Sheetmetal Work

Hazard Review

- **Crushing injuries**
- **Cuts, lacerations**
- **Musculoskeletal injuries**
- **Strains**

Related Safe Work Practices

- **Hazardous Materials**
- **Hot Work (Welding)**
- **Lifting, Body Mechanics, and Ergonomics**
- **Lock Out and Tag**

Personal Protective Equipment

- **Eye protection**
- **Hearing protective device**
- **Hard or Bump hat**
- **Leather gloves (except turning machines)**
- **Safety shoes**

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This safe work practice has been broken down into two sections:
A. General
B. Specific Machines

The General section provides information that applies to just about every situation. The section on Specific Machines gives information that may be specific or unique to a particular task. You are advised to read sections A and then to read about the applicable machine from section B.

A. GENERAL

Before

1. Complete required training. This includes
   - a review of the manufacturer's operating manuals, and
   - training on this SWP and those listed as related. These must be completed before the initial assignment and every 2 years thereafter.

2. Seek training from an experienced employee/supervisor prior to using any machine that you are not familiar with.

3. Use caution while handling sheet metal stock as it can be heavy and very sharp:
   - Team lift (see *Lifting, Body Mechanics, and Ergonomics*) any item over 50 pounds.
   - Watch for buckling of sheets as they can fold around your hands.
   - Have a rolling table ready to accept sheets with the top clear and the wheels locked.

3. Keep all work areas clear of debris, scraps and tripping hazards.

4. Do not wear baggy clothing, jewelry, or loose fitting gloves as they can get caught in equipment.

During

1. Do not use more force than necessary to actuate machines as this can cause impact injuries to hands and arms.

2. Adjust machines as necessary to use the minimum physical force. Let machines do as much of the work as possible, don't force metal through them.

3. Keep hands clear of moving parts of machines.

After

1. Remove finished metal items to a table out of the way.

B. SPECIFIC MACHINES

1. Shear
   - First don PPE: hearing protective device, gloves, work boots, apron and safety glasses.
   - Visually scan the area for anyone who may be at risk and say "clear" loud enough to be heard over the noise of the machine.
   - Apply foot to the dead-man pedal to activate cutting mechanism.
   - Turn machine to "off" position, remove work-piece from lower tray and place on "clear" table.
   - Keep hands away from handwheel when back gage is moving.
   - Do not:
     i. press any buttons on the counter unless you intend to reset the read out or adjust the scale factor.

ii. use the shear without the hold-down.
iii. stand behind the shear during operation, as e.g. sheets might fall down.

- It is recommended that any replacement of the blades and/or hold-down is carried out by 2 people.
- Disconnect the power and lock the shear, (fuses may be removed) when replacing any parts. Use lock out and tag procedures (see *Lock Out and Tag* SWP).

2. Hand Brake
   - Check for any obstructions in the swing area of the machine.
   - Once metal is loaded into the machine, use both hands to pull the locking handle toward you to lock.[1]
   - Use one hand to push the upper counter-weight forward and your other hand to lift the lower handle until you have the desired angle of bend.
   - Center your body in front of the locking handle and use both hands to unlock the piece from the machine.
   - Place the work-piece clear of your work area.

3. Manually Operated Turning Machine
   - Verify that you are using the correct set of matched wheels before loading metal into the machine.
   - Load metal and set to the desired depth.
   - Keep your fingers and hands clear of wheels while operating the turning handle.
   - Use caution while holding the raw side of the work-piece as it can be very sharp. A "U" shaped piece of metal can be used to support the work-piece.

4. Slip Rolling Machine
   - Do not wear baggy clothing, jewelry, or loose fitting gloves as they can get caught between the rollers.
   - Adjust the clearance between the tubes on the rolls keeping your hands clear of the space between rolls.

5. Band Saw
   - With the machine off and disconnected from power (see *Lock Out and Tag* SWP), check the blade for any damage, alignment, and proper tension (check blade speed by turning machine on before putting work-piece on cutting platform).
   - Avoid exposures to fumes, dust or the risk of fire or explosion while machining some materials. Use local exhaust ventilation to help control exposure. If local ventilation is not available, speak to EHS about other options.

[1] RPD Industrial Investigation, EHS Case #3119, DOI 6/2/06.

- Do not start machine unless all guards are in place, keep guards in place when sawing.
- Adjust and secure table before loading workpiece.
- Do not exceed the maximum table load (as per manufacturer's instructions).
- Position the top guides as close possible to the workpiece.
- Prepare to hold small or unstable workpieces by means of a clamp or other device to avoid loss of control.
- Keep hands clear of the saw blade at all times.
- Keep the work area free of tools and off-cuts.
- Stop the machine to make adjustments.
- Stop the machine before leaving it unattended.
- Wear eye protection.
- Use care in uncoiling and installing new saw blades as the teeth are sharp.
- Do not leave saw blades on the floor.

6. Lockformer (22 gauge milled steel or 24 gauge stainless steel)
   - Do not use metal pieces smaller than 6 inches wide.
   - Use extreme caution when placing work-piece into the machine as it will grab the metal and pull it into the machine along its entire length.
   - Be ready to "catch" the finished piece to prevent the end from "popping up".

7. Drill Press
   - Secure the work-piece prior to starting work.
   - Keep drill bits well lubricated with cutting solution.
   - Drill small diameter pilot hole and work up to desired hole size.
   - Turn off machine prior to removing work-piece. Use caution, as pieces may be hot or have sharp "burrs".

8. Workhorse Slitter (18 gauge milled steel)
   - Set slitter gauge to desired width.
   - Keep hands clear of cutting wheels by holding the metal to be worked at the opposite side of the cutting wheels.
   - Follow the piece through its cut while maintaining pressure against the back gauge.
   - Turn off power and clear the freshly cut metal out of the path of the next cut.

9. Bench Rod and Bar Cutter (3/8" milled steel rod or 3/16" milled steel flat bar)
   - Secure work-piece and adjust gauging devices as required.
   - Apply enough force to cut desired piece, but no more.
   - Keep body and limbs away from operating handle to prevent being struck by it.
   - When machine is not in use remove operating handle and leave machine in the closed position.

10. Hydraulic Powered Leaf Brakes (HBPU-1012-6)

- Read operator's manual. In addition to safe work practices, note how to properly keep the machine lubricated for every 8 hours of operation.
- Bend short pieces of material in center of brake to equalize strain.
- Always have both angle bar and insert bar mounted to the bending leaf when making capacity bends.
- Always use material with squared ends. Rolled edges will cause material to bow.
- Always adjust for differences in gauges – never clamp the top material heavier than that for which the links and top are set for.
- Do not attempt to form material beyond the rated capacity of the machine, as it could result in personal injury to the operator and/or damage to the machine.
- Never use brake to bend rods, they will nick the nose bar.
- Never operate the bending leaf unless the top leaf is set back 1-1/2 to 2 times the material thickness.

11. Rotex Punch (16 gauge milled steel and 18 gauge milled stainless steel)
    - Use center punch to mark location of hole to be punched on work-piece.
    - Match punch dies and verify alignment.
    - Lubricate dies with light oil before punching hole.
    - Stand off to one side when operating machine to prevent handle from hitting your head.

References:

1. Operating Manual 10M10 – Mechanical Shear, Roper Whitney of Rockford, Inc. November 6, 1998
2. Operating Manual 10M14 – Mechanical Shears, Snow and Galgiani, Roper Whitney or Rockford, Inc., July, 7, 1999.
3. Startrite Operating Instructions and Parts List, T/V series 10 Speed Bandsawing Machines Handbook 3A. Sections 1-47. Startrite 1981.
4. Chicago Dreis & Krump Instruction Machine Manual, Hydraulic Powered Leaf Brakes, Model No. HBPU-1012-6, Serial No. 328227-T.

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