MACHINERY HAZARD

MKH COURSE

PRESENTATION OUTLINE

1. Objectives & Topics
2. Machinery Parts
3. Types of Hazards
4. Types of Accidents
5. Machinery Hazards Control Methods
6. Hazard Identification
7. Risk Assessment Considerations
8. Conclusion & Case Study

COURSE OBJECTIVES

- State the definition of machinery
- Explain the 10 types of machinery hazards
- Elaborate the methods for the prevention and control of machinery hazards

COURSE TOPICS

- Definition of Machinery
- Machinery parts and functions
- Machinery hazards
- Types of machinery related accidents
- Hazard control methods
- Conclusion
- Group activity

DEFINITION

Machinery

" An equipment that supplies power, has static and movable parts, each with their own respective functions "

BS 5304:1975

MACHINERY PARTS

- Operative / Functional

  Implements the functional output such as the blade on a chain saw

- Non operative / Non functional

  Supplies power or movements to the operational parts such as the force of the motor

MACHINERY PARTS

- Every shaft, wheel, drum, pulley, system of fast and loose pulleys, coupling, clutch, driving belt or other device by which the motion of a prime mover or other source of mechanical power is transmitted to or received by any machine or appliance.

(Definition under FMA 1967)

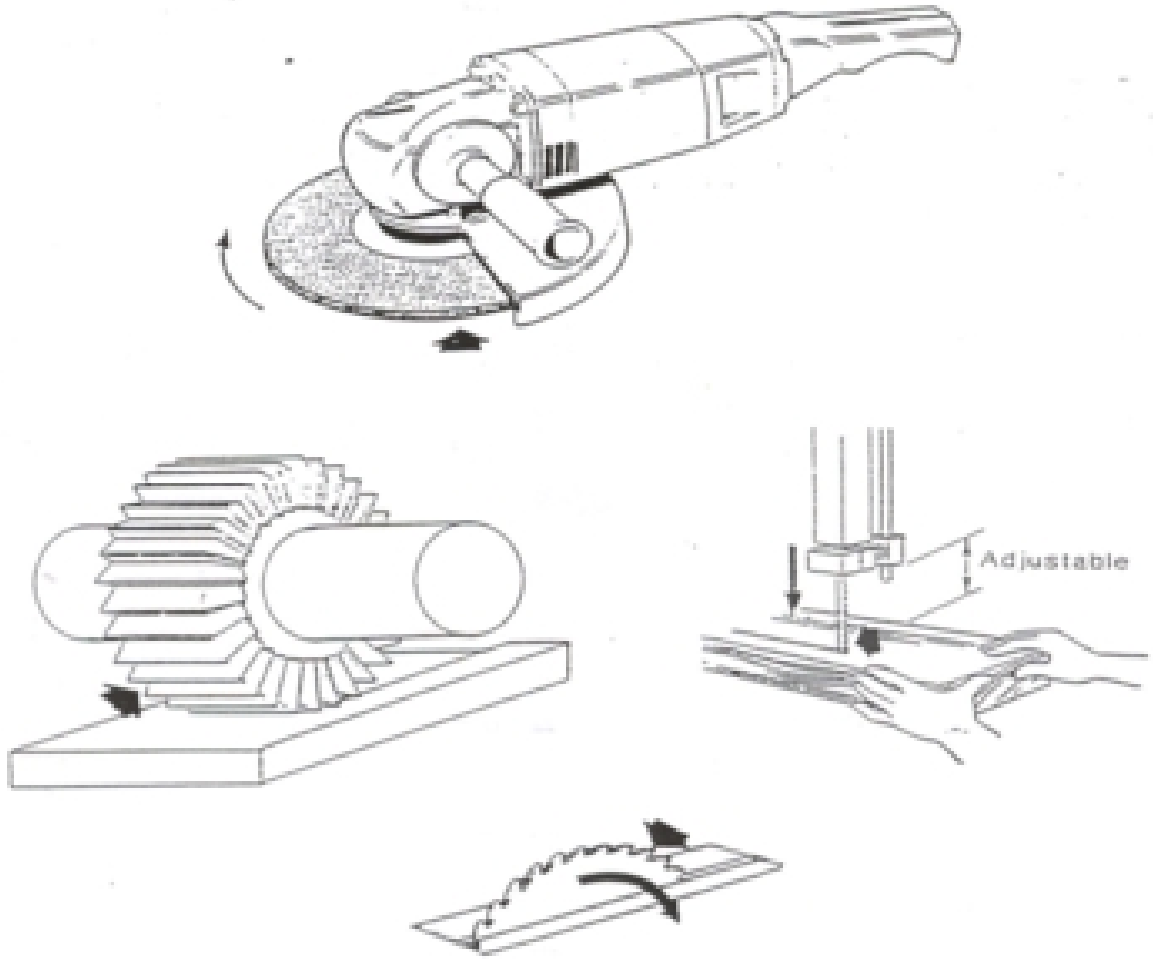
TYPES OF HAZARDS

- Cutting
- Shearing
- Stabbing and Puncturing
- Impact
- Entanglement
- Friction and Abrasion
- Crushing
- Drawing In
- Ejection
- Release of Potential Energy

CUTTING HAZARD

- Contact with sharp surfaces, such as:
  - ✓Saw
  - ✓Blade
  - ✓Disc

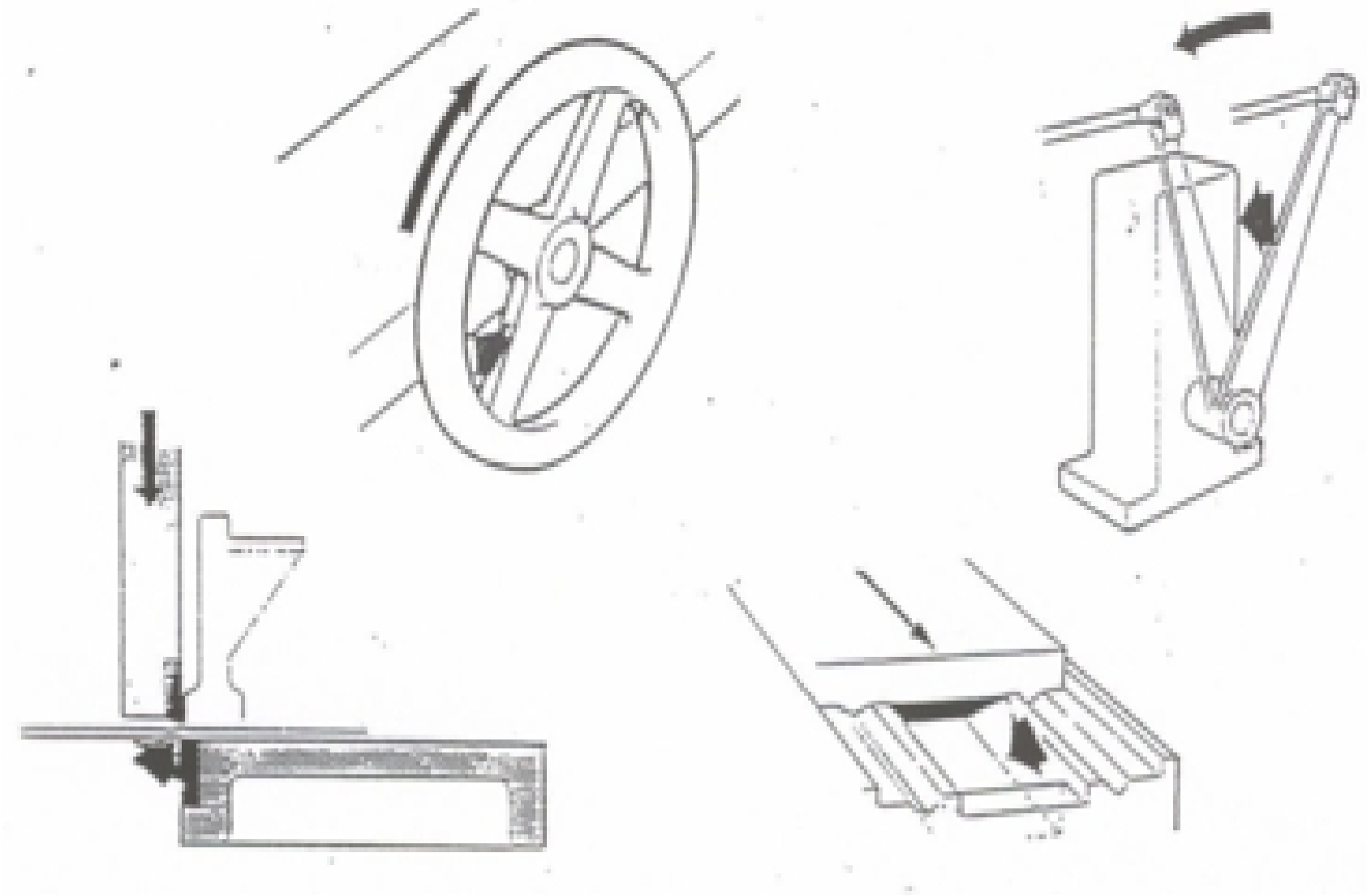
CUTTING HAZARD (ILLUS MH1)



SHEARING HAZARD

- Take out or separate by cutting
- In between two moving machines;
  - ✓ Between machine part and material
  - ✓ Between static and moving machine parts

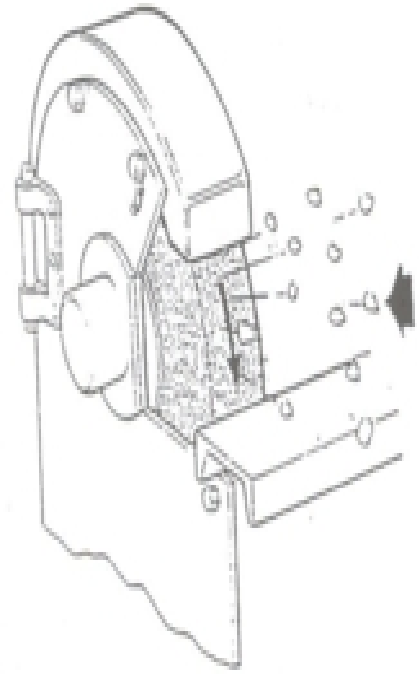
SHEARING HAZARD (ILLUS MH2)

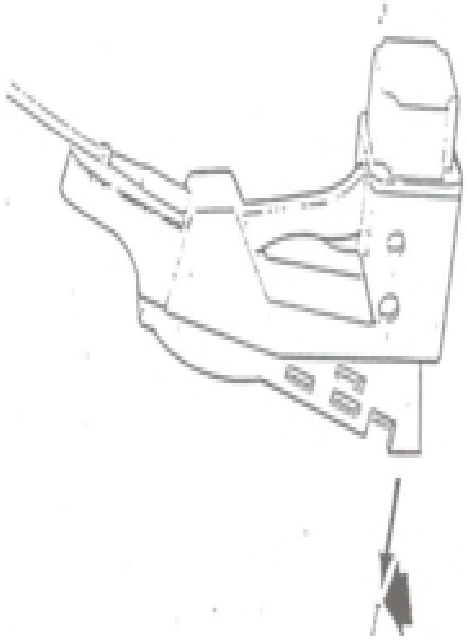


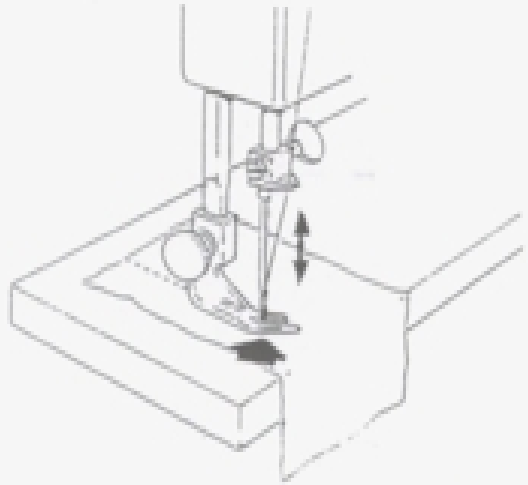
STABBING AND PUNCTURING HAZARDS

- Puncturing of a machine part, material and flying objects into the body
- Example: needle, stone blast debris

STABBING AND PUNCTURING (ILLUS MH3)







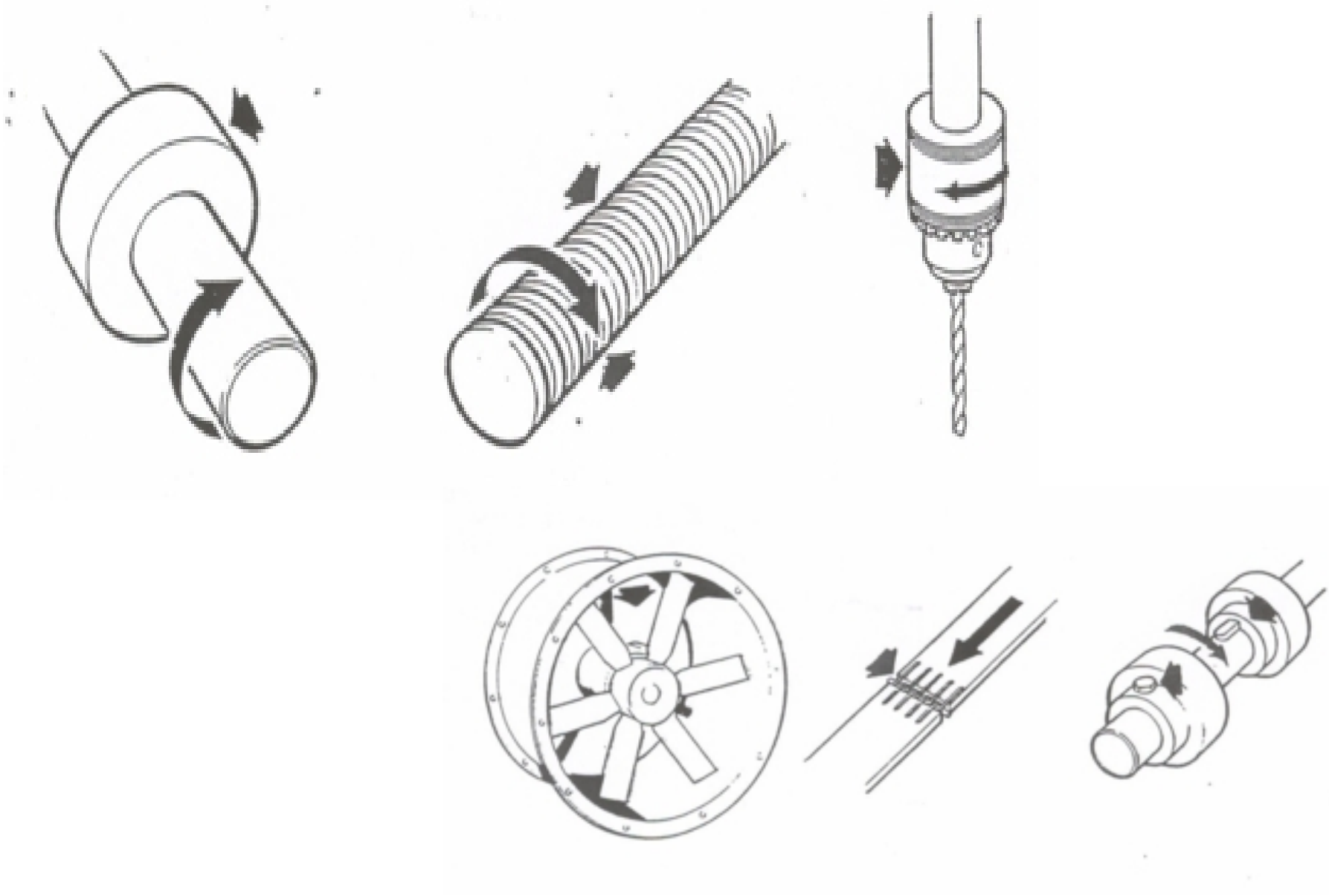
IMPACT HAZARD

- Object or machine part hits the body but does not puncture or pierce through it
- Example: Hit by a moving object/part

ENTANGLEMENT HAZARD

- Clothing or hair becomes entangled with a spinning or moving machine part
- Example: roller machine, gear, shaft, wheel, chain

ENTANGLEMENT HAZARD (ILLUS MH4)

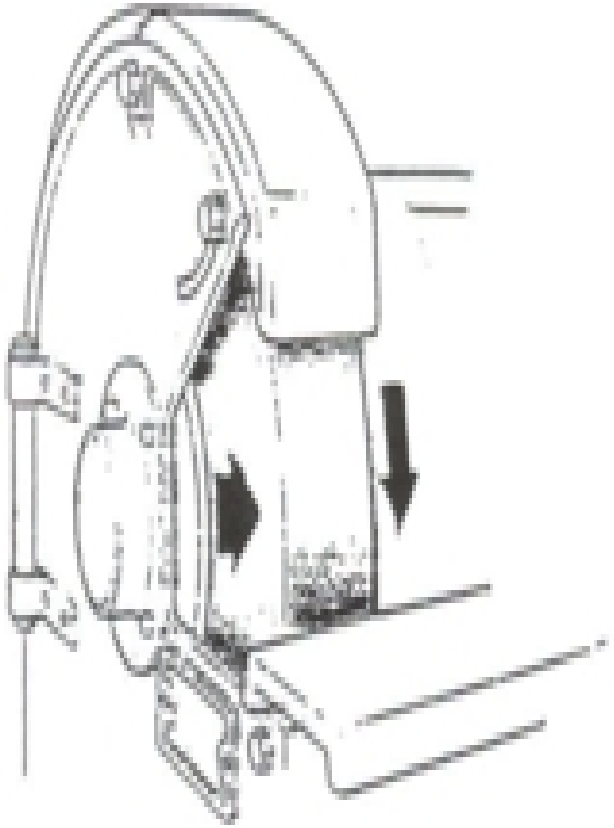


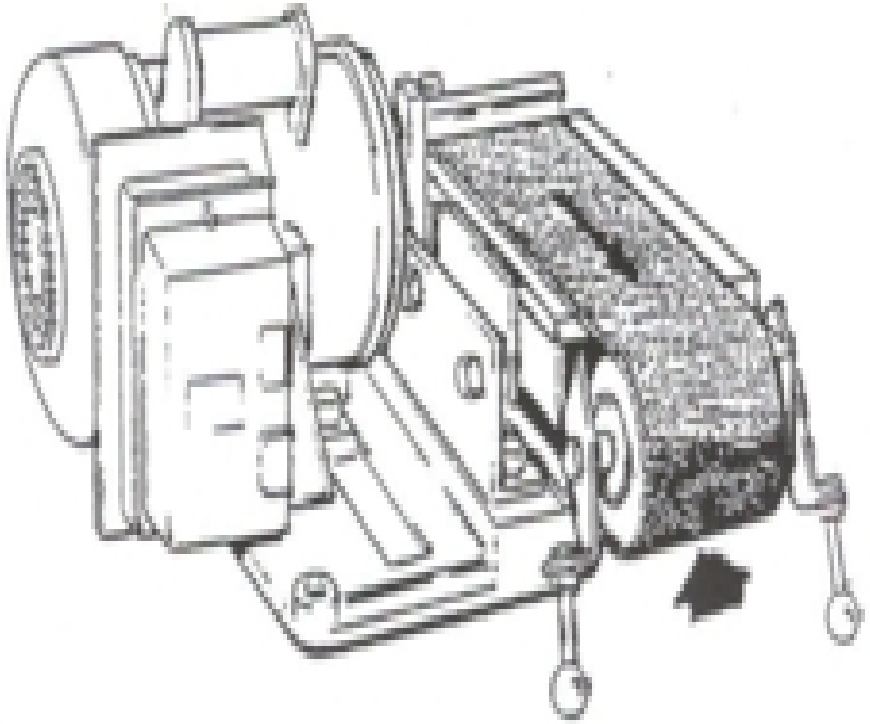
FRICTION OR ABRASION HAZARDS

- Burns or tear on the skin's outer layer

- Example: abrasive wheel, sanding

FRICTION OR ABRASION (ILLUS MH5)

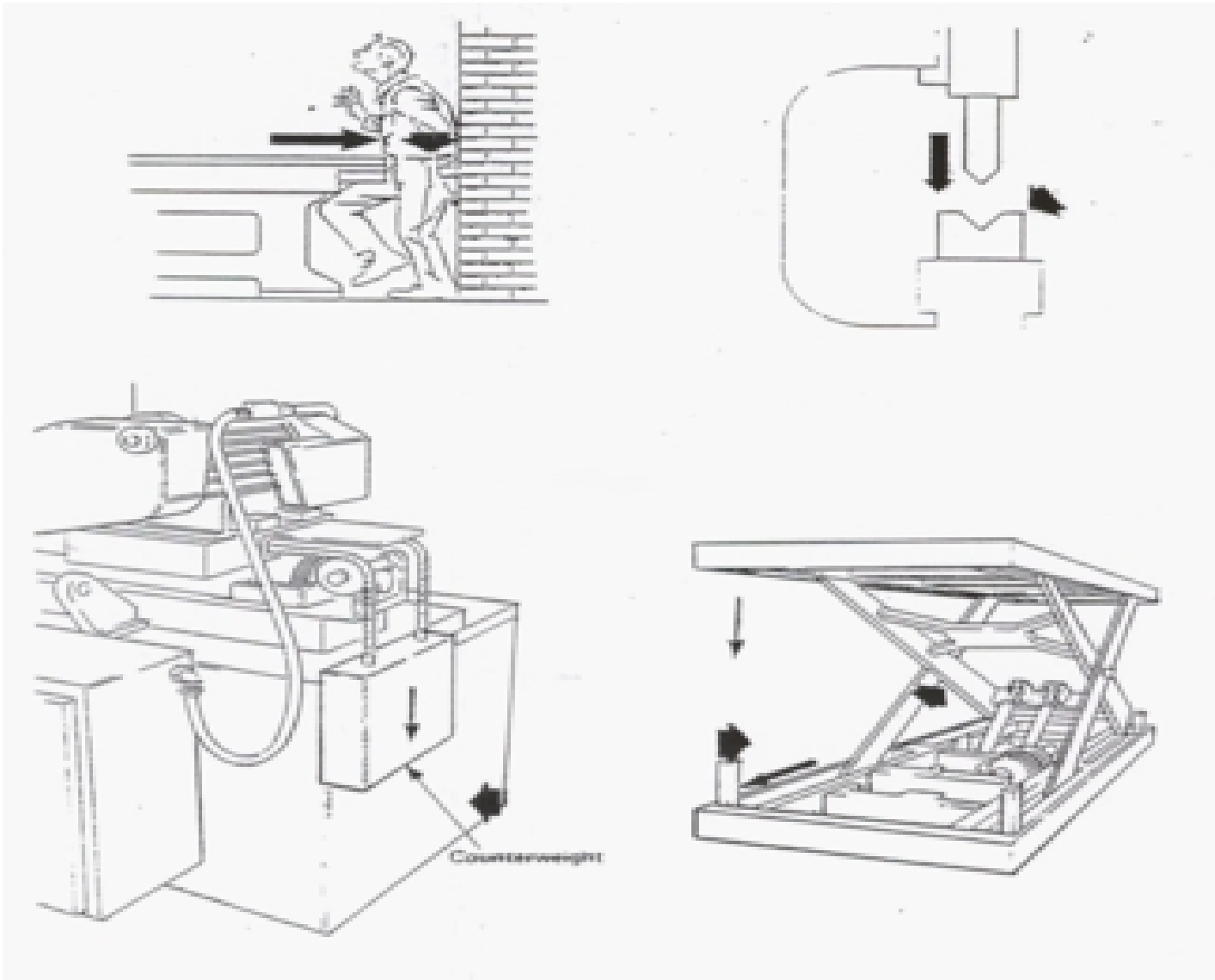




CRUSHING HAZARD

- Crushing of the body in between hard two objects / machine parts
- Example: stamping machinery, power press

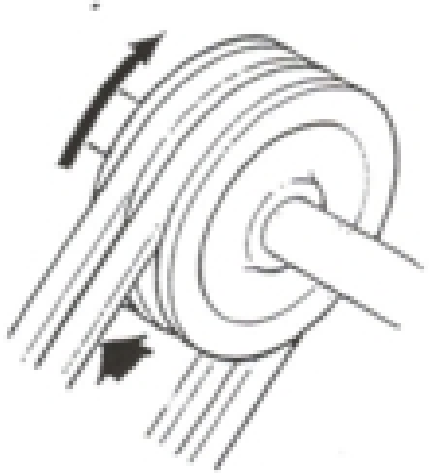
CRUSHING HAZARD (ILLUS MH6)

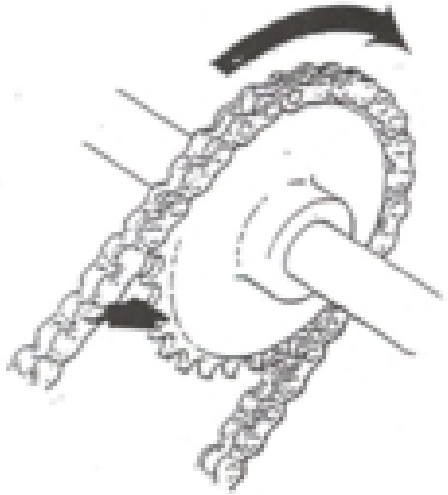


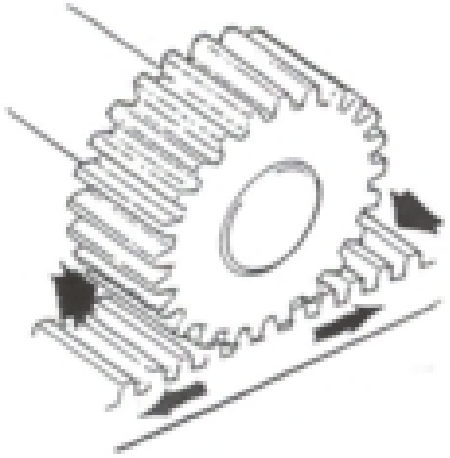
DRAWING IN HAZARDS

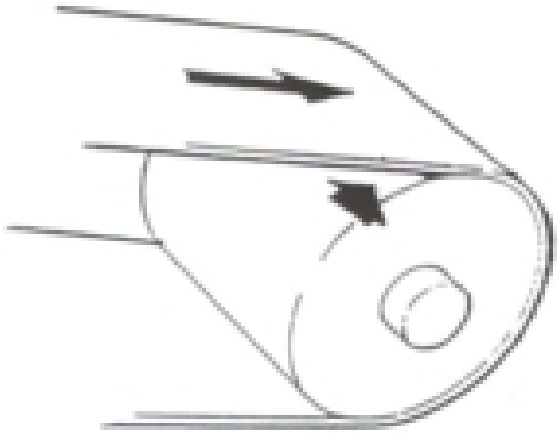
- Body is pulled towards the machine and is trapped in between the machine's moving parts
- Example: Roller machine

DRAWING IN HAZARDS (ILLUS MH7)









EJECTION HAZARDS

- The material or machine part is pushed out
- Reason:
  - ✓ Machine failure
  - ✓ Material failure
- Example: abrasive wheel, drill

RELEASE OF POTENTIAL ENERGY HAZARDS

- Example:
  - ✓ Release of pressure
  - ✓ Falling object
  - ✓ Unreleased energy in a spring

TYPES OF ACCIDENTS

- Contact or trapped in between a machine and another object/material
- Entangled in a machine part
- Entangled in a material
- Contact with ejected/flying machine parts
- Contact with ejected/flying materials
- Contact with release of potential energy

MACHINERY HAZARDS CONTROL METHODS

- Hazard Identification
- Risk Assessment
- Risk Control
  - ✓ Engineering
  - ✓ Administrative

These methods are discussed in detail in a separate lesson

MACHINERY HAZARDS CONTROL METHODS

- Hazard Identification
- List the various methods of hazard identification

HAZARD IDENTIFICATION

List the various methods of hazard identification

Answers:

- Observation
- Inspection
- Complaints
- Accident statistics
- Legislature review
- Information from manufacturer
- Review of other reference sources

RISK ASSESSMENT

- Use of Table 2-D Matrix
- Factors to be taken into consideration:
  - ✓ Design characteristics
  - ✓ Work method
  - ✓ Work environment
  - ✓ Individual characteristics
  - ✓ Operational factors

RISK ASSESSMENT CONSIDERATIONS

Design characteristics

- Identify the machinery hazard

RISK ASSESSMENT CONSIDERATIONS

Work Method

- Input and output material
- Actual operations
- Maintenance works
- Waste disposal
- Coordination and measurement of work materials

RISK ASSESSMENT CONSIDERATIONS

Work environment

- Lighting
- Noise
- Dust
- Access routes
- Temperature
- Condition of work floor

RISK ASSESSMENT CONSIDERATIONS

Individual factors

- Incompetent operators
- Psychological and physiological factors

Operational factors

- Unplanned movement / starting of machines
- Mechanical failure
- Duration of operations

CONCLUSION

- Working with machinery results in various hazards that can lead to accidents
- In controlling these hazards, various methods need to be employed. They are:
  - ✓ Risk Identification
  - ✓ Risk Assessment
  - ✓ Risk Control
  - Engineering and Administrative measures

CASE STUDY (GROUP DISCUSSION & ACTIVITY)

MACHINERY HAZARD

Company AC Sdn Bhd is a manufacturer of type ACX bicycles. The company recently purchased some new machinery and equipment with the aim to increase its production capacity. They included:

- Two (2) units machine saw - permanent steel type
- One (1) unit drill – permanent type
- Four (4) units power press
- One (1) unit air compressor – mobile type

Q: Based on the above, list the hazards for each of the new machines