template.
2. The "locator pin" template.
3. The "die button locator" template.



THE SAVED PART METHOD is probably the most popular. When a run is completed, one part is set aside to be used as a template for repeat orders. Units are placed in approximate position on the TEE-SLOTTED PLATE and punches and stripping springs removed. With the "template" in position, the punches are then replaced and fed through the previously punched hole into the die. (When using Heavy Duty Units*.) When all of the units are thus positioned, they are bolted firmly in place on the plate. Next step is to position back and side gages against the edge of the template and bolt them in place. The punches are then removed, the springs replaced and the punch assembly returned to the unit. The set-up template is removed and returned to storage and the set-up is ready for production.

*In Heavy Duty units, punches or locator pins are used for locating. In Regular Duty units, the punch, only, is removed and Locator Pins (see below) are used.

THE LOCATOR PIN METHOD uses a 1/8" thick set-up template with 1/8" diameter holes (jig-bored when precision location is required) in the location of all holes shown on the blueprint (regardless of diameter called for). By removing the punches and springs in Heavy Duty units, or punches, only, in Regular Duty units, LOCATOR PINS are inserted and the part set-up is completed by the same method used in the "saved part" procedure. The concentric tapered point of the locator pin assures accurate positioning of the units. LOCATOR PINS are available in the same body diameters as the punch in any given unit. See table of sizes below. PIERCE-ALL has complete engineering and manufacturing facilities to furnish accurate templates for this method. Submit part print for template quotation.

THE DIE BUTTON LOCATOR METHOD also used a 1/8" template but instead of 1/8" diameter holes for location of units, holes are made to the same size as the O.D. of the die button of the unit to be used in each hole location. With this method, it is not necessary to remove punches or springs. Units are positioned in approximate location on the TEE-SLOTTED PLATE and the template dropped over the die buttons and left there. With the templates locating the units from the die button, the units are then locked in place. Gages, in this case, are usually small blocks permanently bolted to the template to save set-up time. After production is completed, the template is removed and the units used on the next set-up.

NUT, BOLT AND WASHER SETS FOR TEE-SLOTTED BOLSTERS AND BED RAILS

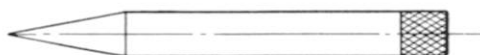
For Series RD-3/4 use 9581, LD-3/4 use 9582. For all other Series, order Catalog Number 9580.

PIERCE-ALL TEE-BOLTS for locking units on plates and bedrails make it unnecessary to waste time sliding bolts in from the ends of the plate. (Sometimes the ends are inaccessible if the plate is up close to the gibs of the press.) They also save time by allowing units to be positioned and locked in any sequence without disturbing the rest of the set-up. "TEE" of the bolt slips through the slot in all standard units, then down into the TEE-SLOT in the plate. The bolt is then swung 90° and the nut locked tight. Bolts are always assembled and bolt, washer or nut cannot be misplaced.



LOCATOR PINS FOR SET-UP

Use with units no.	Cat. no.
LD 3/4	9300
RD 3/4	9304
RD 1	9305
RD 1 1/4	9301
RD 1 3/4	9302
RD 2 1/4	9303
HD 1 & 1 1/4	9311
HD 1 1/2	9312
HD 2	9313

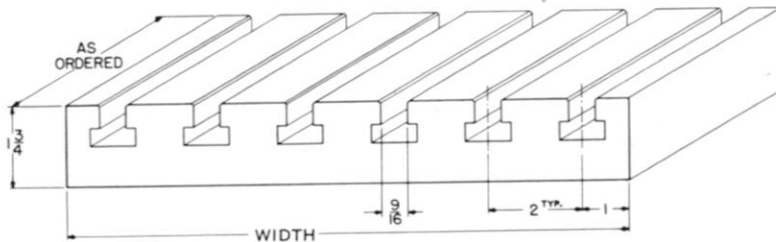


MOUNTING ACCESSORIES

TEE-SLOTTED BOLSTER PLATES -- STANDARD AND SPECIAL

Pierce-All Tee-Slotted bolster plates for punch presses or press brakes are stocked in standard sizes for immediate shipment. They are made of hot rolled plate and are ground top and bottom to provide a flat mounting surface. For lengths shorter than catalog, we will saw cut from a larger piece. See set-up charge

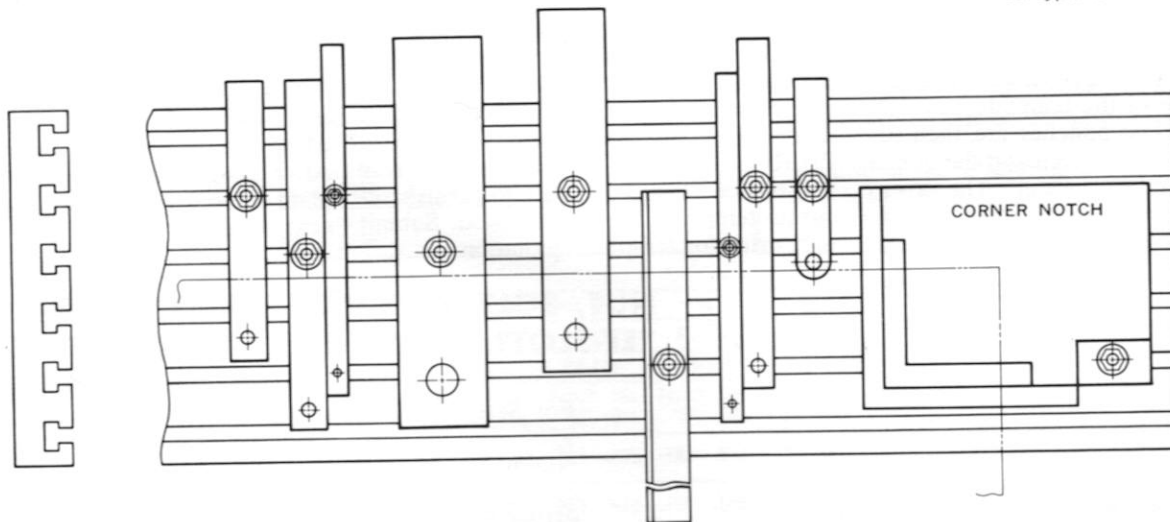
for cutting to length in price book. Where longer than catalog lengths are required, we suggest ordering two standard lengths (or one standard and one altered) and ordering the butting ends machined square. This will provide purchasing economies and ease of handling.



WIDTH	NO. SLOTS	CATALOG LENGTHS BY INCHES				
		24"	30"	36"	48"	60"
12"	6	9415-24	9415-30	9415-36	9415-48	9415-60
18"	9	9425-24	9425-30	9425-36	9425-48	9425-60
24"	12	—	9435-30	9435-36	9435-48	9435-60
30"	15	—	—	9445-36	9445-48	9445-60



Unlimited flexibility for setting up all types of units.



The drawing above shows a typical set-up for short run, non-repeat applications. This method is most economical and versatile where precision location of holes or notches is not required. It can be template-set for accurate repeat jobs by punching or jig boring location holes the same diameter as the die button in

$\frac{1}{8}$ " sheet stock. The sheet is then dropped over the buttons and left in place to act as a "support table" or, regular pilot pin holes can be put in a $\frac{1}{8}$ " template with clearance holes added to clear T-bolts. The units are then bolted in position. See page 35 for template set-up methods.

TO ORDER, SPECIFY:

(For catalog sizes) quantity, catalog number.

(For cut or special* sizes) quantity, length, width.

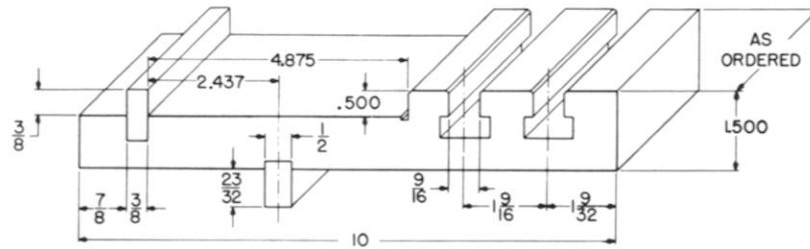
*When ordering two or more plates to be butted together, specify if butted edges are to be machined square.

TEE-SLOTTED BED RAILS FOR PRESSES and PRESS BRAKES (Set up with steel Template Strips or Rail Spacers)

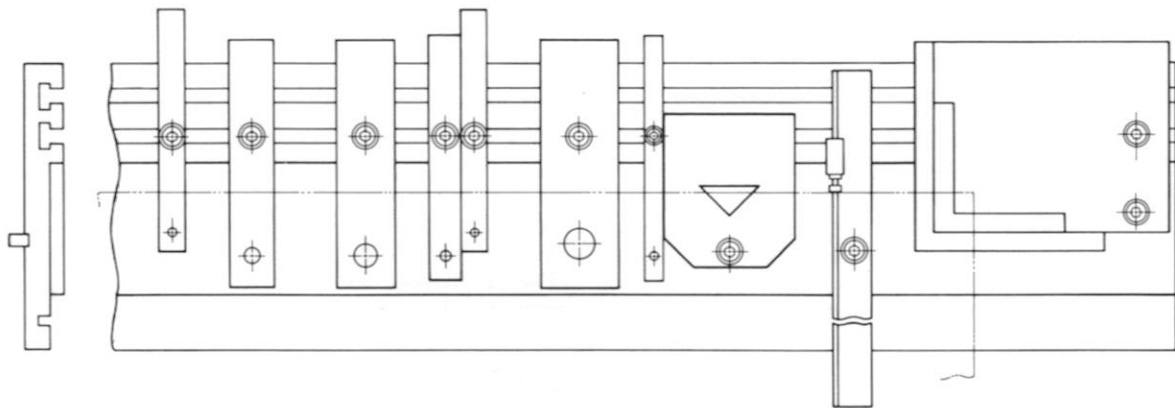
The 9500 Bed Rail for press brakes or punch presses is a highly flexible mounting method which permits the use of low cost $\frac{1}{2}$ " thick x $4\frac{1}{2}$ " C.R.S. template strips for locating punching and notching units and gaging accessories. These strips can be jig-bored for precision hole location of units. The units and accessories are then bolted down using the tee-slots. The side view drawing shows a bottom key for fast mounting in press brakes. Key on top of the rail permits use of template strips

and fast set-up Rail Spacers (see page 38).

Without the top key in place, wider template strips can be used to permit a greater front to back area for staggered hole patterns. The 9500 Bed Rail is stocked in 4, 5 and 6 foot lengths for ease of handling, but can be ordered saw cut to shorter lengths. For longer lengths, rails are supplied with butting ends machined at small extra charge (See Price Book). Top and bottom keys are standard on all lengths.



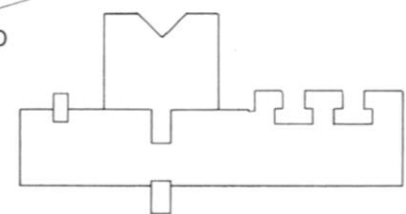
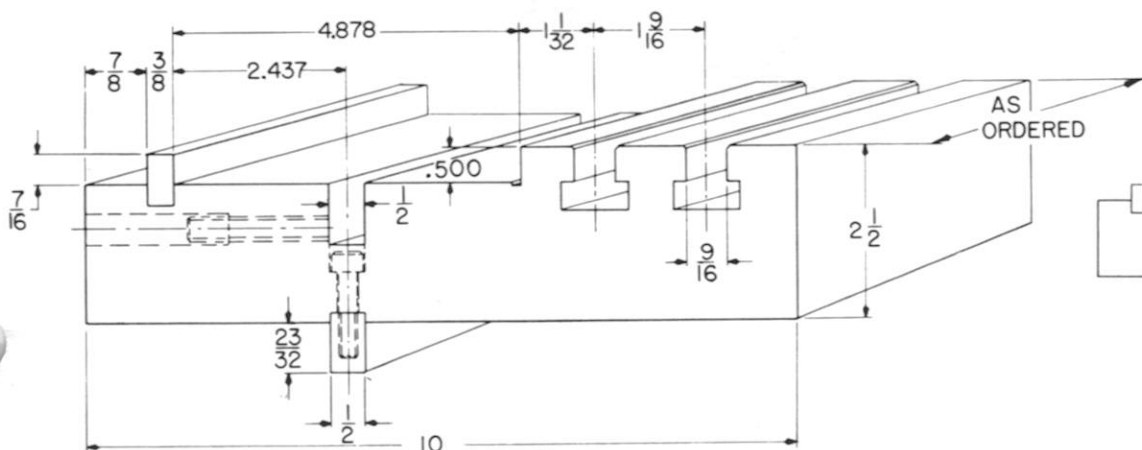
TO ORDER, SPECIFY:
QUANTITY, CATALOG NUMBER 9500
AND LENGTH.



FORM DIE TEE-SLOTTED BED RAILS FOR PRESS BRAKES

The Style 9510 Bed Rail has all the features of the 9500 described above, but is made 1" thicker and is furnished with an auxiliary slot which accepts most standard press brake dies.

This eliminates the need for removing the rail to use the brake for forming operations. Also, by making the brake dies the same shut height as the units being used, combined punching and forming progressive set-ups are possible. Stock lengths and ordering information is the same as for 9500 styles.



9510 BED RAIL
WITH DIE MOUNTED

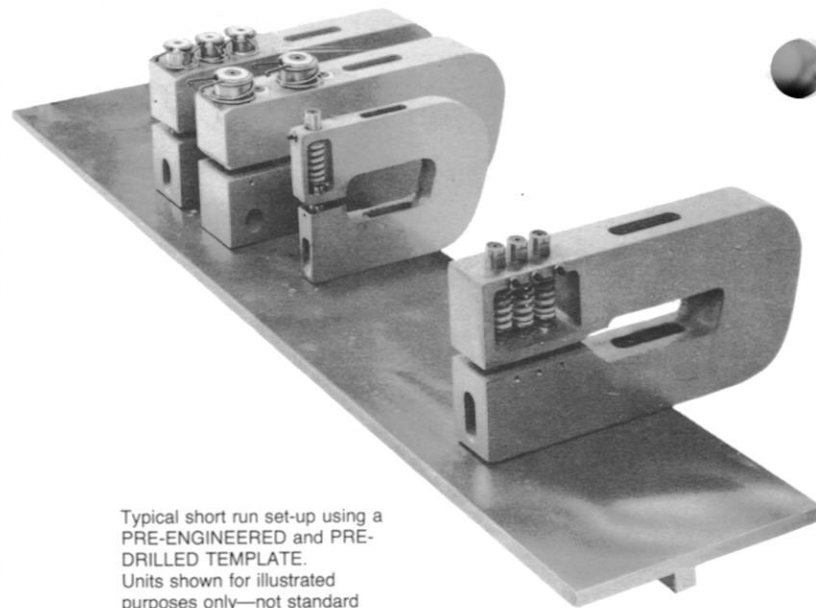
TO ORDER, SPECIFY:
QUANTITY, CATALOG NUMBER 9510
AND LENGTH.

STEEL TEMPLATES FOR PUNCH PRESS OR PRESS BRAKE

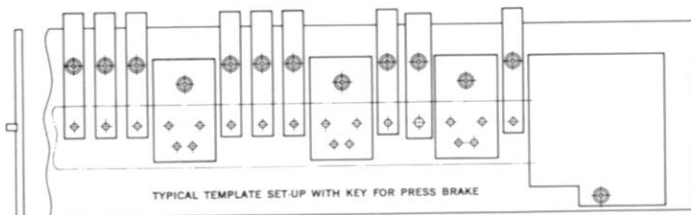
STEEL TEMPLATES are the fastest and most economical mounting method for continuous or repeat production operations. $\frac{1}{2}$ " thick plates are used for templates and are jig-bored to accommodate pilot pins. Hold down holes are drilled and tapped for locking units in place.

Main advantage of template mounting, in addition to low cost and repeat set-up accuracy, is the savings in down time afforded by setting up outside the press and then locking in position with a few bolts. Also, units can be removed and used in other set-ups and the template stored.

TO ORDER, SEND FLAT DEVELOPMENT PRINT OF PART TO BE MADE.



Typical short run set-up using a PRE-ENGINEERED and PRE-DRILLED TEMPLATE. Units shown for illustrated purposes only—not standard or available on special order.



Set-up drawing on page 37 shows $\frac{1}{2}$ " x $\frac{1}{2}$ " template strip mounted on 9500 Bed Rail.

RAIL SPACERS FOR 9500 and 9510 BED RAILS

For quick, accurate and convenient mounting of unit tooling on Bed Rails for presses and press brakes, use Rail Spacers. These are designed to mount units in straight lines or in staggered hole patterns. Spacers are also made for notching units.

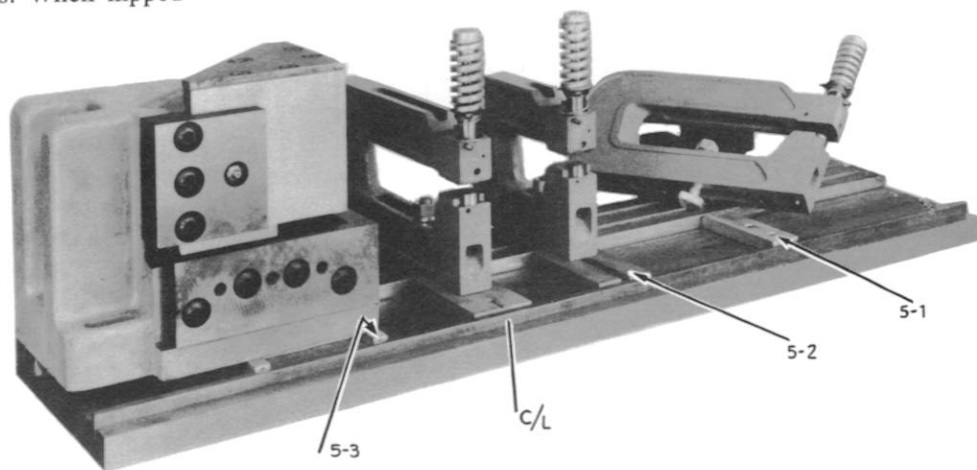
All Rail Spacers snap into the Bed Rail and slide easily for quick left to right positioning. Spacers for notching units have three pilot pin holes for squaring up the units. All spacers have two built-in locating methods. On one side, there are two pilot pin holes used when punching in-line patterns. When flipped

over, a slot is available to permit the units to be positioned front to back. A center mark on the spacer makes measuring left to right location simple.

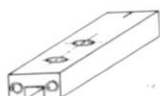
Two spring loaded balls in the back of the spacers press against the back of the slot, holding them firmly in place and against the key of the Bed Rail, assuring accurate line of holes in straight-line set-ups, spacers are plated to prevent rusting.

TO ORDER, SPECIFY:
QUANTITY, CATALOG NUMBER

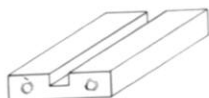
PART NO.	FOR USE WITH UNITS	RAILSPACER WIDTH
9590	5 x 5 Corner Notch Unit	4 $\frac{1}{2}$ "
9591	Up to 1" Wide	1 "
9592	1 $\frac{1}{4}$ " to 2" Wide	1 $\frac{1}{2}$ "
9593	2 $\frac{1}{4}$ " to 3" Wide	2 "
9594	3 $\frac{1}{2}$ " Wide	3 $\frac{1}{2}$ "
9595	4" Wide	4 "
9596	5" Wide	5 "



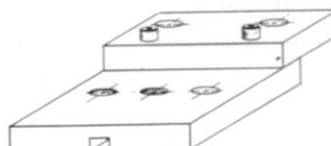
Railspacers are equipped with spring load ball-locks for firmly positioning the railspacer against the key used as the gauging position.



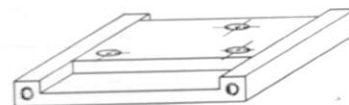
5-1 STANDARD UNIT
Straight-Line Pattern



5-2 STANDARD UNIT
Staggered Pattern



Part No. 9597
Auxiliary plate for mounting,
gaging or stops

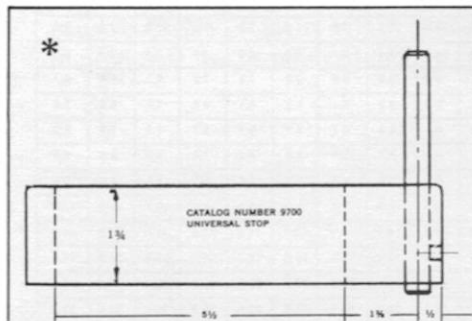


5-3 CORNER NOTCHING SPACER
Flipped over for
front to back adjustment

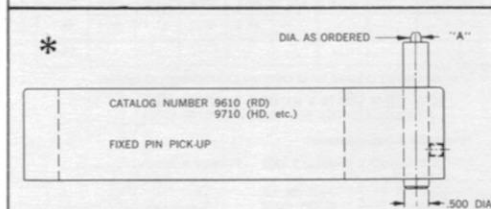
GAGES, STOPS and PICKUP PINS

Standard and semi-standard WORK STOPS will meet most gaging conditions. Each stop accepts $\frac{1}{2}$ " cap screw or T-bolt for positioning. All cast holders* are $1\frac{1}{8}$ " wide and equipped with $\frac{1}{2}$ " pilot pins. Stops are ground in the same manner as the per-

forating units to insure the stop being square and vertical with the mounting. Stops are made to operate with the $2\frac{19}{32}$ " die height of the Regular Duty (RD) Units and the $3\frac{1}{2}$ " die height of the Heavy Duty (HD, HDA, HDTP) Units.

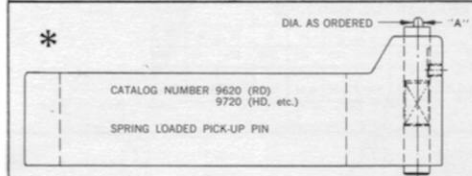
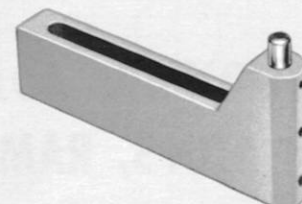


UNIVERSAL—Used for both RD and HD Units. Quarter-turn of gauge pin brings adjusting screw into position to correct any error in blank size up to $\frac{1}{8}$ ".

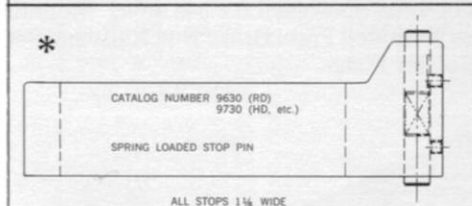
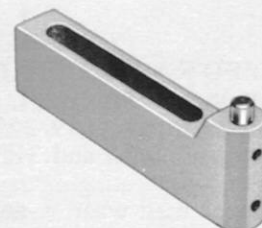


FIXED-PIN PICKUP — For locating on holes previously pierced for multiple or pass-along operations. Specify Dimension "A".

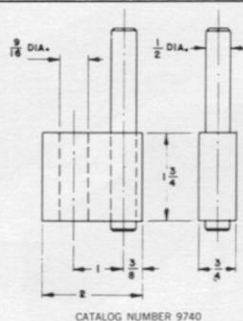
Two basic castings are used for the RD and HD styles. Pin construction is varied as shown in drawings.



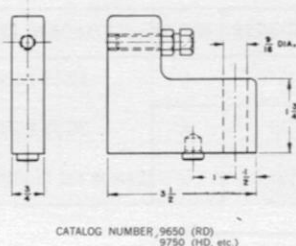
SPRING-LOADED PICKUP PIN — For progressive piercing when using edge of sheet for gauging. Specify Dimension "A".



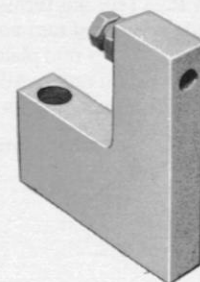
SPRING-LOADED STOP PIN — For progressive piercing when using edge of sheet for gauging.



UNIVERSAL FIXED PIN TEMPLATE WORK STOP
A compact, economical stop for use with RD, HD, HDA, HDTP Series of Perforating and Notching Units. Designed especially for use on mounting templates. Requires $\frac{1}{2}$ " hold-down cap screw.
UNIVERSAL FIXED PIN TEMPLATE WORKSTOP



ADJUSTABLE TEMPLATE WORK STOP
Same features as No. 9740 Stop but with added adjustment to compensate for variations in size of work-piece. Order by appropriate number for unit series with which it is to be used.



APPROXIMATE PRESSURES (TONS) REQUIRED FOR PUNCHING ROUND HOLES IN MILD STEEL

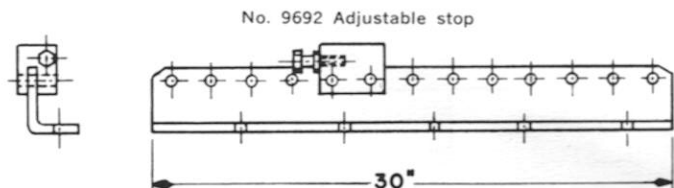
DECIMAL EQUIVALENTS OF STANDARD GAUGES OF STEEL AND ALUMINUM SHEETS

NUMBER OF GAUGE	SHEET STEEL (U. S. Std.) (Thickness in decimal parts of an inch)	ALUMINUM (B & S)	NUMBER OF GAUGE	SHEET STEEL (U. S. Std.) (Thickness in decimal parts of an inch)	ALUMINUM (B & S)
3	.2391	.2294	21	.0329	.0285
4	.2242	.2043	22	.0299	.0253
5	.2092	.1819	23	.0269	.0226
6	.1943	.1620	24	.0239	.0201
7	.1793	.1443	25	.0209	.0179
8	.1644	.1285	26	.0179	.0159
9	.1495	.1144	27	.0164	.0142
10	.1345	.1019	28	.0149	.0126
11	.1196	.0907	29	.0135	.0113
12	.1046	.0808	30	.0120	.0100
13	.0897	.0720	31	.0105	.0089
14	.0747	.0641	32	.0097	.0080
15	.0673	.0571	33	.0090	.0071
16	.0598	.0508	34	.0082	.0063
17	.0538	.0453	35	.0075	.0056
18	.0478	.0403	36	.0067	.0050
19	.0418	.0359	37	.0064	.0045
20	.0359	.0320	38	.0006	.0040

FEED RAIL, ADJUSTABLE STOPS, RAM PLATES

FEED RAIL WITH ADJUSTABLE STOP—A sturdy combination of FEED RAIL and ADJUSTABLE STOP. Available in two heights; 2 19/32" for use with the Regular Duty (RD) Series of units, and 3 1/2" for use with the Heavy Duty (HD,

HDA, HDTP) Series of units. Designed for use on 1/2" Mounting Template, 9500 Series T-Slotted Press Brake Bed Rails and 9400 Series of T-Slotted Bolster Plates.

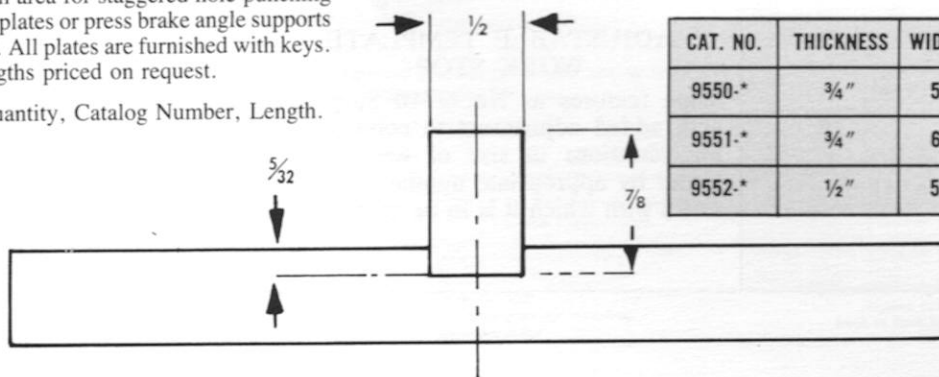


Catalog Number 9691 (RD) Rail only
9791 (HD, etc.) Rail only

Design allows attaching FEED RAIL to No. 9500 T-Slotted Bed Rail in a Press Brake.

RAM PLATES are furnished in sizes shown in table to provide additional ram area for staggered hole punching problems. Wider ram plates or press brake angle supports are furnished to order. All plates are furnished with keys. Interim or longer lengths priced on request.

To order, specify: Quantity, Catalog Number, Length.



CAT. NO.	THICKNESS	WIDTH	*STANDARD LENGTH IN.
9550.*	3/4"	5"	12-18-24-30
9551.*	3/4"	6"	36-48-60-72
9552.*	1/2"	5"	(Can be cut to interim size)

HOLE DIAMETER		1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	
		.125	.1875	.250	.3125	.375	.4375	.500	.5625	.625	.6875	.750	.8125	.875	.9375	1.000
Metal Gauge	Thickness inches	PRESSURE IN TONS														
28	.015*	2	.2	.3	.4	.4	.5	.6	.7	7	.8	.9	1.0	1.1	1.2	1.3
26	.018*	2	.3	.4	.4	.5	.6	.7	.8	9	1.0	1.1	1.1	1.2	1.3	1.4
24	.024*	2	.4	.5	.6	.7	.8	.9	1.1	1.2	1.3	1.4	1.5	1.6	1.8	1.9
22	.030*	3	.4	.6	.7	.9	1.0	1.2	1.3	1.5	1.6	1.8	1.9	2.1	2.2	2.4
20	.036*	4	.5	.7	.9	1.1	1.2	1.4	1.6	1.8	1.9	2.1	2.3	2.5	2.6	2.8
18	.048*	.5	.7	.9	1.2	1.4	1.6	1.9	2.1	2.4	2.6	2.8	3.1	3.3	3.5	3.8
16	.060*	6	.9	1.2	1.5	1.8	2.1	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.7
14	.075*	.7	1.1	1.5	1.8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	5.1	5.5	5.9
12	.105*	1.0	1.5	2.1	2.6	3.1	3.6	4.1	4.6	5.1	5.7	6.2	6.7	7.2	7.7	8.2
11	.120*	1.2	1.8	2.4	2.9	3.5	4.1	4.7	5.1	5.9	6.2	7.1	7.6	8.3	8.8	9.4
10	.135**	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	6.6	7.3	7.9	8.6	9.2	9.9	10.6
9/32"	.157**	—	2.3	3.1	3.8	4.6	5.4	6.1	6.9	7.7	8.4	9.2	10.0	10.7	11.5	12.3
3/16"	.188**	—	2.8	3.7	4.6	5.5	6.4	7.4	8.3	9.2	10.1	11.0	12.0	12.9	13.8	14.8
1/4"	.250**	—	—	4.9	6.1	7.4	8.6	9.8	11.1	12.3	13.5	14.7	16.0	17.2	18.4	19.7
5/16"	.375**	—	—	—	—	11.1	12.8	14.8	16.5	18.5	20.2	22.1	23.8	25.8	27.5	29.5
1/2"	.500**	—	—	—	—	—	—	19.7	22.0	24.6	26.9	29.5	31.8	34.4	36.8	39.4
5/8"	.625**	—	—	—	—	—	—	—	—	30.8	33.7	36.9	39.9	43.0	46.0	49.2
3/4"	.750**	—	—	—	—	—	—	—	—	—	—	44.3	47.7	51.7	55.2	59.0
1"	1.000**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	80.0

To obtain tonnage required for punching round holes in mild steel multiply as follows:

3.1416 X DIAMETER OF HOLE X MATERIAL THICKNESS X 25 =

PUNCHING PRESSURE REQUIRED FOR ONE HOLE

To obtain tonnage required for notching mild steel multiply as follows:

TOTAL SHEAR LENGTH X MATERIAL THICKNESS X 25 = PRESSURE REQUIRED FOR TOTAL LENGTH OF SHEAR

Formula for stripping pressures —

Shear Length X Thickness X 3500 = Pressure in Pounds.

**USE HD, HDA, HDTP, OT SERIES UNITS

*USE RD, LD SERIES UNITS

APPROXIMATE PRESSURE (TONS) REQUIRED FOR NOTCHING

METAL THICKNESS	GAUGE	20	18	16	14	12	11	10	9	8	7	6	5	4	3
DECIMAL		.036	.048	.060	.075	.105	.120	.135	.187	.250	.375	.500	.625	.750	1.000
TONS REQUIRED TO NOTCH 1" LENGTH		99	1.30	1.65	2.05	2.85	3.25	3.65	5.01	6.60	9.55	12.5	15.75	18.75	25.00

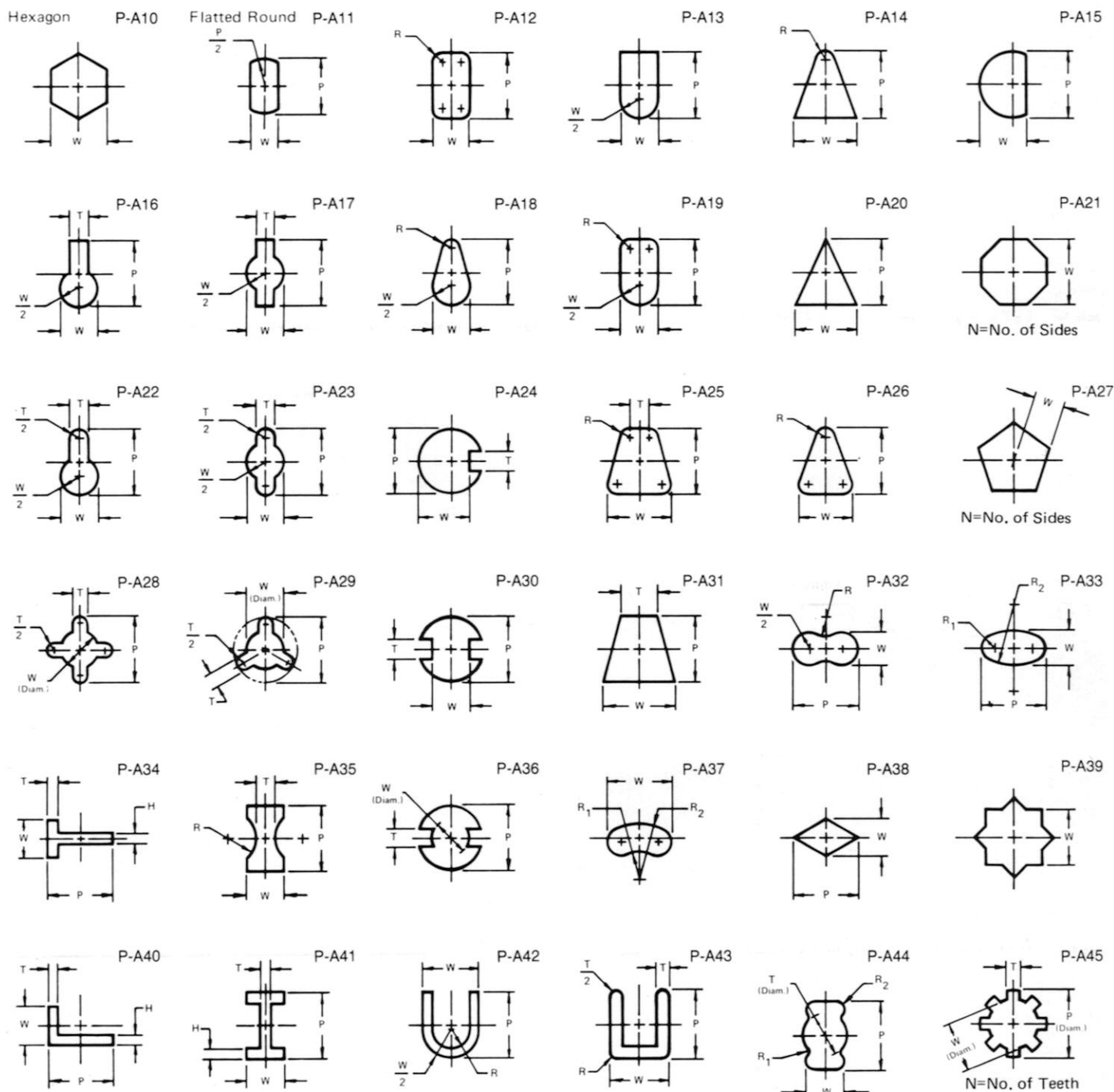
PLEASE READ THIS BEFORE SELECTING AND ORDERING

SHOULD YOU ORDER UNITS FOR ROUND OR SHAPED HOLE PUNCHING?

Units can be ordered for ROUND or SHAPED hole punching. SHAPED UNITS can be used for BOTH ROUND and SHAPED holes. ROUND UNITS are for ROUND holes only but are convertible to SHAPED hole punching using an inexpensive CONVERSION KIT.* Since re-usability is the key to profitable use of unitized tooling, you should consider fu-

ture needs when ordering units. It is suggested you order SHAPED units NOW if you anticipate a need for shaped holes later. The shaped units will come equipped with the conversion kit parts and can be ordered with ROUND PUNCHES AND DIES.

TABLE OF SPECIAL SHAPES



NOTES FOR USING TABLE

1. All shapes will be centered on the shank or body as shown, unless otherwise specified.
2. Specify shape and orientation to holder—90° keying is standard.
3. Specify part number of unit for which punches and dies are ordered (RD-1¼, HD-2, and so forth).
4. Specify either material thickness, or total die clearance.