

possibility of breakage, especially where multiple impressions or nesting methods are employed

Preliminary or breakdown operations must be designed so that they accomplish the specific purpose and must be systematically arranged so that they do not create a hazard for the operator as he completes the forging cycle

Radical bends or severe reductions in volume that might tend to jerk the tongs from the hands of the operator should be avoided. Such operations should be modified or completed in additional operations

The thickness and width of flash, gutter, and sprue should be ample so that flash or tong holds are not sheared off. The size of the gates is important. They should be designed in relation to the size of the stock and the tongs used. Gates should have enough width, depth, and clearance to allow safe handling

Some dies, especially for smaller hammers, are designed with cutoffs which shear the completed forging from the end of the bar. If possible, such cutoffs should be placed on one of the rear corners of the die for the operator's safety. If cutoffs are placed on the front of the die and are used by placing the stock across the knife portion at an angle, enough clearance must be provided between the die and the hammer frame or gib

Hammer die maintenance is important because of the nature of forging work and the abnormal abuse to which the dies are subject. For example, fillet and corner radii in the impressions may be enlarged or sharpened by impact pressures, scale, abrasion, and wear. It is therefore necessary to inspect these radii and correct any alteration that may be hazardous

Sometimes the face of a forging die may be welded either to correct some defect or to maintain specifications. A hard, brittle, or thin-skinned weld can become a flying hazard under impact. The rod and the preheating and postheating methods should be selected with extreme caution

Provisions for storing dies, such as racks and rails, are essential to safety, good housekeeping, and efficiency

Dies preferably should be stored in an area separate from the forge shop and away from vibration

BOARD HAMMER MAINTENANCE CHECK			
Date	Hammer No	Location	
ITEM CHECKED	CONDITION	TYPE OF REPAIR	EST HRS TO REPAIR
TIE BARS & SPRINGS			
FRAME STUDS & SPRINGS			
DIE KEYS & SHIMS			
SOW BLOCK KEY & SHIMS			
RAM CLEARANCE			
GUIDE BOLTS & ADJ			
MOTOR MOUNTS			
MOTOR COUPLING			
ROLLSHAFT BEARINGS			
WIRING & CONTROLS			
FLYWHEEL & BEARINGS			
DRIVE GEARS			
ROLL ADJUSTMENT			
LUBRICATION			
STEAM LINES			
BOARDS & WEDGES			
AIR LINES			
AIR FOOT SWITCH			
AIR CYL & LINKAGE			
TREADLE & LINKAGE			
BOARD CLAMPS & LINKAGE			
DOGS & STOPS			
KNOCKOUT ARM			
FRICTION RODS			
SAFETY RODS			
REMARKS			

FIG 28-24 (upper left) – Maintenance checklist for board drop hammers

Maintenance and inspection

A well-planned preventive maintenance program for forging hammers will help to reduce the number and severity of accidents by minimizing part breakage and wear. Regular inspections will disclose production units which are not operating up to standard so that repairs or adjustments can be made

The results of a good maintenance program can be measured in reduced operating costs which include

- 1 Cost of machine downtime, breakage, and lost production
- 2 Cost of replacement parts and labor
- 3 Cost of accidents due to faulty equipment

Maintenance checklists for hammers (Figs 28-24 and 28-25) can be the basis for formulating a definite, planned inspection program. A written checklist avoids the errors resulting from verbal reports that are often forgotten or misunderstood