

TROUBLE SHOOTING TIPS FOR HAND BRAKES...

This step-by-step guide covers:

- ☑ Leveling a new hand brake
- ☑ Capacity Adjustment
- ☑ Clamping for Metal Thickness
- ☑ Clamp Adjustment
- ☑ Bending Leaf Adjustment
- ☑ How to Correct Clicking or Snapping Bending Leaf and more!



Many in the sheet metal trade are not completely satisfied with the performance of their hand brakes. Originally reprinted with the editor's permission years ago from a series of articles in SNIPS magazine, we have updated and revised the guide for you now.

We hope these tips will be a help to your shop staff. Please save them for permanent reference.

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The hand brake, or at least the operating principle it incorporates, was probably developed right after the invention of the wheel. It's a work-horse machine that is used for a multitude of sheet metal bending operations – not only in heating/ventilating and roofing shops – but also in places like model shops and for short run manufacturing of many items such as control boxes, panels, shelving, building components, cabinetry, etc.

It is an uncomplicated piece of equipment, and with proper adjustment and periodic maintenance, it will last and perform forever. Thus, the purpose of these articles is to set forth, with photos for best explanations a check-up routine for proper setting of hand brakes and correction of the problems that often develop.

One of the oldest builders of hand brakes is Chicago Dreis & Krump Mfg. Co. However, there are several others, notably: Tennsmith; Roper Whitney and Proformer . The trouble shooting information being presented is more or less universal in scope and should apply to all of the current brake builders.

Leveling the New Hand Brake

It is mandatory to set the hand brake level, with the shipping skids removed, and bolt it to the floor before operating. If the brake is not level, the top leaf will creep and produce error in the parts being formed.



When the shipping skids have been removed, the new brake should be bolted to the floor before operating.



To adjust the leveling, be sure that the bed adjustment saddle and top adjustment screw collar are locked into position so that the adjustment screw cannot move back and forth.

To adjust:

1. – Check to be sure all bolts and set screws are tight.
2. – Check to be sure that bed adjustment saddle and top adjustment screw collar are locked into position so that the adjustment screw cannot move back and forth in the saddle. The front shoulder of the screw and face of the collar must be snug (not tight) against the saddle. Be sure that set screw in top adjustment nut is snug. Check both sides of the brake.
3. – If top leaf still creeps, place a wedge under the rear leg at the creeping end until the creeping stops. Replace the wedge with permanent shims.

Capacity and Top Adjustment

Before shipment from the factory, all brakes are adjusted to their maximum capacity. Therefore, it is necessary to readjust the brake when lighter gauge materials are formed.

Hand brake capacity is established with the bending leaf angle bar in the high position. This allows a full rated 1" minimum flange on capacity material (mild steel) with top leaf adjusted back from the bending edge, twice the material thickness.

When the angle bar is removed, the brake capacity is reduced four gauges. When both angle bar and insert bar are removed, the brake capacity is reduced seven gauges. When forming lighter gauges of material, the top leaf setting can be reduced in accordance with material thickness.

For adjustment of the top leaf, release the slot casting bolt and adjust set screws to push or pull to desired setting. When the adjustment is made, tighten the set screws and slot casting bolt securely.

Note: Later model brakes adjust forward or backward by means of a turn knob for desired setting.



For adjustment of top leaf of brake, slot casting bolt is released as shown here.



Showing how hand brake capacity is established with the bending leaf angle bar in the high position



Shown here angle iron being removed. With angle bar removed brake capacity is reduced by four gauges.



For further adjustment of top leaf of brake, after releasing slot casting bolt, set screws as shown here, are adjusted to push or pull to desired setting.



For clamping adjustment, adjust by means of clamping handle adjusting nuts as shown here.

Clamp Adjustment

For easy operation of the clamping handle, apply only enough pressure so that the top leaf clamps the material and it cannot be moved by applying hand pressure regardless of the thickness of the material.

For clamp adjustment, here are some suggestions:

1. – Release clamping handles sufficiently to allow material to pass between the top leaf and the bed.
2. – Adjust by means of clamping handle adjusting nuts as shown. To tighten clamping pressure, release the top nut and tighten the bottom nut. Do this on both sides of the brake. It is recommended that this adjustment be made for each thickness of material.

NOTE: When hemming and flattening material where double or triple thickness is required, clamping pressure must be adjusted to suit the combined thickness.

Bending Leaf Adjustment

The bending leaf must be in proper alignment at all times since this will affect the material being formed. After a brake has been in operation for awhile, the bending leaf will have a tendency to settle. Therefore, periodic checks and adjustments are required, as follows:

1. – Raise the bending leaf until the bending edge is in the 90° position.
2. – If, when sighting along the “vision line” (vertical line), the bending edge is



To realign the bending leaf, release the bolts that fasten the hinge to the bending leaf plate, as shown.

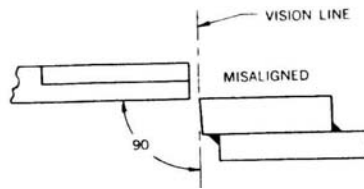


Figure 1: Showing how misalignment is seen along “vision line” (vertical plane) and the bending edge is away, or not in the same plane.

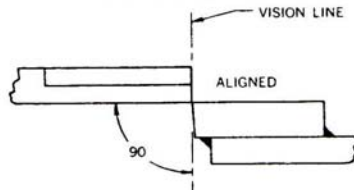


Figure 2: Showing how the bending leaf is adjusted properly when the edge and bottom bar edge coincide.

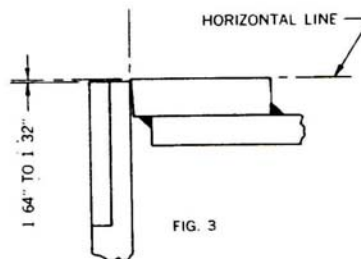


Figure 3: Showing bending leaf adjustment by lowering the bending leaf to see if it is flush, or slightly below the bottom bar when in the down

away, or not in the same plane (misaligned as shown in Figure 1), release the bolts that fasten the hinge to the bending leaf plate as shown in the photo. Then tighten the adjusting screw at the bottom. The bending leaf is adjusted properly when the edge and bottom bar edge coincide (as shown in Figure 2).

3. – Lower the bending leaf and see that it is flush, or slightly below the bottom bar when in the down position (as shown in Figure 3).

4. – Follow the same procedure at the opposite end.



To correct clicking or snapping bending leaf, tighten the truss rod bolt on the bottom of the bending leaf.

Clicking or Snapping Bending Leaf Causes

The noisy condition of a clicking or snapping bending leaf results from the bending leaf being set too low in the center. It is noticeable only when forming lighter gauge material.

As explained earlier, the brakes are set for capacity material when the top edge of the bending leaf is flush, or slightly lower than the bottom bar on the ends, and the center of the bending leaf is below the bed approximately 1/32”.

When forming lighter gauges, the bending leaf does not have the tendency to follow the material upwards in the center, therefore, it contacts the bottom bar, causing a snap. This may also cause a bow in the part being formed.

How to Correct Clicking or Snapping Bending Leaf

To correct the clicking or snapping bending leaf, the following procedures should be followed:

1. – Tighten the truss rod nut sufficiently on the bottom of the bending bar, as shown.
2. – Adjust bending leaf center truss nut.

NOTE: Step #2 may or may not be necessary. If, after following the procedure as in Step #1, and a bow is still evident, this may be the result of too much crown on the bed. (This crown is necessary to compensate for deflection).

Release the center bed adjusting nut as shown. Also, if a pinching action is noticed in the center, between the top leaf and bending leaf, release the top leaf adjusting bolt slightly.

3. – If the bending leaf becomes bowed, or a gap is noted between the bending leaf and the bed in the center of the brake, correct as follows: with the leaf in the down position, tighten the bending leaf adjusting bolts. On most brakes these are located next to the lifting handles on the lower bending leaf. This will force the center inward into a straight alignment.



To correct a clicking or snapping bending leaf, it is necessary to adjust the bending leaf center truss nut, and release the center bed adjusting nut.

Top Leaf and Bed Adjustment

As stated in earlier articles, the hand brake is furnished pre-set by the factory to form maximum capacity material. The top leaf and bed are crowned to compensate for deflection. The heavier the work material, the more crown required.

Therefore, when changing from one gauge to another, adjustment of the top leaf and bed may be required if accurate bends are to be expected. When any adjustment is made to either the bed or top leaf adjustment nuts, or both, it is necessary to adjust the truss rod adjustment nuts to the same extent.

Over-Bend Adjustment

If the sheet bends over farther on one side than on the other, and the proper alignment is maintained as outlined in the "Bending Leaf Adjustment," this indicates the top leaf nose bar is not parallel to the bending edge and it is necessary to set back the top leaf on the end where the sheet is over bent.

To correct:

1. Unclamp handle slightly
2. Adjust top leaf so that both ends are the same as shown in the photo.



Adjust top leaf so that both ends are the same as shown in the photo.

Box and Pan Brake – Jaw Alignment

To insure that jaws form a straight bending edge at the nose bars, use the following procedures:

1. Set fingers in partially opened top leaf with thumb screws and nose clamp bar bolts loose.
2. With angle bar mounted to bending leaf, bring up bending leaf, using its pressure to straighten line of nose bars.
3. Tighten thumb screws and clamp bar bolts.

Note: When complaints are received, they generally are about bowing of the part being formed, especially where lighter gauge material is used. From past experience, we find this condition is not the fault of the brake, provided that it is adjusted correctly. Rather, it is the result of the shearing process.

How to Obtain Best Results

To obtain the best results, make sure that the sheet, prior to bending, is sheared straight with a squaring shear that has sharp, properly set blades. To shear by means of a hand shear, Unishear, or slitter, will cause the edge of the sheet or strip to become stressed.

Bending close to this edge (for example: a 1/2" flange, 90°) will tend to bow the material. The farther the bend line is away from the sheared edge, the less amount of bow.

There is no way the brake can overcome this bad material pre-condition. Problems also arise when the edge of the sheet is wrinkled due to shearing, handling, or simply to inferior quality material. The brake cannot be expected to overcome these conditions.

Timely Tips

The hand brake will do the work for which it is designed, provided that it is kept clean, well lubricated, properly adjusted and used correctly.

Following are some timely tips on the use and care of the hand brake.

- * Never bend material heavier than the rated capacity of the brake.
- * Never bend against seams unless the clamping pressure and top leaf front-to-back adjustment is properly set to compensate for the multiple thickness of the material.
- * Always have the angle bar in standard or top position when making capacity bends.
- * Always use material with straight, squared shear edges. Rolled edges will cause material to bow. Where the edges of the sheet are wrinkled, due to poor shearing process, handling, or just inferior material, the brake cannot be expected to bend accurately to overcome these conditions.
- * It is neither advisable nor recommended to bend wire or rod. This will damage the hand brake nose bar and bending leaf bar.
- * Never use pipe extensions on clamping handles to obtain more leverage, such as when flattening a seam or hem.
- * Never flatten a hem or seam under the nose bar when the material thickness is more than four equal gauges less than the rated capacity of the hand brake.
- * Never push or pull against the legs of the brake.

Duplicate Bends and Counter-Balance

To obtain duplicate bends, position the adjustable stop gauge on the rod, as shown, to the desired setting. The locking screw must be securely tightened. The counterweight can be raised or lowered to counter-balance the bending leaf properly.



To obtain duplicate bends, position the adjustable stop gauge on the rod, as shown, to the desired setting



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