

## Ironworker

# Detail Sheets

An ironworker is a machine that has multiple work stations where various operations may be performed single or simultaneously. Operations include, but not limited to, punching, shearing, notching, coping and forming. The machine can be either mechanical or hydraulic.

**Operator involvement:** The operator feeds or places the stock between the dies or blades, checks that the material is properly positioned, activates the cutting cycle and removes the completed part. Usually this is a manual operation requiring the operator to work in close proximity to the cutting zone to guarantee proper stock placement.

**Hazards:** Crushing or amputation hazards: primary hazards include point of operation and material handling, with the possibility of placing the hand in the danger zone. Hold down devices on these machines exert extreme pressure which is another hazard. Broken parts can fly from the machine if a punch gets broken.

**Machines:** The in-feed side of an iron worker station, particularly the structural shearing station, is generally safeguarded by design. Access to the point of operation is limited by the restrictor, which holds the work piece in position during punching and shearing operations.

Ensure that the offside (blind side) of each machine station is safeguarded to prevent someone other than the operator from accidentally reaching into the point of operation.

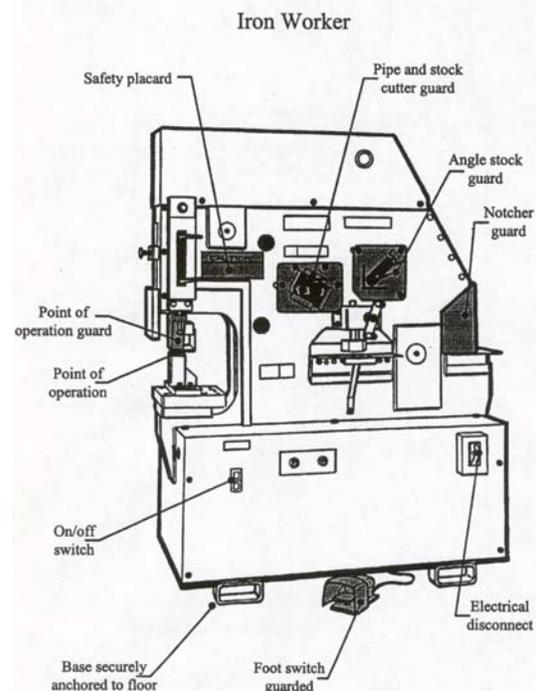
Guarding usually consists of self-closing guards that are open only when material is in the cutting area.

All the work stations on mechanical clutch iron workers operate at the same time, so any work stations not in use must be guarded.

**Guarding:** Unless openings are 1/4 inch or less, install point of operation safeguarding at each station to prevent entry into the danger zone during the operating cycle.

### Case Study

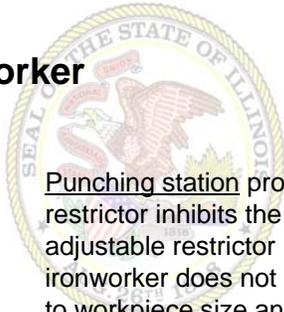
A 44 year-old male maintenance repairman died when a piece of metal struck him in the chest. The victim was working on an ironworker after he removed a jammed piece of metal from the punch assembly. The machine went through a punch cycle after the victim removed the cover plate. A piece of metal from the punch broke off and struck the victim in the chest. It is not known how the cycle was initiated.



**References:** 29 CFR 1910.212; ANSI B11.5

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1-800/972-4216

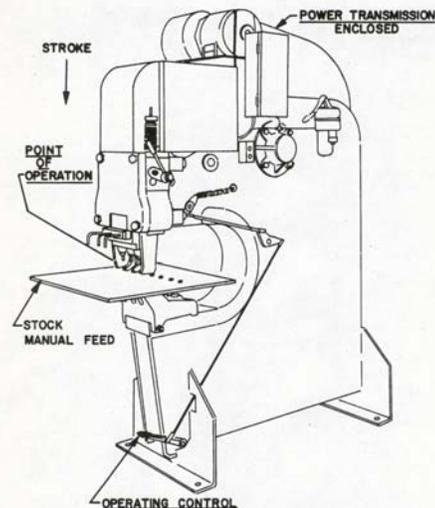
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- ❑ Punching station provide a guard or an adjustable restricter. When properly adjusted, an adjustable restricter inhibits the operator from placing his fingers or hand(s) into the point of operation. Although an adjustable restricter may not actually prevent such entry into the point of operation, normal use of an ironworker does not required an operator to place parts of his body beyond the adjustable restrictor due to workpiece size and configuration.
  - ❑ Structural shearing station on the *infeed side* provide a guard; device; or awareness barrier; at the dropoff side provide a safeguard or movable cover.
  - ❑ Flat shearing station, on *infeed side*, provide a guard for end of the flat shearing station; at the *droffoff side* provide a guard, awareness barrier, device or movable cover.
  - ❑ Coping-notching station, provide a guard with openings to permit the coping and notching or angles and flats or a moveable cover.
1. Guard all power transmission apparatus, including rotating components such as flywheels, sheaves, gears and shafts, meshing gears, belts and chains.
  2. Provide single stroke capability for machines using clutches. In shops fabricating structural steel, may operate in continuous mode only as long as the operator continuously engages the operating means, but may operating in single stroke with single engagement of the operating means.
  3. Provide compression springs that operate on a rod or guided within a hole or tube and is designed to prevent interleaving of the spring coils in the event of breakage.
  4. Guard foot controls and provide a non slip contact area. Identify the foot control as to the machine station that it is to operate.

### Safer Work Practices

- ❖ Provide a device (i.e., magnetic motor starter) that disconnects the drive motor from the power source in the event of failure and requires operation of the motor start button to restart the motor when power conditions are restored to normal.
- ❖ Use warning signs and color coding to indicate a hazardous condition for each guard, barrier or restrictor used, unless the point of operation opening is 1/4 inch or less.
- ❖ Require use of hand tools to eliminate the need for the operator to place his hands or fingers within the point of operation, in addition to the use of safeguarding.
- ❖ Always make sure the die set is properly sized and in good condition before installation at the punch unit.
- ❖ Wear eye protection at all times.



The number of accidents and the circumstances in which they occur show that most can be avoided by a knowledge of the risks and by adopting safety measures. The simple safety steps given below will help to prevent most accidents at grinding machines. You may find them useful as a safety check list.