

MACHINE GUARDING: SPOT THE VIOLATION

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Industrial Hygiene**



2015 OSHA Most-cited Violations

- **1. Fall Protection – 1926.501**
- **2. Hazard Communication – 1910.1200**
- **3. Scaffolding – 1926.451**
- **4. Respiratory Protection – 1910.134**
- **5. Lockout/Tagout – 1910.147**
- **6. Powered Industrial Trucks – 1910.178**
- **7. Ladders – 1926.1053**
- **8. Electrical (wiring methods) – 1910.305**
- **9. Machine Guarding – 1910.212**
- **10. Electrical (general requirements) – 1910.303**

1910 Subpart O – Machinery and Machine Guarding

- **1910.211 Definitions**
- **1910.212 General requirements for all machines**
- **1910.213 Woodworking machinery requirements**
- **1910.214 Reserved**
- **1910.215 Abrasive wheel machinery**
- **1910.216 Mills and calenders in the rubber and plastics industry**
- **1910.217 Mechanical power presses**
- **1910.218 Forging machines**
- **1910.219 Mechanical power-transmission**

MACHINE GUARDING VIDEO



1910.212 GENERAL REQUIREMENTS FOR ALL MACHINES

1910.212 General requirements for all machines

- **Machine guarding for personnel:**
 - **Machine operator**
 - **Everyone else**
- **Point of Operation (POO) Guarding – Area on machine where work is being performed on the material being processed**
- **Keep your hands out of the POO!**

1910.212 General requirements for all machines

- **Point of Operation (POO) Guarding**
- **Barrels and Drums – Revolving drums, barrels, and containers shall be guarded by an enclosure which is interlocked with the drive mechanism**
- **Fans**

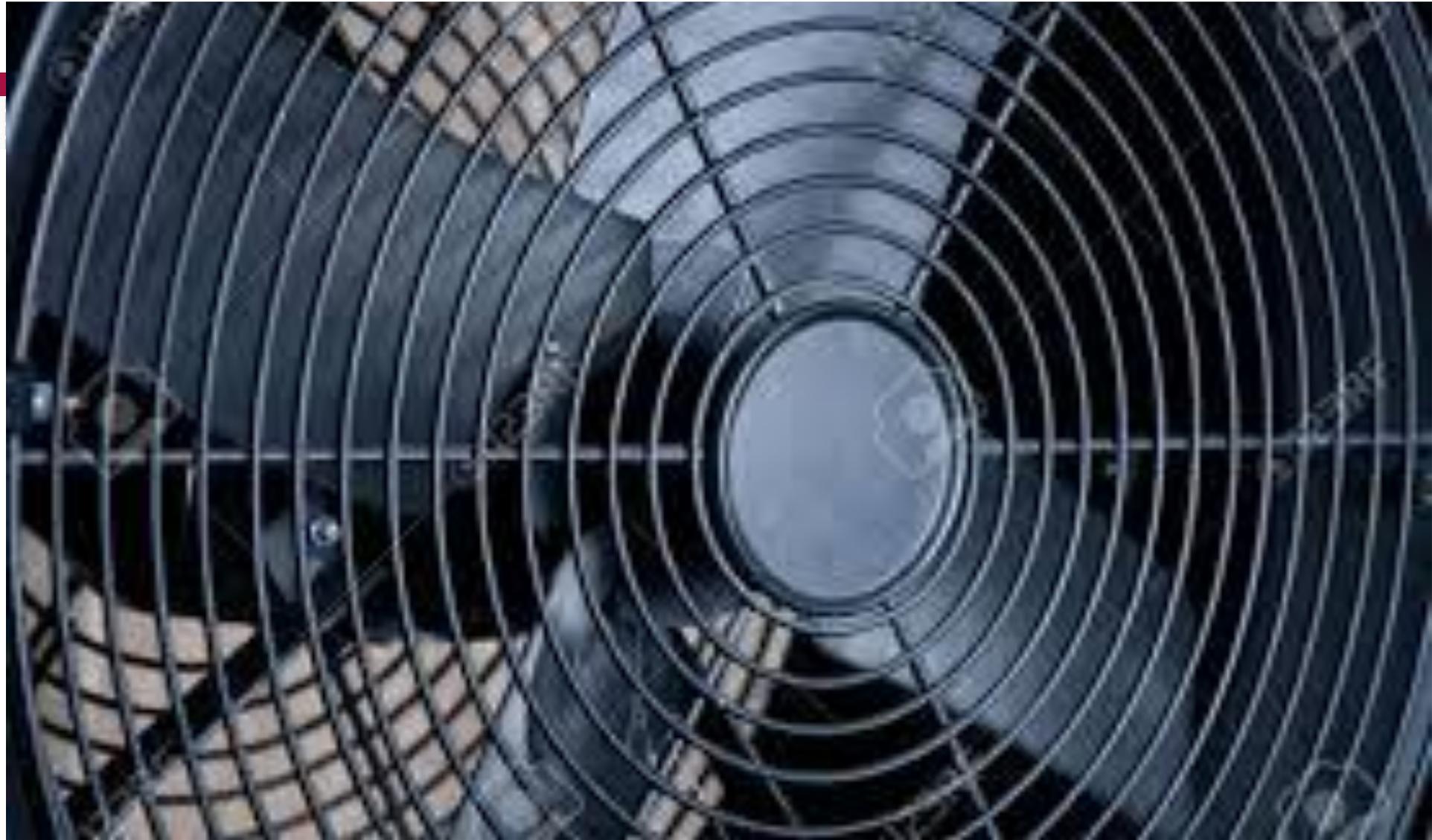
Fans – Exposure of blades less than 7 feet above ground, blades shall be guarded with openings of no more than 1/2 inch



Fans – Exposure of blades less than 7 feet above ground, blades shall be guarded with openings of no more than ½ inch



OSHA compliant machine guarding



1910.212 General requirements for all machines

- **Point of Operation (POO) Guarding**
- **Barrels and Drums – Revolving drums, barrels, and containers shall be guarded by an enclosure which is interlocked with the drive mechanism**
- **Fans – Exposure of blades less than 7 feet above ground, blades shall be guarded with openings of no more than 1/2 inch**
- **Anchoring Fixed Machinery**

Anchoring Fixed Machinery – Shall be securely anchored to prevent “walking” or moving



1910.212 General requirements for all machines

- **Point of Operation (POO) Guarding**
- **Barrels and Drums – Revolving drums, barrels, and containers shall be guarded by an enclosure which is interlocked with the drive mechanism**
- **Fans – Exposure of blades less than 7 feet above ground, blades shall be guarded with openings of no more than 1/2 inch**
- **Anchoring Fixed Machinery – Shall be securely anchored to prevent “walking” or moving**

ABRASIVE WHEEL MACHINERY (GRINDERS)

Grinder – Tool rest plate greater than 1/8 inch



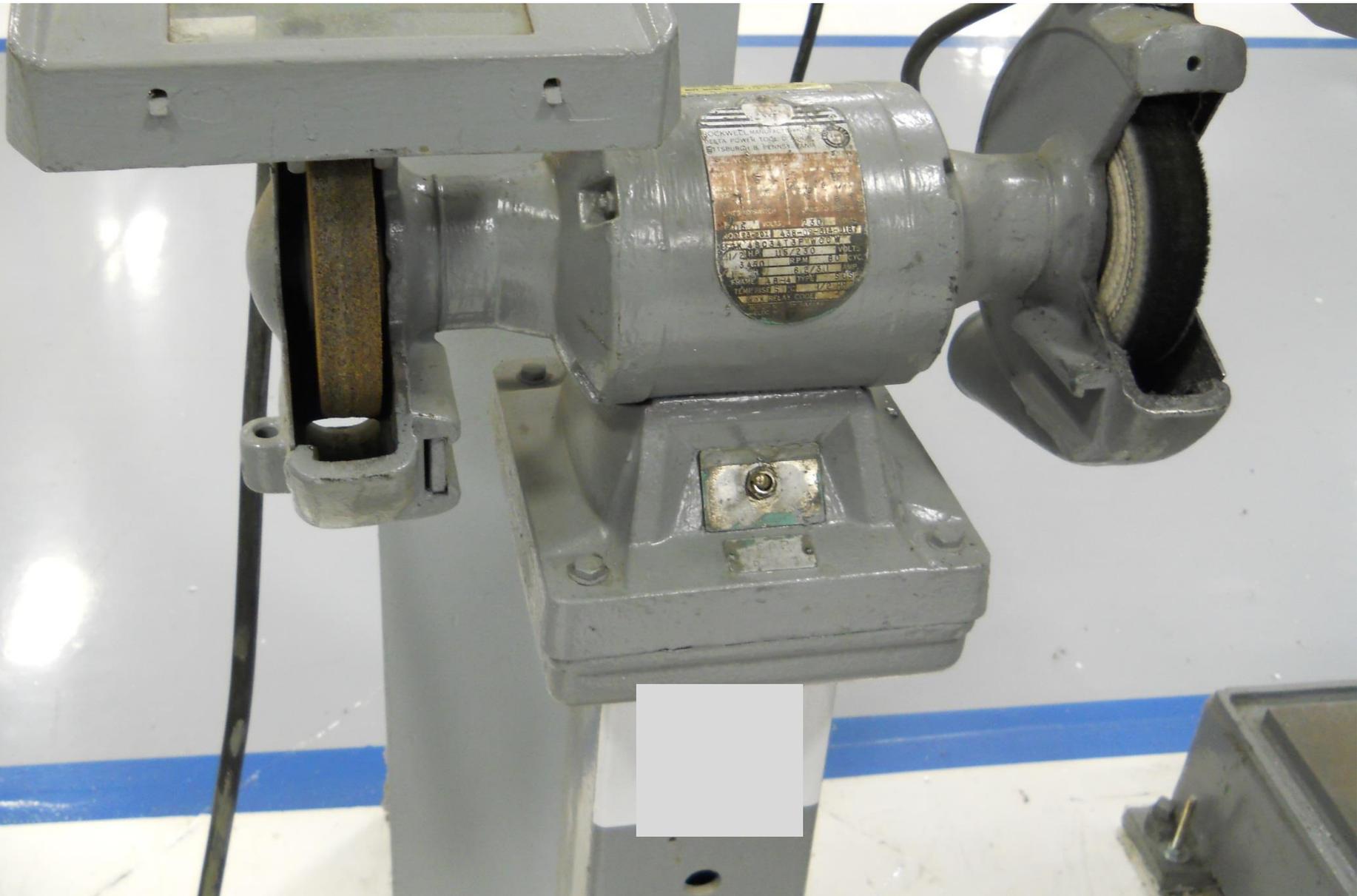
Grinder – Adjustable tongue guard gap greater than 1/4 inch



Grinder – Tool rest plate greater than 1/8 inch, and adjustable tongue guard gap greater than 1/4 inch



Grinder – No rest plate



Grinder – The safety guard shall cover the spindle end, nut, and flange projections. Also, no tongue guard



LATHES

Lathe - No chuck shield



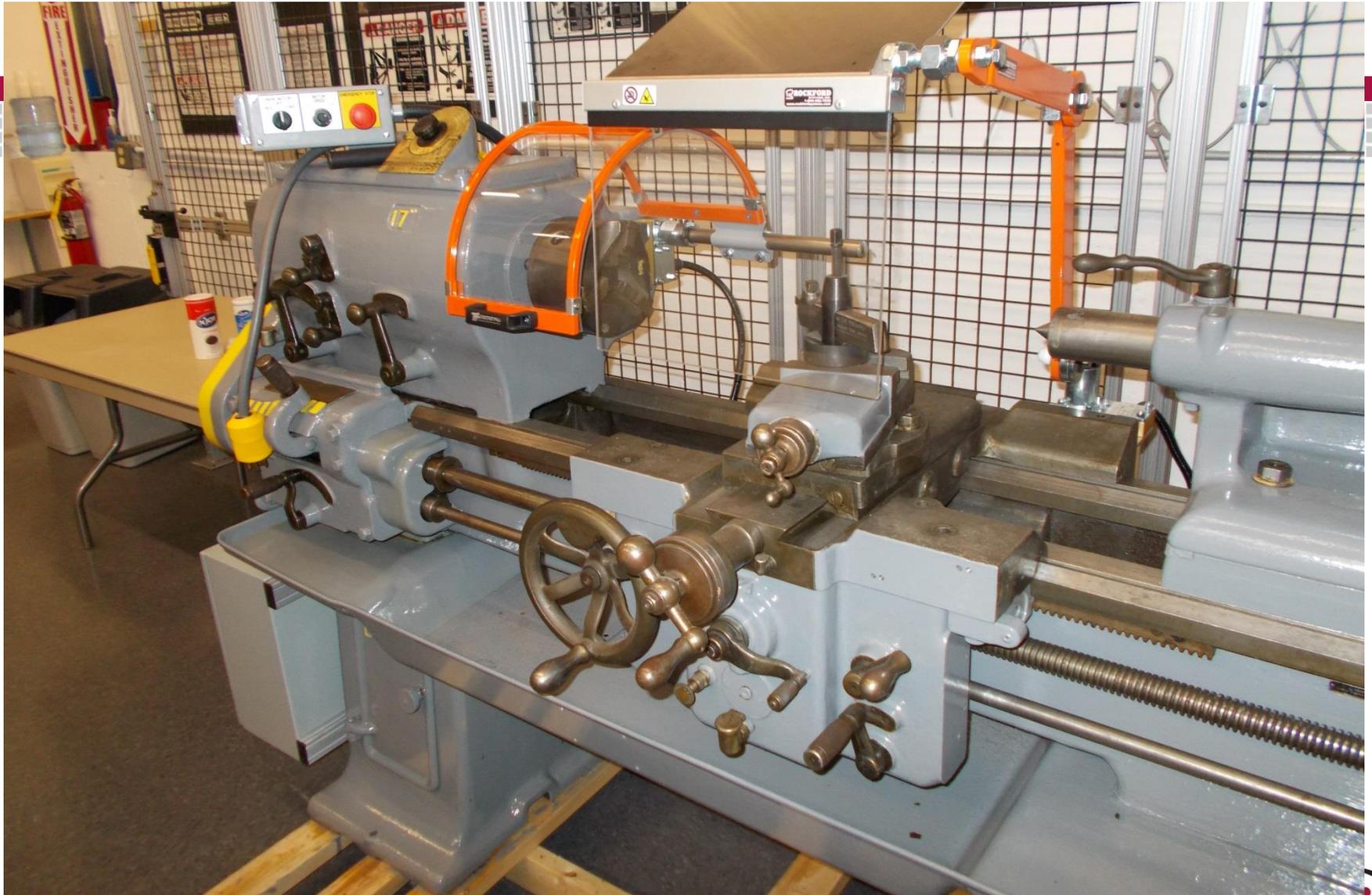
OSHA compliant machine guarding



OSHA compliant machine guarding



OSHA compliant machine guarding

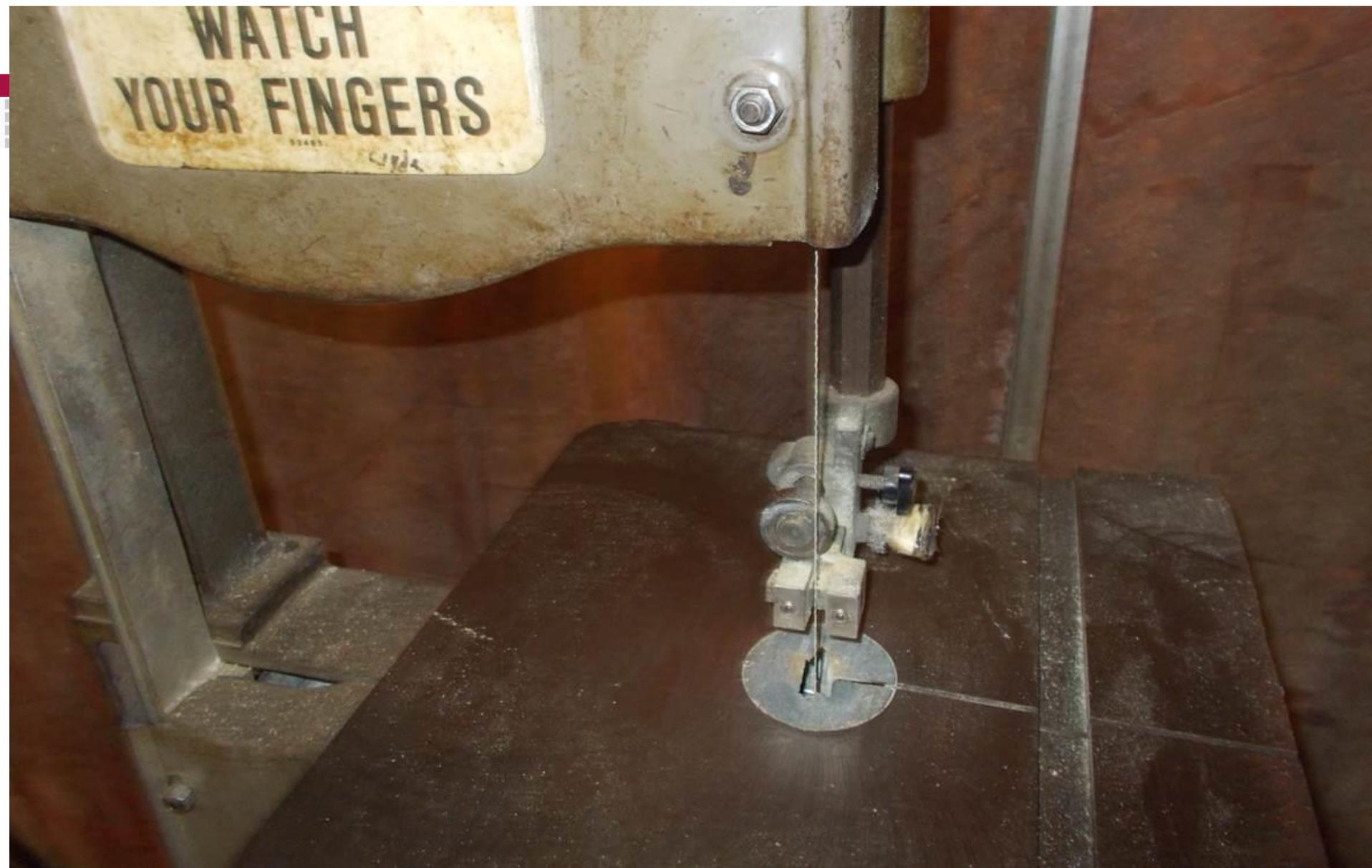


OSHA compliant machine guarding. Spring-loaded chuck key

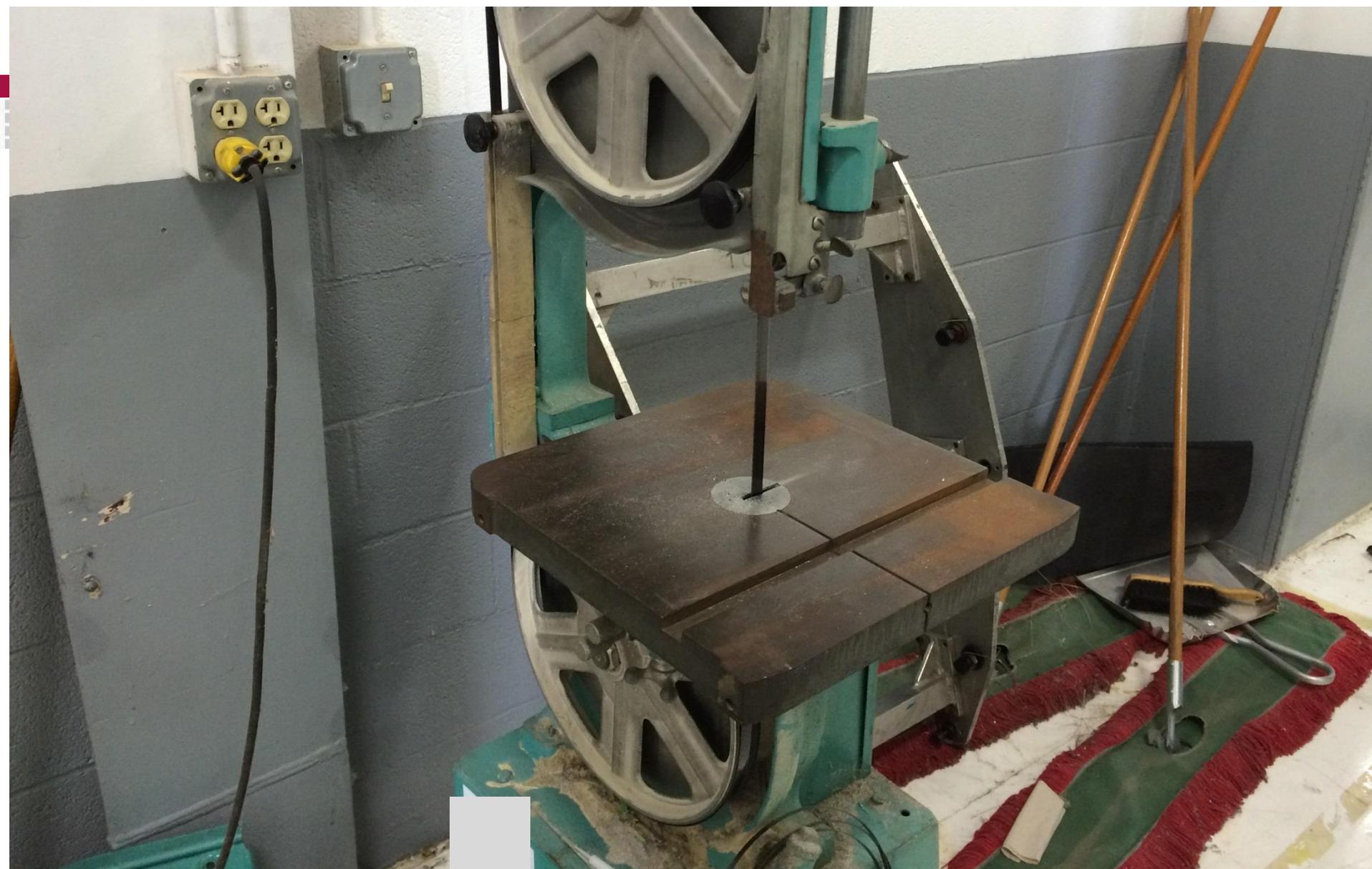


SAWS

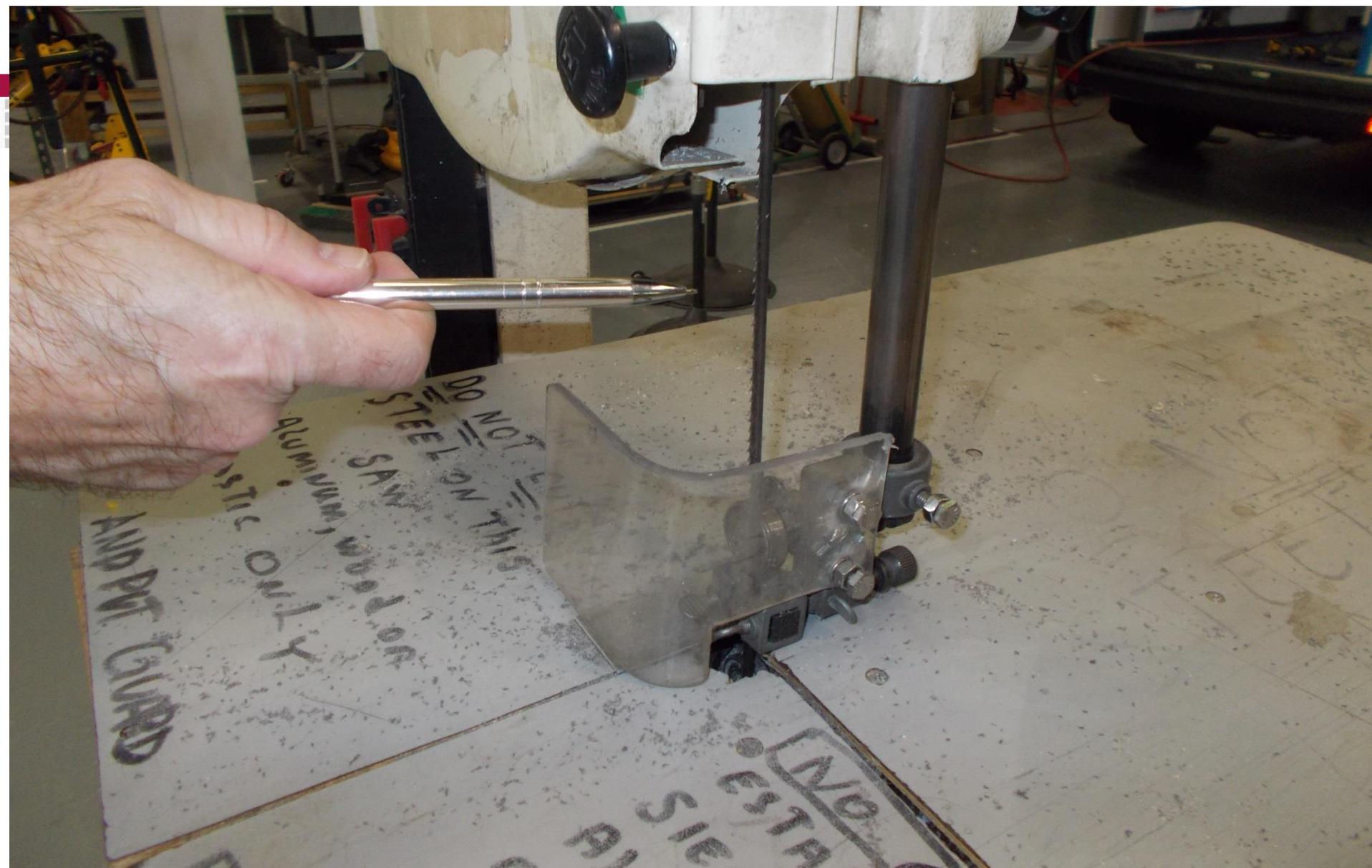
Band Saw – All portions of the saw blade shall be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and the table



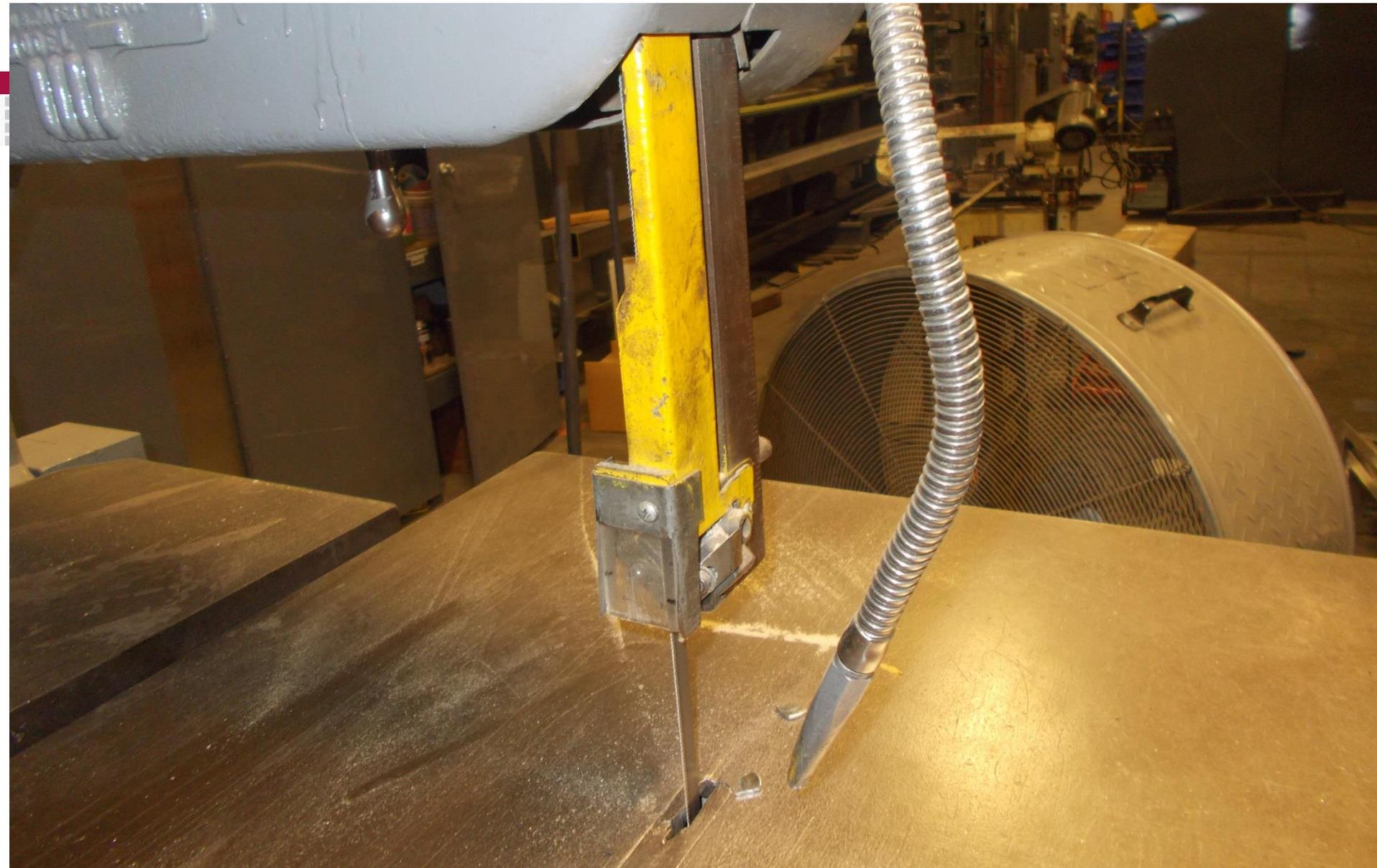
Band Saw – Blade not guarded and band saw wheels not fully encased



Band Saw – All portions of the saw blade shall be enclosed or guarded



OSHA compliant machine guarding?



Band Saw – All portions of the saw blade shall be enclosed or guarded



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Horizontal Saw – All portions of the saw blade shall be enclosed or guarded



Table Saw – Guard has been removed



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Radial Arm Saw – Auto return sufficient enough to return the blade to the starting position when released by the operator



Chop Saw – Guard secured with zip tie



DRILLS AND MILLING MACHINES

Drills – No point of operation chip shield



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OSHA compliant machine guarding



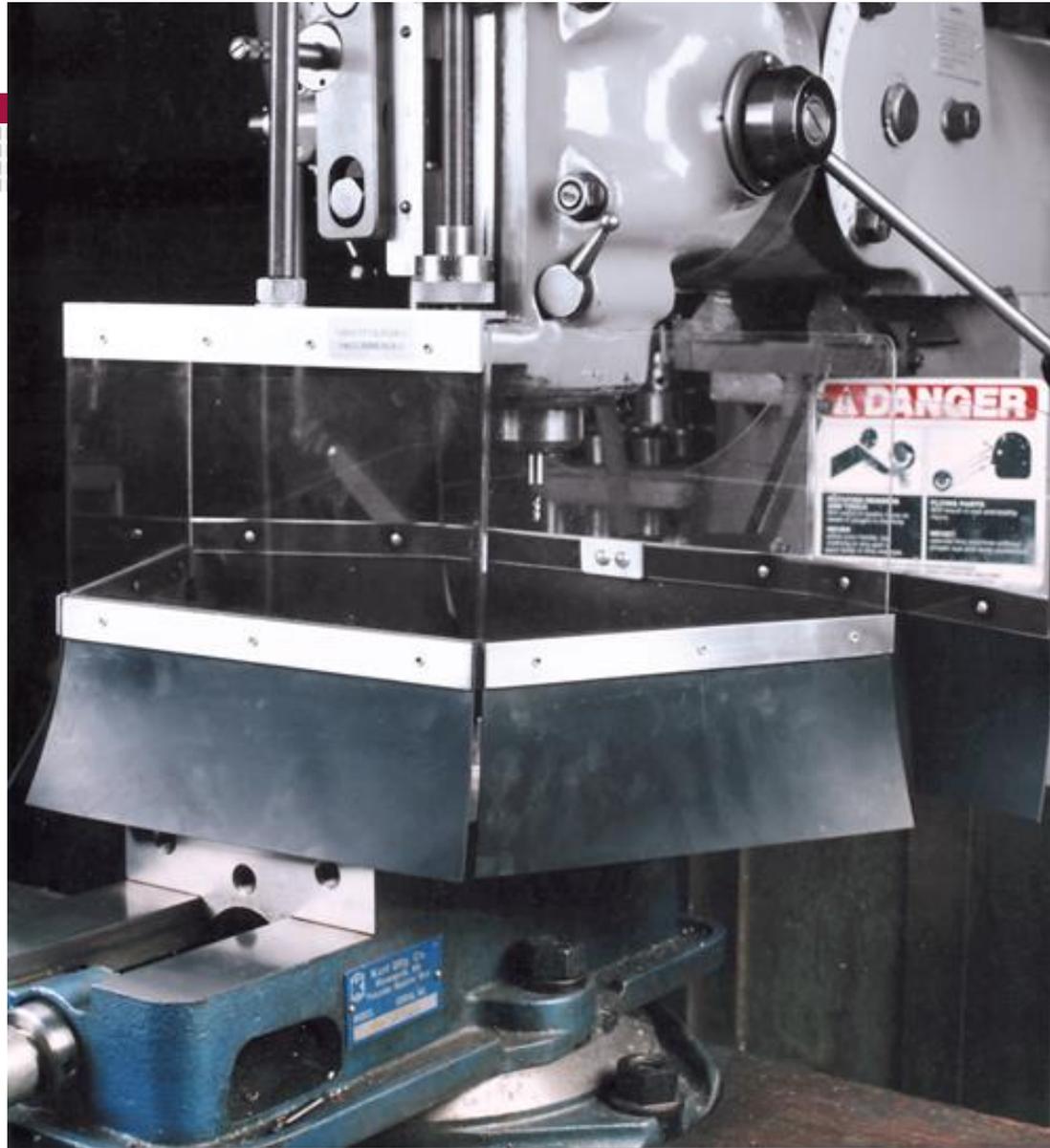
Drills – Chip shield is not solid material



Milling Machine – No point of operation chip shield



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SHEARS

Shear – Part of guard has been removed and does not prevent operator from coming into contact with shear blade



Guard does not prevent operator from coming into contact with shear blade



Machine Hazard Maximum Allowed Opening

Distance of opening from point of operation hazard (inches)	Maximum width of opening (inches)
0.5 to 1.5	0.250
1.5 to 2.5	0.375
2.5 to 3.5	0.500
3.5 to 5.5	0.625
5.5 to 6.5	0.750
6.5 to 7.5	0.875
7.5 to 12.5	1.250
12.5 to 15.5	1.500
15.5 to 17.5	1.875
17.5 to 31.5	1.875
32 and over	6.000

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Shear – Not guarded from the rear to keep non-operator personnel from reaching the point of operation



OSHA compliant machine guarding. Awareness barrier



OSHA compliant machine guarding



BRAKE PRESS

Brake Press – Operator has no point of operation protection



OSHA compliant machine guarding Laser light curtain, two-handed control, etc.



Two-handed controls too close together



Brake Press – Laser light curtain not long enough. Can reach point of operation from below



PINCH POINT, NIP POINT, OR ENTRAPMENT
You are exposed to moving machine parts that can crush, dismember, and cause death.
DO NOT operate this machine without safeguards in place.
NEVER place your hands or any part of your body in this machine.
NEVER operate this machine unless a presence-sensing device is installed at the proper safety distance.
WARNING: An injury will result in loss of limbs or sight, or could cause death. This sign does not cover all elements that could happen while operating this machine. Do not remove or cover this sign.

A WARNING
BLANKING
This sign is located near the blanking area of the machine. It is used to warn operators of the danger of the blanking area. The blanking area is the area where the blanking tool is used to cut the blank. The blanking area is a dangerous area and should be avoided. The blanking area is a dangerous area and should be avoided. The blanking area is a dangerous area and should be avoided.
MUTING
This sign is located near the muting area of the machine. It is used to warn operators of the danger of the muting area. The muting area is the area where the muting tool is used to cut the muting. The muting area is a dangerous area and should be avoided. The muting area is a dangerous area and should be avoided.

Brake Press – Hands too close to point of operation



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Brake Press – No side protection for non-operator personnel



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Brake Press – Side guard protection on hinge for die change but laser light curtain out of service



Brake Press – Side guard protection on hinge for die change but machine control terminal in the way



Brake Press – Not guarded from the rear to keep non-operator personnel from reaching the point of operation



HYDRAULIC PRESS FLATTENER

Hydraulic Press Flattener



Hydraulic Press Flattener – Inadequate guarding



AND FINALLY...

Saw of Death – No explanation needed



- **Questions?**
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