Metal working equipment: Standard operating procedures

Revised 08/14/2013

LATHE

1. All stock must be properly secured in the lathe chuck or mounted prior to the machining process taking place. Use the correct sized clamp or vise for the stock being machined.
2. Turn the chuck or faceplate by hand to ensure there is no binding or danger of the work striking any part of the lathe.
3. Check to ensure the cutting tool will not run into the chuck or lathe dog. If possible, feed away from the chuck or dogs.
4. Before starting the lathe, ensure the spindle work has the cup center imbedded; tail, stock and tool rests are securely clamped; and there is proper clearance for the rotating stock.
5. Prior to starting the lathe, ensure that small diameter stock does not project too far from the chuck without support from the tail stock center.
6. When using wood, do not mount a split work piece or one containing knots.
7. When roughing stock, do not force the tool in the work piece or take too big a cut.
8. The operator must always be aware of the direction and speed of the carriage or cross-feed prior to engaging the automatic feed.
9. Never leave the key in the chuck. Do not let go of the key until it is free of the chuck and secured in its proper holding place.
10. Select turning speed carefully. Large diameter stock must be turned at a very low speed. Always use the lowest speed to rough out the stock prior to final machining.
11. The correct speed and feed for the specific material and cutting tool must be used. Stop the machine before making adjustments or measurements.
12. Do not remove metal or wood chips from the table or stock by hand. Use a brush or other tool to properly remove chips or shavings from the table or stock.
13. Never attempt to run the chuck on or off the spindle head by engaging the power.
14. Do not stop the rotation of the chuck by reversing the power to the lathe unless tapping holes.
15. Do not leave tools, bits or excess pieces of stock on the lathe bed.
16. All belts and pulleys must be guarded. If frayed belts or pulleys are observed, the lathe must be taken out of service and the belts or pulleys replaced.
17. Stop the machine immediately if odd noise or excessive vibration occurs.
18. Only properly sharpened drill bits and cutting tools in good condition should be used. Dull drill bits and chipped or broken cutting tools must be removed from service.
19. When an operator has finished working on the lathe, and before leaving the lathe for any reason, the power must be shut off and the machine must come to a complete stop.
20. When an operator observes an unsafe condition with the lathe or stock being worked, the operator must report it immediately to the PI.

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MILLING MACHINE

1. Keep all guards in place while operating the machine.
2. While operating the milling machine allow no one else to touch it.
3. Keep hands away from moving cutting tools.
4. Do not make measurements of the stock while the milling machine is powered.
5. Do not allow large quantities of chips to accumulate around the work piece or machine table. After stopping the machine, use a brush or rag to remove all excess chips from the mill bed and stock.
6. Use a rag or Kevlar gloves to handle sharp cutting tools.
7. Cutting tools must be securely fastened in the machine spindle with the proper accessory. Never try to tighten cutting bits or tools by hand.
8. Do not power the machine to tighten or loosen cutting bits or tools.
9. Work pieces and stock must be rigidly fastened to the mill bed with clamps, a vise, or special fixtures.
10. Use appropriate speeds and feeds for the type and size of cutter being used and the material being machined.
11. Make sure the cutting tool is clear of the work piece before starting the machine.

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DRILL PRESS

1. Know the location of start and stop switches or buttons and keep the drill press table free of tools and other materials.
2. Use only properly sharpened drill bits, sockets and chucks in good condition. Remove dull drill bits, battered tangs, or sockets from service.
3. Do not remove by hand metal or wood chips from the table or stock. Use brushes or other tools to properly remove chips.
4. Do not attempt to oil the machine or make adjustments to the work while the drill press is in motion.
5. Do not insert a drill chuck key into the chuck until the power is shut off and the machine has come to a complete stop.
6. All belts and pulleys must be guarded; if frayed belts or pulleys are observed, the drill press must be taken out of service and the belts or pulleys must be replaced.
7. All stock must be properly secured with a vise or clamps prior to a machining process.
8. If the stock slips in the vise or clamp, the operator must not attempt to hold the work with his/her hand or try to tighten the vise/clamp while the machine is in motion. Shutdown the power to the machine prior to re-tightening the loose stock.
9. Use the correct speed and drill for the type of stock being machined.
10. Use the appropriate bit for the stock being machined. Bits with feed screw or extremely long bits should not be used.
11. The drill bit should be mounted the full depth and in the center of the chuck.
12. Position the table and adjust the feed stroke eliminating the possibility of the bit striking the table.
13. Feed the bit smoothly into the work. If the hole being drilled is deep, withdraw the bit frequently to remove shaving on the bit.
14. Never attempt to remove a broken drill with a center punch or hammer.
15. When an operator has finished working on the drill press, and before leaving the drill press for any reason, the power must be shut off and the machine must come to a complete stop.
16. When an operator observes an unsafe condition on the drill press, or stock that is being worked on, they must report it immediately to the PI.

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VERTICAL BANDSAW

1. Ensure the blade is properly adjusted prior to turning on the machine.
2. Check to ensure the band saw blade is sharpened
3. Check to ensure the band saw is correct for the type of stock and correct speed being used.
4. Allow the saw to reach full set speed prior to cutting stock.
5. Do not force stock into the saw blade. Let the speed of the blade cut stock appropriately.
6. Make “release” cuts before cutting long curves.
7. Plan saw cuts to avoid backing out of curves in the stock.
8. Never push a piece of stock with hands in front of the saw blade. Use a push stick. Keep hands at a safe distance on either side of the stock being machined.
9. Use a push stick or board to push small or irregular sized stock. Small work pieces can also be secured with a tabletop vise or clamp.
10. All round stock must be secured in a tabletop vise or clamp prior to starting the cut.
11. Hold the stock flat on the table prior to starting the cut.
12. If the saw blade binds on a piece of stock, turn the saw off and wait until it comes to a complete stop before attempting to remove the blade from the stock.
13. Do not allow large quantities of chips to accumulate around the work piece or drill press table. After stopping the machine, use a brush or rag to remove all excess chips from the drill press table and stock.

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BELT & DISC SANDERS

1. Access to Emergency Stop buttons
2. Ensure the machine and area is clean and free from obstacles.
3. Ensure all guards and adjustable table on disc sander are secured and correctly fitted.
4. Never use without extraction and appropriate dusk mask.
5. Never attempt an operation if you are unsure of what you are doing.
6. Never use for more than one operation at any one time- belt sanding or disc sanding.
7. Ensure the on –off switch works correctly.
8. Check that the sanding belt & disc are installed correctly.
9. Adopt a comfortable stance appropriate to the operation that you are performing.
10. Ensure work is held correctly-. Sitting firmly on right hand side of disc table
11. Use firm, forward pressure without overloading the machine.
12. Ensure area is left in clean condition and any waste is removed.