



Making a Cross Match Punch



Figure 1: Using an awl to manually punch time fuse.



Figure 2: A simple jig that utilizes a drill press as the punching mechanism.



Figure 3: A dedicated cross match

Introduction:

One of the most reliable ways to insure ignition of commercial time fuse is to punch a hole through it and insert a short stick of black match. This process, known as "cross matching," provides two paths of ignition and has proven itself very reliable. The thin piece of black match takes fire much more readily than if the time fuse were merely dipped in slurry prime. Not only is the ability to take fire superior, this method is quick and requires no drying time. The time fuse can be matched and then immediately put to use.

The first obstacle with this method, however, is finding an easy way to make the small hole through the piece of time fuse. The three most commonly used methods of achieving this task are presented here in order of increasing complexity.

Method 1:

The most primitive method of punching the time fuse hole involves the use of an awl to manually drive a hole through the fuse. The fuse is first cut to size, then marked where the holes are to be punched. The holes are usually punched at least 1/4" from each end of the time fuse. Making the hole any closer to the end of the fuse will often result in splitting the end of the fuse open.

The awl should be at least 1/8" diameter so that the black match will fit through the resulting hole. A block of wood with a hole slightly larger than the awl diameter drilled near it's edge allows the time fuse to be supported while allowing the awl to pass through the time fuse.

Since the powder core of commercial time fuse is surrounded by a water resistant layer of tar pitch, some believe that twisting the awl when piercing the fuse can result in smearing the tar and blocking the powder train. I find that it is difficult to pierce the fuse without twisting the awl back and forth at least slightly, and have never had ignition blockage problems.

Method 2:

While the awl method works, it quickly becomes tiresome if you have many fuses to make. A drill press can easily be converted to a cross match punch using a simple block of wood clamped to the drill stand. The wood should contain a hole slightly larger than the diameter of the time fuse to be punched (I use a 9/32" hole), drilled into the edge of the block to a depth of about 5/8". This hole is then intersected by a smaller hole that is slightly larger than the diameter of the tapered rod that will be used to punch the hole (I use a 9/64" hole). The small hole should be located at least 1/4" from the end of the larger hole and run all the way through the block of wood.

A metal rod of at least 1/8" diameter is then sharpened on a grinder and

punch made using a small arbor press.

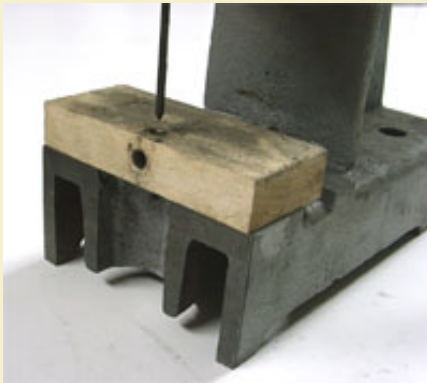


Figure 4: Closeup of the punch block.



Figure 5: Punch block held to base with two wood screws through the bottom.

inserted into the drill chuck. The diameter of the rod you use will be dictated by the diameter of your cross match. It is possible to punch the hole with a flat-ended rod, but I prefer to use a sharp point.

The punch block is now clamped to the drill stand so that the punch rod is centered over the small hole, as seen in Figure 2. The time fuse is simply inserted into the hole in the side of the block until it will not go in any further, then the punch is brought down using the drill press as an arbor press (with the power off). This will result in cross match holes that are consistently punched at the same distance from the end of the time fuse.

Method 3:

If you really find yourself cross matching a lot of time fuse, it may be worth the trouble of making a dedicated cross match punch using a small arbor press, as seen in Figure 3. This press uses the same punch block as described above, except it is fastened to the base of the arbor press by screwing through the bottom with a few wood screws (see Figure 5).

The square press head must be removed from the press and fitted with a tapered punch pin. It is easiest to drill a hole in the end of the rod and press fit the punch pin using a hammer. The pin can then be sharpened on a grinder after it is in place.

It is best to install the punch pin first, then push it through the block of wood to insure alignment before the block is secured to the metal base. This way there are no surprises after the wood has been attached.

Since you will often be punching holes through time fuse that is already secured and pasted into a shell, it is desirable to be able to work with very short segments of time fuse. The distance between the cross punch hole and the edge of the wood block should be made as short as possible to help with this goal. Since most arbor presses have feet that will extend beyond the edge of your wood block, it may be necessary to cut them off with a hack saw (preferably a vertical power cutoff saw). Figure 4 shows a close-up of the truncated base, revealing the inner cavity of the cast iron feet.

Your lightweight and portable cross match punch can easily be clamped to your workbench when in use, as seen in Figure 3. This method eliminates the setup time and location restriction of the drill press method while also allowing you to work with short time fuses pasted into shells that would not clear the drill chuck if punched using drill press jig.

One final note about cross matching: be sure the cross match is firmly held in place after it is inserted. This can be accomplished by squeezing the junction with a pair of pliers after the match is centered. The cross match hole should only be as large as it needs to be for the match to pass through, leaving no extra space for slop. Failure to secure the cross match can result in it falling out due to the centrifugal forces of the rapidly spinning shell as it exits the mortar. 🔥