

TIN KNOCKER

TK 422 PORTABLE BRAKE

INSTRUCTIONS & PARTS DIAGRAM



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**TIN KNOCKER
SAFETY RULES
TK 422 PORTABLE BRAKE**

1. Never use a machine or tool for anything other than its intended purpose. Use the proper tool and equipment for the task.
2. Do not operate the machine in excess of its rated capacity.
3. Never use a pipe or bar on the clamp or bending apron handles for additional leverage.
4. Keep clear of the apron swing area, while operating the brake.

WARRANTY

All new SME machines are sold with a one-year limited warranty, on factory defective parts. The warranty is limited to the original user. SME at its option, will repair, replace or refund the purchase price of any part, tool or machine that fails during the warranty period. SME will pay normal shipping charges for replacement parts. After 90 days from date of purchase, all express or overnight delivery charges are the responsibility of the customer. Purchaser must contact SME, at the address below, any written claim, with proof of original purchase. Replacement parts will be invoiced to purchaser and credit issued when the failed part is delivered to SME. Removal, reinstallation or replacement parts shall be at purchasers' / user's expense. Failure due to improper use of the machine voids the warranty.

NOTE: This machine has been tested and adjusted prior to shipment, but can and often does require readjustment due to vibration and bouncing during transport. Readjustment can easily be done by following the procedures described within. These are procedures with which you, as a user, should be familiar, as you will use them repeatedly over the life use of the machine. If you have difficulty in performing these procedures, we are here to support you.

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TK 422 PORTABLE BRAKE,

RECEIVING THE MACHINE

Inspect before signing Bill of Lading. Upon receipt closely examine the machine for damage during shipment. Any loss or damage should be noted in detail on the delivery receipt and reported to your distributor immediately. Free replacement from TK International is dependent upon the notation and the Bill of Lading or delivery slip.

INSTALLING THE MACHINE

Locate the Brake in a well-lighted area on a solid, level floor. Be sure you have adequate room to swing both handles and Bending Leaf.

PRECAUTIONS

DO NOT use the Brake to bend rods, nails or wires. This will cause damage to the edge of the top blade. DO NOT exceed the capacity of the Brake.

OPERATING THE TK 422 PORTABLE BRAKE

Your brake is a general-purpose tool for bending and forming sheet metal. The brake is operated in the following manner.



The 422 Portable's legs are folded and held in place by a chain and c-hook.



Lifting handles are attached to end of the brake so two men can lift and move the brake where it is needed. Once the brake is where you want it set it down, unhook the chains from the c-hooks and lift the brake. The legs will unfold into place. NOTE: ensure the leg are fully opened and on level ground.



Install the Stand Locking Bolts (P/N 422005) Find number (5) in four places and tighten securely.

Pushing the clamp handles toward the rear of the brake lifts the ram from the bed and apron. Insert the material to be bent into the opening between the ram and bed assembly and clamp the material in place by pulling the clamp handles forward. Raise the apron to bend the material to the desired angle.

Allowing for metal thickness - The ram assembly must be adjusted to allow for clearance when making bends according to the thickness of the material being formed. This adjustment is made by slightly releasing the clamping pressure on the clamp handles and moving the forward edge back, away from the edge of the clamp block on the bed. This movement is accomplished by loosening the bracket lock bolts (Find Number 5) one on each end of the bed assembly. For 22 gauge materials allow a clearance equal to twice the thickness of the material being worked. For lighter gauges, allow a clearance equal to one and one half times the thickness of the material. A larger bend radius can be accomplished by increasing the clearance.

Clamping pressure – Clamping pressure should be adjusted according the thickness of the material being worked. A common cause of bending and forming problems is excessive clamping pressure. Clamping pressure should be adequate to hold the material securely in place but not so great as to require undue effort in locking the clamp handles. Clamping pressure is adjusted by turning the nuts on the threaded rod portion of the yoke assembly below the clamp swivel. The lift of the ram assembly is adjusted by turning the nut above the clamp swivel. When the clamping pressure is properly adjusted, lock the nuts against the clamp swivel to prevent any change in adjustment.

Capacity – The capacity of the brake is 22-gauge mild steel.

Bending and repeat bends - Bending is accomplished by clamping the work piece under the ram assembly so that the desired line of bend is held at the forward edge of the nose bar and by elevating the apron assembly until the desired degree of bend is obtained. The maximum degree of bend is approximately 140 degrees. Due to the "spring back" in various materials some overbending may be required to get the desired bend angle. For repeat bends, adjust the stop on the stop rod to limit the swing of the apron assembly. The stop is secured in place with a setscrew.

There are four adjustments to do in the following order. Use test strips approximately 2 inch x 3 inch of the same material and thickness you will be forming. You will also need several full lengths or near full-length pieces by about 4 inches wide of the material you are setting up for.

Check **CLAMPING PRESSURE** by placing test strips in the brake about 3 or 4 inches away from each end of brake. Adjust the clamping pressure so that it is at most only enough to keep the material from slipping. It is not desirable to use more clamping pressure. More pressure can “pre-load” the brake in a way, which will force a distortion. Your best results may be with zero clamping pressure. To change clamping pressure use the nuts at the bottom of the cam assembly stem.

RADIUS/SET BACK refers to the distance between the leading edge of the clamp and the inside edge of the apron. Look at your brake from behind. Loosen bolts allowing you to move the clamp forward or back on the table. Now from the front, look at the distance between the leading edge of the clamp and the inside edge of the apron. Move the clamp back from the apron at least 1.5 times the thickness of the material being formed. Be sure to move the clamp back a little too far and then move it forward to take out any slack. Recheck clamping pressure. Be sure clamping pressure is very little or none.

Check **END TO END CLAMP ALIGNMENT** by placing a test strip about 3 or 4 inches from each end of the brake, and bend to approximately 90 degrees. See if they appear to be bent to the same degree. Remove the test strips from the brake and stack one inside the other. Compare the sharpness of the radius. If one test strip is over bent or has a sharper radius, increase the radius set back on the “tight end” slightly and test again. Here too, you want to be sure move the clamp back a little extra and then bring it forward to take out any slack.

TRUSS RODS are adjustable to help make the center of the brake bend the same as the ends. Use truss rods to change the shape of the brake and/or to stiffen it. On models with 2 truss rods on the clamp, you can stiffen the clamp to some degree by “pushing” with the larger truss and then “pulling back” with the smaller one.

There is a large nut on each of the truss rods, which can add pressure in the center of the clamp, table, or apron. If adjustment is needed, usually the clamp is the place to start. A combination of adjusting the clamp, apron and table truss rods may be needed. After making a change, use the 2” x 3” test strips near the ends of the brake to re-check clamp pressure and end to end alignment, then use a full length strip to see if the middle is forming the same as the ends.

CAUTION: OVER TIGHTENING TRUSS RODS CAN CAUSE PERMANENT DISTORTION. If, after several tries, you do not get the desired effect, back off pressure on all truss rods and try again with a different sequence. Sometimes a slight upward crown to the table and apron is desirable. When the test strips look right, use the brake normally. If it then changes after using the brake for a while,

you will need to re-adjust. But first see if the set back or end to end alignment changed by using “2 x 3” test strips near each end. After a break-in period, truss adjustment is rarely needed. But you do need to adjust clamp pressure and radius set back for varying gauges. **MOST DISTORTIONS ARE DUE TO TOO MUCH CLAMPING PRESSURE & / OR NOT ENOUGH RADIUS SET BACK.**

When adjusted, a hand brake should form consistently the full length of the brake. Reasonable accuracy is what we are going for here – you don’t need to get out your protractor and dial gauge. And remember it is necessary to change adjustments when heavier or lighter material is formed. At the least, adjust your brake for the heaviest material you use and leave it there for the lighter material too.

OIL APRON PINS, CLAMPING CAMS, & VERTICAL GUIDES BEHIND THE CLAMP FREQUENTLY.

There is a block at the bottom of the cam stem where you adjust clamping pressure with the nuts above and below the block. After you adjust clamping pressure, the nuts above the block should be locked against each other so that there is a gap between the block and the nut above the block of about 1/32” to 1/8” (or about .030 to .125). This will allow some movement of the anchor pin/block assembly, which is necessary when only one end of the clamp is opened. Having way too much gap, say 1/4” or more, will cause wear on some cam assembly parts and on the anchor pin. Having no gap can cause some cam assembly or vertical guide parts to bind and wear faster. This adjustment should be made whenever you change the gauge of material being formed. At least set it up for the thickest material you normally form with a 1/8” gap above the block. This will leave you room to adjust the nut under the block for some thinner materials without having to adjust the nuts above the block too.

During the break in period, clamping pressures is an adjustment that will change with use. Keep in mind that it is important to use correct clamping pressure and minimize the gap above the block at the bottom of the cam stem. It is also very important to avoid having too much clamping pressure. Clamping pressure and set back are the two adjustments that do need your attention whenever you change the gauge of material you are forming.

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“HOW MUCH CLAMPING PRESSURE?”

Clamping pressure, or cam-over pressure, is adjustable. Having a lot of it is often thought to be a good thing. Try this when the middle is not bending the same as the ends; instead of adding more clamping pressure reduce it. Consider the possibility that any brake is naturally stiffer near the ends than the middle. When cam pressure is added more than a very light touch, the material being formed has more pressure applied to it on the ends than the center before the bend is even started (because the brake will flex slightly more

in the center than it will at the ends). So both the material and the brake are in a distorted condition from the get go. Adding more clamping pressure makes it worse. You may have noticed a wavy condition to the material hanging out the back of the brake when clamped. Try reducing truss pre-load, and reduce clamp pressure. See if you get a better bend, and if it is much easier to pull the cam over. Try zero clamp pressure next. With little or zero clamp pressure, you will see the entire clamp or head assembly of the brake lift at the start of a bend, but that is ok since it is all lifting evenly. OIL APRON PINS, CLAMPING CAMS, & VERTICAL GUIDES BEHIND THE CLAMP FREQUENTLY.

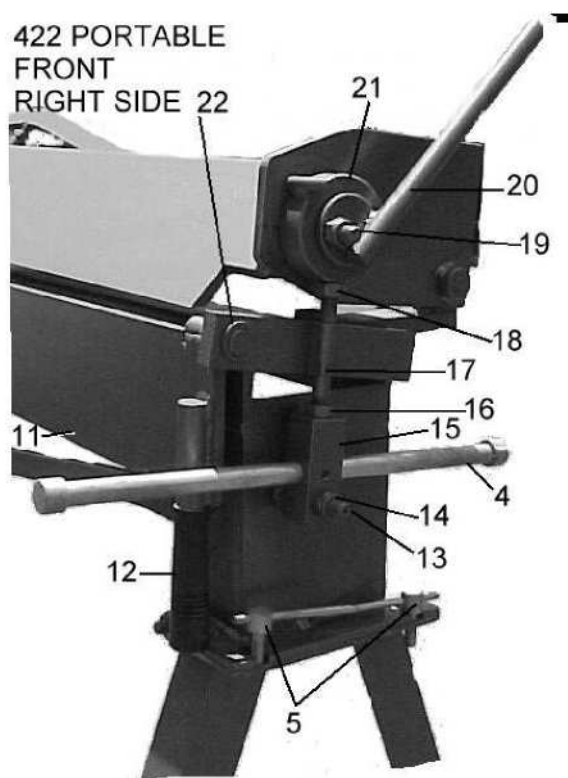
RADIUS SET BACK OR BEAM ADJUSTMENT

When you are forming light material, set your clamp back from the edge of the table at least 1.5 times the thickness of the material being formed. When forming maximum rated material use at least 2 times, and better to try 3 times material thickness for your set back. Set back allows a radius. Up to a point, more radius results in needing less pressure to make the bend. Less pressure means everything is distorting less and you get more consistent bends.

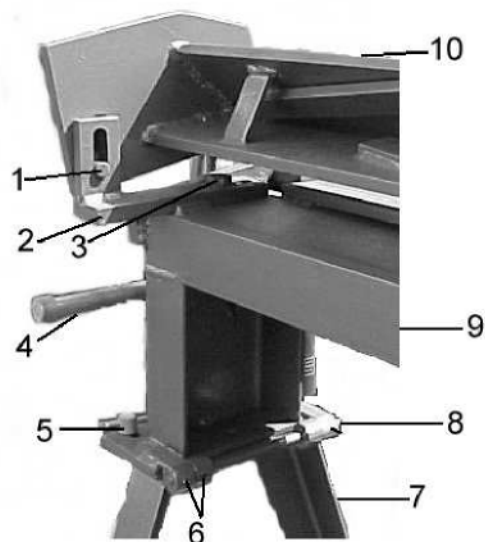
USING A "BOOT" TO INCREASE INSIDE BEND RADIUS

When forming some materials, such as aluminum, it is desirable to bend against an edge that is not so sharp as the standard edge. This will decrease the tendency of aluminum to stress crack, or fracture, when forming it. You can make a 'boot' from about any light gauge material, say about 4' wide by the length of your brake. Something like 22ga – 24ga mild steel is good. Put the material in the brake so that you are bending a 2' flange, but bend it all the way over until it lies against the top of the brake. Now you can tape it or use other means to keep that piece in place. With this 'boot' in place, you will increase the inside radius of the bends you make. An additional 'boot' will increase the inside radius of bends even more. Note that as you add one or more 'boots', you must also adjust the clamp set back, so to maintain the 1.5 – 3 times material thickness as your minimum radius set back, also called beam set back. And, clamping pressure will need to be adjusted. Remember that less pressure is usually better than too much pressure. OIL APRON PINS, CLAMPING CAMS, & VERTICAL GUIDES BEHIND THE CLAMP FREQUENTLY.

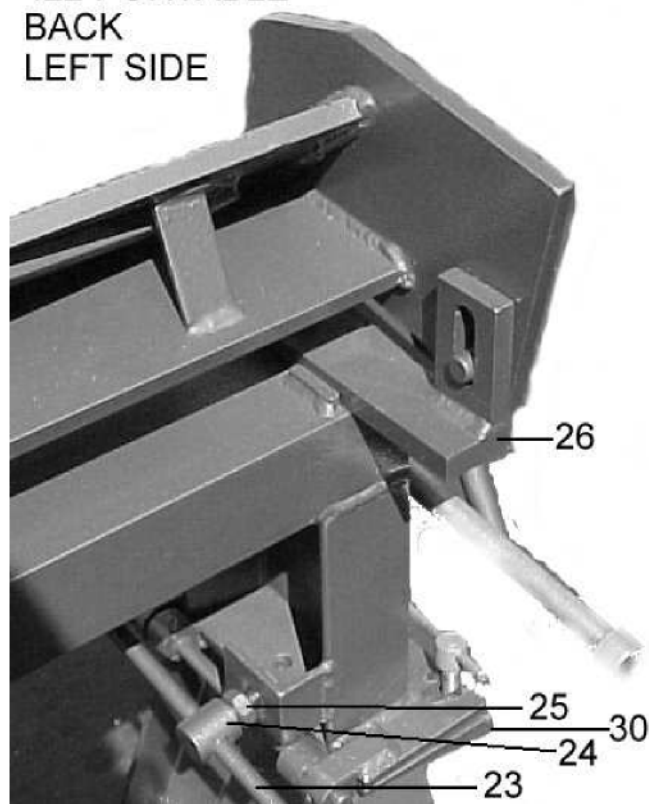
422 PORTABLE
FRONT
RIGHT SIDE



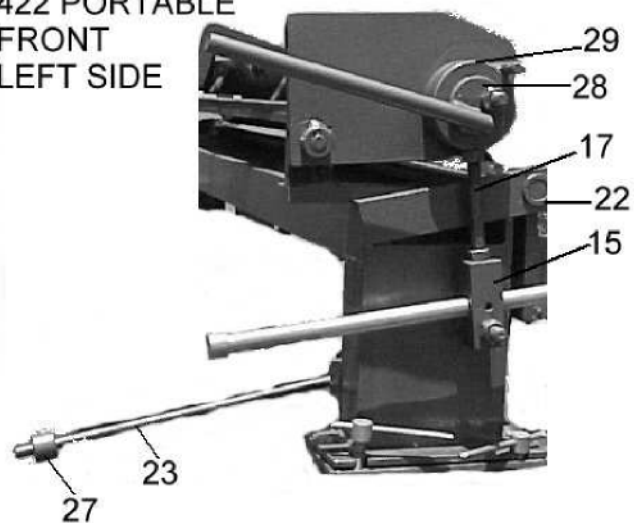
422 PORTABLE
BACK
RIGHT SIDE



422 PORTABLE
BACK
LEFT SIDE



422 PORTABLE
FRONT
LEFT SIDE



Parts For 422 Portable Brake			
Fine No.	Part No.	Description	No. REQ'D.
1	422001	Ram Pin	2
2	422002	Right Ram slide	1
3	422003	Ram Slide Bolt	2
4	422004	Carrying Handle	2
5	422005	Stand Locking Bolts	4
6	422006	Set Screws	6
7	422007	Right Folding Stand	1
8	422008	Folding stand hinge Pin	2
9	422009	422 Bed	1
10	422010	422 Ram Ass'y	1
11	422011	Bending Leaf Ass'y	1
12	422012	Rubber Lifting hand guard	2
13	422013	Bed Stud connecting Block	2
14	422014	Nut	4
15	422015	Connecting Block	2
16	422016	Connecting Nut Right	2
17	422017	Connecting Link adjustment rod	2
18	422018	Connecting Nut Left	2
19	422019	Connecting Ram stud	2
20	422020	Eccentric handle Right	1
21	422021	Eccentric Ram connecting right	1
22	422022	Bronze leaf pivot bushing	2
23	422023	Stop Rod	1
24	422024	Stop, Swivel	1
25	422025	Nut, Swivel	2
26	422026	Left Ram Slide	1
27	422027	Stop	1
28	422028	Eccentric handle Left	1
29	422029	Eccentric Ram Connecting Left	1
30	422030	Left folding stand	1