

Section 4

Machine Guarding and Safety Devices

1. WSH (General Provisions) Regulations related to machine guards and safety devices
2. Types of machine guards and their functions
3. Types of safety devices and their functions

WSH (*General Provision*) Regulations

Every **danger area** of a machine shall be securely fenced or provided with effective safeguard to prevent the worker from coming into contact with the part.

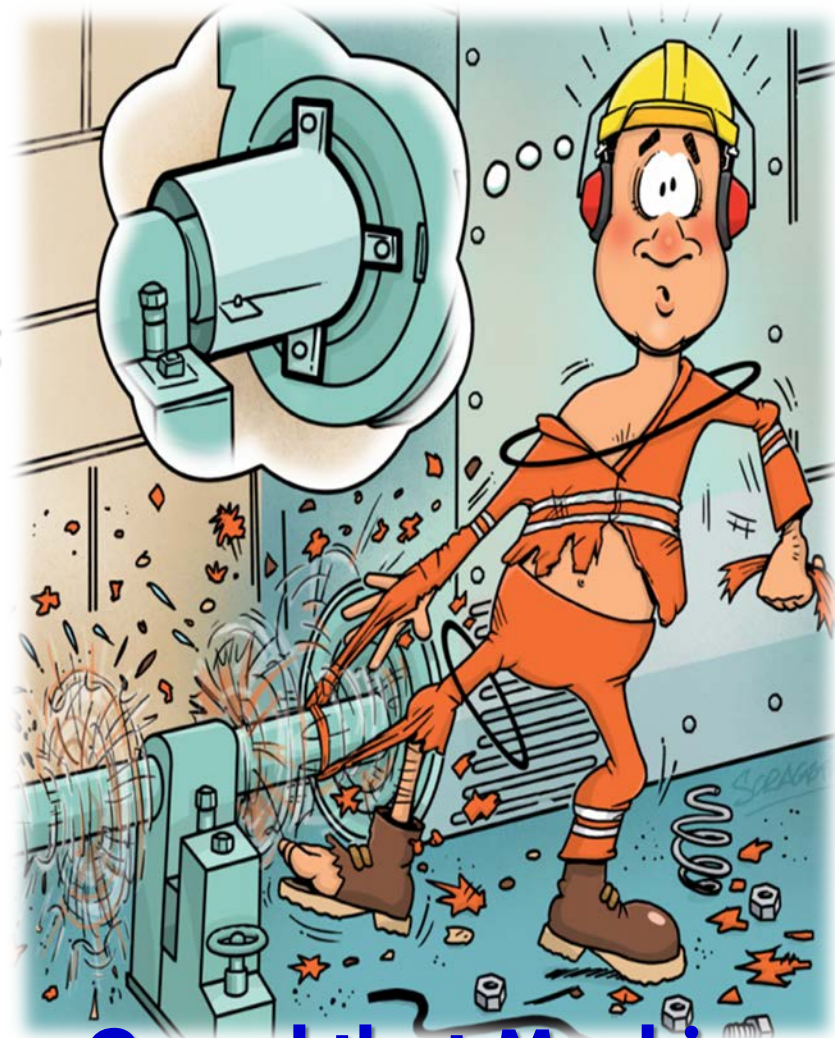
Efficient safety devices must be provided by which the power can be **promptly cut-off** from the machinery.

WSH (*General Provision*) Regulations

Machine Guards

Fencing or barriers are provided to :

1. keep workers from touching moving parts of machines.
2. protect workers from flying debris, sparks and splashing chemicals.

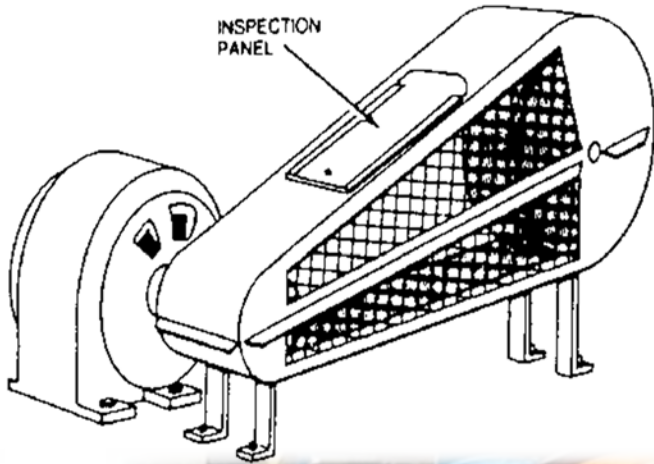


Guard that Machine !

Types of Machine Guards

Fixed Guards

They are stationary (immovable) barriers that are usually firmly fastened in place, making it difficult to remove them.



Types of Machine Guards

Adjustable Guards

In situations where fixed guards **would interfere with machine functions**, **Adjustable and Self-Adjusting Guards** are commonly used.

These guards are movable, allowing them to be used in many situations; particularly around points of operation.

Adjustable Guards are manually set/moved by a machine operator.

- Some simply swing into position.
- Others must be carefully set up to accommodate different sized raw materials.

ADJUSTABLE GUARD OF LATHE MACHINE



Adjustable Guard

Stopper

Pressure Tripping Pedal

Guard in **OPEN** position

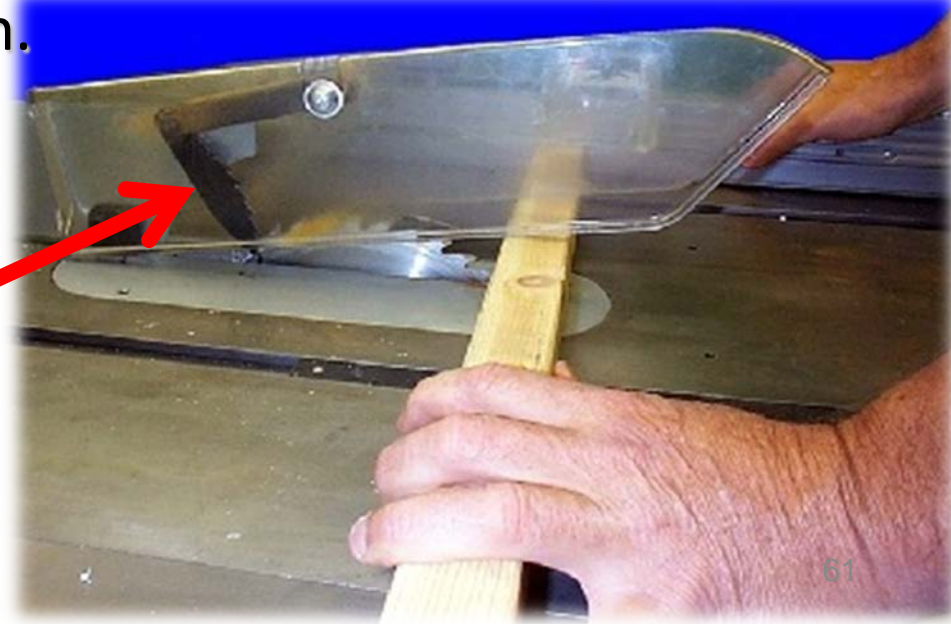


Guard swing downwards to **CLOSE** position

Self-Adjusting Guards

Self-Adjusting Guards automatically moves as materials enter or move through the machine and do not require constant re-positioning.

- These self adjusting guards automatically move out of the way to allow materials of different sizes to be processed.
- Once the material passes, the guard falls back into place again covering the point of operation.



**Circular table Saw
self-adjusting guard**

Safety Devices

Safety Devices are used to provide protection and allow workers to operate the machinery with minimal restrictions.

Most Safety Devices protect a worker's entire body by quickly shutting down the machinery when tripped.

Others only protect the hands.

They do this by either:

- Keeping a machine from starting if a hand is in the wrong place.
- Restricting the machine operator's hand and arm movements.

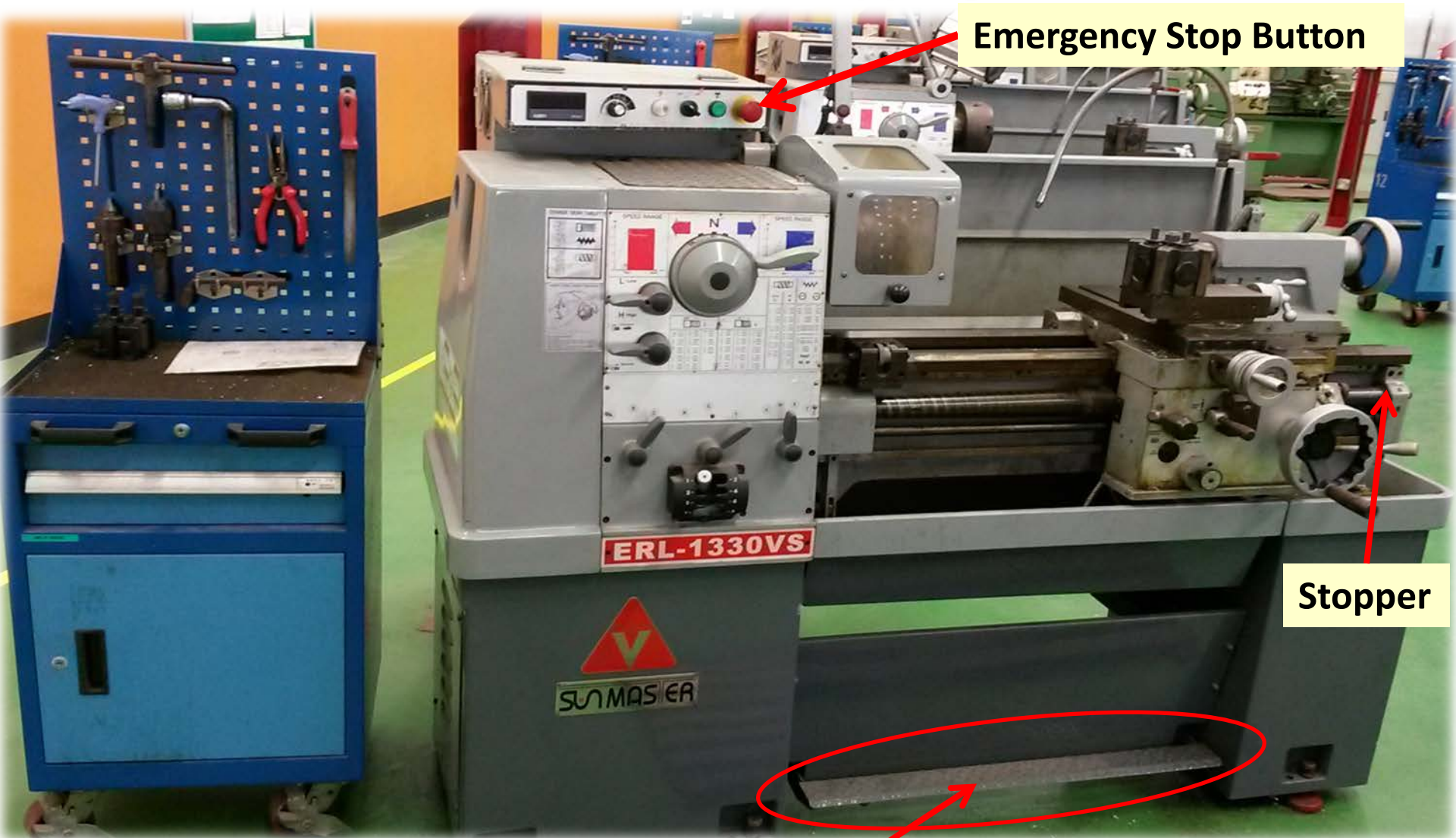
Safety Devices - Pressure-Sensitive Trips

They are simply wires or cables that are attached to switches. If a worker touches the cable, the switch "trips" and stops the machine.



Trip-wire cable

Safety Devices – Pressure Tripping Pedal on a Lathe



Emergency Stop Button

Stopper

Pressure Tripping Pedal

Safety Devices – Pressure sensitive mats

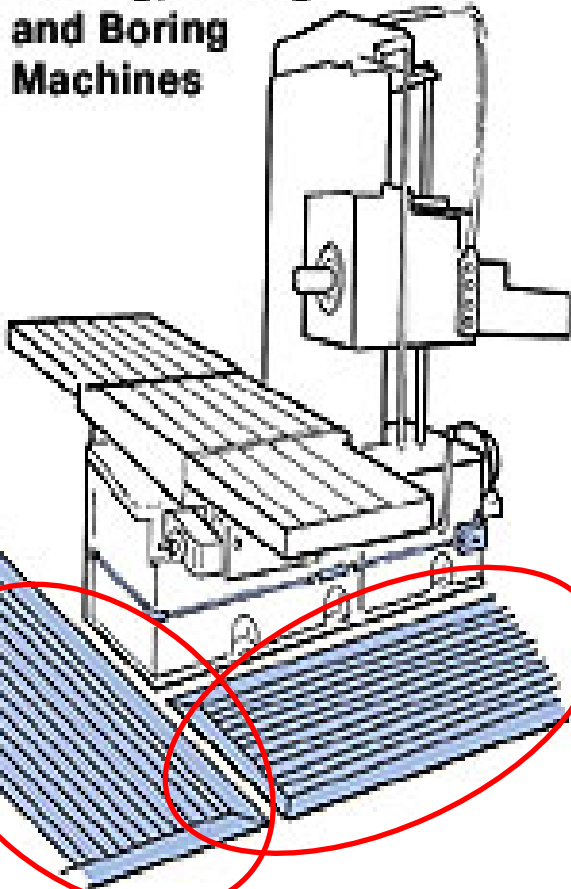
Two ways to apply pressure sensitive mats in machine:

- The mats are set up to **shut** a machine down if a worker steps **on** them. This prevents the worker from getting close enough to touch moving parts.
- Another way, the mat is used to shut down the machine when a worker steps **off** of the Mat. In this case, the worker must be **on** the mat and safely away from hazards for the machine to run.

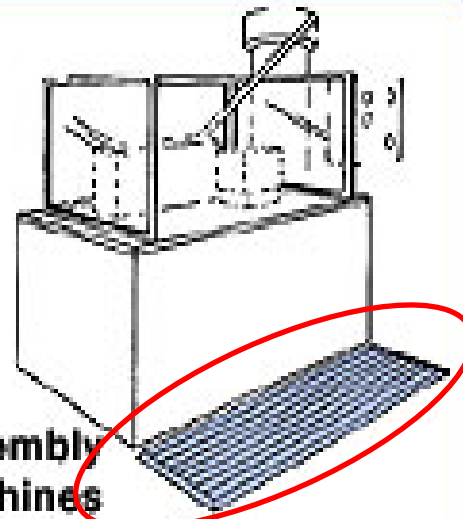
[Video on Safety mat for robotic workspace](https://youtu.be/dTIPjIRnkbE)
<https://youtu.be/dTIPjIRnkbE>

Safety Devices – Pressure sensitive mats

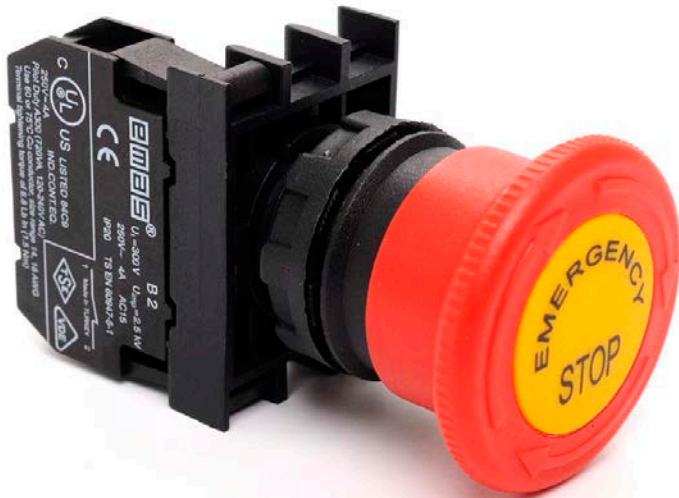
**Drilling, Milling
and Boring
Machines**



**Assembly
Machines**



Emergency Switch



Emergency Switch

Emergency switch is provided when emergency stopping of machine is necessary, and hence, the **switch** shall:

- *Be easily accessible to the operator.*
- *Be designed for unexpected activation.*

