



## Naval Support Detachment Monterey / Naval Postgraduate School



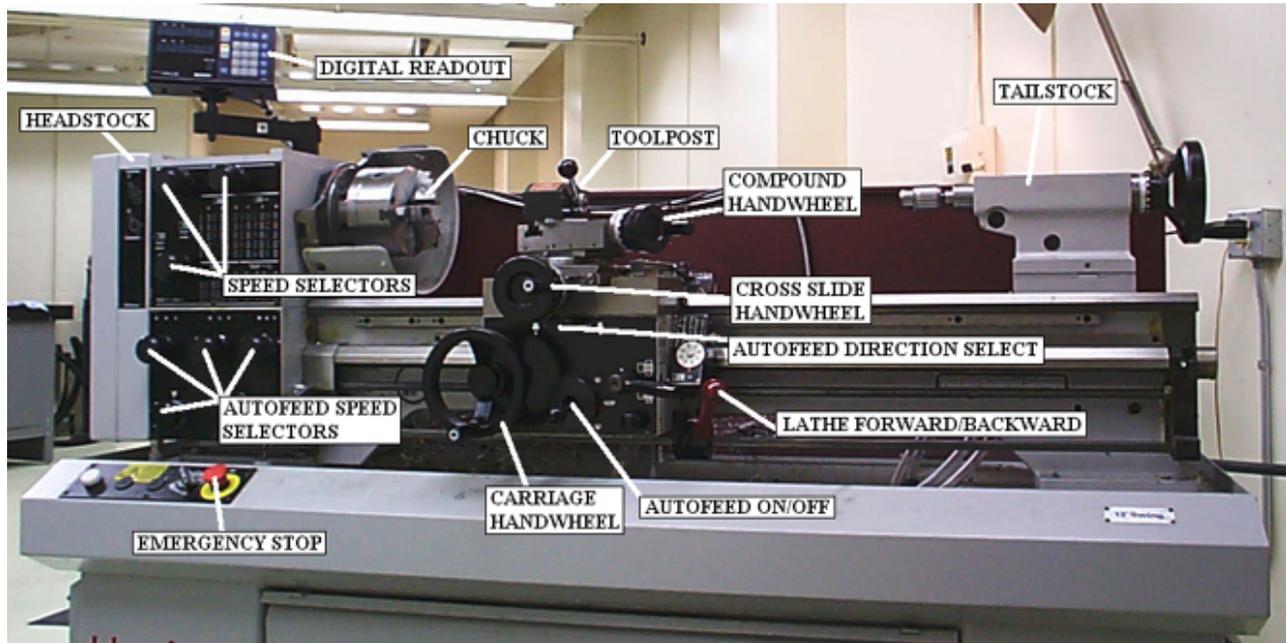
# SAFETY GRAM

## LATHES (Wood or Metal)

June 19, 2009

**Background:** A lathe is a machine that “turns” a workpiece about its own centerline, and into the cutting tool edge, but except for this rotation, the workpiece does not move. The cutting tool is mounted in a traveling tool holder that can move into the work and along its length. The workpiece is mounted in one of two basic ways: 1) *Between Centers*. A mounting hole is drilled into each end of the work, the stock is mounted between centers, and a special “turning dog” secures the workpiece to the headstock shaft so it will turn. 2) *In A Chuck*. A chuck is a jaw-type holding device mounted on the head-stock shaft that clamps the work securely. The chuck is used for short or thick stock and or “Facing” (cutting the accessible end) and for internal cutting.

“Between Centers” is used for long of thin stock to prevent deflection. Additional support may be given



through “steady” or “follow” rests placed against the sock at points between the centers.

**Purpose:** The purpose of this Safety Gram is to highlight the safety devices associated with the use of lathes. This document is not all inclusive of the specific process of “turning” stock. Specific training is required prior to your use in your departmental lab / machine shop. OJT training will be provided by supervisors / lab managers.

**The purpose of machine guarding is to protect the machine operator and other employees in the work area from hazards created by ingoing nip points, rotating parts, flying chips.**





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**Scope & Applicability:** Lathe machinery regulatory requirements are applicable to all faculty, staff, and students, temporary/term, contract, and permanent employees as well as visitors who may be engaged in operating lathe machinery located within NSAM/NPS labs, machine shops and other facilities.

**Operation of Machine & Wood Lathe Machinery (29 CFR 1910.212 & .213):**

1. Machine guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, and flying chips. The guard shall be such that it does not offer an accident hazard in itself.
2. Point of operation (guarding) - is the area on a machine where work is actually performed upon the material being processed. The guarding device shall be in conformity with any appropriate standards therefor, or, in the absence of applicable specific standards, shall be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.
3. Anchoring fixed machinery. Machines designed for a fixed location shall be securely anchored to prevent walking or moving.
4. Each machine shall be so constructed as to be free from sensible vibration when the largest size tool is mounted and run idle at full speed.
5. A mechanical or electrical power control shall be provided on each machine to make it possible for the operator to cut off the power from each machine without leaving his position at the point of operation.
6. On applications where injury to the operator might result if motors were to restart after power failures, provision shall be made to prevent machines from automatically restarting upon restoration of power.
7. Power controls and operating controls should be located within easy reach of the operator while he is at his regular work location, making it unnecessary for him to reach over the cutter to make



- adjustments. This does not apply to constant pressure controls used only for setup purposes.
8. On each machine operated by electric motors, positive means shall be provided for rendering such controls or devices inoperative while repairs or adjustments are being made to the machines they control.
9. Profile and swing-head lathes and wood heel turning machine. Each profile and swing-head lathe shall have all cutting heads covered by a metal guard. If such a guard is constructed of sheet metal, the material used shall be not less than one-sixteenth inch in thickness; and if cast iron is used, it shall not be less than three-sixteenths inch in thickness.
10. Cutting heads on wood-turning lathes, whether rotating or not, shall be covered as completely as possible by hoods or shields.



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11. Shoe and spoke lathes, doweling machines, wood heel turning machines, and other automatic wood-turning lathes of the rotating knife type shall be equipped with hoods enclosing the cutter blades completely except at the contact points while the stock is being cut.
12. Lathes used for turning long pieces of wood stock held only between the two centers shall be equipped with long curved guards extending over the tops of the lathes in order to prevent the work pieces from being thrown out of the machines if they should become loose.
13. Where an exhaust system is used, the guard shall form part of the entire exhaust hood.

**Standard Operating Procedure:**

**1. PERSONAL PROTECTIVE EQUIPMENT REQUIRED:**

- (a) Goggles or Face Shield (Impact Resistant)
- (b) Hearing Protection

**2. OPERATION:**

**WARNING!** Lathe chips are sharp; do NOT remove them with your hands.

**DANGER!** an air hose should NEVER be used to remove chips. The flying particles might injure you or a nearby person.

- a) Only authorized personnel shall operate this equipment.
- b) Dress appropriately! Remove necktie, necklace, wrist watch, rings and other jewelry, and loose fitting sweaters. Wear an apron or a properly fitted shop coat. Safety glasses are a must!
- c) Clamp all work solidly! Use the correct size tool and work holding device for the job. Get help when handling large sections of metal and heavy chucks and attachments.
- d) Check work frequently when it is being machined between centers. The work expands as it heats up and could damage the tailstock center.
- e) Be sure all guards are in place before attempting to operate the machine.
- f) Turn the faceplate or chuck by hand to be sure there is NO binding or danger of the work striking any part of the lathe.
- g) Keep the machine clear of tools!
- h) Stop the machine before making measurements and adjustments.
- i) Remember--chips are sharp! Do NOT try to remove them with your hands when they become "stringy" and build up on the tool post. Stop the machine and remove them with a suitable tool such as pliers.
- j) Do NOT permit small diameter work to project too far from the chuck without support from the tailstock. Without support, the work will be tapered, or worse, spring up over the cutting tool and/or break.



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**(Lathe SOP continued)**

- k) Be careful NOT to run the cutting tool into the chuck. Check any readjustment of work or tool for ample clearance when the cutter has been moved left to the farthest point that will be machined.
- l) Stop the machine before attempting to wipe down, a machine surface.
- m) Before repositioning or removing work from the lathe, move the cutting tool clear of the work area. This will prevent accidental cuts from the cutter bit.
- n) Avoid talking to anyone while running a lathe! Do NOT permit anyone to fool around with the machine while you are operating it. You are the only one who should turn the machine on or off, or make adjustments to the lathe.
- o) If the lathe has a threaded spindle nose, never attempt to run the chuck on or off the spindle using power. It is also dangerous practice to stop such a lathe by reversing the direction of rotation. The chuck could spin off and cause serious injury to you. There is also the danger of damaging the machine.
- p) You should always be aware of the direction of travel and speed of the carriage before engaging the half-nuts or automatic feed.
- q) Always remove the key from the chuck. Make it a habit NEVER to let go of the key until it is out of the chuck and clear of the work area.
- r) Tools must NOT be placed on the lathe ways. Use a tool board or place them on the lathe tray.
- s) When filing on the lathe, be sure the file has a securely fitting handle.
- t) Stop the machine immediately if some off sounding noise or vibration develops during operation. If you cannot locate the trouble, get help from your instructor. Under no condition should the machine be operated until the trouble has been corrected.
- u) Remove sharp edges and burrs from work before removing it from the machine.
- v) Plan your work thoroughly before starting. Have all needed tools on hand.
- w) Use care when cleaning the lathe. Chips sometimes stick in recesses. Remove them with a brush or short stick., NEVER clean a machine tool with compressed air.

**DANGER!** Stop the machine before making measurements or cleaning out chips!

**SAFETY NOTE!** Under NO condition should a lathe be reversed to brake it to a stop!