

Safe Operation of a Lathe (Manual Metalworking Lathe)

Standard Operating Procedure (SOP)

1. Purpose

To ensure the safe and correct operation of a manual engine lathe for turning, facing, drilling, boring, threading, and parting operations while preventing serious injury and machine damage.

2. Scope

Applies to all personnel operating centre lathes (gap-bed, toolroom, or engine lathes).

3. Responsibilities

Operator: Must be fully trained and authorized. Never operate alone until signed off. Never by-pass safety devices.

Supervisor/Instructor: Verify training, machine condition, work-holding, and tooling before use.

4. Required Personal Protective Equipment (PPE)

- Safety glasses or full face shield
- Hearing protection (mandatory)
- NO gloves, rings, watches, neckties, loose sleeves, or long hair - must be tied back.
- Short or tightly rolled sleeves
- Steel-toe boots

5. Pre-Operation Checks

Machine condition:

- Clean – no chips on ways, chuck, or cross-slide
- All guards in place (chuck guard, leadscrew cover, splash guard)
- Way oil reservoirs full; one-shot oiler works
- No oil leaks, loose bolts, or unusual noises

Work-holding:

- 3-jaw or 4-jaw chuck: jaws clean, correct step, scrolled properly
- Workpiece does NOT extend more than 3× diameter beyond chuck without steady rest
- Tailstock centre or drill chuck tight and aligned

Tooling:

- Tool bits sharp and correctly ground
- Tool height on centre
- Tool post and holder rigid – minimum overhang

Speeds & Feeds:

- Correct spindle RPM for diameter and material (never exceed machine plate)
- Feed direction and rate selected before engaging

6. Safe Operating Procedure**Start-Up**

1. Put on all PPE.
2. Remove chuck key (hang on hook or use spring-eject type).
3. Close and latch chuck guard.
4. Start spindle in lowest speed; listen for abnormal noise.
5. Jog carriage and cross-slide to confirm smooth movement.

Turning & Facing

- Take light trial cut to verify setup.
- Use sharp tools and proper cutting fluid (flood coolant or brush-on).
- Never let tool rub – it work-hardens the material.
- Keep hands clear of rotating workpiece and chuck.

Drilling / Boring with Tailstock

- Use only tailstock-rated drill chucks or centres.
- Peck drill holes deeper than 3× diameter.
- Lubricate centre with anti-seize or grease.

Threading

- Use thread dial correctly; never engage half-nuts while spindle stopped.
- Clear chips frequently; use cutting oil.
- Stop machine at end of thread cut. Back out cross slide. Use reverse function to return to start of cut.

7. Shut-Down Procedure

1. Stop spindle and wait for complete stop.
2. Move carriage to tailstock end.
3. Retract tool and tailstock.

4. Brush or vacuum chips (never use compressed air on yourself).
5. Apply light way oil to all unpainted surfaces.
6. Remove tooling and workpiece.
7. Leave chuck key out and machine clean.

8. Absolutely Prohibited Actions

- Never leave chuck key in chuck
- Never wear gloves while lathe is running
- Never stop a rotating chuck with your hand
- Never adjust or measure while workpiece is turning
- Never engage feed or half-nuts while spindle is stopped (threading)
- Never run lathe with chuck guard open
- Never take heavy roughing cuts without back gear engaged
- Never use cracked or damaged tool bits or centres
- Never reach over or around a spinning workpiece

9. Emergency Procedures

- Hit stop button
- Power off at main disconnect for electrical faults or shock
- Report all incidents immediately

10. Maintenance & Inspection

- Daily: Clean, oil ways, check oil levels
- Weekly: Check chuck jaws, back lash, belt tension
- Monthly: Lubricate headstock and apron gears
- Annually: Professional spindle bearing check and alignment

11. Training Requirements

Operators must complete:

- Supervised hands-on setup and operation
- Successful completion of three different jobs (facing, turning, threading) with final inspection, or the operator will be limited only to the type of job that has been inspected and passed assessment for
- Practical test before solo authorization

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