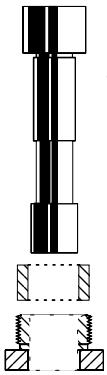
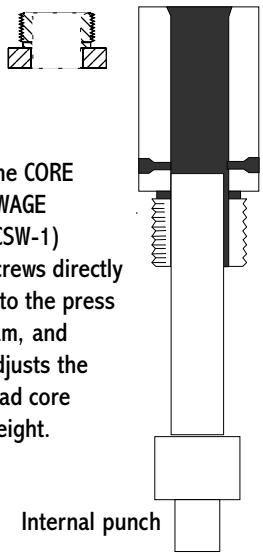
How to Swage Bullets Using The CORBIN LTFB-4-S or -M Die Set

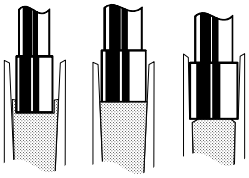


External punch fits into the FLOATING PUNCH HOLDER in the press head.

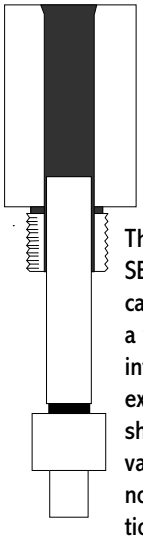


The CORE SWAGE (CSW-1) screws directly into the press ram, and adjusts the lead core weight.

Internal punch



Too small OK Too large



The CORE SEATER (CS-1) can be used with a variety of internal and external punch shapes for various base and nose configurations.

Type -S dies are 1-inch in diameter, with a 5/8-24 shank, and fit into the ram of the Corbin CSP-1 All-Steel press. The type -M dies are 3/4-inch in diameter, with a 5/8-24 shank, and fit into the ram of the CSP-1 or the CSP-3 Silver Press (horizontal). The 4-die set consists of a CORE SWAGE (CSW-1), a CORE SEAT(CS-1), a POINT FORM (PF-1) die, and a LEAD TIP (LT-1) die, each with one internal and one external punch.

The external punch is held in the floating punch holder, a long, black, 7/8-14 threaded cylinder, which comes with the press. A threaded bushing is removed from the bottom of the punch holder, and a round bushing inside the punch holder drops out, and is placed over the external punch, and then screwed back into the bottom of the punch holder to secure the punch. The punch holder screws into the press head, so the punch faces the ram. (Large diameter punches have their own captive threaded bushing: do not remove this from the punch.)

The die screws into the press ram, with its internal punch inside the ram. A stop pin in the front of the CSP-1 press or the top of the CSP-3 press contacts the tail of the internal punch during the back stroke, stopping the punch movement as the die continues back, and thus ejecting the part from the die.

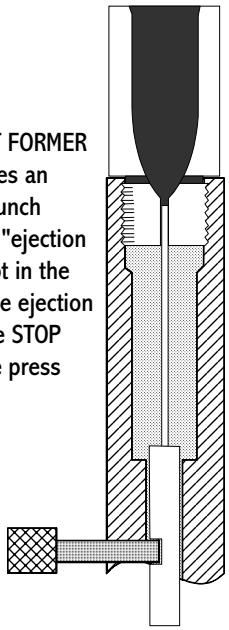
Never try to swage a component that will not go into the die by hand. The swaging operation depends on each component being slightly smaller than the die bore, and increases the bullet diameter a little with every step. The core seating die and point forming die are matched to each other for a given jacket and core material to within 0.0005 to .0008 inches with the core seater being smaller. Use a small amount of CORBIN SWAGE LUBE (CSL-2) on the cores and the jackets before each operation: moistening the fingertips with lube and handling the materials is generally sufficient.

The first die is the CORE SWAGE. It has three small bleed holes in the circumference. It is used to adjust the lead core weight precisely, and to size the cut or cast lead cores so they fit into the bullet jacket. The lead should fit easily by hand into the die before swaging. Adjust the punch holder closer to the die to make the core lighter, and adjust it away from the die to make a heavier core. Try to always swage at the very end of the stroke, so that you get maximum leverage with minimum effort. The force required should never be so great as to bend the punches or crack the die. Type -M dies are for use with pure soft lead only. Type -S dies can be used with lead up to Bhn10 in hardness. Lead resistance to flow, and thus internal die pressure, goes up with the square of the Bhn hardness: doubling the number from 5 to 10 makes the pressure go up four times!

Cut or cast your lead cores so they are within about 5-6 grains of the desired weight, but on the heavy side. To find out the correct weight, weight the jacket and cut lead cores to go with it so the combination gives you your final bullet weight plus about 5-6 grains. Then swage away the extra weight in the core swage die, for perfect cores. Clean the cores free of any lube BEFORE putting them into the jackets (hot water and detergent in a pan will clean them: spread them out to dry on a towel afterward). For lead tip bullets, the core must be either very close to the jacket mouth, or slightly longer than the jacket after seating.

The second die is the CORE SEATER. Seating the core means to press it into the jacket and expand the jacket to nearly finished diameter. Jackets are undersized as produced, and depend on core seating to achieve their proper diameter. The external punch for the core seater must fit the jacket, rather than the die, if you intend to make open tip bullets. If you intend to make lead tip bullets, the punch may fit inside but close to the end of the jacket at the point where the lead will be seated. Or for a large lead tip it may have to fit the die bore rather than inside the jacket. Core seating punches are designed for a given jacket wall thickness, taper, and length of core (weight) so you may need more than one to cover a variety of jackets and weights or styles. If lead spurts around the punch, or if the punch digs into the jacket wall, your bullets will probably be undersized because the pressure will not build sufficiently to expand the jacket. The solution is to change jackets, core length, or get a punch to fit the jacket and core length combination correctly.

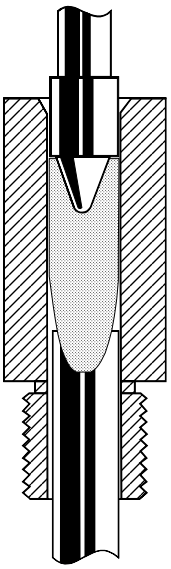
The external CS punch can also have a projecting cone on the end to make hollow points. The internal punch can be flat, domed or have a conical projection to form the mirror image of that shape in the bullet base. An open tip is just a core seated below the jacket mouth. You can also make an open tip hollow point by having a conical projection on the punch that fits inside the jacket. A lead tip hollow point is made by using a HP punch that fits the die, and a core longer than the jacket. You cannot, however, make an open tip hollow point (contradiction in terms).



The POINT FORMER (PF-1) uses an internal punch called the "ejection pin". A slot in the head of the ejection pin fits the STOP PIN on the press frame.

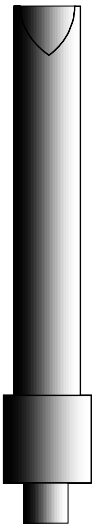
Place the clean core into the jacket, and put both into the core seating die with the jacket mouth (open end) facing out. Move the ram gently forward and align the external punch with the jacket mouth, then adjust the external punch so that the core will just be expanded to the maximum allowed by the die as the press reaches the end of the stroke. The force should be quite gentle, never enough to crack the die or bend the punches. If the jacket and core stay together in the die when the ram is moved back, rather than coming out with the external punch, it means that they have been expanded enough to grip the die walls. If the jacket sticks on the external punch, it may be removed by holding the pressure for a count of five and then ejecting, or by removing the punch and tapping on the jacket mouth with a brass hammer while rotating the punch several times (this expands the jacket and it falls off by itself). Sticking can be caused by improper fit of punch to jacket, or not enough lube on the punch tip.

The seated core and jacket should be just slightly under finished diameter. For example. a .308 bullet should have a seated core and jacket of about .3078 to .3079 inch diameter. About .0002 inches is a reasonable amount to expand in the final point forming operation, which is next. For larger lead tip bullets, you may be able to use the external flat base punch from the point forming die, as a core seating punch: it should fit the core seat die closely, so that lead cores longer than the jacket would not bleed around it.



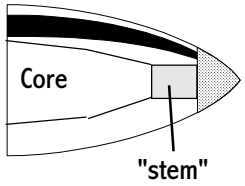
The Lead Tip die gently reshapes the deformed lead which results from ejection from the point forming die. The internal punch can be changed for different shapes in the same diameter. The external punch is the same one used in the Point Form die (shown here is a Hollow Base punch).

After seating all the cores in the jacket, remove the core seating die and punch, and install the POINT FORMER (PF-1). This die has the ogive or nose curve shape machined into the die cavity itself. It does not form the nose using a punch. The internal punch is in reality only an ejection pin, and is retracted out of the die cavity during swaging so it plays no part in the shaping of the bullet. The ejection pin has a long head with a slot across it. The stop pin in the press frame must be removed and then inserted into the slot, so it holds the internal punch secure to the frame. Push the seated core and jacket into the point forming die using an external punch that matches the base shape. (If you change base shapes in the core seating operation, you will need a matching external punch for the point former).



The internal LT punch matches the caliber (diameter) of the die set, and is also matched to the ogive curve of the point forming die. However, you can specify flat tip, sharp tip, or semi-spitzer (rounded) tip all with the same ogive.

Push the jacket and core into the die with the open or lead end first. The die will curve the jacket and lead into a bullet shape. Push only far enough to make the lead extend from the tip of the jacket, and put the ogive curve on the bullet, Do not attempt to push lead up the ejection pin hole or close the tip to a smaller point than the diameter of the ejection pin. For lead tip bullets you want the "stem" of lead that attaches the top to the main core to be large enough in diameter so that the tip will not break off in handling or feeding. Do not try to make too small a tip: this is not effective because the jacket walls themselves, when pushed together at the tip, will cut into the "stem" diameter holding the lead tip to the main core. You need enough extruded lead so the cavity of the LEAD TIP die (LT-1) is filled completely.



Use the LEAD TIP FORMER (LT-1) to gently push the lead tip to perfect shape, shearing off any extra lead as a little ring against the jacket. The lead should be large enough so that it can form nicely, without voids or pits. The pressure used is extremely light: just enough to shape the blob of lead into a nice tip, no more. If you press too hard, a ring or step will be formed in the ogive of the bullet.