

## Magnabend™ – Electromagnetic sheet metal folding machine

### What is Magnabend™?

The Magnabend™ is a machine for folding sheet metal and is a common item used in the metal work environment. It can be used to bend both magnetic metals like galvanised steel and non-magnetic metals such as brass and aluminium. The machine is different from other folders as it clamps the work piece with a powerful electromagnet rather than by mechanical means.

The machine is essentially a long electromagnetic bed with a steel clamp bar located above. In operation, a piece of sheet metal is placed on the electromagnetic bed. The clamp bar is then placed into position and once the electromagnet is turned on the sheet metal is clamped in place by an electromagnetic force of many tonnes.

A bend in the sheet metal is formed by rotating the bending beam which is mounted on hinges at the front of the machine. This bends the sheet metal around the front edge of the clamp bar. Once the bend is complete a micro switch should be activated to turn the electromagnet off.

### The incident

While undertaking a practical task using sheet metal, a year 12 student suffered a crush injury to his finger when the clamping bar that he was carrying came close to the electromagnetic bed of the Magnabend™. As the student was preparing to position the clamping bar it came within range of the active electromagnet which clamped the bar and trapped the student's fingers between the two surfaces.

### The hazard

It was found that the machine had a fault that allowed the electromagnet to self-engage without the operator pressing the "start" button. A far more serious injury (such as amputation) could have resulted from this hazard.

### Recommendations for control

The following controls are recommended to address this hazard:

1. Inspect all machinery of this type within your workplace to ensure safe operation, particularly with respect to electrical switches. If faults are found, isolate the machinery until it can be fixed and is safe for operation.
2. Schools need to create their own maintenance and inspection program. Guidance can be taken from the resource below. Note: maintenance and inspection programs must include the electromagnet switch gear.
  - [Equipment Maintenance Record](#)
3. As with all items in this working environment, staff and students should be inducted and trained in the use of the equipment and deemed competent before they are permitted to use the equipment unsupervised.
4. Standard safe operating procedures and the machine's manufacturer's manual should be readily available to all users which incorporate a process of safely checking if the electromagnet is active before operating the machine. For further information refer to the Safe Operating Procedure below:
  - [Safe Operating Procedure](#)
5. The training and maintenance documents/records should be retained by the school. Documentation for all plant should be in accordance with [Managing Risks of Plant Code of Practice 2013 S6 Keeping records](#) and kept for the life of the plant.