



OSHA INSTRUCTION

Directive Number: CPL 2-1.35

Effective Date: March 26, 2002

Subject: National Emphasis Program on Amputations

ABSTRACT

- Purpose:** This directive describes policies and procedures for implementing a National Emphasis Program (NEP) to identify and reduce the workplace hazards which are causing or are likely to cause amputations.
- Scope:** This instruction applies OSHA-wide.
- References:** OSHA Instruction CPL 2-0.102A, November 10, 1999, Procedures for Approval of Local Emphasis Programs and Experimental Programs.
- Cancellations:** OSHA Instruction CPL 2-1.33, National Emphasis Program on Amputations., November 9, 2001.
- State Impact:** See paragraph V
- Action Offices:** National, Regional, and Area Offices
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Executive Summary

On February 28, 1997 Instruction CPL 2-1.24 established and implemented a *National Emphasis Program on Mechanical Power Presses* as part of the Agency's strategic goal of reducing amputations in general industry workplaces. In order to capitalize on the success of the Program, OSHA, through this Instruction CPL 2-1.35, *National Emphasis Program on Amputations* is administratively revising the Program to target more types of machinery than those listed in CPL 2-1.24, *National Emphasis Program on Mechanical Power Presses*, and allow the Regions and Area Offices to target and schedule inspections in workplaces that are most likely to use the selected machinery. In addition to mechanical power presses, this Program targets all types of power presses (including press brakes), as well as saws, shears, and slicers, because these machines account for a significant number of amputation injuries in general industry. The machines listed in Appendix A also pose amputation hazards. However, the targeting of machines listed in Appendix A is appropriate only if Regional or Area Offices supplement this National Emphasis Program (NEP) with Local Emphasis Programs focusing on some or all of these machines.

Significant Changes

This Instruction, CPL 2-1.35, *National Emphasis Program on Amputations*, builds upon and expands the existing National Emphasis Program on Amputations. Major changes include:

- In addition to mechanical power presses, all types of power presses (hydraulic, pneumatic, etc.), as well as press brakes, saws, shears, and slicers, will be included in this Program;
- Simplifying paperwork and reporting requirements by the Regions and Area Offices by streamlining the targeting and site selection process, inspection coding, and program evaluation criteria.

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- I. Purpose. This directive describes policies and procedures for implementing a National Emphasis Program (NEP) to identify and reduce workplace machine hazards which are causing or are likely to cause amputations.
- II. Scope. This instruction applies OSHA-wide.
- III. References.
 - A. OSHA Instruction CPL 2-0.102A, November 10, 1999, Procedures for Approval of Local Emphasis Programs and Experimental Programs.
 - B. OSHA Standards at Subpart O, Machinery and Machine Guarding.
 - C. OSHA Standards at Subpart P, Hand and Portable Powered Tools & Other Hand Held Equipment.
 - D. OSHA's Safety and Health Management Guidelines, 54 FR 3904, January 26, 1989.
 - E. OSHA Instruction CPL 2.25I, January 4, 1995, Scheduling System for Programmed Inspections.
 - F. Executive Order 12196, Section 1-201.
 - G. OSHA Standard 29 CFR 1960.16.
 - H. OSHA Instruction STP 2-0.22B, March 21, 2001, State Plan Policies and Procedures Manual (SPM).
 - I. OSHA Instruction CPL 2.103, September 26, 1994, Field Inspection Reference Manual (FIRM).
 - J. OSHA Publication 3157, A Guide for Protecting Workers from Woodworking Hazards.
 - K. OSHA Technical Links Web Page, Machine Guarding, <http://www.osha-slc.gov/SLTC/machineguarding/index.html>.
- IV. Cancellation. OSHA Instruction CPL 2-1.33, 11-09-2001, National Emphasis Program on Amputations.
- V. Federal Program Change. This instruction describes a Federal Program Change for which State adoption is not required. States are asked to keep their Regional

Administrators informed of State-developed local emphasis programs, experimental programs, local problem solving projects, etc., especially any that relate to State Strategic Plan goals. They should also coordinate the assignment of an IMIS identifier code with their Regional Administrator and submit the coding instructions necessary for IMIS and OPTMS Strategic Plan tracking, as appropriate.

- VI. Action. OSHA Regional Administrators, Area Directors and National Office Directors must ensure that the policies and procedures set forth in this directive are followed. Regional Administrators must also ensure that the State Consultation Program Managers and the State Plan State Designees in their Regions are apprised of the contents of this NEP and its required Area Office Outreach initiatives. Regional Administrators are to encourage Consultation Programs' involvement in this Agency-wide effort.
- VII. Application. This instruction applies to general industry workplaces where saws, shears, slicers, press brakes, and power presses of all types are present. This instruction also applies to workplaces identified pursuant to paragraph IX(C).
- VIII. Background. OSHA believes that the failure to guard machinery is a primary cause of amputation. OSHA has determined that CPL 2-1.24, *National Emphasis Program on Mechanical Power Presses*, which had been in effect since February 28, 1997, needs to be expanded because of the significant number of amputations that have resulted from the operation of saws, shears, slicers, and power presses of all types. The goal of OSHA's enforcement policy is to achieve effective worker protection.

The operation of saws, shears, slicers, and power presses can be extremely dangerous, and compliance with OSHA's machine guarding and safeguarding standards needs to be improved. Injuries involving these machines often result in death or permanent disability, and OSHA's inspection history indicates that employee exposures to these unguarded or inadequately guarded machines occur in many workplaces. Subparts O and P of 29 CFR 1910 provide for safety measures that need to be used for the safe operation of saws, shears, slicers, and power presses. These machines are covered by 29 CFR 1910.212, .213, and .217. This NEP provides additional information on how to identify and guard against hazards associated with these machines.

The machines identified by this directive were determined from three sources: a 1990 NIOSH research project on machine safety, the OSHA IMIS database, and BLS data. The NIOSH project reported that workers who operate and maintain machinery suffer approximately 18,000 amputations and over 800 deaths each year. Consolidation of the NIOSH, OSHA, and BLS data revealed that saws, shears, slicers, and presses, are machines that frequently cause amputations.

- A. **Saws:** The two types of saws most frequently identified as causing amputations are table saws and radial arm saws. These types of saws are used primarily in

woodworking shops and manufacturing maintenance shops. Compliance Safety and Health Officers (CSHOs) should consider other types of saws including, but are not limited to, hand held saws, chop saws, miter saws, and band saws.

The guards normally used on many of these saws are self-adjusting to the thickness of the material being cut, meaning that, by themselves, they do not necessarily prevent contact with the saw blade. However, when used in conjunction with push sticks or push blocks as required under 29 CFR 1910.213(s)(9), these safeguards can minimize the potential for injuries. For repetitive sawing operations or for jobs when standard guards cannot be used, jigs, featherboards, or a combination of the two can be used to minimize or eliminate employee exposure during sawing operations. See 1910.213 (a)(15). When the saws are used for ripping, additional safeguards are required in the form of spreaders and/or anti-kickback fingers. See 1910.213(c), (d), (e), and (f). For saws used to cut material other than wood (metal, plastic, meat, etc.), safeguarding of moving parts and points of operation is required under 1910.212 and .219.

- B. **Shears:** Mechanical power shears are self-contained machines using a mechanically driven ram for the shearing action. The ram moves a non-rotary blade at a constant rate past the edge of a fixed blade. The machine components generally consist of the frame, ram, blades, hold-down(s), guards, drive, clutch, brake, motor, and controls. According to OSHA's database, shear-associated amputation injuries occurred primarily on three types of equipment:
- Squaring shears used in metal working shops to cut sheets of metal;
 - Alligator shears used to cut metal stock in fabrication shops and scrap metal in scrap yards; and
 - Guillotine shears used in many industries, such as the paper and plastic film industries, to trim or cut/slice rolls and slabs of paper, plastic film, and other materials.
- C. **Slicers:** The most common slicers are meat and food slicers. These are powered machines that use a rotary blade to cut sections of meat or other foods into thin slices.
- D. **Power Presses:** This NEP covers all types of power presses, including, but not limited to, mechanical power presses, hydraulic presses, pneumatic presses, and press brakes. Power presses are powered machines used to work on metal or other material with cutting, shaping, or combination dies attached to plungers, platens, or slides (rams). A press consists of a stationary bed or anvil, and a slide. The slide has a controlled reciprocating motion toward and away from the bed surface

and at right angles to it. It is guided in the frame of the machine to give a definite path of motion. Power presses are used in a wide variety of industries to punch, shear, and form metal, metal products, and other materials.

Requirements for safeguarding of the referenced machines can be found at Subparts O and P of 29 CFR 1910. See Appendix C for a list of related ANSI and ASME standards. Compliance Officers need to make an initial determination if a machine in an establishment is one of the pieces of equipment listed/described above.

Requirements for safeguarding of hand held portable powered tools (saws, shears, etc.) are found in 29 CFR 1910.243.

IX. Program Procedures. This NEP includes four major field activities: program approval, outreach, targeting/selection, and inspection. Inspections are to begin immediately upon the effective date of this directive.

- A. Program approval. Each Area Office's inspection program must be approved by the Regional Administrator and the Regional Solicitor. This is most easily accomplished by setting out the targeting and selection system in a Regional Program Directive, as for a Local Emphasis Program. Other forms of documentation may, however, be used at the discretion of the Regional Administrator.
- B. Outreach. Each Regional and Area Office must develop and continue to offer outreach programs that support the purpose of this NEP to identify, reduce workplace hazards associated with saws, shears, slicers, and power presses of all types. Programs may include letters to employers, professional associations, and local unions, or other activities designed to involve employee and management stakeholders in the identification and elimination of hazards associated with these machines. The Office of Public Affairs will provide support to the Regional and Area Offices. The employers with ten or fewer employees are to be included in the outreach effort, but are not to be included in the inspection activities. At the discretion of the Regional and Area Offices, outreach materials may either be mailed directly or made available upon request to employers, professional associations, and local unions. The attached appendices and a PowerPoint⁷ presentation summarizing this NEP provide useful information which may be used, in whole or in part, by the Regional and Area Offices.
- C. Site Selection. Inspections conducted under this NEP must be scheduled and conducted pursuant to the following priorities.

1. The intent of the NEP is to target workplaces with machines that cause (or are capable of causing) amputations and workplaces where amputations have occurred, in order to reduce amputation injuries while maximizing the Agency's scarce inspection resources.
2. Establishments with ten or fewer employees are not to be inspected, but are to be included in the outreach effort.
3. Inspections must concentrate on industries and establishments where saws, shears, slicers, and power presses are used and where there have been in amputations involving these types of machines.
4. Developing Inspection Lists. Area and Regional Offices will develop lists of such establishments to be inspected, using the sources described below:

Standard Industrial Classification (SIC) Codes. Using the most recently available Dun and Bradstreet employer list prepared by the National Office, each Area Office will prepare a master list of establishments in the SICs in the tables below.

National Data. The SICs listed are those which, based on five years of nationwide IMIS data, had the highest number of violations of 29 CFR 1910.212, .213, and .217 and also had BLS reported amputation injuries in 1998 and 1999.

NOTE: OSHA has addressed hazards which produce workplace injuries by developing standards designed to reduce those hazards. The machine guarding provisions of 29 CFR §§ 1910.212, .213, and .217 were developed, in part, to address machine hazards that can cause, and have caused, amputations. Thus, in developing this NEP, OSHA used IMIS data from October 1996 through September 2001 to ascertain the 10 industries (by 4-Digit SIC Code) that received the greatest number of 1910.212 violations, the 10 industries that received the greatest number of 1910.213 violations, and the 10 industries that received the greatest number of 1910.217 violations. After developing the three lists, OSHA reviewed 1998 and 1999 BLS data regarding reported amputations for each one of the industries on the respective lists. If the BLS data indicated that an industry had zero reported amputations during both of these periods, OSHA removed that industry from the list and added the industry with the next greatest number of violations of the relevant standard, such that there again would be

ten industries on a particular list. The process continued until the ten industries with the greatest number of standard-specific violations, and which also had BLS reported amputations, were identified. This process provided assurance that the NEP is focused on industries with both a significant number of amputation-related hazards and amputation injuries.

The 10 industries listed under each OSHA standard are listed in alphabetical order (not in order of their SIC Code numbers or the total number of citations for the particular industries), and there is some “industry” redundancy for the three standards (e.g. “Fabricated Metal Products, Not Elsewhere Classified” is listed under 1910.212, .213, and .217).

The listed SICs also cover industries with varying numbers of establishments. For example, according to Dun & Bradstreet, March 2002:

SIC 2542; 854 establishments
SIC 2434; 3351 establishments
SIC 3089; 7,748 establishments
SIC 3599; 19,028 establishments

1910.212 All Machines

<u>SIC Code</u>	<u>Industry</u>
3499	Fabricated Metal Products, Not Elsewhere Classified
3443	Fabricated Plate Work (boiler shops)
3441	Fabricated Structural Metal
3599	Industrial and Commercial Machinery and Equipment, Not Elsewhere Classified
3442	Metal doors, Sash, and Trim
3469	Metal Stampings, Not Elsewhere Classified
3496	Miscellaneous Fabricated Wire Products
3714	Motor Vehicle Parts and Accessories
3089	Plastic Products, Not Elsewhere Classified
3444	Sheet Metal Work

1910.213 Woodworking Machinery

3499	Fabricated Metal Products, NEC
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2431	Millwork
2451	Mobile Homes
3089	Plastic Products, NEC
2421	Sawmills & Planning Mills
2434	Wood Kitchen Cabinets
2511	Wood Household Furniture, Except Upholstered
2541	Wood Office & Store Fixtures, Partitions, Shelving, & Lockers
2448	Wood Pallets & Skids
2499	Wood Products, NEC

1910.217 Power Presses

3499	Fabricated Metal Products, Not Elsewhere Classified
3443	Fabricated Plate Work (boiler shops)
3441	Fabricated Structural Metal
3429	Hardware, Not Elsewhere Classified
3442	Metal Doors, Sash, Frames, Molding, and Trim
3469	Metal Stampings, Not Elsewhere Classified
3496	Miscellaneous Fabricated Wire Products
3714	Motor Vehicle Parts and Accessories
2542	Office & Store Fixtures, Partitions, Shelving, & Lockers, Except Wood
3444	Sheet Metal Work

5. Area Offices will add to the master list individual general industry establishments where amputation injuries or fatalities related to saws, shears, slicers, and power presses have occurred in the last five years. Local evidence of amputations will be based on IMIS accident data and, if available, workers' compensation data, OSHA 200 and OSHA 300 data, NIOSH data, and other reliable sources of information (e.g., reports of amputations from hospital admission, Emergency Medical Services, fire department, and police reports). In all cases, the basis for development of the master list and additions to it must be documented.
6. Establishments on the master list prepared pursuant to IX(C)(4) are to be arranged alphabetically by company name. Additions to the master list from the list prepared pursuant to IX(C)(5) are to be arranged alphabetically and added to the bottom of the master list.

Based on local knowledge, Regional and Area offices may delete establishments that are not likely to have the targeted machinery, or firms known to be out of business, documenting the basis for such determinations. Further, any establishment [other than those where

amputations are known to have occurred] having had a comprehensive safety inspection in the previous 24 months will be deleted from the list.

Once the master list, with additions, is completed, each establishment is to be assigned a sequential number starting at the top of the list with number one. The random numbers table (see the most current version of OSHA instruction CPL 2.25) will then be applied to create the first cycle of five to fifty establishments. Subsequent cycles will then be created in the same way until all establishments on the list have been assigned to a cycle. Cycles may be created all at once or as needed, and need not be the same size.

Inspections may then be scheduled using the first cycle list. Establishments on the cycle list may be inspected in any order so that area office resources are efficiently used. Once a cycle is begun, all establishments in the cycle are to be inspected before a new cycle is begun, except that carry-overs will be allowed, as provided for in OSHA Instruction CPL 2.25I, at paragraph B.1.b.(1)(e)(1).

If cycles are not prepared, establishments on the inspection list are to be inspected in the order determined by the application of the random numbers table.

- D. Inspection Procedures. Inspections initiated under this NEP will be scheduled and conducted in accordance with provisions of the FIRM, except as noted below.
1. Once an inspection has been scheduled and assigned, the OSHA IMIS database will be searched for the employer's citation and fatality/accident history prior to the opening conference. This can be accomplished by conducting an establishment search in the IMIS Database Access section on the CSHO Home Page of the OSHA web site.
 2. At the opening conference the CSHO will inquire of the employer whether any of the referenced types of machines are present in the workplace. If any of these machines are present in the workplace the CSHO must conduct a thorough inspection of the machine(s) with particular attention to employee exposure to nip points, pinch points, shear points, cutting actions, and other point(s) of operation. When possible, the CSHO also should evaluate employee exposures during any of the following:
 - Regular operation of the machine.
 - Setup/threading/preparation for regular operation of the machine.
 - Clearing jams or upset conditions.
 - Making running adjustments while the machine is operating.

- Cleaning of the machine.
- Oiling or greasing of the machine or machine parts.
- Scheduled/unscheduled maintenance.
- Lockout/tagout.

3. The CSHO will review all relevant OSHA 200 and OSHA 300 logs at the establishment for amputation injuries or hazards.
4. Inspections routinely will be limited to hazards associated with power presses, saws, shears, and slicers, but the CSHO may expand the scope of the inspection beyond those machines if other hazards or violations are observed during the walkaround or documented in the OSHA 200 and OSHA 300 logs. Inspections will be scheduled beginning the current fiscal year, and will continue until further notice or until all establishments on the list have been inspected.
5. Because the nature of this program may yield a number of significant cases, Area Directors, Supervisors, Team Leaders, and CSHOs should ensure that the requirements for case development are being met.

X. Scheduling and Resource Allocation. This is a National initiative, which affects existing inspection scheduling priorities, as indicated below. Area Offices must develop and implement targeting systems which are suited to the Region's resources.

- A. Resources. Regional Administrators must ensure that adequate resources are designated for this NEP.
- B. Planning. Each Regional Administrator will report, to the Director of Compliance Programs, the number of NEP inspections that are planned for each fiscal year.
- C. Priority. Inspections conducted under this NEP have a lower priority than inspections conducted under Site Specific Targeting (SST), but have a higher priority than other programmed inspections. When possible, inspections conducted under this NEP will be combined with SST inspections and/or other programmed and unprogrammed inspections. This NEP may be combined with other existing initiatives, such as Local Emphasis Programs which identify targets on a different basis. Regional or Area offices may also supplement this NEP with LEPs focusing on some or all of the machines in Appendix A.

XI. Coordination.

- A. National Office. This NEP will be coordinated in the Office of General Industry Compliance Assistance, Directorate of Compliance Programs. Questions and comments should be directed to the National Office Coordinator.

- B. Field. Each Regional Administrator will name a coordinator for this National Emphasis Program.
- XII. Consultation Programs. Area Offices should develop Local Emphasis Programs (LEP) on hazardous machinery associated with amputations in concert with the Consultation Project in the same state jurisdiction. The development and implementation of outreach programs for the LEPs may be a joint activity for the Area Office and Consultation Program. When appropriate, 21(d) Consultation Projects are encouraged to develop their own strategic approaches to address the need to reduce injuries and accidents related to saws, shears, slicers, and power presses.
- XIII. Training. Because of the technical nature of some of these inspections and/or machines, CSHOs who conduct inspections under this NEP, and consultation staff, must have had adequate training or experience with both general and specific machine guarding and safeguarding concepts and techniques.
- A. The OSHA Training Institute (OTI).
- The OTI provides training materials to CSHOs, consultation staff, and employers. Also, additional sessions of the OTI's mechanical power press and machine guarding courses can be made available. Technical training at the OTI can be expanded to include the use of a stop time measuring device to measure the safety distance on a mechanical power press, should it be determined that such training is needed.
- B. Additional Training.
1. On-the-Job Training. Area Directors and supervisors must ensure that inexperienced CSHOs also receive on-the-job training by accompanying experienced compliance officers during these NEP inspections.
 2. Enforcement and Compliance Issues. Continuing guidance regarding enforcement and compliance issues will be provided by the office of General Industry Compliance Assistance as new issues arise.
- XIV. Federal Agencies. This instruction describes a change that affects Federal agencies. Executive Order 12196, Section 1-201, and 29 CFR 1960.16, maintains that Federal agencies must follow the enforcement policy and procedures contained in this Directive.
- XV. Program Evaluation. Area Offices will collect data relevant to the effectiveness of this NEP and submit it to the Regional Office. The Regional Office, after summarizing the information, will forward it to the National Office after the end of each fiscal year. At a minimum the evaluation should respond to the requirements of CPL 2-0.102A, Section D.

XVI. IMIS Coding. All General Industry inspections (**programmed and unprogrammed**) must be coded as an **amputation hazard** in the IMIS by marking “**amputations**” in the Strategic Plan Activity item 25(f) on the OSHA 1, when there is potential worker exposure to an amputation hazard.

Any settlement agreement (formal or informal) where the employer commits to implementing or improving a safety and health program must be designated as such by entering the informal conference date in item 13A on the OSHA Form 167I and then marking item 13D, “S&H Prgm Initiated.” Any settlement agreement where the employer commits to providing OSHA 200 and OSHA 300 data in future years must be identified by entering the informal conference date in item 13A on the Form 167I and then marking item 13C, “OSHA 200 and OSHA 300 Required” and entering the number of years the data must be provided.

Current instruction for completing enforcement forms OSHA-1, OSHA-7, OSHA-36, and OSHA-90 and Consultation Request Form-20 and Visit Form-30 will be applied when recording inspections conducted under this NEP as follows:

A. Enforcement.

1. The OSHA-1 Form for any programmed inspection covered under this national emphasis program for amputations will be marked "PLANNED" (Item 24h) and "NATIONAL EMPHASIS PROGRAM" (Item 25d). Record “**amputate**” in the space in item 25d.
2. Whenever an OSHA-7 is completed by a Federal office and the applicable complaint alleges the presence of amputation hazards, complete the OSHA-7 in the usual manner, and record “**amputate**” in the space in item 50.
3. Whenever an OSHA-36 is completed by a Federal office and the inspecting CSHO is able to identify at the site of the fatality/catastrophe the presence of amputation hazards, complete the OSHA-36 in the usual manner, and record “**amputate**” in the space in item 36.
4. Whenever an OSHA-90 is completed by a Federal office and the applicable referral case has amputation hazards as one of the subjects, complete the OSHA-90 in the usual manner and record “**amputate**” in the space in item 30.

B. Consultation. Whenever a visit is made in response to this NEP, a Consultation Request Form and/or Visit Form is to be completed as follows:

1. Complete the Consultation Request Form-20 in the usual manner and record “**amputate**” in the space in item 25.
2. Complete the Visit Form-30 in the usual manner and record “**amputate**” in the space in item 28.

XVII. Appendices. The Appendices and a PowerPoint® presentation summarizing this NEP contain information developed to assist employers, employees, and compliance officers in the implementation, training and outreach requirements of this Program. The Area Office may use its discretion in selecting whatever materials it deems appropriate for outreach purposes.

APPENDIX A

Other Machines

- Bending, rolling, and shaping machinery
- Boring, drilling, milling, and planing machinery
 - Conveyors, both gravity and powered
- Food and beverage processing and packaging machinery
 - Grinding and polishing machinery
 - Printing Machinery

APPENDIX B

Sample Employer Self-inspection Checklist

Answers to the following questions should help the interested reader to determine the safeguarding needs of his or her own workplace by drawing attention to hazardous conditions or practices requiring corrections.

Requirements for All Safeguards

1. Do the safeguards provided meet the minimum OSHA requirements?
2. Do the safeguards prevent workers' hands, arms, and other body parts from making contact with dangerous moving parts?
3. Are the safeguards firmly secured and not easily removable?
4. Do the safeguards ensure that no objects will fall into the moving parts?
5. Do the safeguards permit safe, comfortable, and relatively easy operation of the machine?
6. Can the machine be oiled without removing the safeguard?
7. Is there a system for shutting down the machinery and locking/tagging out before safeguards are removed?
8. Can the existing safeguards be improved?

Mechanical Hazards

The Point of Operation:

1. Is there a point-of-operation safeguard provided for the machine?
2. Does it keep the operator's hands, fingers, body out of the danger area?
3. Is there evidence that the safeguards have been tampered with or removed?
4. Could you suggest a more practical, effective safeguard?
5. Could changes be made on the machine to eliminate the point-of-operation hazard entirely?

Power Transmission Apparatus:

1. Are there any unguarded gears, sprockets, pulleys, or flywheels on the apparatus?
2. Are there any exposed belts or chain drives?
3. Are there any exposed set screws, key ways, collars, etc.?
4. Are starting and stopping controls within easy reach of the operator?
5. If there is more than one operator, are separate controls provided?

Other Moving Parts:

1. Are safeguards provided for all hazardous moving parts of the machine, including auxiliary parts?

Nonmechanical Hazards

1. Have appropriate measures been taken to safeguard workers against noise hazards?
2. Have special guards, enclosures, or personal protective equipment been provided, where necessary to protect workers from exposure to harmful substances used in machine operation?

Electrical Hazards

1. Is the machine installed in accordance with National Fire Protection Association and National Electrical Code requirements?
2. Are there loose conduit fittings?
3. Is the machine properly grounded?
4. Is the power supply correctly fused and protected?
5. Do workers occasionally received minor shocks while operating any of the machines?

APPENDIX C

Related ANSI and ASME Standards

1. ANSI B11.1-1988 (R1994) Mechanical Power Presses
2. ANSI B11.2-1995 Hydraulic Power Presses
3. ANSI B11.3-1982 (R1994) Power Press Brakes
4. ANSI B11.4-1993 Shears
5. ANSI B11.5-1988 (R1994) Ironworkers
6. ANSI B11.6-1984 (R1994) Lathes
7. ANSI B11.7-1995 Cold Headers and Cold Formers
8. ANSI B11.8-1983 (R1994) Drilling, Milling, and Boring Machines
9. ANSI B11.9-1975 (R1997) Grinding Machinery
10. ANSI B 11.10-1990 (R1997) Metal Sawing Machines
11. ANSI B11.11-1985 (R1994) Gear Cutting Machines
12. ANSI B11.12-1996 Roll-Forming and Roll-Bending Machines
13. ANSI B11.14-1996 Coil-Slitting Machines
14. ANSI B11.15-1984 (R1994) Pipe, Tube, and Shape Bending Machines
15. ANSI B11.16-1988 Metal Powder Compacting Presses
16. ANSI B11.17-1996 Horizontal Hydraulic Extrusion Presses
17. ANSI B11.18-1997 Machinery and Machine Systems for Processing Strip, Sheet, or Plate From Coiled Configuration
18. ANSI B11.19-1990 (R1997) Safeguarding When Referenced by the Other B11 Machine Tool Safety Standards
19. ANSI B5.37-1970 (R1994) External Cylindrical Grinding Machines (Centerless)

20. ANSI B5.42- 1981 (R1994) External Cylindrical Grinding Machines (Universal)
21. ANSI B65.1-1995 Printing Press Systems
22. ANSI B65.3-1991 Safety Standard for Guillotine Paper Cutters
23. ANSI B7.1-2000 Use, Care, and Protection of Abrasive Wheels
24. ANSI B151.5-1982 (R1988) Plastic Film and Sheet Winding Equipment
25. ANSI B151.20-1999 Plastic Sheet Production Machinery
26. ANSI B155.1-1994 Packaging Machinery and Packaging-Related Converting Machinery
27. ANSI B177.1-1997 Three Roller Printing Ink Mills
28. ANSI O1.1-1992 Woodworking Machinery
29. ASME B5.52M-1980 (R1994) Mechanical Power Presses, General Purpose Single Point
30. ASME B15.1-1996 Mechanical Power Transmission Apparatus
31. ASME B15.1A-1997 Addenda to B15.1-1996
32. ASME B15.1B-1998 Addenda to B15.1-1996
33. ASME B20.1-1996 Conveyors and Related Equipment, with Interpretations A and B
34. ASME B20.1A and B20.1B Addenda to B20.1-1996
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