



A typical example of a good drill for restoring. The body is worn, the gears are stiff, but everything is there waiting for a little TLC. And below, restored to its former glory

Return to glory

Aaron Moore shares his techniques for a complete overhaul of a classic eggbeater drill



A basic hand drill, such as an 'eggbeater' drill, is one of the most useful and inexpensive tools to have in your workshop. Few are manufactured new today and those that are don't come close to the quality of the vintage models. The only exception to that was the CT-6 drill made by Bridge City Tool Works, but it is sadly no longer in production. As a result, the CT-6 can easily fetch over £400 these days, so unless you have that kind of coin lying around, let's get back to the abundantly

available vintage models. I use two Millers Falls drills all the time – a No.2 and a No.5A – but other quality drills were also made by Stanley and Goodell-Pratt. All three of these brands, as well as several others, are commonly available today.

I can't say enough good things about these tools, but you may be thinking: "I've used these drills before and they're garbage," to which I would reply: "You have never used a nice one." A properly tuned drill spins effortlessly and with a little practice,

provides the user with incredible control. One downside to these drills, however, is they weren't designed to be taken apart for repair. The handles are pinned and peened in place so restoring an old drill presents a few challenges, which can be overcome. What follows in this article is my basic approach to hand drill restoration, which requires no elaborate tools or procedures, just a drill press. I suppose there's some irony in needing a drill press to restore a hand drill, but I digress...

Acquiring the drill

The first thing you need to do is go out and purchase a drill from one of the usual sources – try looking on eBay, at flea markets, tool shows, or if all else fails, steal one from a fellow woodworker! You need to look hard for three things: solid handles without cracks or a loose fit, gears with no chipped or missing teeth and a complete chuck, including all three jaws and the associated springs. Obviously, major flaws, such as missing parts, cracked or welded bodies, or completely rusted out drills are no good, but those are often thrown out and never make it online or to the flea markets. Most drills I've seen for sale are in at least satisfactory condition and can be had for £7-20, although drills in really good condition will often run to somewhere between £45-80.



Using properly sized screwdrivers, disassemble the drill as shown

Disassembly/chuck tune-up

With the drill in hand, the restoration process can begin. Start by taking everything apart as shown. Be sure to use properly sized screwdrivers, preferably with a hollow-ground tip, so the screw heads don't get chewed up. The chuck can be disassembled for a really thorough cleaning, but if everything is working, I just soak the chuck overnight in WD-40. Taking the entire chuck apart can be tricky, especially when putting it back together, so don't go down that road unless you really need to. To get the chuck apart, there are usually two holes or slots on the top of the chuck that allow a tool to unscrew the top portion from the main body. The split-line between the top and main body of the chuck is often hard to see and begins right where the knurling pattern starts.



Leave the chuck assembled unless it absolutely requires a full cleaning. You can see the slots on the top of the chuck where a tool can unscrew the top from the body. The top portion of the chuck stops right where the knurling pattern begins



Drop the chuck in some penetrating oil, like WD-40, and let it soak for several hours to loosen up jaws and springs

Screw cleanup

The few loose screws that were removed can be cleaned up on the drill press in seconds. Place the screw in the chuck with gentle hand pressure so the threads aren't damaged – do not use the chuck key. Then, use a smooth mill file to remove the major dirt, corrosion and dents. After a few seconds of filing, check your work and switch to 220 grit abrasive. Go up to 300-400 grit to achieve a nice polish, then repeat this process for all the screws you removed from the drill.



Gently chuck the screws into the drill press and file the tops clean of dents, scratches and corrosion



After filing, polish up the heads with some abrasive



After a few minutes, the screws will be as good as new

The side knob

Turning to the handles – that's a lathe joke – there are typically three to deal with. The easiest is the side knob, which should simply unscrew from the body. Chuck it into the drill press just like the screws and start sanding.

Both the wooden knob and the metal ferrule can be sanded/polished at this point. Apply your preferred stain, finish and set it aside to dry. The other two handles are a little more difficult in their setup.



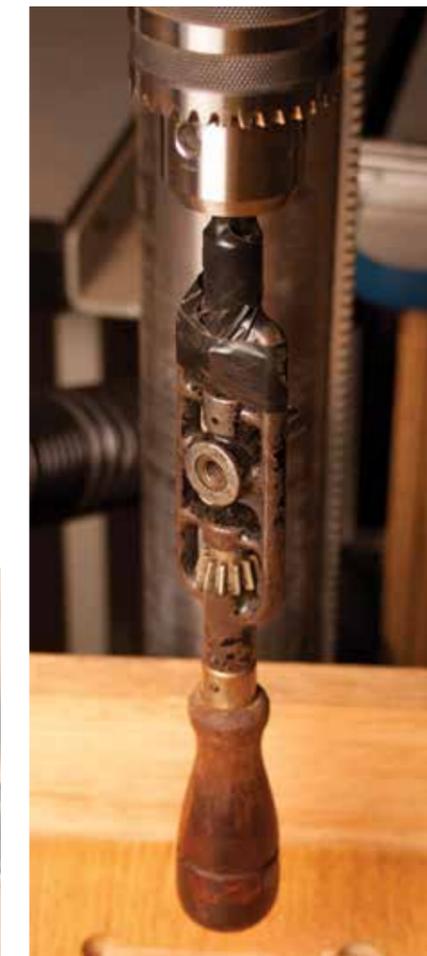
Chuck the side knob into the drill press and start sanding

The main handle

The main handle can't be separated from the body, which makes sanding it a little frustrating. What I find works well is to wrap the small gear with tape – avoid tapes with a lot of stubborn adhesive like duct tape – and then carry that tape around the body, the screw post for the chuck and back down again. This locks the free-spinning screw post to the body, which means that the screw post can be chucked into the drill press just like the screws and knob. Because of the weight and length of the body, run the drill press at a low speed – something around 400rpm – and sand the handle with even pressure from both sides at once. Pressing the handle between two pieces of abrasive keeps everything balanced. When the handle is sanded to satisfaction, again, apply any stain and finish you like and set it aside to dry.



Cleaning up the handle and knobs can be a challenge, but there's a simple solution for each



By wrapping tape around the chuck gear and carrying it around the body, the chuck post becomes locked to the body. Mount it in the drill press and run it at a low rpm. Sanding the main handle is now straightforward

The crank knob



Clamp a post in the drill press and run a belt from the post to the ferrule on the crank knob. With a little tension, the knob should spin quite easily for sanding and finishing

The last wooden piece to address is the crank knob. Again, this can't be removed from the crank arm as they are typically riveted/peened in place. To get around this, install a large diameter post into the drill press – I use a 12mm centre punch and track down a timing belt. These are found in a lot of mechanical devices or can be purchased online fairly cheaply. Wrap the belt around the centre punch and the ferrule on the knob, take out the slack with gentle pressure and clamp the crank arm down as shown. You may want to spin the drill press by hand at first to make sure there aren't any wild belt tracking issues that could damage the knob when the press is fired up, but you should find the knob is spun by the timing belt quite easily. Sand and finish the small knob as before. The knob may slip a little when sanding, especially if you're using really aggressive abrasive or pressing too hard. Fortunately, it's small so there isn't a lot of sanding to do. Just take your time and keep your fingers clear of the belt to avoid a pinch. When the knob is done, you can also scrub the crank arm with a steel brush and/or steel wool.

The chuck

With the wooden parts out of the way, we can now turn our attention to the metal. The chuck should already be cleaned and working smoothly, but it may have some rust or staining that you'll want to address, or ignore depending on the severity. For getting rid of rust, I like to use Evapo-Rust. The chuck can be scrubbed with a steel brush, especially to clean out the knurled portion, but there isn't too much you can do here. You can install a matching piece of threaded rod to the chuck so the whole thing can be thrown in the drill press for polishing, but obviously any sanding or polishing you do will start to remove or minimise the knurling pattern. Do the best you can and move on.

The crank gear

For the crank and body of the drill, I like to use enamel paint. I'm sure there are several brands out there, but I use Testors brand and have no complaints. I would recommend going with the gloss version instead of the flat finish, typically red on the crank and black on the body. I've tried the flat and it just looks wrong on the metal even though I typically prefer a matt finish on my wood projects. I like to brush the paint on so I can ensure it doesn't get into the gears and oil holes and it flows very nicely, so I've never had an issue with brush marks. Starting with the crank, clean off any obvious grease, rust, or dirt and scrub the teeth clean with a steel brush, then the paint can be applied. Two coats will usually be plenty, but make sure it has fully dried between coats and before you start putting the drill to use. Depending on the

temperature and humidity, this paint can take anywhere from 2-10 days to completely dry. Basically, if it has any tackiness to it, wait longer. I like to over-paint the gear's edges a little bit to make sure I get full coverage, but do your best to keep the paint out of the gear teeth. The excess paint is removed in the next step.

When the paint has dried, slide a bolt through the centre of the gear that matches the diameter as snugly as possible. Clamp it down with a nut and then chuck the entire assembly in the drill press. Wrap some 220 grit abrasive around a hard surface like a small block of wood, then grind the top and side edges to remove any dents, dirt, or excess paint. Move to a 300-400 grit abrasive for final sanding and add a little oil or wax to help protect the exposed metal from rust.



Painting the main gear is simple, just try to avoid getting paint between the gear teeth



It's easiest to paint right over the top edge; this will get sanded clean later on



Place a snug-fitting bolt through the gear, lock it down with a nut, then chuck the entire assembly into the drill press



Wrap some abrasive around a block of wood and polish the side and top edges. Make sure the paint is completely dry before doing this or the metal dust will get embedded in the paint

The body

The body is handled in a similar way to the crank. Again, clean the body as needed to remove any dirt, etc. and you may want to wrap the newly restored handle in some cloth or cling film to avoid accidentally getting paint on it. Using black gloss paint, coat the entire drill being very careful to avoid getting any paint on the gears or plugging up the oil holes. The best way to do this is to use a relatively small brush – about 6mm wide is ideal – and work at a steady pace. If you miss a spot, you may find it's better to let the paint dry, then go back and get the missed area on the second or even third coat. Trying to go back after a few minutes to touch up your work may cause the paint you've already laid down to pull, which can create drag or brush marks. It may also be tempting to simply touch up a few chipped areas with the paint and walk away, but the colour and shine of the old paint compared to the new will never be a perfect match and after going to all the effort of restoring the tool, I think it's worth painting the entire body no matter what. After a couple of coats of paint the drill should be ready for re-assembly and fine-tuning.

Re-assembly

When the paint has fully dried, put the drill back together again using properly sized screwdrivers. Make sure the oil holes are free of any dirt or paint you may have accidentally brushed into the holes. If necessary, clean them out with a nail. Now put a few drops of lightweight machine oil, such as 3-in-One in the chuck and the oil holes. The drill should spin freely and with very little slop between main gears. Too much clearance allows the gear to



Wrap the handle in a cloth or cling film to keep it clean then start painting the body. Take your time and keep the paint clear of the gears and oil holes. I like to clamp the chuck post in a rubber-jawed vice so I can rotate the drill as I work and then walk away to let it dry

slide back and forth on its post, which makes drilling harder to control. You can add a shim to the gear to reduce the play, but you will probably need to make your own from plastic shim stock in order to find something with just the right thickness. To be clear, this shouldn't be necessary on most drills, but if you're noticing a lot of gear movement when drilling and it's throwing you off your game, adding a shim can definitely help you out.



There are typically two or more oil holes as shown here. Clean the holes out with a nail if need be, then add some lightweight machine oil and work it into the gears



If the drill has a handle that unscrews for bit storage, add some wax to the threads to help preserve them



When everything is ready, re-assemble the drill and it's nearly ready to go to work



Unless you're a collector, you shouldn't feel compelled to track down the original straight-fluted bits – modern bradpoint bits work better and are readily available

Conclusion

One last note about these drills: many come fitted with a hollow handle that has a cap which unscrews for storage of the original straight-fluted bits. You should wax the wooden threads so the cap will unscrew with ease, but don't worry about using these bits specifically. Hand drills are typically intended for drilling holes up to 6mm diameter – larger than that and you should switch to a hand brace with auger bits. Most drills won't come with the original bits today and they can cost a fair amount to replace. The truth is that modern bradpoint bits work better and are readily available, so unless you're a collector, you shouldn't feel compelled to track down the old bits. Now, regardless of what bit you're using, chuck it in and get to work. Your drill is now ready for another few lifetimes of service. *F&C*

Supplier details

Bridge City Tool Works
Web: www.bridgcitytools.com

Evapo-Rust
Web: www.evapo-rust.com

Millers Falls Co; Goodell-Pratt
Web: www.oldtoolheaven.com

Testors enamel paint
Web: www.testors.com