

CONVENTIONAL LATHES

Equipment Identification:

Completed by:

Date:

MACHINE ACTION TOOL

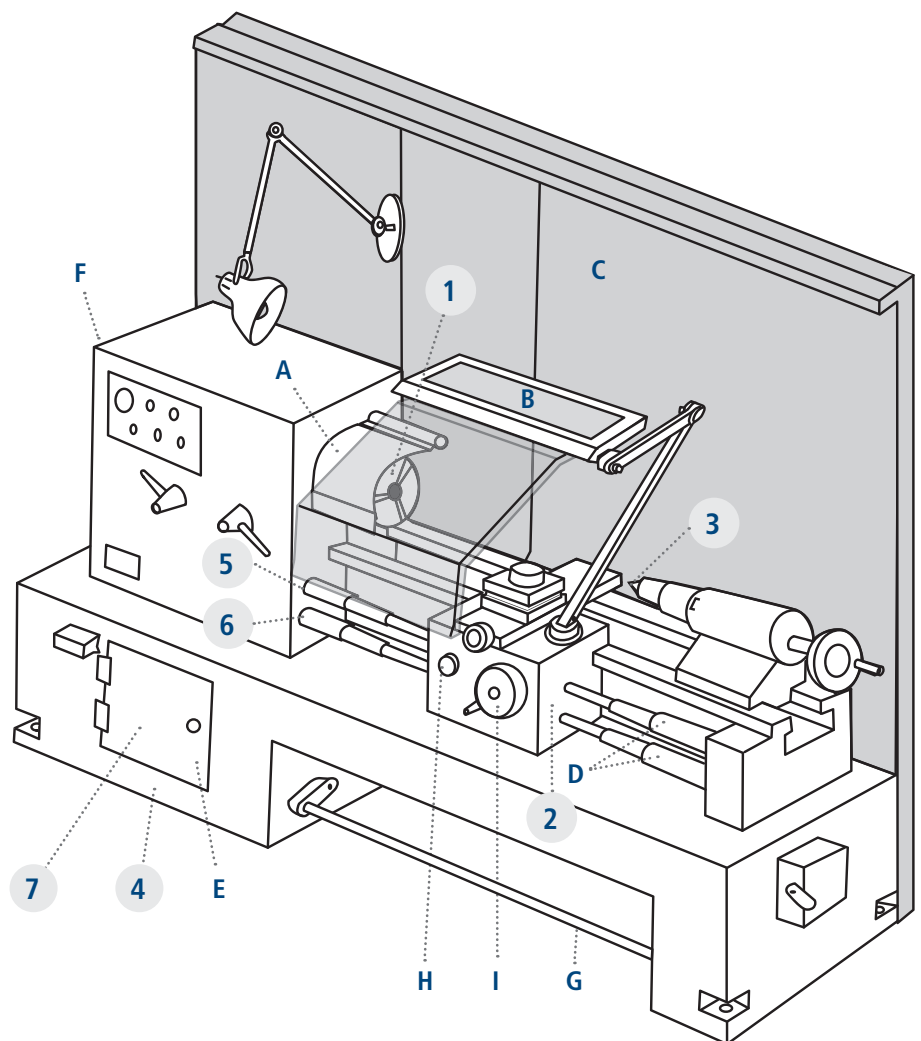
The purpose of this technical sheet is to provide information on the main risk factors associated with conventional lathes and to propose different ways to control them.

Manual lathe components

- 1 Chuck
- 2 Tool holder
- 3 Tailstock
- 4 Frame
- 5 Leadscrew
- 6 Feedshaft
- 7 Access to power transmission elements

Safety features

- A Interlocking chuck guard
- B Movable front guard
- C Rear guard
- D Leadscrew and feedshaft protectors
- E Fixed or interlocking guard
- F Rear spindle end guard
- G Foot-operated emergency stop
- H Emergency stop button
- I Handwheel with automatic disengagement or plain solid



CONVENTIONAL LATHES

HOW TO USE THIS DOCUMENT?

In the manner of an audit:

- Systematically review potential risk factors and identify those that are present.
- For each of the identified risk factors, review the proposed prevention measures to select those that seem most appropriate.

For training purposes:

- Target the instructions within the set of prevention measures.
- Provide the necessary means to comply with the instructions.
- Pass on instructions to workers and ensure their implementation.

CAUTION

This document focuses only on mechanical and electrical risk factors. However, there may be other risk factors when using this machine, including those of a chemical, biological or ergonomic nature.

DESCRIPTION

The lathe is a machine tool that allows the shaping of parts by chip removal. The machine process steps are individually controlled by the operator without the aid of a CNC digital program. Unlike many other machine tools, it is the workpiece that rotates and the tool that is held stationary.

INJURIES



The most common injuries with this machine are cuts, amputation, fractures, crushing and foreign objects, electrification and burns.

RISK FACTORS

#	MECHANICAL	PRESENT? (Yes / No)
1	Contact with the rotating part or chuck	
2	Accidentally starting the lathe during maintenance or repair	
3	Contact with the power transmission elements	
4	Contact with the sharp edges of the stationary workpiece, chips, or tool	
5	Fall of material	
6	Falling, slipping	
7	Projections of various elements (chuck key, tool fragments, part, chips, etc.)	
7 a)	Projection of the chuck key	
7 b)	Projection of fragments in case of tool breakage	
7 c)	Projection of the part or fragments due to a poorly secured part	
7 d)	Projection of fragments due to wrong cutting parameters	
7 e)	Chip projection and movement	
#	ELECTRIC	
8	Contact with elements usually or accidentally energized	

1

CONTACT WITH THE ROTATING PART OR CHUCK**PREVENTIVE MEASURES**Applied ☒Not applicable ☐ n/a

NOTES (responsible / schedule / priority)

TECHNICAL MEASURES

Install an interlocking chuck guard without a locking device* linked with the spindle drive.	<input type="checkbox"/>	
<ul style="list-style-type: none"> The guard covers the entire chuck body, from the frame to the end of the jaws. The guard should cover at least the top half of the chuck. 		
Install a clear, movable guard in front of the cutting area.	<input type="checkbox"/>	
Install a guard for the leadscrew and feedshaft if accessible.	<input type="checkbox"/>	
Modify the handwheels so that they have automatic disengagement or are plain solid (no spokes).	<input type="checkbox"/>	
Install a valve to adjust the flow of cutting fluid to have easy access without getting close to the chuck or the rotating part.	<input type="checkbox"/>	
Install a brake (mechanical, electrical, etc.) to quickly stop the rotation of the chuck and the workpiece.	<input type="checkbox"/>	
Install an emergency stop device within reach of the worker. The emergency stop must activate the brake.	<input type="checkbox"/>	

SAFETY INSTRUCTIONS

Wait for the complete stop of the chuck rotation before carrying out any intervention near the chuck or the part, such as removing or fixing a part, measuring, removing chips, etc.	<input type="checkbox"/>	
Use a brush with long, smooth handle without loops or hooks to remove chips.	<input type="checkbox"/>	
Never approach the rotating workpiece or chuck with gloves or a rag.	<input type="checkbox"/>	
Wear close-fitting clothing.	<input type="checkbox"/>	
Do not wear jewelry.	<input type="checkbox"/>	
Tie back long hair and contain it in a cap.	<input type="checkbox"/>	
Never leave the chuck and workpiece running unattended.	<input type="checkbox"/>	
Do not use hand tools (lathe file and emery cloth) to deburr or finish a part. Use a system specifically designed and adapted for deburring or polishing operations that keeps hands away from the danger zone and thus reduces the risk of being caught.	<input type="checkbox"/>	

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ACCIDENTALLY STARTING THE LATHE DURING MAINTENANCE OR REPAIR**PREVENTIVE MEASURES**Applied ☒Not applicable ☐ n/a

NOTES (responsible / schedule / priority)

SAFETY INSTRUCTIONS

Apply a lockout procedure during maintenance or repair work:	<input type="checkbox"/>	
<ul style="list-style-type: none"> Isolate energy sources Lock out the isolation devices Dissipate residual energy Make sure that no start-up is possible. 		

3

CONTACT WITH THE ELEMENTS OF THE MOVEMENT TRANSMISSION MECHANISMS**PREVENTIVE MEASURES**Applied ☒Not applicable ☐ n/a

NOTES (responsible / schedule / priority)

TECHNICAL MEASURES

Install fixed or interlocking* guards to limit access to pulleys, belts, gears, etc.	<input type="checkbox"/>	
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*NOTES

An interlocking guard without a locking device must have the following characteristics:

- It causes the machine or its dangerous parts to stop working when it is moved;
- It makes it impossible to start the machine or to operate its dangerous parts until it is replaced;
- it does not cause the machine or its dangerous parts to start up when it is put back in place.

For interlocks, use a safety switch with forced opening of the contacts, installed according to the positive actuation principle.

**CONTACT WITH THE CUTTING EDGES OF THE STATIONARY WORKPIECE,
CHIPS, OR TOOL**

PREVENTIVE MEASURES

Applied ☒Not applicable n/a

NOTES (responsible / schedule / priority)

SAFETY INSTRUCTIONS

Mount the part as far away from the tool as possible.	<input type="checkbox"/>	
Coat the end of the tool with a material that protects against sharp edges during handling.	<input type="checkbox"/>	
Use a rag or cut-resistant gloves for handling, only when the workpiece and chuck are stopped.	<input type="checkbox"/>	
Prefer tightening the mounting elements of the part and the tool by pulling towards you.	<input type="checkbox"/>	
Immediately store unused cutting tools.	<input type="checkbox"/>	
Remove the chips with a brush.	<input type="checkbox"/>	

5

FALL OF MATERIAL

PREVENTIVE MEASURES

Applied ☒

Not applicable n/a

NOTES (responsible / schedule / priority)

TECHNICAL MEASURES

Anchor the lathe frame securely to the floor.	<input type="checkbox"/>	
Provide mechanical handling equipment (hoist, lifting table transport trolley, etc.) adapted to the weight and size of the parts, tools and assembly accessories.	<input type="checkbox"/>	
SAFETY INSTRUCTIONS		
Check that there is no object on the lathe that could potentially fall.	<input type="checkbox"/>	
Wear CSA approved safety shoes with steel toe caps.	<input type="checkbox"/>	

6

FALLING, SLIPPING

PREVENTIVE MEASURES

Applied ☒Not applicable n/a

NOTES (responsible / schedule / priority)

TECHNICAL MEASURES

Install a movable transparent guard in front of the cutting area to prevent the projection of chips or cutting fluid.	<input type="checkbox"/>	
Install a screen behind the lathe to prevent chips or fluids from splashing onto the floor.	<input type="checkbox"/>	
Repair and clean the floor: uneven surface, holes, slippery floor, presence of chips, etc.	<input type="checkbox"/>	
Install a mat with beveled edges.	<input type="checkbox"/>	
SAFETY INSTRUCTIONS		
Minimize cutting fluid flow and pressure.	<input type="checkbox"/>	
Direct the cutting fluid stream to minimize splashing.	<input type="checkbox"/>	

Remarks

[illegible]

PROJECTIONS OF VARIOUS ELEMENTS (CHUCK KEY, TOOL FRAGMENTS, PART, CHIPS, ETC.)

PREVENTIVE MEASURES

Applied ☒Not applicable ☐

NOTES (responsible / schedule / priority)

TECHNICAL MEASURES

Install a chuck guard.	<input type="checkbox"/>	
Install a clear, movable guard in front of the cutting area.	<input type="checkbox"/>	
Install a screen behind the lathe at a height of 1.8 meters (6 feet). This height can be adjusted according to the distance (see ISO 13857: 2008.) Another option is to install the lathe next to a wall.	<input type="checkbox"/>	
Orient the lathe in such a way as to prevent the projections from reaching workstations nearby.	<input type="checkbox"/>	

SAFETY INSTRUCTIONS

Tangent (position the cutting tool in relation to the workpiece) only when the workpiece is rotating.	<input type="checkbox"/>	
Stop the lathe if an unusual vibration or sound is heard.	<input type="checkbox"/>	
Wear a CSA approved safety glasses with side shields near the lathe.	<input type="checkbox"/>	
If necessary, wear a CSA approved safety face shield in addition to protective eyewear.	<input type="checkbox"/>	

7 a) PROJECTION OF THE CHUCK KEY

PREVENTIVE MEASURES

Applied ☒Not applicable ☐

NOTES (responsible / schedule / priority)

TECHNICAL MEASURES

Provide a spring-loaded chuck key (self-ejecting) to install the workpiece on the chuck.	<input type="checkbox"/>	
Make sure the chuck guard cannot be put on while the key is still on the chuck.	<input type="checkbox"/>	

SAFETY INSTRUCTIONS

Make sure the key is removed from the chuck before starting the lathe.	<input type="checkbox"/>	
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7 b) PROJECTION OF FRAGMENTS IN CASE OF TOOL BREAKAGE

PREVENTIVE MEASURES

Applied ☒Not applicable ☐

NOTES (responsible / schedule / priority)

SAFETY INSTRUCTIONS

Check that the cutting edges of the tool are in good condition.	<input type="checkbox"/>	
Securely attach the inserts and cutting tools before starting the machine.	<input type="checkbox"/>	
Stop the rapid feed at a sufficient distance from the workpiece assembly.	<input type="checkbox"/>	

7 c) PROJECTION OF THE PART OR FRAGMENTS DUE TO A POORLY SECURED PART

PREVENTIVE MEASURES

Applied ☒Not applicable ☐

NOTES (responsible / schedule / priority)

SAFETY INSTRUCTIONS

Make sure that the part is secured in the chuck according to best practices.	<input type="checkbox"/>	
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7 d) PROJECTION OF FRAGMENTS DUE TO WRONG CUTTING PARAMETERS

PREVENTIVE MEASURES

Applied ☒Not applicable ☐

NOTES (responsible / schedule / priority)

SAFETY INSTRUCTIONS

Consult the tool manufacturer's data or other technical information to choose the right cutting parameters combination (feed rate, depth of cut, cutting speed, lubrication) according to the material, the operations to be carried out, the assembly method and the tool used.	<input type="checkbox"/>	
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7 e) CHIP PROJECTION AND MOVEMENT

PREVENTIVE MEASURES

Applied ☒

Not applicable ☐

NOTES (responsible / schedule / priority)

SAFETY INSTRUCTIONS

Choose the right cutting parameters to avoid long metal chips. ☐

Use cutting and drilling tools equipped with chip breakers. Otherwise, move back and forth when drilling. ☐

Use pliers to remove a long chip only when the chuck is stopped. ☐

The preferred method for cleaning chips should be the use of a brush. If compressed air is needed, make sure the pressure stays below 200 kPa (30 psi). Never blow with your mouth towards the chips to remove them. ☐

8 CONTACT WITH ELEMENTS USUALLY OR ACCIDENTALLY ENERGIZED

PREVENTIVE MEASURES

Applied ☒

Not applicable ☐

NOTES (responsible / schedule / priority)

TECHNICAL MEASURES

Install and identify a circuit breaker near the lathe. ☐

SAFETY INSTRUCTIONS

Apply a lockout procedure during maintenance or repair work: ☐

- Isolate energy sources
- Lock out the isolation devices
- Dissipate residual energy
- Make sure that no start-up is possible.

Check the insulation of the power cables and grounding of the electrical circuit of the lathe. ☐

Remarks

NEED ASSISTANCE?

Do not hesitate to consult your MultiPrevention consultants if you have any questions about this sheet or about occupational health and safety.

REFERENCES

The proposed preventive measures come in part from the Regulation respecting occupational health and safety (RROHS, S-2.1, r.13), the Quebec Act respecting occupational health and safety (AOHS, S-2.1), ISO Standard 23125, *Machine Tools-Safety - Turning Machines*, 2010 and the INRS safety data sheet, Lathes, 1998.

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