Power roll forming and bending machine

Conventional metal forming and bending machines, also known as plate bending rolls, produce smooth, circular bends in sheet, strip, or coiled stock. Metal is fed between successive pairs of rolls that progressively bend and form it until the desired shape and cross section is obtained. The radius of the bend can be adjusted by changing the location of the rolls. These machines are normally equipped with instant start, stop, and reverse controls.

Hazard

Severe crushing injuries, amputations, and even death can occur if a worker is caught and drawn into the counter-rotating infeed rolls. The risk of injury is high during the initial feeding of the stock. Wearing gloves with fingertips and loose clothing also increase the risk of entanglement.

Workers can also be struck by the moving work piece or pinned between it and a fixed structure.

Imagine what this machine can do to arms and hands if it can bend metal like this.

Solution

Installing fixed or adjustable barrier guarding at the point of operation is usually not practical, primarily due to the flexibility needed to bend various sizes of stock. Some protection for the operator and anyone near the machine can be provided by using devices such as safety trip cables (emergency stop) and hold-down controls; however, these safety devices do not directly prevent entanglement or entrapment. They are intended to help prevent or minimize injury by stopping the machine quickly.

Hold-down button or foot controls are designed to actuate roll movement only when held in the run position. The control should automatically return to the stop position when released.

A trip device (bar, tensioned wire/cable, or kick panel) is interlocked with the machine's control circuit and positioned so that it may be easily actuated by any person caught or drawn toward the rolls and will stop the machine before serious injury can occur. It should run the entire length of the machine at the front and in the back. Also, ensure the braking system is adequate, as the safety devices are only effective if the dangerous parts of the machine stop quickly.

In addition to the measures detailed above, an emergency stop button should be provided at the machine control console and at any remote work station. If more than one person is needed to operate the machine, controls should be furnished for each person.

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Safety trip cable running the entire length on this roll bending machine.

Stock should be held sufficiently far back from the edge being fed to prevent close proximity to the point of operation. Whenever practical, use feed or roller tables.

Consider wearing gloves without fingertips or palm protection only. Prohibit loose-fitting clothing.

Maintain adequate distance from the work piece being formed to prevent being struck by it.

References

- **General Industry**

  Oregon OSHA Division 2/Subdivision O 29 CFR 1910.212 — General Requirements for All Machines

  Oregon OSHA Division 2/Subdivision J 29 CFR 1910.147 — The Control of Hazardous Energy (Lockout/Tagout)

- ANSI B11.12 *Safety Requirements for Roll Forming & Roll Bending Machines*