Practical Application of OSHA Safety Requirements in the Press Room

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Press Inspection Kit
E + R = O: Event + Response =

OUTCOME!

IF YOU CONTINUE TO DO WHAT YOU HAVE ALWAYS DONE, YOU WILL CONTINUE TO GET THE SAME RESULT!
Press Room Safety!!!!

• Is what I am about to do safe?
• How could this operation hurt myself or someone around me?
• Don’t just look down, up ahead, around the corner and especially up!!!
• Think First: Is this safe?
Why Use Lockout/Tagout?

• What needs to be locked out?
  – Energy both available and stored!
  – What areas of the press cell have potential energy issues?
    • Control power-Remove at the disconnect.
    • Air power-Remove and exhaust at the source.
    • Spring Tension-All brake assemblies contain springs under pressure that provide the force needed to stop the slide of the press under motion.
    • Flywheel Rotation
    • Static Weight-Slide Assembly-Always block the slide weight unless the slide is at BDC.
Additional Power Sources

- Thermal
- Hydraulic
- BASICALLY-IF THERE IS FORCE AVAILABLE, THERE IS DANGER!
Why Inspect?

• OSHA Compliance.
• Insure Press Operational Safety.
• Predictive Maintenance-Work to avoid the emergency breakdown.
Theory of the Box

Crown

Columns

Five Square Boxes

Base/Bed
What Is Required

• Date Of Inspection

• Machine Identification
  – Model Number
  – Serial Number
  – Tag or Machine Number
What is Required Continued

• Name of Inspectors

• How often does the machine have to be inspected?
  – Not specified, just on a regular basis, could be semi-annual or annual.
  – Must keep record of most recent inspection and previous inspection results on file. Format not specified.
Record Specifications

Machine
- Model
- S2-150-96-48 Sample

Machine
- Serial Number
- H222684

Design Specs
- Stroke
- Bed Area
- Shut Height and Slide Adjustment
Frame Inspection Items

• Visually inspect for cracks

• Tie Rods

• Counterbalance Cylinder Rods at Connection Point to Slide.

• Broken or Loose Bolts.

• Vibration or Wobbling of Any Driving Component.
Flywheel End Play
Closer Look at Endplay
Vertical Lift Clearances

- Clearances to be checked as a part of inspection
  - Main Pin or Crankshaft Bushing Clearances
  - Upper Connections or Eccentric Straps
  - Wrist Pins or Ball Seats
  - Lower Connection Screws
• Housings, Adjusting Nuts, and Slide
  – Lower Connection screws and adjusting nuts are enclosed in housing assemblies.
  – We will inspect both the thread clearances and adjusting nut clearances.
Total Allowable Clearance
If a machine is 500 tons or less the total allowable lift clearance should be .060” or less.
Over 500 to 1000 tons total allowable lift clearance should be .085” or less.
Component Safety
Slide Adjusting Mechanism

• Check function of slide adjusting motor.
• Check upper and lower limit limit switches.
Slide Limits
Driveshaft Assembly

• As the machine is running is there any excessive gear or air noise?

• Using heat gun all bearings should be running at 100 degrees F or less. Sometimes due to climatic conditions the bearings may run up to 120 F.
Driveshaft Assembly Con’t

• Watch for any flywheel endplay
• Listen for air bypass
• Check clutch brake travel
• Any brake stopping time issues.
Counterbalance Cylinders

- Air Leaks
- Rod Scoring
- Regulators Functional
- Safety caps to provide parts from flying out during component failure.
Pneumatic System

- Air pressure switches to verify system pressure.
- LOX Valve to turn off pressure and exhaust.
- Regulators functional.
Exhausting Air Valve
Electrical Controls

- Is there a lockable keyed selector switch?
- Are there dual palm buttons?
- Anti-Tie Down, Anti-Repeat.
- If there are multiple operators does each operator have a set of palm buttons?
Electrical System and Controls

• Is there a motor restraining cable?
• Is there a fusible disconnect to remove power from the machine?
• What is the condition of the panel?
• Further discussion will be covered under Step 15-OSHA Compliance Questioner
OSHA Compliance Questioner

• Does your company have written procedures for safe machine operation?
• Is there disciplinary action taken if procedures are violated?
• Is there a formal training program to train the employees in the specified procedures?
Questioner

• Are all Authorized, Effected, and Others trained in accordance with the training requirements outlined in 29CFR 1910.147, Control of Hazardous Energy.

• Do you have proper documentation to verify the above?
Questioner

• Is all of your machinery kept clean and properly maintained?

• Is there an established process for machine operators to report equipment/guarding concerns and failures?

• If (2) hand controls are used, are they located at an appropriately safe distance and positioned as ergonomically as possible?
If there is more than one operator, are separate two hand controls provided or are there other effective guards and devices being used to protect the operators?
• Are all machinery and equipment that pose a danger of tipping or other movement securely placed or anchored?
• Is there an electrical disconnecting switch or a red emergency stop device on the machine or near operator’s position at each machine?
Questioner

- Are the various power sources; electric, hydraulic, pneumatic or thermal for each machine capable of being locked on in the OFF position?
- Lock Out/Tag Out
Questioner

• Are there manually operated shut off valves and disconnect switches that control machinery/equipment operation clearly identified and readily accessible?

• Are all moving parts located less than seven feet above the floor or working level properly guarded?
Questioner

- Are employees protected from point of operation hazards, ingoing nip points, rotating parts, flying chips, and sparks?
- Are machinery guards arranged so that they do not pose a hazard in their use?
Guarding?
Does this work?
• Are the tools used for placing and removing material the appropriate length, type and size to avoid having an operator’s hands in the machine?
• Are hand tools for placing and removing being used in conjunction with safeguarding and not in lieu of guards?

• Are the opening in the fan blade guards no larger than ½” for fans located lesss than seven feet above the floor or working level?
Questioner

• Are the On/Off switches constructed in a manner that they cannot be accidentally turned on?

• Is stop time calibration included in the PM Program?
Questioner

• When employees are required to remove or bypass a guard or safety device are lockout procedures followed?
Questioner

- Are machine components designed and secured to minimize hazards caused by breakage or release of mechanical energy?
- What about Counterbalance Cylinders?
• Is the brake capacity sufficient to stop the motion of the slide quickly and hold the slide and its attachments at any point in the travel?
Questioner

• Are two hand trip controls protected against unintentional operation?
• Ring Guards
• Are two hand controls arranged and constructed so that concurrent operation is needed to trip the press?

• If multiple operators are running the machine does each operator have a set of palm button controls?
On part-revolution clutch presses, does the clutch release and the brake apply when the external clutch engaging means is removed, de-activated, or de-energized?

Is there a red colored stop control provided with the clutch brake control?
Questioner

• With a clutch brake controls is a means of selecting Off, Inch, Single Stroke, and Continuous provided?

• Is the type of press operation capable of supervision by the employer? Keyed selector switch.
Questioner

• Is the INCH operating mode designed to prevent hands in the point of operation by

  – Requiring concurrent use of both hands to actuate the clutch?

  – Being a single control protected against accidental actuation, where the operator cannot reach into the point of operation while using the control?
• Do two hand controls for single stroke conform to the following
  – Each hand control is protected from unintended operation and designed to required concurrent use of both hands to operate the press?
• Are controls of more than one operating station designed to be activated and deactivated in complete sets of two operators and capable of being supervised by the employer?
If all operating controls are bypassed, is the clutch brake control system designed to prevent actuation of the clutch?
If the clutch brake control system contains both the single and continuous function, is it designed so that completion of the continuous circuits may be supervised by the employer?
Does the initiation of a continuous run require a prior action or decision by the operator, such as the use of a keyed selector switch?

If foot control is provided, is the selection method between hand and foot controls separate from the stroking selector and capable of being supervised by the employer?
Questioner

- Does every power press control system have a power disconnect switch capable of being locked in the Off position?
- Is the motor start button protected against accidental operation?
• Do all mechanical power press controls incorporate a type of drive motor starter that will disconnect the drive motor from the power source in the event of control voltage or power source in the event of control voltage or power source failure?
Questioner

• Are all AC Control circuit and solenoid valve coils powered by not more than 120 volts AC supply obtained from the transformer with an isolated secondary?

• Are higher voltages necessary for operation of the machine isolated form any control mechanism handled by the operator?
Questioner

- Do air counterbalance cylinders retain the piston and rod in case of breakage or loosening?
- Do spring counterbalances have the capacity to hold the slide and its attachments at mid-stroke with the brake applied?
Questioner

• Do air counterbalance cylinders incorporate means to prevent a sudden loss of pressure in the event of air supply failure?

• Is air controlling equipment protected against foreign material and water entering the pneumatic system of the press?
Questioner

• If required, is the control system constructed so that a failure within the system does not prevent a normal stopping action from being applied to the press when required, but does prevent initiation of successive stroke until the failure is corrected?
Questioner

- When required, does the brake monitor meet the following requirements;
  - Is the brake monitor constructed to automatically prevent the activation of the subsequent stroke if the stopping time or braking distance deteriorates to a point where the safety distance being utilized does not meet requirements?
Thank you for your attention!

• Are there any questions?

• If you have any questions in the future please contact:
  • Jeff Fredline, jfredline@cncpressrepair.com
  • Press Inspection formats available at no charge!

• Again, THANKS!