

Shop Tool Maintenance

Correct Care and Use of Hand Operated Shears

Second of a series on Shop Tool and Maintenance

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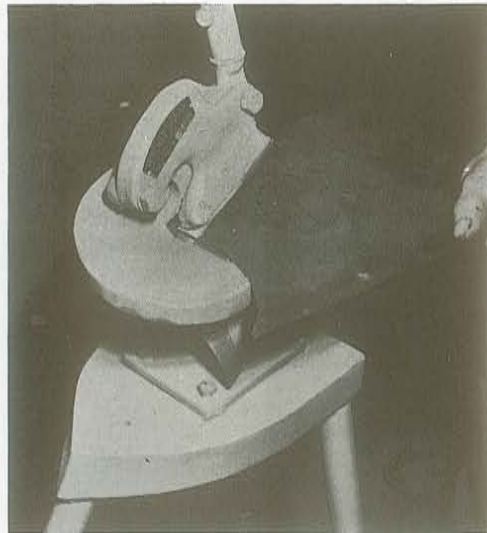
WHILE POWER TOOLS, such as brakes, shears, presses, etc., are important and widely used in the sheet metal industry, hand operated shears still find many applications in most phases of sheet metal work because they provide the necessary versatility and adaptability to meet virtually every metal cutting requirement.

Because hand operated shears are so widely used by the sheet metal industry, it is important that their function, capabilities and limitations be clearly understood by the user to insure maximum utility and long tool life.

At the outset, let us understand that no single type



Proper blade clearance must be maintained to provide clean, burr-free cuts and prevent harmful strain on the shear. Too little clearance will throw strain on the frame and cause blades to chip. Too much clearance causes burrs and dulling of blades. When manufacturers make specific blade clearance recommendations for various gauges of metal, they should be followed to assure maximum utility and efficiency of the shear.



When using a throatless shear to make irregular or angle cuts with sharp turns or changes of direction, the metal should be held flat and pivoted from the heel of the blades

of shear will do every metal cutting job. There are some types of shears such as the throatless shear, capable of doing a wide variety of work, but even this shear has its limitations. It can be safely said that more hand operated shears are destroyed or damaged because they were used for work other than that for which they were designed, than any other reason. Overextending the capacity of a shear—trying to cut metal heavier than its stated capacity—is another common mistake reported by manufacturers. It is poor economy and bad practice to attempt to make a single shear do every cutting job in the shop.

HAND OPERATED SHEARS are made in many styles—each designed to handle a particular type of cut, and in the long run greater economy and longer tool life will be gained by using the right shear for the job. Because

labor time and costs are vital considerations in any sheet metal shop, the use of a shear designed to do a certain job faster, more efficiently and with less waste becomes more important than ever.

One of the most important and versatile hand operated shears used in the industry today is the throatless



Illustrating the type of cut which can be made on a throatless shear. The material is 10 ga. Note how the material is "split" by the shoulder design of the shear, permitting unhampered cutting and providing absolute freedom of movement of the material being cut. When making radius or irregular cuts, the work should be pivoted along the

desired pattern at the same time the downstroke of the blade is made. This coordinated action assures fast, smooth cutting

shear. Designed to make straight, curved or irregular cuts, the throatless shear's construction makes it possible to turn metal to any position while the cut is being made. This type of shear cuts metal as easily as a pair of scissors cuts paper. Throatless shears are made in various sizes to handle material up to $\frac{3}{16}$ in. mild steel.

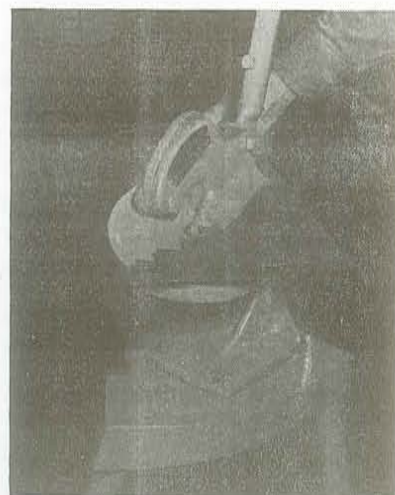
When using a throatless shear, all cuts should be started at the vertex or heel of the blades because this



Large capacity shears are generally provided with some means of holding heavy material flat during the cut. Illustrated is a Beverly shear equipped with an adjustable ball-bearing hold down cutting a $\frac{3}{16}$ -in. mild sheet. The ball-bearing provides adequate pressure yet offers no resistance to movement of the material being cut. This also prevents marring or scratching of polished or coated material

is the point of least resistance and greatest power. Circular and irregular cuts are made by turning the work, at the same time following through with the cutting stroke of the blade. When a cut has been finished, the work should be pushed forward at the same time the blade is raised by the handle so that the next cut can be started at the heel of the blades. Zig-zag notching and cuts with sharp turns or changes in direction should be made at the point where the blades meet when the shear handle is in the upright position. When using throatless shears, the material being cut should always be kept flat on the bed of the shear for best results. Large capacity shears are usually provided with hold downs to prevent heavy-gage metal from lifting during the cut.

ANOTHER IMPORTANT and widely used hand operated shear is the slitting shear. Used primarily for making

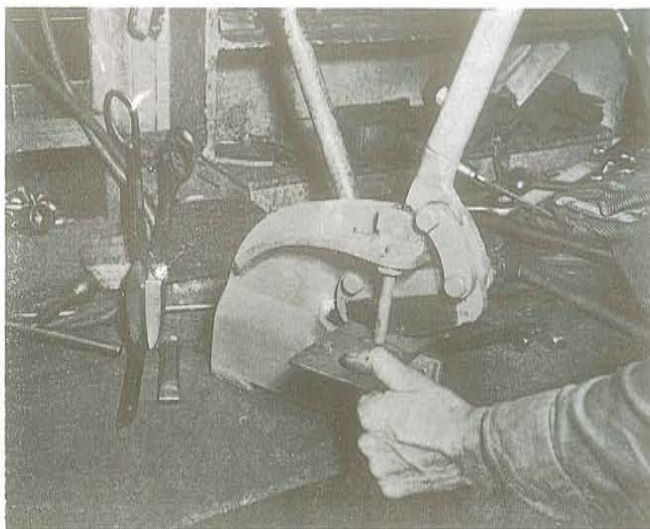


Zig-zag cuts are easily made on a throatless shear because movement of the work is unhampered by a throat or center post

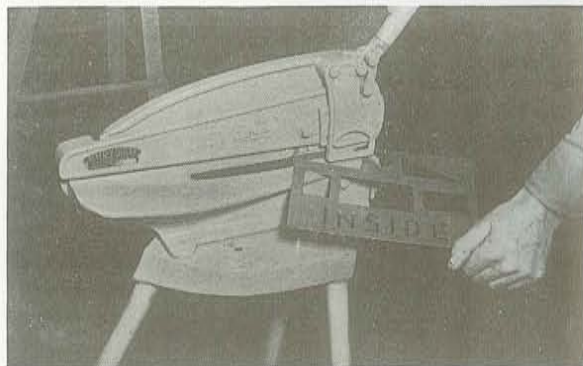
straight cuts in sheets or for trimming, slitting shears are often used for cutting iron bar stock, strapping, etc. Some system of compounding the lever effort of the blade handle is usually employed to make cutting of heavier material easier and faster. As in the larger capacity throatless shears, an adjustable hold down is provided on larger model slitting shears to insure that the metal being cut will be held flat on the bed of the shear. If heavier gages are not held firmly flat against the downward cutting action of the blade, the metal will slip and frequently wedge between the upper and lower blades, causing them to chip or crack.

Inside slotters, which permit cutting inside the edges of a sheet are extremely valuable tools to the sheet metal worker. The model illustrated here has sufficient throat depth to cut up to 8 in. inside any edge of the material. The slotter shown utilizes a unique arrangement of five blades to achieve punch press accuracy and sharp, clean cuts. The four lower blades arranged in a rectangle, form a die to support and assist the fifth or upper blade as it cuts down through the metal. Continuous cuts, during which the work may be pivoted at any point in the stroke can be made on this type of shear, thus giving it a wide range of versatility. The illustration demonstrates the type of work which can be done on these shears.

With ordinary care, and a few simple precautions, hand operated shears should perform satisfactorily for many years.



Slitting shears are used primarily for making straight cuts. The Beverly SS-3 illustrated is making a cut in 1/4 in. x 3 in. bar stock. An adjustable hold-down keeps material flat during the cut



The inside slotter will cut inside a sheet, slit through, and do many different types of design work inside or outside the edges of a sheet

Obviously, the blades on any shear, regardless of the type, require more attention than any other part of the tool. The blades on most shears are quickly and easily

removed for inspection and re-sharpening. In general, the best practice is to return the blades to the manufacturer for re-sharpening, as correct angle, rake and clearance are most important to the cutting efficiency of the blades. Do not permit inexperienced personnel to tamper with the grinding of shear blades because altering the contour, shape or angle of a blade will impair its ability to make clean, accurate cuts.

The matter of shear blade clearance is very important, and manufacturers' specifications should be implicitly followed. Usually, one clearance will handle the full range of a particular shear, but it may be found that slight alterations in clearance will improve cutting efficiency at both ends of the capacity range.

Tips on Shearing

1. NEVER overload the shear. Manufacturers' specifications are clear as to the capacity of their product and should be carefully followed.
2. KEEP BLADES SHARP at all times, should be the primary rule of every shop. It is wise to have an extra set of blades on hand to replace blades when they become dull or require re-sharpening. This will insure "new-shear performance" for many years at small cost.
3. KEEP PROPER ADJUSTMENT of blades for the job being done. The ideal adjustment is to keep the greatest clearance possible between the blades and still obtain a clean burr free cut. Too much clearance will cause the blades to leave a "burr" or rough instead of clean-cut edge on the metal, while too little clearance when cutting heavier gages of metal will throw a strain on the shear and blades sufficient to at times not only nick or crack the blades but to even bend their steel-cast frames.
4. Hold metal down flat on lower cutting blade and shear table at all times.
5. In cutting make use of the full stroke of the blade.
6. Keep all moving parts oiled.
7. USE THE PROPER SHEAR FOR THE JOB BEING DONE, and the material to be cut.

(The End)