

Appendix E - Hazardous Mechanical Motions and Actions

The following illustrations portray common hazardous machine mechanical motions and actions. This list is not intended to be all inclusive. Other machine hazards exist under specific circumstances. All illustrations are courtesy of OSHA.

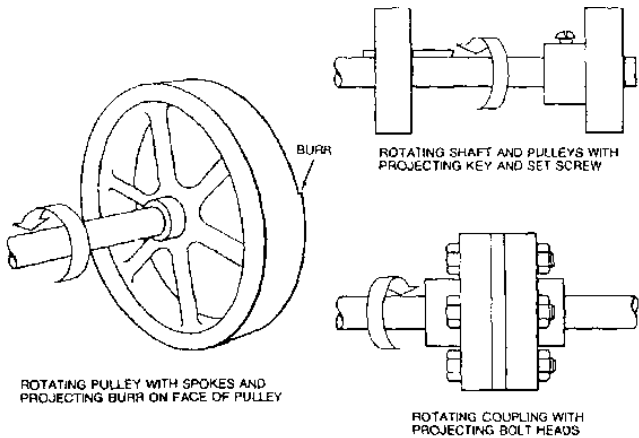


Figure 1: Rotating motion hazards.

Rotating motion can be very dangerous. Even smooth, slowly rotating shafts can grab hair and clothing, pulling a worker into a machine hazard. Common rotating mechanisms are: collars, couplings, cams, clutches, flywheels, shaft ends, spindles, meshing gears, and horizontal or vertical shafting. Projections (such as set screws and bolts) or nicks and abrasions exposed on rotating parts increase this hazard.

Figure 2: Examples of in-running nip points.

In-running nip point hazards are caused by the rotating parts on machinery. Parts can rotate in opposite directions while their axes are parallel to each other. These parts may be in contact or in close proximity. For example, stock fed between two rolls produces a nip point. Nip points are also created between rotating and tangentially moving parts. Some examples would be: the point of contact between two gears, a power transmission belt and its pulley, a chain and a sprocket, and a rack and pinion gear set.

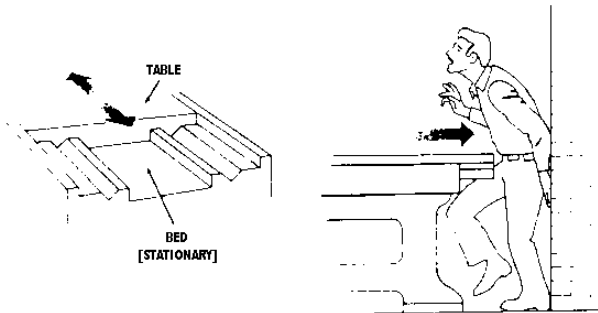
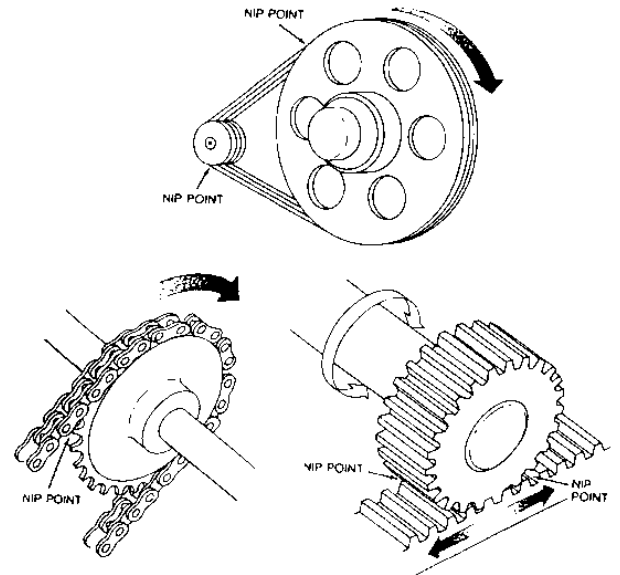
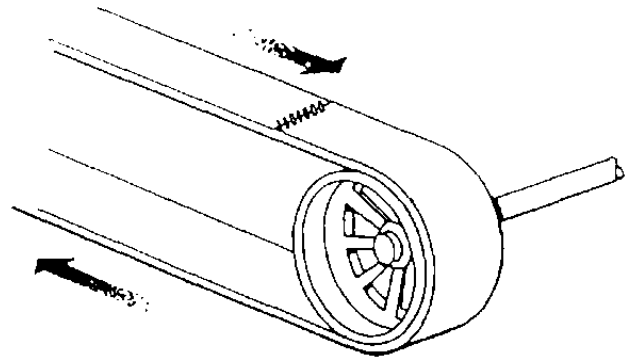


Figure 3: Hazardous reciprocating motion.

Reciprocating motions may be hazardous because, during the back-and-forth or up-and-down motion, a worker may be struck by or caught between a moving and a stationary part.

Figure 4: Hazardous transverse motion.

Transverse motion creates a hazard because a worker may be struck or caught in a pinch or shear point by the moving part in relation to a nearby fixed object.



TRANSVERSE MOTION OF BELT

Figure 5: Dangerous cutting actions.

Cutting actions may involve rotating, reciprocating, or transverse motion. The danger of cutting action exists at the point of operation where finger, arm and body injuries can occur, and where flying chips or scrap material can strike the head, particularly in the area of the eyes or face. Examples of mechanisms involving cutting hazards include band saws, circular saws, boring and drilling machines, turning machines, lathes, or milling machines.

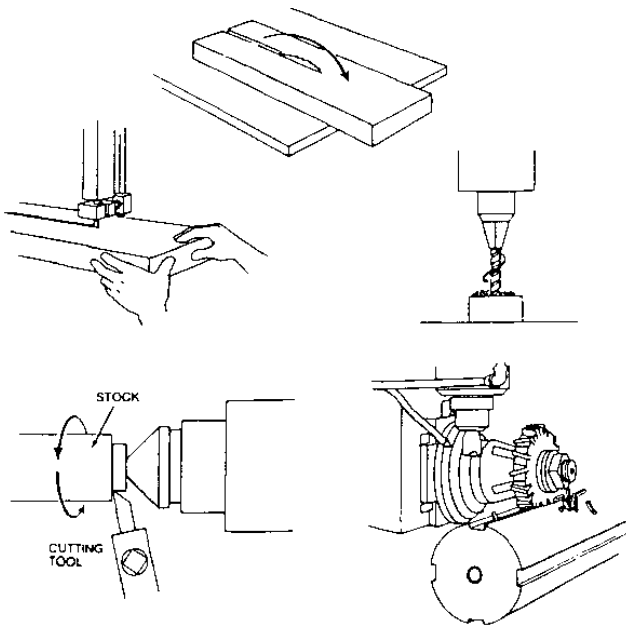
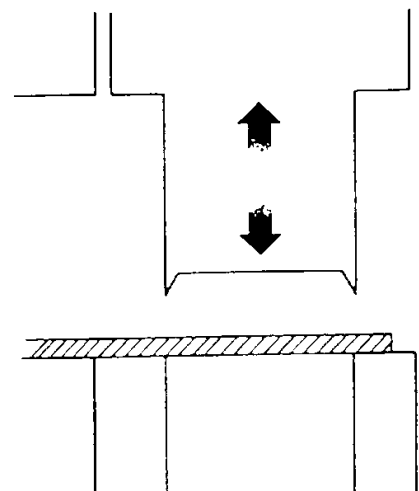


Figure 6: Punching action.

Punching action results when power is applied to a ram for the purpose of blanking, drawing, or stamping metal or other materials. The danger of this type of action occurs at the point of operation where stock is physically inserted, held, and removed by hand. Typical machines used for punching operations are mechanical power presses.



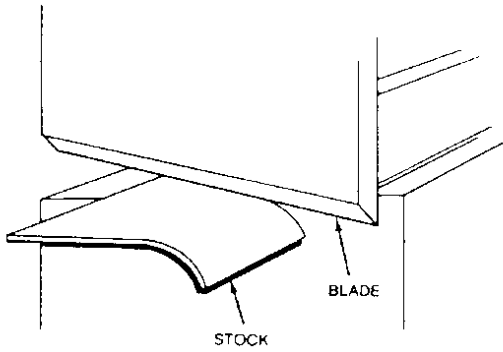


Figure 7: Shearing action.

Shearing action involves applying power to a slide or knife in order to trim or shear metal or other materials. A hazard occurs at the point of operation where stock is physically inserted, held, and removed by hand. Examples of machines used for shearing operations are mechanically, hydraulically, or pneumatically powered shears.

Figure 8: Bending action.

Bending action results when power is applied to a slide in order to draw or stamp metal or other materials. A hazard occurs at the point of operation where stock is physically inserted, held, and removed by hand. Equipment that uses bending action includes power presses, press brakes, and tubing benders.

