

SUBJECT: Guidelines for Point of Operation Guarding of Power Press Brakes.

Purpose: To provide guidelines for determining compliance with the guarding requirements for power press brakes.

Scope: This instruction applies MNOSHA-wide.

References:

1. Federal OSHA Instruction CPL 2-1.25, "Guidelines for Point of Operation Guarding of Power Press Brakes," dated February 14, 1997.
2. American National Standards Institute Standard, ANSI B11.3-1982 and ANSI B11.3-2002, "Safety Requirements for Construction, Care, and Use of Power Press Brakes" and ASME B5.55-2008 "Specification and Performance Standard, Power Press Brakes".
3. American National Standards Institute Standard, ANSI B11.19-2003, Performance Criteria for Safeguarding.
4. 29 CFR 1910.212, "General Requirements for Machine Guarding."
5. Standard Interpretations, 02/11/2004 – Use of laser guarding systems with hydraulic press brakes.
6. Standard Interpretations, 03/25/2004 – Questions about the use of laser guarding devices.
7. 29 CFR 1910.147, "The control of hazardous energy (lockout/tagout)."
8. Machine Guarding E-tool; link
<http://osha.gov/SLTC/etools/machineguarding/animations/pbsmall.html>

Cancellation: This instruction cancels MNOSHA Instruction STD 1-12.12, dated February 24, 2011.

Background: OSHA's machinery and machine guarding regulations (29 CFR Part 1910 Subpart O) require one or more guarding methods to protect (operating, minor servicing and other nearby) employees from exposure to hazardous machine energy. When guarding by barriers or physical devices is infeasible, guarding by "safe distance" is permitted if the employer meets conditions outlined in this directive.

ACTION:

A. General Requirements.

1. To protect employees who are not operating or performing minor servicing from exposure to hazardous machine energy, an employer must provide power press brake guarding by physical barriers or by restricting access to power press brakes.
2. A power press brake must not be "energized" [as defined under paragraph 1910.147(b)] when the point of operation is not guarded by one or more physical barriers or physical devices unless:
 - a. under the operating control of a trained operator (see paragraph A.2.c.);
 - b. under the operating control of an employee authorized to perform minor servicing which complies with the note following paragraph 1910.147(a)(2)(ii)(B);
 - c. as provided under the servicing and maintenance testing and positioning

requirements of paragraph 1910.147(f).

3. Employees performing minor servicing on machines or equipment during normal production operations must be protected from exposure to hazardous energy by physical barrier guards and, when such guarding is not feasible, by alternative measures which otherwise provide effective protection. When machines or equipment are not in normal production operations, servicing and maintenance must be performed under the control of hazardous energy requirements (lockout/tagout) of paragraph 1910.147 or paragraph 1910.333(b).
4. During **normal production operations**, the power press brake operator must be protected to the extent feasible by physical barriers or physical devices from exposure to hazardous energy sources at the point of operation and elsewhere on the power press brake. Feasible means of point of operation protection may be limited by the dimensions of the parts being produced and the type of press brake involved (ie. mechanical verses hydraulic), and could include:
 - a. **Two-hand controls** require the concurrent actuation of the operator's hand controls during the hazardous portion of the machine cycle such that the operator cannot reach the hazard before the hazardous motion has ceased. Two modes may be available for operation depending on the control system:
 - 1) Single stroke mode. This functions much like two-hand controls on mechanical power presses. Two hand controls are used to cycle the press brake and would be held depressed while the ram descends. This mode could be used for parts that can be formed without holding the stock.
 - 2) The sequence mode is used when there is a need to hold the workpiece, or maintain positioning of a part. This may also be known as stroke-stop mode.

Sequence is accomplished by stopping the slide on the downstroke (on down-acting machines) just above the workpiece, not more than $\frac{1}{4}$ " above the stock, then while holding the part, using the foot switch to complete the cycle. The operator is protected during the first portion of the cycle by using the two hand control.
 - b. **Presence sensing devices** (light curtains) are to be applied, adjusted, maintained and inspected in accordance with the manufacturer's recommendations. Refer to their manual for details. Light curtains may be used in a stroke-stop and mute mode and allow the operator to hold the part after the press brake stops at the $\frac{1}{4}$ " point above the stock. Muting refers to the light curtains being deactivated. Light curtains may also be used in a "floating beam blankout" mode where one or more individual beams are shut off (or muted) while the part is being formed and the blanked beams move with the part being formed.
 - c. **Hold-outs or restraint devices** are an inexpensive alternative applicable in some cases and are designed to prevent an operator from being in the point of operation at all times.
 - d. **Pull-outs** have limited applicability on power press brakes but may be used when press brakes are used as punch presses and the part does not need to be held.
 - e. **Movable barrier (gate) devices** have limited applicability on power press brakes.
 - f. **Laser safeguarding devices** will only be deemed acceptable if such devices effectively and reliably prevent worker injury. Laser guarding devices can only be used on hydraulic press brakes that meet certain criteria including, but not limited to: control reliability features, stopping performance, and ram closing speed.

5. Because of constraints imposed by certain manufacturing or fabricating processes, safeguarding by maintaining a safe distance from the point of operation may be acceptable but **only** when safeguarding by physical barrier or physical devices **is not feasible**. “Safe distance” means the clearance between an employee (typically his or her fingers holding and supporting a piece part) and the power press brake point of operation. Safeguarding by maintaining a “safe distance” is acceptable if all of a-d is demonstrated:
 - a. The employer demonstrates that physical barriers and physical devices are not feasible to guard the power press brake point of operation. Physical devices typically include: two-hand controls, holdouts or restraints and presence sensing devices.
 - b. **The employer demonstrates that power press brake point of operation guarding by maintaining a safe distance is limited to one-time only fabrication of made-to-order or custom-made piece parts**, such as in a model shop or a research and development lab. Small quantity runs, typically performed in a job shop, may be affected by this provision; high volume piece part rates of production will not. A “small quantity run” means fabrication of more than one of the same or similar piece part over a continuous time frame of no more than four hours per month.

NOTE: Special feasibility guidelines for small quantity runs: When physical guards and physical devices are not feasible for small quantity runs as defined above, safeguarding by maintaining a safe distance as described in this directive is an alternative to power press brake replacement or major renovation which otherwise could provide employee protection.
 - c. The employer has a safety program which includes safe work procedures, training, and supervision to ensure that work is performed using “safe distance” alternative measures.
 - d. The employer has a workplace history of operating power press brakes safely by maintaining a safe distance from the point of operation. *Such a history is characterized by absence of injuries related to failure to maintain a safe distance.* Workplace history will be evaluated by OSHI’s review of employer records and interviews or observations of employees.
6. Safeguarding of power press brakes is covered by American National Standards Institute standard ANSI B11.3-1982 , ANSI B11.3-2002, and ASME B5.55-2008. OSHA recognizes the ANSI B11.3 standard as the national consensus standard covering power press brakes guarding. Paragraph 6.1.4.3 of ANSI B11.3-1982 specifically addresses safeguarding by maintaining employees at a safe distance when a power press brake is being operated. By specific notation in paragraph 6.1.4.3, “[a] dimension value has not been assigned to the minimum safe distance.” B11.3-2002 paragraph 8.7. 1. states that the safe distance for each job set-up shall be determined. For the purpose of maintaining a “safe distance” as discussed in this instruction, **the operating employee and helping employees must not approach closer than necessary and in no case, closer than 4 inches (10.16 centimeters) to the power press brake point of operation. The minimum safe distance of 4 inches (10.6 cm) shall be measured from the exterior point of contact of the power press brake die closest to an employee.**

- B. “Safe Distance” Safeguarding Program. An employer who adopts “safe distance” protection must have (and be prepared to demonstrate to MNOSHA) an effective program. An employer

can meet this obligation by establishing and having employees follow an effective program which includes exposure prevention procedures and training and enforcement of these procedures as delineated in paragraphs 1 through 5 below.

1. Exposure Prevention Procedures. A “safe distance” exposure prevention procedure must be developed and documented by the employer and utilized by employees. The exposure prevention procedure must include provisions for maintaining a minimum safe distance as discussed in paragraph A.7. above.
2. Training. Employees must be trained to follow established exposure prevention procedures before operating a power press brake covered under the procedures.
 - a. Training Content. Employee training must include at least the following:
 1. The need for a safety oriented working relationship between the power press brake operator and his or her helper.
 2. The function and purpose of operating controls; operating mode controls; die space height adjustment positions; and other brake controls.
 3. The hazards of placing any parts of the body within the point of operation.
 4. The hazards and potential exposure related to each specific piece part bending operation particularly with respect to the piece part itself (for example, whipping) and to tooling (including loading and unloading).
 5. The function and purpose of hand-feeding tools.
 6. The dangers of unsafe work practices, inattention, horseplay, and misuse of equipment.
 7. The necessity and importance of reporting immediately to the supervisor any condition concerning the power press brake and its operation that may affect the safety of an employee.
 - b. Effectiveness of Training. The employer must ensure that after training, employees perform applicable exposure prevention procedures proficiently. Power press brake operators and helpers must also comply with the safe operating instructions and recommendations of the power press brake manufacturer or industry-recognized safe working practices for power press brakes. [Successful completion of apprenticeship training may be referenced to demonstrate this latter element of employee proficiency.]
3. Retraining. Retraining must be conducted whenever a periodic inspection (see paragraph 5 below) reveals, or whenever the employer has reason to believe, that there are deviations from or inadequacies in an employee’s knowledge or use of exposure prevention procedure or other work practices required to operate a power press brake safely. This retraining must introduce new or revised control methods and procedures, as necessary, and must reestablish employee proficiency to operate the power press brake safely.
4. Supervision. The employer must ensure, through effective supervision, that power press brakes are operated only by trained employees and must enforce the work practices on which power press brake operator training is based. This supervision must include periodic inspections as delineated in paragraph 5 below. Any deviations or inadequacies

in the exposure prevention procedures or work practices must be corrected promptly. Employer measures must include retraining and other appropriate corrective action.

5. Periodic Inspection. An employer must conduct a periodic inspection of the “safe distance” exposure prevention procedure at least annually to ensure that this procedure and other provisions in this instruction are being followed. This periodic inspection must be performed by a trained person; that is, an inspector, other than the person using the “safe distance” exposure prevention procedure. The periodic inspection must be designed to identify any deviations or inadequacies. The periodic inspection must include a joint review by an inspector and each trained employee of that employee’s responsibility under the exposure prevention procedure. The employer must ensure that the periodic inspections have been performed. Normally, the employer must be able to identify the power press brake on which the exposure prevention procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.
- C. Enforcement. Whether or not safeguarding is provided by maintaining a safe distance, an employer shall be cited for violation of paragraph 1910.212(a)(3)(ii) when a physical barrier or a physical device is feasible (except as otherwise allowed under paragraph A.6.b. above) but not used to protect employees from other point of operation of a power press brake. When physical guards and physical devices are not feasible and safeguarding by maintaining a safe distance is not provided as discussed in paragraph A.7. of this instruction, an employer shall be cited for violation of the General Duty clause, M.S. § 182.653, subd. 2.

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