A COMPLETE PRESS BRAKE SERVICE

HOW TO ORDER:

General Purpose Dies:
Specify the punch and female die by catalog numbers,
gauge to be formed, die openings and exact length
required.

Special Design Dies:
Submit detail blueprint or sketch, give model capacity
and make of press to be used and probable production.

Brake Die Steel:
Best brake dies are made of prehardened die steel
having an excellent combination of strength, wear­
resistance and toughness, heat-treated to a mean
285 brine!!.

Reconditioning Service:
Reworking or resurfacing your existing dies is an
important phase of our operation, a fast factory service
is available at a nominal cost.

Scale:
Diagrams shown in the catalog are drawn to
1/2 "
scale.

Fine Polished Finishes:
Extremely fine polished finishes can be supplied at an
additional cost.

Special Try-Out Service:
All special application dies are tested in-house. It is
advisable that the customer furnish, for
try~out,
a
sample of the actual productional material, in order to
avoid any variations in performance due to
inconsistency of materials.

Safety Tongue:
Dimensions are
1/2" wide by
3/4" high, safety tongue is
preferable if punch is to be used in sections, where
weight of punch is great, or where stripping pressure
would create downward pull.

Flame Hardened Dies:
Will be furnished where sharp corners are to
be maintained, unless otherwise specified all forming
surfaces will be made of 4150 brake die steel.

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<th>1, 2</th>
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<td>and Offset Dies</td>
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We do all we can to supply dies that will produce material to your specification.
Since we have no control over how the dies are actually put to use, it must be
understood that it is the user who has the responsibility of making certain that a
proper application with due regard to safety in operation is followed. Safety and
industrial standards must be considered to insure that point of operation
protection is effective.
Our dies are never intended to be used in equipment without means provided for
preventing hands or other parts of the body from entering or remaining in the die
spaces at any time.
When using brake die tooling, compliance with all safety requirements as outlined
by the American National Standards Institute Bulletin A.N.S.I. 481-3 as well as
other local, state, and federal standards which may apply, should be adhered to.
A copy of ANSI 481-3 may be obtained from American National Standards
Institute Inc. at 1400 Broadway, N.Y., N.Y. 10018

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UNIQUE ROTARY BENDERS
For PRESS BRAKES — Patented Bending Technology

CLAMP
Material is securely clamped without other holdowns. No skidding.

BEND
The sheet always stays level. Faster bending with improved safety and consistency.

OVERBEND
Rocker bends beyond 90° to allow for springback. Overbend rockers can bend to 120° in one press stroke.

INCREASE Your Productivity and Quality

• No Part “Whip Up”...safer material handling
• Mar-Free Bending with the Delrin® Rocker Option
• Built-in Gaging or CNC Automatic Gages
• Improved Part Consistency and Precise Radii Control
• Lower Tonnage Requirements...1/2 of wipe dies

STANDARD ROTARY PRESS BRAKE DIES

<table>
<thead>
<tr>
<th>CATALOG NO.</th>
<th>ROCKER DIA.</th>
<th>MATERIAL THICKNESS</th>
<th>FLANGE HEIGHTS (Standard Die)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RB-1</td>
<td>1&quot;</td>
<td>22GA (.030&quot;) to 14GA (.075&quot;)</td>
<td>7/10&quot; to 2&quot;</td>
</tr>
<tr>
<td>RB-2</td>
<td>1-1/2&quot;</td>
<td>13GA (.089&quot;) to 11GA (.120&quot;)</td>
<td>5/8&quot; to 2&quot;</td>
</tr>
<tr>
<td>RB-3</td>
<td>2&quot;</td>
<td>10GA (.134&quot;) to 8GA (.164&quot;)</td>
<td>13/16&quot; to 2&quot;</td>
</tr>
</tbody>
</table>

THICKER MATERIALS AND SPECIALS BY QUOTATION

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
UNIQUE ROTARY BENDERS
For PRESS BRAKES — Patented Bending Technology

Proven COST EFFECTIVE on these Applications

1. MAR-FREE BENDING
Most dies can be equipped with Delrin® Rockers to bend pre-finished and stainless steels without tool marks.

2. BEND SHORT FLANGES
   on the ends of large sheets with no part whip-up. Operators run more parts safely with less scrap...even on heavy gauge material.

3. ONE-HIT CHANNEL DIES
   Adjustable channel die shown.

4. QUICK CHANGE DIES
   Anvil sections easily changed in the press for special applications.

5. HAT BENDS OR OFFSETS

6. BUILT-IN GAGES
   or specify clearances for automatic gages.
   PELICO GAGE SHOWN
   A) Gage rotates as die closes, spring returns gage each time.
   B) Gage is adjustable.

7. COMPLETE HEMMING DIES
   A) Bend part to 120°
   B) Flatten to 180°

NOTE: Run different part thicknesses by shimming here.

Let us quote your application
Families of parts are often satisfied with one die designed for your needs.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
The dimensions shown on the accompanying illustrations are generally considered Standard. Some die users believe the Standard Tongue is preferable, others feel that the Hook Tongue or Safety Tang is safer to use. This may be especially true if the punch is to be used in sections, where weight or dimensions of punch are great, or where stripping pressure would create an extreme downward pull as in the case of a Channel Forming Die. We offer both, however Standard with tolerances as shown will be furnished unless specifications are to the contrary.

All combinations of these general purpose press brake dies are available from stock. Below are illustrated the general purpose dies recommended for forming 26 gauge to 11 gauge mild steel. Open angle air forming can be performed with these dies by limiting punch penetration into dies with the press brake ram adjustment mechanism. Punch B1A has sides relieved to permit closer back gauging and longer return flanges than number B1 punch.

Number B1B punch and B2A die are not recommended for high production or where punch is cut into sections, but it is an economical die set for light sheet metal forming.
90° DEGREE FORMING PUNCHES AND DIES

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
GOOSENECK PUNCHES

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
OFFSET DIES

SEE SAFETY WARNINGS ON INSIDE FRONT COVER

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30° DEGREE FORMING PUNCHES AND DIES

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
From a single bar, four female die openings can be achieved thereby replacing several single Vee dies. Four way dies are generally used for straight bending operations similar to those illustrated. However other operations, such as radius forming and use as a die holder are feasible.

**NOTE** - Unless specified all three way dies are furnished with the smallest Vee opening at 60 degrees.

<table>
<thead>
<tr>
<th>Die No.</th>
<th>Size</th>
<th>3 Die Openings</th>
<th>4 Die Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>3V22</td>
<td>2.25&quot;</td>
<td>5.00&quot; 7.50&quot; 10.00&quot;</td>
<td></td>
</tr>
<tr>
<td>3V27</td>
<td>2.75&quot;</td>
<td>7.50&quot; 11.25&quot; 15.00&quot;</td>
<td></td>
</tr>
<tr>
<td>3V32</td>
<td>3.25&quot;</td>
<td>1.00&quot; 1.50&quot; 2.00&quot;</td>
<td></td>
</tr>
<tr>
<td>3V37</td>
<td>3.75&quot;</td>
<td>1.125&quot; 2.00&quot; 2.50&quot;</td>
<td></td>
</tr>
<tr>
<td>3V42</td>
<td>4.25&quot;</td>
<td>1.00&quot; 2.00&quot; 3.00&quot;</td>
<td></td>
</tr>
<tr>
<td>3V47</td>
<td>4.75&quot;</td>
<td>1.25&quot; 2.00&quot; 3.00&quot;</td>
<td></td>
</tr>
<tr>
<td>3V52</td>
<td>5.25&quot;</td>
<td>1.50&quot; 2.50&quot; 3.50&quot;</td>
<td></td>
</tr>
<tr>
<td>3V57</td>
<td>5.75&quot;</td>
<td>1.50&quot; 2.50&quot; 4.00&quot;</td>
<td></td>
</tr>
<tr>
<td>3V67</td>
<td>6.75&quot;</td>
<td>1.50&quot; 3.00&quot; 5.00&quot;</td>
<td></td>
</tr>
<tr>
<td>3V77</td>
<td>7.75&quot;</td>
<td>2.00&quot; 3.50&quot; 6.00&quot;</td>
<td></td>
</tr>
<tr>
<td>3V10</td>
<td>10.00&quot;</td>
<td>2.50&quot; 4.00&quot; 8.00&quot;</td>
<td></td>
</tr>
<tr>
<td>3V12</td>
<td>12.00&quot;</td>
<td>3.00&quot; 6.00&quot; 10.00&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**COMBINATION DIE HOLDERS**

General purpose die can be used directly over combination die holder provided press has sufficient ram adjustment.

**NOTE:** Items shown on this page are not drawn to scale.

A filler block is necessary to use general purpose dies when combination die holder is low and press does not have sufficient ram adjustment to reduce die space over die holder to 5-1/2".

Four way die is held by combination die holder as shown in illustration. General purpose dies are substituted for 4 way when it is removed.

The four way die can be set directly on the bed of the press if it does not have sufficient die space. However this practice is not recommended if a hold can be used because the wear is on the bed surface rather than on an easily replaced die holder.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
### CONVENTIONAL DIE HOLDERS

<table>
<thead>
<tr>
<th>No.</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDH-A</td>
<td>2&quot;</td>
<td>1-1/2&quot;</td>
</tr>
<tr>
<td>BDH-B</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>BDH-C</td>
<td>2&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>BDH-D</td>
<td>2&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>BDH-E</td>
<td>2&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>BDH-F</td>
<td>3&quot;</td>
<td>1-1/2&quot;</td>
</tr>
<tr>
<td>BDH-G</td>
<td>3&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>BDH-H</td>
<td>3&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>BDH-J</td>
<td>3&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>BDH-K</td>
<td>4&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>BDH-L</td>
<td>4&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>BDH-M</td>
<td>4&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>BDH-N</td>
<td>4&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>BDH-O</td>
<td>5&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>BDH-P</td>
<td>5&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>BDH-Q</td>
<td>5&quot;</td>
<td>5&quot;</td>
</tr>
</tbody>
</table>

*All Die holders can be furnished in any length up to 24 ft. in mild steel or prehardened Brake Die Steel.*

### THREE AND FOUR WAY COMBINATION DIE HOLDERS

<table>
<thead>
<tr>
<th>No.</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDH4A</td>
<td>2-1/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4B</td>
<td>2-1/4&quot;</td>
<td>4-3/4&quot;</td>
</tr>
<tr>
<td>BDH4C</td>
<td>2-3/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4D</td>
<td>2-3/4&quot;</td>
<td>4-3/4&quot;</td>
</tr>
<tr>
<td>BDH4E</td>
<td>3-1/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4F</td>
<td>3-1/4&quot;</td>
<td>4-3/4&quot;</td>
</tr>
<tr>
<td>BDH4G</td>
<td>3-3/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4H</td>
<td>3-3/4&quot;</td>
<td>4-3/4&quot;</td>
</tr>
<tr>
<td>BDH4I</td>
<td>4-1/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4J</td>
<td>4-1/4&quot;</td>
<td>4-3/4&quot;</td>
</tr>
<tr>
<td>BDH4K</td>
<td>4-3/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4L</td>
<td>4-3/4&quot;</td>
<td>4-3/4&quot;</td>
</tr>
<tr>
<td>BDH4M</td>
<td>5-1/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4N</td>
<td>5-3/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4O</td>
<td>5-3/4&quot;</td>
<td>4-3/4&quot;</td>
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<td>BDH4P</td>
<td>6-3/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4Q</td>
<td>7-3/4&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4R</td>
<td>7-3/4&quot;</td>
<td>4-3/4&quot;</td>
</tr>
<tr>
<td>BDH4S</td>
<td>10&quot;</td>
<td>3-1/4&quot;</td>
</tr>
<tr>
<td>BDH4T</td>
<td>12&quot;</td>
<td>3-1/4&quot;</td>
</tr>
</tbody>
</table>

*Any Die holder 4" high or over can be furnished with half moon burnouts for mounting.*

### MISCELLANEOUS DIE HOLDERS

The Die holders shown illustrate the variety of types available. These items can be obtained in various sizes to suit any press requirement. Fastening means will be provided upon request.
Dies B50-B51 are a form fitting radius die set with spring back allowance built in. It is recommended for only one type and gauge of material for true accuracy.

Die B54-B55 is used to radius the edge of a sheet prior to a rolling operation, thus eliminating the flat ends normally encountered.

On light gauges, where kinking is a problem, die set B52-B53 is recommended. The spring pad will prevent initial break-down of stock.

**ADJUSTABLE FEMALE DIES**

Die No. B206 could be considered to be one of the most versatile additions to a Press Brake. With this type of tool, openings can be arranged from 1/4" to 15". Spacers are provided to produce the opening desired. Slotted spacers allow for easy removal to change die opening. When not in use, spacers are positioned at sides of the die block. These dies can be furnished in all lengths up to 20 ft. or sectioned to accommodate additional lengths.

*SEE SAFETY WARNINGS ON INSIDE FRONT COVER*
Forming a radius on a sheet having a pre-formed return flange is accomplished by die set B56-B57 provided there is a short flat distance between return flange and end of radius. If return flange falls on end of radius, die set B58-B59 must be used and return flange must be pre-formed to an angle less than 90 degrees. Out turned flanges on radius bends can be formed with radius in one stroke if spring back is not too great.

When forming a radius on a sheet that has up-turned flanges on the ends, die set B62-B63 is necessary. Female die has wiper plates on each end to hold the flanges square and prevent them from wrinkling during the forming operation. Length of punch and die must be held closely and consideration should be given to the difference in spring back between the center and the ends.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
Closed curls of 1/2" inside diameter and larger can be produced in die set B100-B101 and B102-B103 in three strokes. Open curls up to 200 degrees can be produced in die set B100-B101 alone, in 2 operations.

Die set B104-B105 and B106-B107 form a curl over a wire core or mandrel in 3 operations. There will be a slight flat on curl along the closing edge for both types shown on this page.

An off-center curl is completed in 3 strokes in die set B108-B109. Curls may range in size from 1/4" diameter to 3/4" diameter in 16 gauge and lighter stock. This type of curling die can be furnished without heels, however we do not recommend this practice.

Off-center curls are performed in 3 strokes in Die set B110-B111 and on-center curls in 4 strokes. On-center curl will not be perfectly round unless a mandrel is used in last operation. Curls may range in size from 1/4" inside diameter to 3/4" inside diameter in 16 gauge and lighter. Range can be increased slightly if mandrel is used.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
Die sets B112-B113 and B114-B115 produce the tightest and roundest curl that can be formed in two strokes within the range of 3/16" to 3/4" inside diameter. Dies can be mounted side by side for progressive forming if press has sufficient length. In forming heavy gauge material, it is advisable to add a tool steel insert.

Die sets B114C-B115C produces and on-center curl in an extra stroke. Roundness of on-center curl becomes somewhat distorted unless a mandrel is used in last operation.

Die sets B116-B117 and B118-B119 should be considered when an accurate on center curl is desired. These dies may be used to produce a curl from 1/4" inside diameter to 1/2" diameter in light gage material. A minimum flat appears on the lead edge and the sheet remains relatively flat during the forming operation. The sheet to be formed must be wide enough to provide for a reasonable amount of stock to extend in front of the die sets for safe feeding of the part.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
Number B130 and B131 are a three high hemming die set recommended for 16 gauge and lighter mild steel. Shimming under adjustment angle on lower section will produce an open or closed hem. Number B130A is shown with equalizing back heel for higher production and heavier material.

Dies B148 and B149 are used to form a Standing Seam in Two Operations. The Top Station forms an acute angle offset, which is subsequently closed at the lower level.

Dies B34 and B35 offer an inexpensive alternative for Hemming 18 gauge and lighter material. This set will require two strokes to bend and close the Hem.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
Standing Seam and Tube Form Dies

1. **Die B142-B143** are usually used to form seams over 12" high. Tightness of seam is controlled by shimming under adjustable anvils.

2. Double flange standing seams are formed in die set B144-B145 and B146-B147 in two operations. The first operation is performed in Die set B144-B145 and the closing operation in die set B146-B147. Die sets can be made the same working height for progressive forming if press braked has suitable length.

3. Die B128 and B129 is used to form a Tube in a successive number of strokes. The peripheral surface of the form may show evidence of this. To accommodate the required height a No. B400R Adapter must be used.

4. The die set B128S-B129S is normally furnished about two foot long. The pre-formed tube is fed thru the dies from left to right, sizing the part in two foot increments. Any length of part can be sized in this manner.

---

See Safety Warnings on Inside Front Cover
A Semi-Hat shaped Channel can be formed on the edge of a sheet with Dies B184-B185. Release Wedge and Hook Stripper assure positive part removal.

Dies B186-B187 can be used to form Flat Bottomed Channels in one stroke. Stripping is assured with Release Wedges and Hook Strippers.

Die set B200-B201 forms 4 square bends in one stroke. Spring pad in die keeps web flat and releases wedges in punch and die permit easy removal of part.

By tapering sides of the channel, the design of die set B204-B205 is simplified and the cost reduced. A pressure pad in the female holds the material against the punch and maintains web flatness. It also serves to eject the part.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
Channels with a web width of 3/4" or less are usually formed in a die set such as B190-B191. Width of web does not permit spring pad in the die.

For channels with web over 3/4", die set B192-B193 is recommended. Both punch and die have release wedges for quick removal of part. The die has pressure pad to help maintain accuracy and keep the web flat.

When considerable material spring-back is encountered in channel forming, overbending is necessitated and die set B194-B195 is recommended. The spring pad actuates the rocker inserts near the bottom of the stroke, causing the overbending.

Small U channels with little spring-back can be formed in one stroke in die set B196-B197. Rocker insert overbends shape to allow for spring-back.
Open angle offsets adjustable up to 5/16" can be performed in die set B82-B83. Shimming behind reversible blocks changes depth of offset. Rotation of blocks changes the radius. Each corner has a different radius to allow for various material thickness.

If the offset is 1" or less from the edge of die set B84-B85 can be used. Dies have a back-up leader so minimized spreading and sharper offsets will result.

Material thickness offsets are performed on die set B86-B87. Dies have a back-up leader to reduce spreading.

On heavier gauge stock, material thickness offsets will always be of the open angle form similar to B88-B89, because the outside radius are too large for the depth of form.

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SEE SAFETY WARNINGS ON INSIDE FRONT COVER
When forming an acute angle offset at the edge of a sheet, a die set such as B70-B71 has the least tendency to spread. Capacity should be limited to 20 gos.

Die sets B72-B73 and B74-B75 produce a Pittsburgh lock seam in two strokes. The die sets can be worked side by side if press has sufficient length or they can be combined into a three high die set to produce the lock seam in two strokes with one handling if production quantities warrant it. B154-B156.

For forming large offsets, best results are obtained with a die set such as B76-B77. Forming angle is tipped to reduce size of vee opening and prevent bowing of offset web.

In forming a shallow open angle offset in the middle of a sheet, die set B78-B79 is recommended. Large radii and maximum relief help reduce press brake requirements. Dies B78A-B79A are used to bottom form open angle offset.

If press brake capacity will not permit a bottoming offset operation, comparatively good results can be obtained by air forming with die set B80-B81 although some accuracy will be lost. Heavy duty offset bottoming type dies are available in die numbers B80A-B81A, not shown.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
For high production flanging operations, die sets B160-161 or B162-B163 are recommended. These dies hold the sheet flat while wiping a 90 degree flange either up or down. Back gauging can be easily be fitted to die set B160-B161 although sheet will move approximately 1/2" down with spring pad. The sheet does not move down when using die set B162-B163 but front gauging is best suited for this operation. Maximum capacity recommended for illustrated dies is 16 gauge although heavier construction will take up to 12 gauge. Release wedges of bronze or hardened steel assure mar free operation in forming.

For wiping a radius on the edge of a sheet, die set B164-B165 is recommended. Overbend allowance is built into die set to compensate for spring-back. Maximum capacity for illustrated die set is 16 gauge.

For forming closed flanged forms die set B168-B169 is used. When die opens in operation, heel travels up making possible the removal of formed sheet.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
For high production and when hemming wide sheets, die set B132-133 is recommended as it completely eliminates whip up of the sheet. First operation is shown by illustration and closing operation on 20 gauge and lighter stock is performed over spring pad in lower section. The capacity can be increased to 18 gauge by extending the anvil in upper section and adding adjustable angle to lower section as shown by dotted lines in illustration. Maximum hem length is 3/4".

Edge and Return Bends can be made in One Operation with Die No. B170-171. This Die permits return bend forms with a single press stroke, without flip up of the sheet. To insure satisfactory operation, return flange dimension must be held to a minimum.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
The action of rocker dies is such as to permit forming in a single stroke, multi-form shapes as U channels, edge channels and contour shapes. The use of rocker dies is usually limited to 16 gauge or lighter.

One set of rockers B175-176 can be used with any combination of lower die sets.

Flush Rocker B175A is used when projected ends shown below would interfere with formed flanges.

Dies B177-178 form a U channel in one stroke with some spring back. Allowance is built into the die set.

Some irregularity is noticed in bottom of channels produced by die set B179-180 due to excess material trapped in die.

Die set B181-182 produces a radius bend and return flange on one stroke. Not recommended for over 1" radius.

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SEE SAFETY WARNINGS ON INSIDE FRONT COVER
Small open hat channels can be produced in die set B202-B203. Depth of channel must be shallow to avoid trapping excess stock between punch and die and cause irregularities of shape.

To form accurate Corrugations in light gauge materials die B228 and B229 can be used. Spring Pressure Pads assure positive stepping and Release Wedges prevent marring of the formed material.

For high production, continuous corrugating and where consistent accuracy is necessary, die sets B230-B231 and B232-233 are recommended. Die set B230-231 is for continuous radius corrugating and die set B232-233 for continuous angular corrugating. After the first operation, the spring loaded pad locates the sheet and the dies become self gauging.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
Dies B120-B121 can be used to increase the rigidity of a flat sheet by forming one or more ribs. Overbend allowance is built into set to allow for spring back.

A standing rib can be made with Dies B152-B153. The acute angle is subsequently flattened in another Die and Operation.

Die set B198-B199 produces a Vee Rib in one stroke. For heavy gauge metals, die can be relieved to reduce the tonnage but some accuracy will be lost.

DIE RIB FORMING DIES

DIE RAM ADAPTING

Ram adapters are mounted to the press brake ram and are used to fill the die space if ram adjustments is insufficient. Ram adapters can be made any height or width to suit conditions and may be cut in sections for use in box forming.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
Safety tangs or hook tongues are necessary on punches of this size to prevent dropping out when ram plates are loosened.

The special gooseneck punches shown above may be used to form boxes and channels with long return legs. Die No. B39 can be fastened directly to press bed in forming a box, where 4 sides are bent up, the punch must be high enough so that when making the last two bends, the preformed sides do not strike the ram.

SEE SAFETY WARNINGS ON INSIDE FRONT COVER
The Aircraft process of metal forming has many advantages over conventional methods. Marring of highly polished metal surfaces is completely eliminated; tooling costs are greatly reduced. Sheet metals of various thicknesses can be used with the same Aircraft die combination. This amazing material is highly resilient and has a very high load bearing capacity. It is extremely tough and resistant to oils.

To obtain the utmost in accuracy in sheet metal forming, it is essential to use a high quality punch. Aircraft punches will give the uniformity you should expect from your Aircraft die. Superfine polish finishes are applied to all Aircraft punches.

**AIRCRAFT FORM PUNCHES**

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<tbody>
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**AIRCRAFT TYPE DIES**

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**URETHANE TYPE DIES**

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<td>BD3</td>
<td>6-1/2</td>
<td>3-7/8</td>
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</tr>
</tbody>
</table>

**SAFETY WARNINGS ON INSIDE FRONT COVER**

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These adjustable gages can be adapted to most any type of press brake. The variable positions of the gage arms give it complete flexibility in horizontal positioning and also to 9" of vertical positioning. With the double dove tail the disappearing gage assembly can be located on either side of gage arms. Each gage is equipped with satin finish stainless steel scale with 1/16" & 1mm graduations. If gage arms are 4 ft. or longer support legs will be needed.

The flip type gages and the disappearing pin gage are interchangeable. Both can be used to gage from the edge of the part, but the pin gage is suitable when the gaging is required from pre-punched holes.

These gages are adaptable to most any type of die and can easily be adjusted for any dimensional changes. These gages would have approximately 5/8" adjustment and are suitable for light gage material (28 to 11 ga.) Refer to page 2 for proper vee opening.

This type of gage with its rugged design is suitable for forming from 10 ga. to 1/4" plate with adjustment to 21/2". Also can be adaptable to any size or type of die. Gages for heavier than 1/4" plate can be priced upon application.

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PROCEDURES FOR PRESS BRAKE

**DIE INSERTION, SETTING AND REMOVAL**

For General Purpose and Special-Purpose Dies with Tongue

**PRELIMINARY STEPS**

(Before insertion or removal of die)

Regarding technique and prevention of damage to press brake, it’s absolutely essential to refer for proper operation procedures to your manufacturer’s press brake operating manual for instructions.

**DIE INSERTION**

(Refer to following PRELIMINARY STEPS above)

NEVER PLACE HANDS BETWEEN DIES WHEN INSERTING DIES.

When using bending type dies which are equipped with tongues, insert them from the side of the machine.

Loosen all ram clamps and die holder set screws.

First insert the lower die approximately its full length allowing it to remain extended past the end of the bed by several inches.

Check the distance remaining between the ram and the lower die to determine if the upper die can be properly inserted. Adjust the shut height as required so that the distance remaining will permit placement of the upper die on the lower die, with the tongue of the upper die almost fully but loosely engaged into the ram clamp.

The upper die can now be carried double sling and set to rest ¾ the extended portion of the lower die with the tongue guided into the slot.

After this alignment and partial insertion of the upper die has been made, relocate the sling at the extended end to support the upper die, push the upper die in to line up with the lower die. Now push the set of dies to the center of the machine for balanced machine loading.

Run the adjustment down so that the dies “kiss,” but do not “stall out” the adjustment motor. This will force the upper tongue into full engagement.

Tighten the ram clamps and the set screws in the lower holder.

Run up the adjustment to accommodate at least twice the stock thickness.

Start the machine and cycle the brake to the top of its stroke.

**DIE SETTING**

(Refer to following PRELIMINARY STEPS above)

Insert a sample sheet and form a part. Readjust as required. Approach the setting slowly. In may be necessary to form several sample sheets before making an acceptable part.

This procedure will avoid the possibility of adjusting dies too close, machine jamming, or overloading the machine, avoiding the possibility of jamming the machine on bottom stroke. Over-adjustment of the ram is to be avoided.

Where deflection becomes a problem, the dies should be shimmed to compensate for machine deflection or crown rearward of the center of the machine. Is not necessarily true that bringing the adjustment down might improve the part.

If the die is already bottoming out is some places, additional adjustment will merely increase the deflection of the machine and may make the part worse rather than improve the part.

**DIE REMOVAL**

(Refer following PRELIMINARY STEPS)

NEVER PLACE HAND BETWEEN DIES WHEN REMOVING DIES.

Check remaining distance between upper and lower die. Run adjustment of ram down to reduce this clearance to several thousandths. Unclamp upper ram clamps and the lower die holder set screws. Adjust ram upward slightly and check to be certain that the upper die will remain resting in lower die. If this does not, the ram clamps may require further loosening. When a hook tongue is used be certain it is not hanging from the hook. If further adjustment is required to permit removal, adjust ram upward so that the die is loose but well confined.

With the upper die tongue partially disengaged and guided in the loosened ram clamp, push both upper and lower die a short distance out of the end of the machine. Push with the hands placed on end of dies, never between.

Position die table (if used for small dies) or sling, at end of machine, adjusted to proper height to accept the upper die. Push upper die over table or into double sling with part of the die remaining in ram. Secure die from falling from table or re-position each sling to allow complete removal of die without falling.

If both dies are removed together and stored as a set, it is advisable to use a sling to prevent falling of upper die from lower die. As a precaution use steel band loops around the set, or straps to hold them in engagement.

**TONNAGE REQUIREMENTS**

The tonnage requirement is determined by the quality of the bend and whether it is a true air bend or whether some die bowing takes place.

To the extent that bowing takes place, the tonnage will increase correspondingly. Bottoming tonnage can be quite high. Accurate determination of bottoming tonnage can only be done by instrumentation and measurement.

Increased tonnage always results in increased frame deflection or “gapping.”

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