MRAT 039	Pillar and bench drilling machines	Applicable to: most resistant materials including timber and plastics	See also: 033
Process(es) covered:	The cutting of holes in sheet or block materials. Cutting oils or other lubricants may sometimes be required particularly when drilling mild steel.		

Control Measures

- Wear eye protection. Tie back long hair, remove or cover jewellery, and cover loose clothing by a secure apron or overall.
- It is impracticable to guard all the hazardous areas during this operation. Correct selection of the bit speed will reduce the risks from flying workpieces but machine vices or clamps should be used where required.
- Use guards around the chuck and bit to reduce the risk of hand or finger injury, but training and experience are essential. Adjust the drill chuck guard to cover the whole of the drill bit when the machine is in use.
- Guards preventing inadvertent contact with belt drives should require a tool to remove them or be interlocked with the power supply to prevent trapping when moving the drive belt. Interlocked guards on belt drives are recommended. Isolate the machine when changing the speed.
- Provide sufficient space around these machines to ensure that the user is not pushed into the machine by a passer-by, and the floor surface should not be slippery to avoid accidental slips while using the machine.
- Reduce the risk of back injury by having two persons handle heavy items.

Immediate Remedial Measures:

A particle could be in the eye	Tell the casualty not to rub the eye, sit him/her down facing the light with the head leaning back. Stand behind the casualty to look for the particle in the eye. If it is over the iris or pupil, DO NOT ATTEMPT TO MOVE IT. Tell the casualty to hold a gauze pad over the eye and close the other one. Send for an ambulance to take the casualty to hospital. If the particle is visible over the white of the eye, the corner of a moistened handkerchief can be used to remove it. Call 111 and seek medical attention.
Injury to the eye	If there is any sign of injury to the eye, tell the casualty to hold a gauze pad over the eye and close the other one. Take the casualty to hospital as quickly as possible.
Other injury	Apply pressure on or as close to the cut as possible, using fingers or a pad of cloth. Leave any embedded large bodies and press round them. Lower the casualty to the floor and raise the wound as high as possible. Protect yourself from contamination by blood.
Coolant is in the eyes	Irrigate immediately with water for at least 20 minutes, holding eyelids apart. Call 111 and seek medical attention.
Minor back pain	Help the casualty to lie down, either on the ground or on a firm mattress, and instruct him/her to rest until the pain eases. Obtain medical attention if symptoms persist.
Back injury resulting in loss of control of, or sensation in, limbs	Keep the head, neck and spine aligned while supporting the casualty's head. Send for an ambulance.

Risk Assessment

Hazards:

Flying workpiece Physical injury Trapping Entanglement Manual handling	Workpieces (and chuck keys or broken drill bits) can be ejected violently if not held correctly or if the machine starts unexpectedly. Human contact with rotating parts and swarf can cause cuts or abrasions. Loss of control of the workpiece can result in spinning that can cause injury. Small particles of waste material can enter the eyes. Belts on drive pulleys present a trapping hazard. Long hair, dangling jewellery or loose clothing can become entangled with rotating parts, dragging the user onto them. Heavy parts, eg, the drill table and machine vices can present a manual-handling hazard

Risks:

Flying workpiece	There is a high risk that trainees will not clamp items securely enough to prevent work being ejected from the machine or broken drills from flying.
User injury	There is a high risk that trainees will put hands or fingers in hazardous places and experienced users may attempt short cuts. The risk of small particles entering the eyes is high.
Trapping	Changing the drive belt from one pair of pulleys to another, especially when the machine may start, presents a real risk.
Entanglement	Entanglement is most likely to occur if rotating parts are exposed. This includes the drill chuck.
Manual handling	Handling heavy components or awkward manipulation will not occur frequently but will present a real risk.

Further Information:

- Chuck keys should not be secured with a chain near the working area as this increases the risk of entanglement.
- For general requirements of controls for electrical machines, see MRAT 000. However, for drilling machines, a foot-operated or knee operated emergency stop switch is considered essential so that the user can stop the machine without letting go of the workpiece or spindle feed.
- A pillar drill with a rack and pinion drive to the table is to be preferred to one without it.
- The drill chuck guard must always be used. If the drill bit is short so that the guard will foul the workpiece before the hole is drilled (as could happen when countersinking for example) then alternative methods should be used, or the drill bit could be fitted into an extension piece. On no account should any task be carried out on a drilling machine without the drill chuck guard being in place.
- Pillar drills are also often used to make holes in timber and wood-based materials. The specific risks of drilling different materials and the use of different types of drill bits, such as hole saws and machine Forstner bits, should be assessed before commencing work.
- These machines should be included in the planned annual maintenance programme.