

Hot Working of Metals

cut so that the motor cannot be started when the props are in use

All die clamps, bolts, washers, blocking, wrenches, and handling equipment should be in good condition at all times

The table wedges which are used for making vertical adjustment of the dies must be kept free of scale so that the wedge can be raised and lowered with minimum pressure. Trucks or driving rams should not be used for this operation. If wedges are kept free of scale, they can be raised or lowered by hand or by air motor wrench

Maintenance

Maintenance of forging presses requires the same precautions used in maintenance work on power presses used in cold stamping. The operating power source should be locked out so that the equipment cannot be energized while it is being worked on. If adjustments have to be made while the press is energized, the work must be carried out under the direct supervision of the maintenance supervisor.

Suitable permanent work platforms should be installed for making brake adjustments and doing repair work at the surge tank and booster cylinders. To prevent falls, maintenance men should not use portable straight ladders nor stand on parts of the press, such as the press crown or the backshaft.

Major repair work on forging presses usually requires removal of bulky, heavy parts. Tearing down of the rolling type clutch, flywheel, ram, pitman, and crankshaft requires special heavy-duty rigging used by skilled workmen trained in this type of work.

The brake should be adjusted properly and kept in good repair. Precautions must be taken to prevent the brake lining from becoming flooded with oil. A sheet steel disk about 2 in. larger than the brake wheel, placed on the eccentric shaft back of the brake wheel, will help reduce the amount of lubricant on the brake.

Pitman bolts should be securely tightened. It may be necessary to design and make a socket or box end wrench with a strong heavy handle for the specific press.

Flywheel hubs, clutch spline hubs, pinion gears, and brake wheels should not be permitted to become loose on the pinion shaft. If they do become loose and run that way very long, keys and keyways will be ruined and

the keys will break out a portion of the pinion shaft on one side of the keyway. The keys on each side of the pinion shaft should be inspected periodically and driven tight if they are loose. When a key will no longer stay tight, it should be replaced with a carefully fitted new key.

When the hub or gear on the shaft becomes too loose, it will be impossible to hold the keys tight and the shaft will have to be turned down. The inside of a steel hub should be welded and bored to a shrink fit on the new shaft size. The keyways should be remachined and new keys made. If the hub is cast iron, a tapered sleeve can be made or a new hub fitted to the shaft.

Experienced repairmen warn against welding the flywheel end of the pinion shaft. If normalizing of the welded section is not complete, a crack may start and allow the shaft to break and drop the rotating flywheel. Crankshafts and backshafts on forging presses likewise should not be welded.

The friction slip on a press should be tightened so that it will not creep even on heavy jobs. If the friction slip is allowed to move a small amount with every forging, this movement will polish or glaze the friction surfaces and soon the friction slip will move more with each forging. This movement will cause the friction surface to score the hub and clamp surfaces.

Rotation of the flywheel on the friction hub will frequently wear or cut the inside diameter of the flywheel so that it runs off center. To correct this condition, the inside diameter of the flywheel can be bored and fitted with a bronze bushing.

Sometimes the eccentric shaft becomes cracked in the fillet on each side of the eccentric. This defect is usually noticed when the shaft is taken out so that the main bearings can be checked or the shaft can be machined. This crack should be examined carefully to determine its length, depth, and direction of travel. If the crack is in a critical area where failure would permit the rolling clutch to drop off, then the shaft must be replaced.

Other Forging Equipment

Hot trimming dies can be made from hardened chrome, nickel, carbon and vanadium steels or from medium carbon steels with