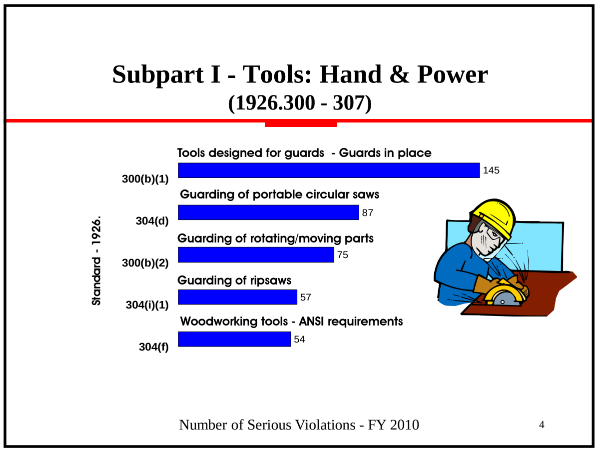
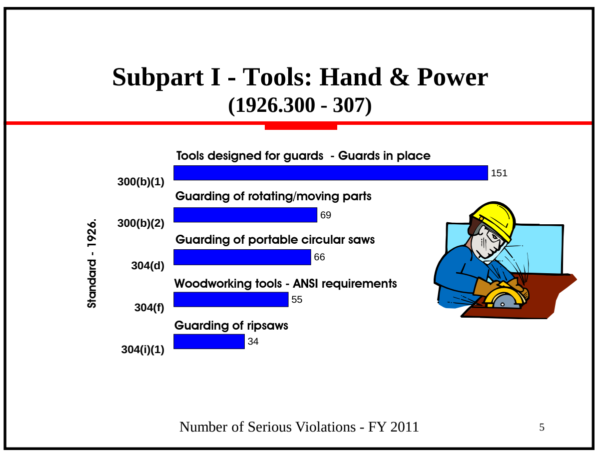
Tools: Hand and Power, Subpart I

Upon successful completion of this module, the participant will be able to:

- Identify the common hazards and citations involving hand and power tools.
- Discuss general principles of safe working practices with hand and power tools, including compressed air.
- Explain hazards and requirements associated with portable powered tools.
- Discuss hazards and requirements associated with other portable tools and equipment.


Subpart I - Tools: Hand & Power
(1926.300 - 307)
Standard - 1926.
300(b)(1)
Tools designed for guards - Guards in place
145
304(d)
Guarding of portable circular saws
87
300(b)(2)
Guarding of rotating/moving parts
75
304(i)(1)
Guarding of ripsaws
57
304(f)
Woodworking tools - ANSI requirements
54
Number of Serious Violations - FY 2010
4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Number of Serious Violations - FY 2011
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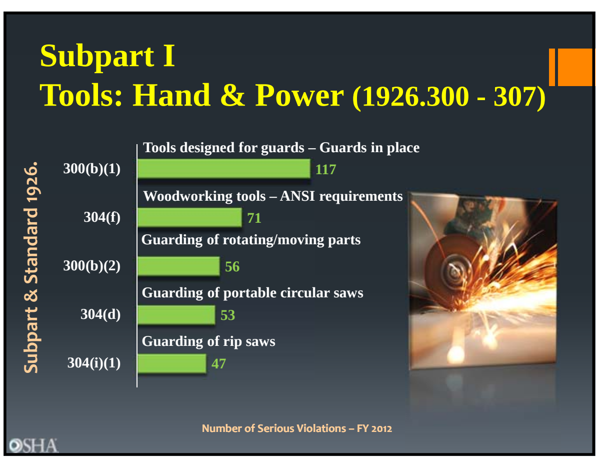
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Tools: Hand & Power (1926.300 - 307)
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71
300(b)(2)
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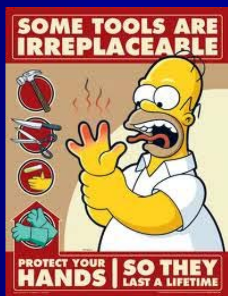
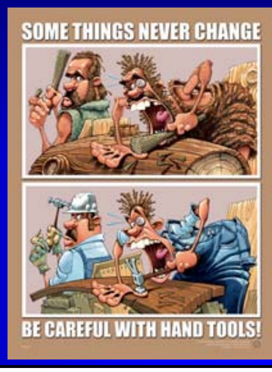
56
304(d)
Guarding of portable circular saws
53
304(i)(1)
Guarding of rip saws
47
Number of Serious Violations – FY 2012
OSHA

Hand and Power Tools





Tools: Hand and Power

29 CFR 1926 Subpart I

- 1926.300 General Requirements.
- 1926.301 Hand tools.
- 1926.302 Power-operated hand tools.
- 1926.303 Abrasive Wheels and Tools.
- 1926.304 Woodworking Tools.
- 1926.305 Jacks: Lever and Ratchet, Screw, and Hydraulic.

General Safety Precautions, 1926.300

- Keep all tools in good condition with regular maintenance
- Use the right tool for the right job

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- **Provide and use the proper PPE**

General Safety Precautions (continued)

Safe work procedures

Responsibility of the employer

General Safety Precautions (continued)

Employers responsibility, 1926.301

- Safe condition of tools
- Including personal tools

Hand Tools, Non Powered 1926.301

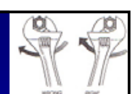
Greatest Hazards

1. Improper Use

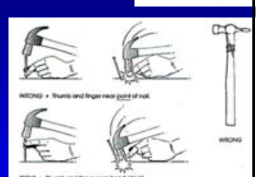
10,000 VAC

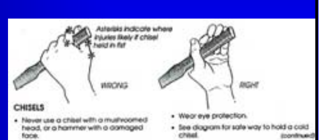
These tools meet or exceed ASTM F1505-01 and IEC 900 Standards for Insulated Hand Tools. These tools are necessary for compliance with OSHA 1910.333 (c)(2), and NFPA 70E

Hand Tools, Non Powered



2. Safe use
   - Direction of knives and blades
   - Sharp knives and blades
   - Safe working surfaces





3. Properly Maintained

Power Tools

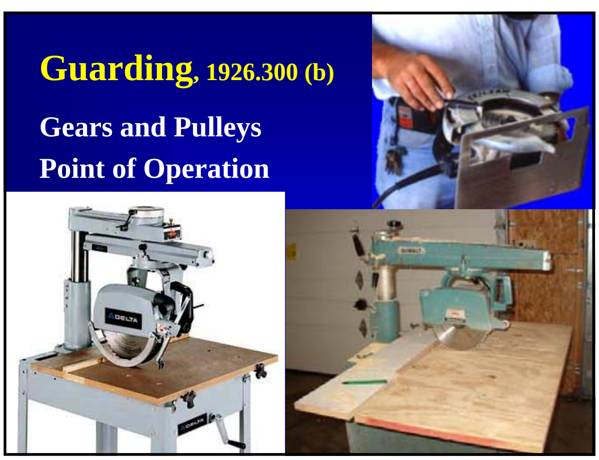
Guarding, 1926.301 (b)

Guarding, 1926.300 (b)

When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use.


Saw Stop


Guarding, 1926.300 (b)
Gears and Pulleys


Guarding, 1926.300 (b)
Gears and Pulleys
Point of Operation

Guarding - Point of Operation

This shows a radial arm saw equipped with proper point of operation guards

The point of operation is where the work is actually performed on the materials – it must be guarded

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Disintegrating saw blade and parts strike operator in the head and face

Saw blade

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Guarding , 1926.300 (b)

Point of Operation

Guarding

- Guard exposed moving parts of power tools
- Guard belts, gears, shafts, pulleys, sprockets, spindles, flywheels, chains, or other moving parts
- Never remove a guard when a tool is in use

26

27

PPE, 1926.300 (c)

Employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazard.

Dust Collection

PPE, (continued)

Proper apparel
- Loose clothing, hair, or jewelry

Damaged Tools
- Tag “Out of Service”
- Remove from work area
- Notify the appropriate person

Switches, 1926.300 (d)

Switches, 1926.300 (d)

1926.300(d)(2)

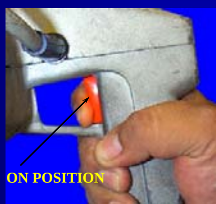
Equipped with a momentary contact "on-off" control and may have a lock-on control – provided, however, that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

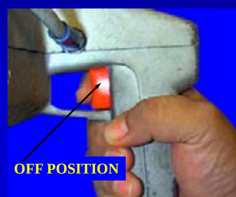
Switches, 1926.300 (d)

Momentary Contact "on/off" switch

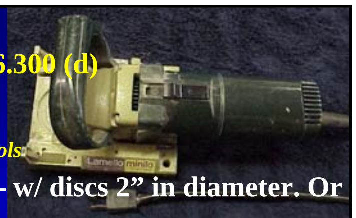
- Drills
- Fasteners
- Drivers
- Grinders – Greater than 2" in diameter.
- Disc and Belt Sanders
- Reciprocating Saws

Power Tools (continued)





Switches, 1926.300 (d)



Positive "on/off" controls:

- Disc Sanders – w/ discs 2" in diameter. Or less
- Routers
- Trimmers
- Shears
- Jig Saws – w/ blade ¼" wide or less

Power Operated Hand Tools, 1926.302

Classification by power source

- Electric
- Pneumatic
- Liquid Fuel
- Hydraulic
- Powder Actuated

Electric Tools, 1926.302 (a)

- Burns
- Slight Shock
- Indirect injuries - Ladders
- Fibrillation

Electric Tools (continued)

1926.301(a)
- Grounding
  - Double insulated
  - Recognition

Electric Tools (continued)

Electric Tools (continued)

Double-Insulated Marking

Electric Tools (continued)

1926.301(a)

- Grounding
  - Double insulated
  - Recognition
- GFCI
  - Wet or damp locations

Electric Tools (continued)

No Flat Extension Cords and all Cords to have Ground Connection

Extension Cords

Electric Tools (continued)

- Never carry tools by cords
  - Never pull cords to disconnect
- Disconnect tools when not in use or during maintenance
- Secure work with vice or clamp
  - Allows two hands for working
- Follow the users manual

Electric Tools, (continued)

Pneumatic Tools
1926.302 (b)

- Appropriate PPE
  - Eye Protection
  - Hearing Protection
- Other Employees
  - Screens

Pneumatic Tools

- Powered by compressed air
- Includes nailers, staplers, chippers, drills and sanders
- Main hazard - getting hit by a tool attachment or by a fastener the worker is using with the tool
- Take the same precautions with an air hose that you take with electric cords

Compressed Air

Shall not be used for cleaning purposes except where reduced to less than 30 PSI and then only with effective chip guarding and personal protective equipment which meets the requirements of Subpart E.

Pneumatic Tools (continued)

Safety wire to prevent accidental separation

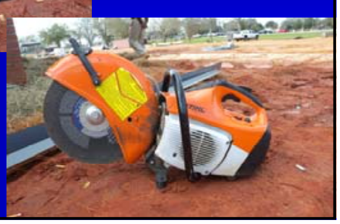
Pneumatic Tool Connections

Unacceptable
Hose Clamp

Acceptable
Hose Clamp

Nail Gun Safety

Fuel Powered Tools, 1926.302 (c)



Fuel Powered Tools

- All fuel powered tools shall be stopped while being refueled, serviced, or maintained.
- Fuel shall be transported, handled, and stored in accordance with Subpart F.

Hydraulic Powered Tools, 1926.302 (d)

The fluid used in hydraulic powered tools shall be approved fire-resistant fluids.

Hydraulic Powered Tools

The manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

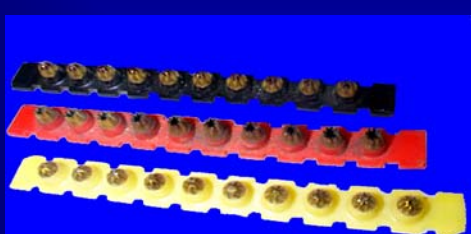
Powder Actuated Tools

1926.302(e)
- Meet ANSI A10.3 – 1970
- PPE
  - Eye Protection
  - Head and face depending on conditions
  - Proper training required

Powder Actuated Tools (continued)

1926.302(e)
- Fasteners used in tool specifically designed for that tool
- Designed for the material that is being driven into

Charges used in powder actuated tools



Right size charge with right size fastener

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Powder Actuated Tools (continued)

Tools must be inspected before use

- Defective tools taken out of service immediately
- Tools not loaded until just before intended firing

Loaded or empty tools are never to be pointed at anyone

Powder Actuated Tools (continued)

1926.302(e)(7) Fasteners not driven into:

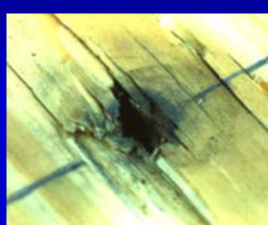
Very hard or brittle materials

- Cast iron
- Glazed tile
- Surface-hardened steel
- Glass block
- Live rock
- Face brick
- Hollow tile

Powder Actuated Tools (continued)

Avoid driving into easily penetrated material

- Unless backed

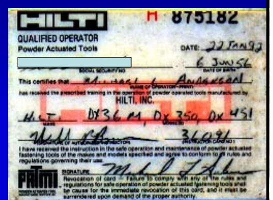


Do not use tools in explosive or flammable atmosphere

Powder Actuated Tools (continued)

Operators must be trained in the operation of this tool

Manufacturer's authorized or developed training



Powder Actuated Tools (continued)

General Safety Precautions:

- Inspection
- Firing
- Misfires
- Defects

Powder Actuated Tools (continued)

Inspection:

It's clean

All parts operate freely

The barrel is free from obstructions

Powder Actuated Tools (continued)

Firing
- Keep hands clear of the barrel
- 5 pounds of force against working material

Powder Actuated Tools (continued)

Misfires
- Wait 30 seconds
- Try firing again
- Wait another 30 sec.
- Remove the cartridge
- Place in water

Abrasive Wheels and Tools, 1926.303

- Flying fragments
  - PPE
- Ring test – 1926.303(c)(7)
- Mounting
  - Follow manufacturers instructions

Powered Abrasive Wheels

Guards
1/4” Tongue Guards
1/8” Tool Rests

Abrasive Wheels (continued)

Ring Test and RPM

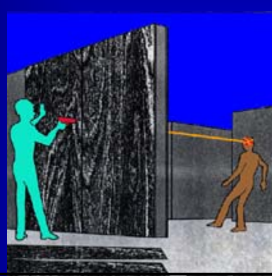
Max RPM

Abrasive Wheels (continued)

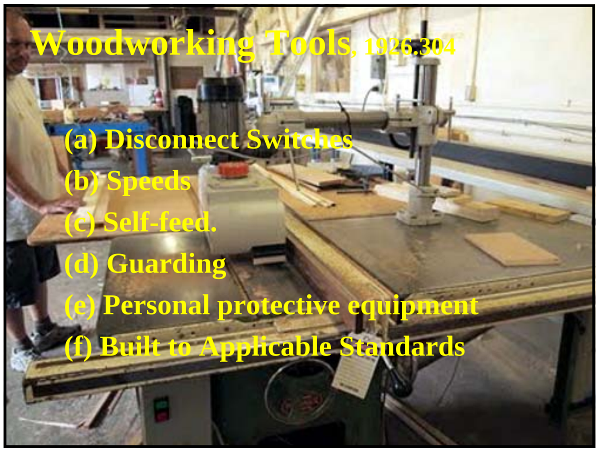
- Start up
  - Not directly in front
- Guards – 1926.303(b)
  - Protect from moving wheel surface
  - Protect from breaking wheel fragments
    - Exception – When work protects the operator

"FATAL FACT"

Employee killed when struck in head by a nail fired from a powder actuated tool. Tool operator was attempting to anchor a plywood form in preparation for pouring a concrete wall.



Woodworking Tools, 1926.304



Wood Working Tools

Jacks - Lever and Ratchet, Screw, and Hydraulic, 1926.305

To set up a jack, ensure:

- The base is on a firm, level surface
- It's centered
- The jack head is placed against a level surface
- You apply the lift force evenly

Lubricate and inspect jacks regularly

Jacks - Capacity

The manufacturer's rated capacity must be marked on all jacks and must not be exceeded

All jacks must have a stop indicator that is not exceeded

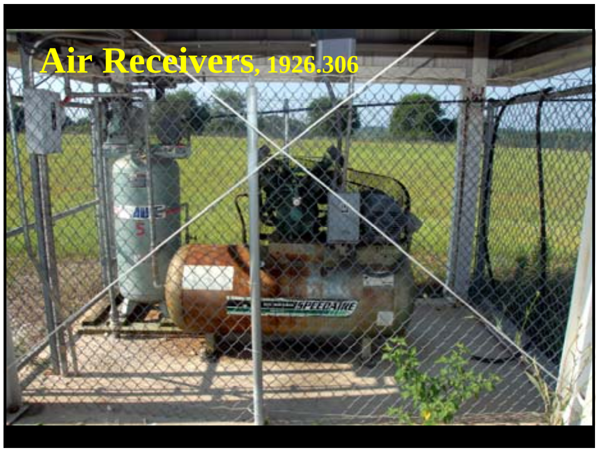
Jack Stands, Inspection and Load Limit

Jacks - Blocking

Immediately block the load after it is lifted. Put a block under the base of the jack when the foundation is not firm, and place a block between the jack cap and load if the cap might slip.

Photo - handyman jack is provided a firm base by using the railroad tie.

The load is cribbed to prevent it from falling.



Receiver Installation, 1926.306 (b)

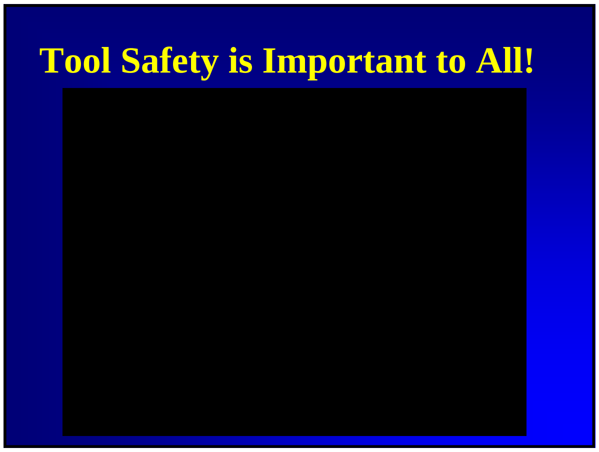
Installation
- Never Underground

Drains and Traps
- Accessible and at Lowest Point

Gauges and Valves
- Provided
- Rated
- Safety Valves Provided

"FATAL FACT"

Employees performing remodeling operations building a wall. Operator was attempting to anchor plywood to a 2"x 4" stud. The nail penetrated the stud and struck the victim. One worker killed when struck by a nail from a powder-actuated tool.


Tool Safety is Important to All!


Hand and Power Tools
29 CFR 1926 Subpart I
Questions?
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