

Subject: Mechanical Power Presses - 1910.217

Purpose: To guide enforcement of 1910.217 Mechanical Power Presses

Scope: This instruction applies MNOSHA-wide. This document covers the requirements for Construction, Safeguarding, Diesetting, Inspection, Injury Reporting, and Presence Sensing Device Initiation for mechanical power presses. It also contains two Appendices which include the *Mechanical Power Press Inspection Checklist* and the *Report Of Injury To Employee Operating A Mechanical Power Press* form.

Reference: The following documents are used as a reference and as a basis for the recommended ACTION section of this instruction:

- A. Federal OSHA Instruction [STD 01-12-024](#) Clarification and Interpretation of 29 CFR 1910.217, Mechanical Power Press, as Applies to the Safeguarding, dated July 30, 1979, specifies requirements for safeguarding die setters at the point of operation and provides alternatives for spring-loaded turnover bars.
- B. ANSI B 11.1-2009, "Safety Requirements for Mechanical Power Presses" provides guidance on the intent and application of the OSHA power press standards.
- C. ANSI B 11.1-1971, "American National Standard for Machine Tools – Safeguarding When Referenced By The Other B11 Machine Tool Safety Standards – Performance Criteria For The Design, Construction, Care, And Operation." [This is the source document for section 1910.217.]
- D. Federal OSHA Instruction [STD 01-12-021](#), Mechanical Power Presses, Clarifications, dated 10/30/78, provides a guide to aid in the recognition of mechanical power press point of operation hazards and provides uniform clarification of definitions, guards, devices, and methods of safeguarding.
- E. Federal OSHA Instruction [STD 01-12-020](#), Mechanical Power Presses Single Stroke Mechanism Requirements, dated 10/30/78, covers single-stroke mechanism requirements on full revolution power presses.

Cancellation: This instruction supersedes MNOSHA Instruction STD 1-12.24, dated March 4, 2013.

Action:

- A. Guarding and Construction, General
 - 1. Single-Stroke Mechanism

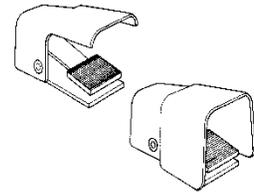
- a. Single-stroke mechanisms will not be required on full revolution clutch mechanical power presses if they are operated only in the continuous mode and the point of operation is fully enclosed by a proper point of operation guard.

Note: Die-setters must be protected by point of operation devices (e.g. two-hand controls) when guards are not in place, and the press must otherwise meet the applicable requirements of 1910.217.

- b. A press control system with an anti-repeat feature built in will provide single-stroke capability and meet the intent of the requirement for a single-stroke mechanism.

2. Foot Pedal Guards

OSHA standards for foot pedals or foot controls of mechanical power presses require that they be protected to prevent operation from falling or moving objects, or by accidental stepping onto the pedal. The illustrations in the ANSI standards show as an acceptable guard one that covers the top of the pedal. However, we should recommend guards that enclose the sides as well, such as the one shown to the far right.



3. Full versus Part Revolution Clutch Presses and Direct Drive Presses

- a. The determination of whether a press has a full or a part revolution clutch is dependent on the type of physical clutch it has, not on the way it operates. Some part revolution clutch presses will operate as full revolution, but are still part revolution presses and must comply with all the part revolution control and safeguarding requirements for the safety of the operator.
- b. Recognition of the two clutch types can usually be made from observation.
 - i. Full revolution clutches:
 - 1) Have a mechanical pin, “dog”, collar, or rolling key that couples the crankshaft to the rotating flywheel when engaged. There is a cam or similar mechanism to disengage the clutch. Once engaged, these clutches will make a full revolution before the cam disengages it.
 - 2) May not have a hose connected to the end of the flywheel. If it does, the hose is relatively small compared to the one on a part revolution clutch and is intended for lubrication. It may only be about the diameter of an average finger.
 - ii. Part revolution clutches:
 - 1) Have air operated friction clutches. These are discs that have material similar to brakes on the sides. These are similar to the clutch in a car with a standard transmission and may be engaged or disengaged at any point in their stroke.
 - 2) May function as a full revolution clutch even though the clutch can be engaged or disengaged during the stroke. Regardless, they are still part revolution clutches and must meet all the control and safeguarding requirements of part revolution clutch presses.
 - 3) Will have an air line coming into the clutch end of the flywheel end of the press. This air line is approximately the diameter of a garden hose and is much larger than the lubrication line that might be used on a full revolution press. The air line will have a solenoid operated valve that causes the clutch to engage when actuated.
 - 4) May be started or stopped at any point in its stroke and is to have an emergency stop button to accomplish this.
 - a) Some older part revolution clutch presses may not have had the emergency stop included in their controls. These should be cited under 1910.217(b)(7)(ii).
 - b) The existence of an emergency stop button should not be used as a sole means of determining the type of clutch on a press. Some full revolution clutch presses have had an emergency stop button installed, but these do not function in the manner required for a part revolution press. These buttons would not disengage the clutch and their existence does not mean that the clutch is part revolution.

iii. Direct drive systems.

The direct drive press does not have a clutch. Instead, it uses a motor to directly control the motion and stopping of the press slide. These direct drives match the operational characteristics of part-revolution clutches because the driving power may be interrupted during the cycle of the press.

4. Air Counterbalance Cylinders

A check valve on the press, downstream of the regulator, will meet the requirement for a *means to prevent failure of capability (sudden loss of pressure) in event of air supply failure* as required in 1910.217(b)(9)(v).

B. Safeguarding the Point Of Operation (POO)

1. Citing point of operation safeguarding deficiencies:

- a. If **no** safeguarding is provided/used: Cite only 1910.217(c)(1)(i). It covers the employer's responsibility to provide and insure the usage of POO guards or properly applied and adjusted POO devices on every operation performed. Grouping with one or more specification standards from 1910.217(c)(2) or (3) should not be done where no safeguarding was used.
- b. If deficient safeguarding is provided/used: Where POO guards or devices do not comply, 1910.217(c)(1)(i) and the more specific standard are to be grouped and cited as a single item. This includes, but is not limited to the standards contained in 1910.217(c)(2), (c)(3), (b)(6), and (b)(7)(v). The latter are specification standards and are to be cited only in conjunction with 1910.217(c)(1)(i). Additionally, 1910.217(c)(5)(i) and/or 1910.217(c)(5)(iii) should be grouped with 1910.217(c)(1)(i).

For example, cite 1910.217(c)(1)(i) **and** (c)(3)(viii)(c) for inadequate safety distance between the two-hand trip and the point of operation on a full revolution press.

2. Two-hand trips and controls are required to be fixed in position. It is not acceptable to mark the safety distance on the floor and maintain the two-hand trip/control pedestal outside of this line/mark. However, if the pedestal is movable, and a positive means is provided to ensure it cannot be moved within the required safety distance, this will not be cited if no hazard is presented. One method of doing this could be to have a sufficiently large base on the pedestal so the buttons cannot physically be located within the safety distance.

- a. Concurrent operation of two-hand controls and two-hand trips means they must exist in an actuated condition at the same time according to the definition in 1910.211(d)(8). ANSI B11.1, the source document for this standard, states in the explanatory information that:

The use of the word concurrent is intended to exclude any inference that a simultaneous moment of actuation must exist between the operations of the individual two hand controls.

We cannot enforce a timed interval as a requirement of the two-hand trips/ controls. However, this is an important safety feature as it prevents a control from being tied down, and protects against a failure of one of the actuating means. Without this feature the press can cycle if a pushbutton is intentionally or inadvertently depressed and, at some later time, the other is depressed.

During function testing of the two-hand trips/controls OSHIs should check for an anti-tiedown feature requiring essentially simultaneous operation of the two-hand trips/ controls. The OSHI should recommend to employers that the simultaneous feature be voluntarily provided, inspected, and maintained to reduce the risk of injury.

There is no obligation that an "anti-tiedown" feature be provided, although the use of tie-downs and bridges are in violation of the requirement for "concurrent" use of both hands and should be cited.

- b. Safety Distance: To cite a full revolution clutch press for safety distance under 1910.217(c)(3)(viii)(c), the OSHI's should clearly state the:
- i. Press manufacturer and model number.
 - ii. Number of revolutions of the flywheel per minute; or the number of strokes per minute when running in automatic continuous mode (This does not mean cycled repeatedly).
 - iii. Number of engaging points of the clutch.
 - a) Partial list of Engagement Points – Full Revolution Presses:

| <u># of Engagement Points</u> | <u>Press Manufacturer</u> |
|-------------------------------|---|
| 14 | Niagara – only |
| 4 | Bliss, Minster, Press Rite |
| 3 | Alva Allen, Johnson, Verson Bliss, Clearing, Cleveland, Consolidated Danly, Diamont, Federal, Minster, Ferracute, L & J, Toledo, Perkins, Robinson, Rockford, Rouselle, V & O, Walsh, Williams/White |
| 2 | Alva Allen, Kenco, Benchmaster Perkins, Gilro, Pressrite |
| 1 | Benchmaster, Famco, Gilro |

There is some overlap in the above list and may not be correct for all press makes and models.

- iv. The distance in inches between each two-hand trip and the nearest crushing/shearing hazard in the die area.

NOTE: The OSHI should inform the employer of other ways to abate the citation, such as the use of other point of operation guards or other properly applied and adjusted point of operation devices that would be appropriate.

- 3. Hand Feeding Tools: Hand feeding tools are not to be used in lieu of point of operation guard or devices. However, when feasible, OSHIs should recommend the use of hand tools for placing or removing parts in and from the dies to reduce employee exposure to the point of operation hazards.
- 4. Additional requirements for safe-guarding under 1910.217(c)(5):

Standard 1910.217(c)(4) specifies that hand feeding tools are not a point of operation guard or device and are not to be used in lieu of the guards or devices required in this section. This standard was intended to apply to the paragraphs preceding 1910.217(c)(4), and not to 1910.217(c)(5). Therefore, if the employer enforces and the employee faithfully uses hand feed tools to load and unload a part revolution clutch press, and hands are not placed in the dies for feeding or removing parts, the employer should not be cited under 1910.217(c)(5)(i) and (iii) which requires a brake monitor, control reliability, and a dual air valve.

Note: OSHI's are not to advise the use of hand feeding tools as a method of abating citations under the requirements of 1910.217(c)(5). They should inform the employer of other methods of abatement, such as the use of point of operation guards or devices that

do not require compliance with 1910.217(c)(5)(i) and (iii). This could include point of operation guards, a Type-A gate device, pull-outs or restraints.

C. Design, Construction, Setting And Feeding Of Dies

1. Protection of Die-setters (A die-setter is defined in 1910.211(d)(11)).

- a. Diesetting Procedure: 1910.217(d)(9)(i) specifies requirements for the protection of diesetters at the point of operation. It requires employers to proactively establish a diesetting procedure to ensure compliance with 1910.217(c). The procedure is not required to be in writing.
 - i. Diesetters shall be protected at the point of operation by a proper point of operation guard or device on every operation performed on a mechanical power press. This means die-setters are covered by the provisions of 1910.217(c) when running test or production parts, die-setting, or troubleshooting on a power press.
 - ii. It is not acceptable for diesetters to operate the press without point of operation guards or devices (except as provided below for "Jog" or "Inch" operation.) Since guards can't normally be used during die-setting operation of the press, point of operation devices (e.g. two-hand trips or controls) are typically needed for safeguarding the diesetter on both full and part-revolution clutch presses.
 - iii. The requirements of 1910.147 apply to portions of the die setting procedure where the die setter is not positioning or testing the set up.

2. Turnover Bar Options:

- a. Spring loaded turnover bars are required by 1910.217(d)(9)(ii).
- b. The current ANSI B11.1 standard merely requires a means to ensure removal from the bar hole before the press can be energized. In addition to spring loading, it also allows for the use of bar storage pockets that incorporate an interlock switch. Either option will comply with the intent of the OSHA standard.

Note that the interlock switch/plug is to ensure that the control circuit for the press is open when the turnover bar is not in place. This interlock does not replace the need for locking out the main electrical power under 1910.147.

- c. When citing 1920.217(d)(9)(ii) the OSHI should allow for the alternative within the wording of the AVD. For example:

"The employer did not provide spring-loaded or interlocked turnover bars on ... "

3. Diesetter Safety With Turnover Bars: Most full-revolution clutch presses have barring holes in the flywheel or crankshaft and are to be considered safeguarded if a proper turnover bar (spring-loaded or interlocked) is used with the:

- a. Main electrical power disconnect switch turned off (or the plug disconnected), the flywheel brought to rest, and
- b. Electrical, pneumatic, gravity, or other energy sources are locked out or isolated as required under 1910.147.

4. Diesetter Safety With Jog or Inch Buttons:

- a. Full Revolution Clutch Presses: Some larger full-revolution presses are not provided with a means for turnover bar operation. In this case, the point of operation would be considered safeguarded during setup if:
 - i. A momentary contact **Jog** pushbutton is used to impart an intermittent motion of the slide (ram) by momentary operation of the drive motor, after the clutch is engaged with the flywheel at rest. (This Jog pushbutton is only to be used to cause a partial, not a full, cycle of the press.)

- ii. The Jog control must require two-hand operation; or be a single control protected against accidental actuation and so located that the worker cannot reach into the point of operation while operating the single control.

Failure to safeguard the die-setter on a full revolution press in accordance with the above shall be cited under 1910.217(d)(9)(i), 1910.217(c)(1)(i), and/or 1910.147 as appropriate.

b. Part-Revolution Clutch Presses.

- i. An Inch-operating-means that meets the requirements of 1910.217(b)(7)(iv) is a satisfactory means of safeguarding during setup. Improper inch controls that allow the employee to be exposed are to be cited under 1910.217(b)(7)(iv).
- ii. Note that "Inch" controls or the "Inch" operating mode do not provide all the features of two-hand controls and may not be used for "Single-Stroke" or "Continuous" operation. Use of the Inch-operating-means by the operator for regular production use is improper and is to be cited under 1910.217(c)(1)(i).

Inch-operating-means are not provided with anti-repeat features that meet the requirements of the standards. This allows the two-hand controls to be tied down in continuous operation. Inch-operating-means also allow the press to be operated with the drive motor in reverse which reverses the rotary limit switches. This means the press will not stop during the die-closing portion of the stroke if the two-hand controls are released.

- iii. The "Bar" push button is sometimes used as a means of jogging a part revolution clutch press instead of using the proper Inch-operating-means. If the point of operation is exposed to the operator(s) or other employees, a citation of 1910.217(c)(1)(i) is to be issued.

D. Inspection, Maintenance, And Modification Of Presses

1. Power press inspections: Only persons knowledgeable with applicable power press construction, safeguarding, and diesetting requirements in 1910.217 (or the current/equivalent ANSI) standard should perform inspections.
2. Retention of Inspection Records: The standard for power press inspection records under 1910.217(e)(1)(i) and (ii), and (c)(3)(iv)(d) for pull-outs, does not specify a duration for records retention. We should recommend that they be maintained for at least 6 months following the end of the year to which they relate. This will allow the employer to demonstrate that they are conducting proper and timely inspections of their presses.

E. Reports Of Injuries To Employees

1. Employers are required to report to MNOSHA all point of operation injuries to employees operating mechanical power presses. Employers are required to make the report by telephone or send a written report to MNOSHA within thirty calendar days of the accident. Documents which establish press point of operation injuries not reported will normally be cited under 1910.217(g)(1). We will not cite employers who provide evidence that they have filed the injury report with Federal OSHA. If the power press injury meets the criteria for reporting a serious injury under 1904.39, the employer must comply with the timelines in 1910.39.
2. The attached AppendixA is a form the employer may use to meet the reporting requirement for mechanical power press point of operation injuries. This form is available in a fill-in PDF form on the MNOSHA website.
3. All reports of point of operation injuries will be referred to the person on phone duty and will be processed as a report of a serious injury (see Intake Processing Manual, chapter 3). If the employer has completed the form (Appendix A) or has made a report to Federal OSHA in writing, the person on phone duty will scan the form or report into the Serious/Fatal Log record.

F. Presence Sensing Device Initiation (PSDI)

PSDI requires certification and validation by an OSHA recognized third-party validation organization. There are no such OSHA recognized third-party validation organizations at this time so this method of operating mechanical power presses is not permitted.

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For the MNOSHA Management Team

Distribution: OSHA Compliance and WSC Director

Attachments: Appendix A - Report Of Injury To Employee Operating A Mechanical Power Press

NOTICE: Minnesota OSHA Directives are used exclusively by MNOSHA personnel to assist in the administration of the OSHA program and in the proper interpretation and application of occupational safety and health statutes, regulations, and standards. They are not legally binding declarations and they are subject to revision or deletion at any time without notice.

Report Of Injury To Employee Operating A Mechanical Power Press

29 CFR 1910.217(g)(1)

The employer shall, within 30 days of the occurrence, report to ... the State agency administering a plan approved by the Assistant Secretary of Labor for Occupational Safety and Health, all point of operation injuries to operators or other employees. The following information shall be included in the report:

| Employer and Establishment Information | |
|--|---|
| Employer's Name: | |
| Workplace Location: | |
| Workplace City, State and Zip Code: | |
| Incident Information | (Use one form per injured employee. This form may be copied.) |
| Employee Name: | Date of Injury: |
| Injury Sustained: (Describe the specific body part(s) injured, and the nature of the injury.) | |
| Task Being Performed: • Operation • Setup • Maintenance • Other (Describe below.) | |
| Type Of Clutch Used On the Press: • Full Revolution • Part Revolution • Direct Drive | |
| Type Of Safeguard(s) being Used: • Two-hand trips. • Two-hand controls • Pull-outs • Sweeps • Other (If the safeguard is not described in this section, give a complete description below or on attachment.) | |
| Cause Of The Accident: • Repeat of press • Safeguard failure • Removing stuck part or scrap. • No safeguard provided. • No safeguard in use. • Other (Include comments below or on attachment.) | |
| Type Of Feeding: • Manual, hands in dies. • Manual, hands out of dies. • Semiautomatic • Automatic • Other (Include comments below or on attachment.) | |
| Means To Actuate Press Stroke: • Foot trip. • Foot control. • Hand trip. • Hand control. • Other (Include comments below or on attachment.) | |
| Number Of Operators Required For The Operation? _____ | |
| Number Of Operators Provided With Controls And Safeguards? _____ | |

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Company Executive Signature and Title

Date