BUYING A USED PRESS

Compared to new presses, used machines cost substantially less and are often available for immediate delivery. The press chosen by a stamper is required to be quickly available on the market at an affordable price to meet the stamping capacity need. Good used machinery can meet the requirements. There are cases where the type of press needed is not readily available from new press builders. For example, press builders except on special order seldom manufacture knuckle joint and single point high force capacity mechanical presses.

New press construction meets specific capabilities. When buying a used press, the selection criteria often are limited to the following:

1. Is the tonnage capacity sufficient for the job?

2. Is the bed size large enough?

3. What repairs or modifications are required?

4. How much does the press cost?

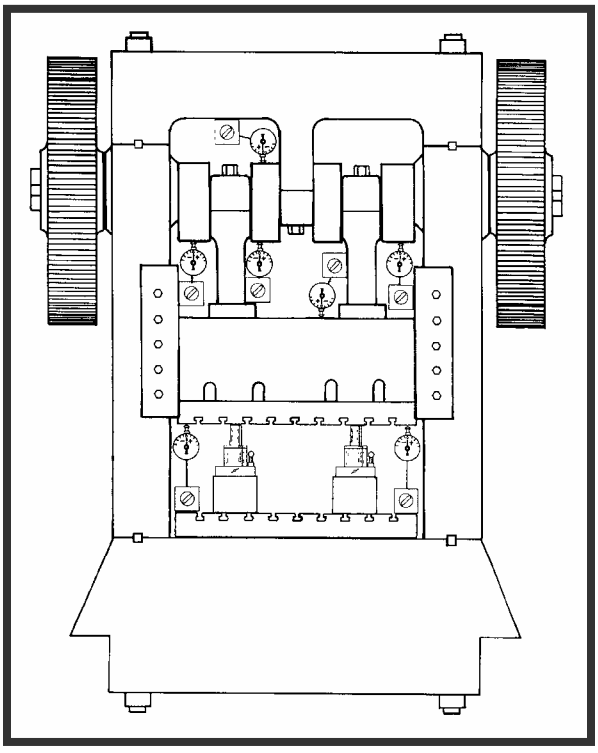

Figure 1. Examples of magnetic-base dial indicator and hydraulic jack placement on a straightside press to measure alignment and bearing clearances. *Smith & Associates*

Examine the Press Bearings

Ideally, the press can be tested under power. This is often possible if the press is in a production plant. Some used machinery dealer's have sales warehouses equipped for testing under power —especially with smaller machines. The press should suit your needs and be in good condition. The reason for the seller disposing of the press normally is that it is surplus to the needs of the ongoing business of the seller. If the seller is replacing an existing machine with a similar new or rebuilt press, the old press may not be economically repairable. The seller should be willing to allow your maintenance technicians to thoroughly inspect the press. An independent press consultant can also be involved in the inspection. This is especially wise if your maintenance technicians are not thoroughly familiar with the machine and all of its controls.

Figure 1 shows the basic procedure of measuring straight side press bearing clearances using dial indicators and jacks. A new press typically has 0.001-inch (0.0254 mm) per inch (25.4 mm) of shaft diameter in each bearing. Additional clearance is required in the connection bearing(s) and adjusting screws. The clearances should not exceed the manufacturer's specifications for acceptable wear. Other straightside press tests include checking for parallelism between the slide and bed with the dial indicator. The correct parallelism test should is performed at top dead center, 90 degrees on the downstroke, bottom dead center and 270 degrees on the upstroke.

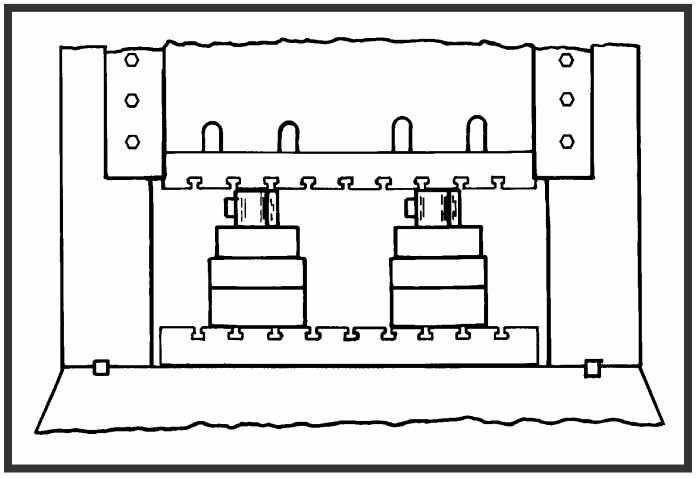

Figure 2. Load cells placed on solid steel support blocks for press testing and calibration. If the load cells do not have a built in readout device, an external readout instrument is used. *Smith & Associates*

Structural Damage Problems

Figure 3 is an exaggerated view of a small die with high tonnage requirements placed in the center of a large straightside press. Although the press force capacity rating may exceed the die requirements, concentrating the load in the center of the machine can produce excessive shear stress forces resulting in damage. An obvious location for cracks to occur are those that radiate from the knock out bar hole openings.

Welding followed by grinding smooth and repainting can repair crack damage. A skilled technician can easily identify this type of repair. The quality of repair and possibility of related unrepaired damage are difficult to determine with certainty.

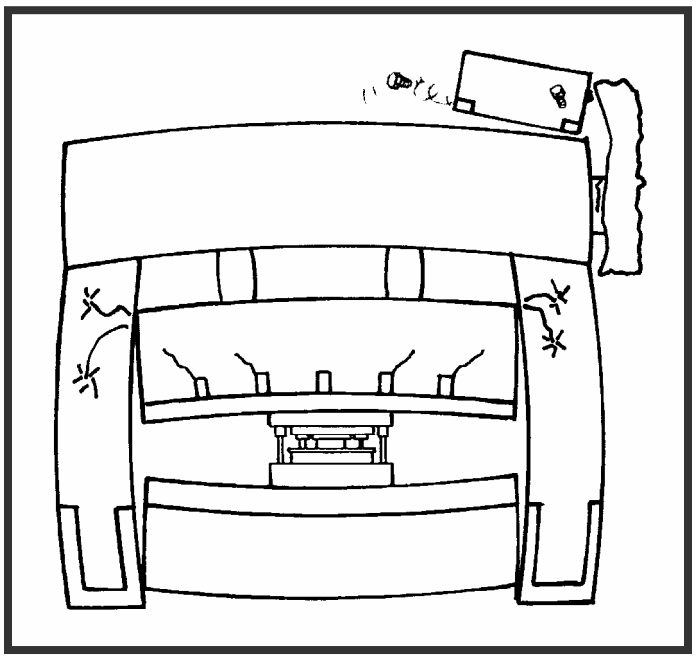

Figure 3. An exaggerated illustration of the damage that can occur if a small die requiring full press tonnage runs in the center of a large press bed.
Smith & Associates

Gap Frame Compared to Straightside Presses

A straight side press in good condition remains parallel if symmetrically loaded. A gap-frame press has an unavoidable angular deflection of approximately 0.0015-in. (0.038 mm) per 1.0 in. (25.4 mm) of front to back bed distance at full load. An exaggerated view of this problem is shown in Figure 4. Cutting dies with close clearances usually run well in the straightside press. The same die may be damaged each time an attempt is made to run it in a gap-frame press. This can occur although the gap press had plenty of tonnage and bed size.

Fitting the open side of the machine with tie-rods may reduce the gap press angular deflection. This will reduce but not eliminate the angular deflection. The cross-sectional area of the rods or bars is small compared to the press frame. In addition, the rods or bars will not permit the large workpieces access to the full press opening.

Some Important Evaluation Considerations

The presses intended use is the most important consideration. Many used presses do not have T-slots in the ram and bolster. T-slots are very important to quickly changing dies and securely fastening them.

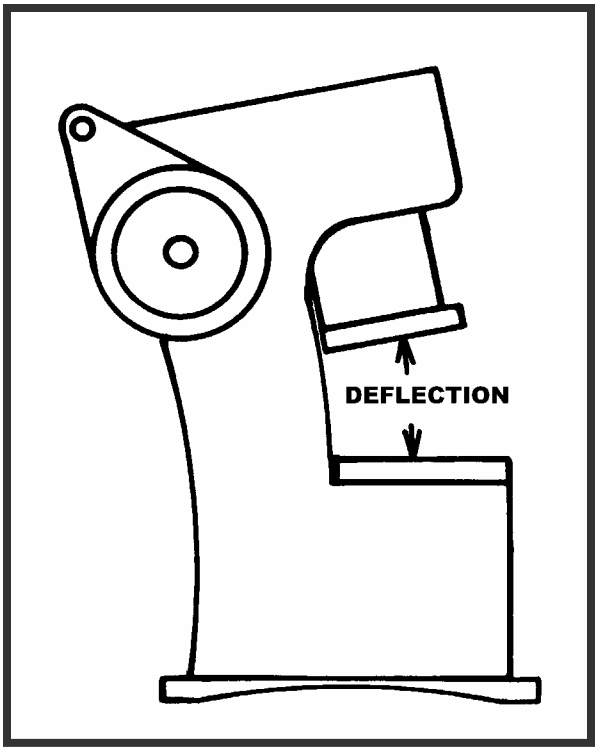

Figure 4. An exaggerated view of the gap frame press angular deflection problem that occurs under load. *Smith & Associates*

For example, a good blanking press should be of very robust construction to resist deflection and limit the severity of snap-through energy release. A blanking press should have a short stroke to keep the actual metal shearing velocity to reasonable speeds.

Hydraulic presses may feature programmable cushion force control as well as controllable force throughout the press stroke. These machines are capable of difficult deep drawing operations that would be difficult with a mechanical press.

The press safeguarding devices and electrical controls must meet current legal requirements for safe operation. Some used presses from the automotive industry are not designed for hands in die operation. If the press does not have modern controls with active control redundancy to insure fail safe operation, the most cost effective solution may be to replace the entire control system with new controls.

Press Gear Condition

If the press has gear reduction, the condition of the gears is very important. It is often uneconomical to replace used press gearing. Figure 5 illustrates the stress points subject to wear and crack formation on large driven gears. Welding and remachining can repair worn or damaged gears. Another solution is to rekey gears to move worn teeth away from the area of engagement at bottom dead center.

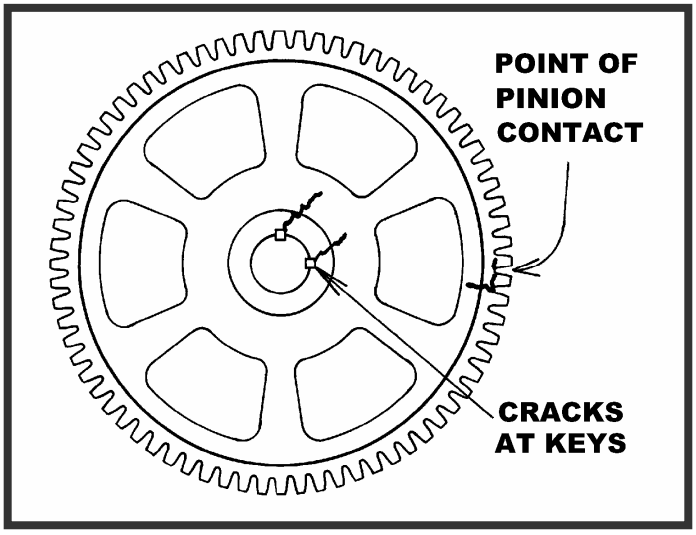

Figure 5. Some stress points subject to wear and crack formation on large driven gears. *Smith & Associates*

Hidden Press Damage

The only way to be reasonably certain that there is no hidden press damage is to completely disassemble the machine and check parts for stress crack formation. A good inspection method is the use of die penetrant or magnetic particle inspection.

Figure 6 illustrates the characteristic appearance of a failed crankshaft due to slow crack propagation. The overload that initiated the crack growth may have occurred several years before the actual failure. The final failure can occur under moderate loading. Most failures of this type display a characteristic "oyster shell" marks typical of crack propagation bands under varying load conditions. The final failure occurs when there is not enough sound metal to transmit the load.

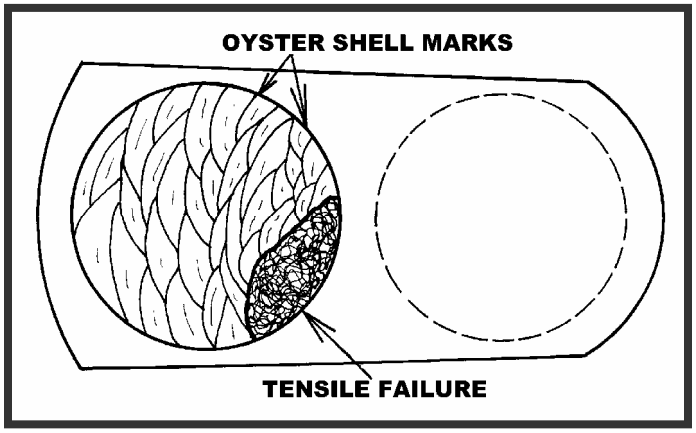

Figure 6. Characteristic appearance of a failed crankshaft due to slow crack propagation *Smith & Associates*

Used Press Guarantees

Many used presses are sold as where is without warranties of any kind. This is especially true of presses sold at auction. Some used press dealers belong to The Machinery Dealers National Association (MDNA). This nonprofit trade association strives to be self-policing and members agree to abide by a code of ethics.

The basic MDNA warranty provides for a 30-day return privilege on presses that prove to be mechanically unsatisfactory although the dealer's option is to repair the problem. Normally, this 30-day period starts from the day the equipment is shipped by the dealer FOB. If the buyer chooses to return the machine, the buyer pays the freight cost. Like any transaction, additional conditions concerning sale as is or extending the warranty must be agreed upon in the written sales contract.

Conclusion

This is an overview of some things to consider when deciding to buy a press. By exercising care in the selection and buying process, used presses can offer excellent value and service.

NOTES: _____