

COLD FORMING OF METALS

spected at intervals determined by the type of service of the presses. Inspections should be quarterly or at the most semiannually for presses in frequent use. A good schedule is to inspect the clutch brake mechanisms whenever the clutch bearings are lubricated.

The unit should be inspected for loose bolts and nuts, broken parts, lubrication leaks, air leaks, faulty or loose lining, excessive accumulation of particles on the friction lining, and broken springs.

The inspection should include the action of the clutch and brake, both at rest and in motion. The travel on the friction disks will indicate the amount of wear. Adjustment should be in accordance with the manufacturer's instructions.

It also is important that the brake be adjusted to stop the press on top center or within 5 degrees of top center, or as specified by the manufacturer. The clutch and brake should operate smoothly and engage and disengage quickly, with little or no coasting on the press slide when the brake engages.

In units with separate brakes, the brake and clutch must never engage simultaneously. Sliding surfaces that maintain parts in alignment should be checked for excessive wear, to prevent parts from cocking or wedging.

Inspection of air friction clutch and brake units will readily disclose leaks in air cylinder packings and in air glands. To increase the life of these packings, air line strainers, lubricators, and moisture traps should be used. Traps and strainers should be checked frequently and foreign matter removed. On air pressure regulators, the regulator diaphragm and air pressure gauge should be checked for looseness and malfunction.

Valves on air friction clutches and brakes are usually the solenoid-operated type and may be either direct acting or pilot operating. Through constant use, the mounting brackets, operating levers, and mounting bolts may loosen. To operate properly, the valves must be rigidly mounted. Hammering of the solenoid magnet field surfaces or residual magnetism in the field may cause the solenoid to stick. Inspection of air valves should include checking for

Excessive scale or moisture in air lines.

Damaged parts, particularly packings.

Overlubrication or other improper lubricating practices

Solenoid failure or damage

Loose parts

Incorrect piping

Electric controls are not usually a part of clutch and brake units, but do affect operation. Pushbuttons, limit switches, relays, and contactors should be inspected for excessive wear, broken springs, loose parts, loose or broken wires, peened magnet field surfaces, badly burned contacts, poor contacts, dirt, any of which may contribute to faulty operation. Since redressing of contact points produces only temporary benefit, faulty contacts should be replaced.

At inspection time, all guards on power presses should be examined. Guards not in good repair should be reconditioned or replaced.

Pressure pads and die cushions should be checked for material between the pressure pad and the bolster plate, likewise for faulty air packings, air leaks, loose nuts or screws on the supporting rods or plates.

Metal Shears

Squaring shears

The knife head, on both foot and power operated shears, should be equipped with a guard which will keep the operator's fingers away from the cutting edge. This guard should extend across the full width of the table and in front of a hold-down (Fig 23-39).

The guard may be a fixed barrier at least $\frac{1}{4}$ in. away from the shear and set not more than $\frac{3}{8}$ in. above the table, or it may be a self-adjusting barrier which will automatically adjust itself to the thickness of the material to be cut, with a limit of $\frac{3}{8}$ in. above the table (Fig 23-40).

The guard should be high enough so that the operator cannot reach over it and under the knife. The barrier may be slotted or perforated to allow the operator to observe the cutting edge of the knife, provided that the openings do not exceed $\frac{1}{4}$ in.

The hold-down can be guarded either separately or as a part of the knife guard.

When helpers and take-away men work at the rear of the machine, the back of the knife should be guarded so that the men cannot get their fingers under it. Chutes or