

Anyone who has experienced capping or lamination during tablet production knows the frustration that comes from trying to diagnose the issue. In this whitepaper, we discuss a possible cause and several solutions.

J-hooks are the distinctive wear patterns on punch tips that are a cause of such tablet defects as capping and lamination. If detected early, J-hooks can be easily and quickly repaired, thereby eliminating the need to purchase replacement tools.

By emphasizing tool maintenance as a standard operating procedure, tablet manufacturers can:

- Increase the life of their tools as much as 80 percent, thereby protecting the company's considerable investment in the purchase of these instruments.
- Eliminate need for press downtime to repair or replace punches with J-hooks.
- Reduce tooling and operating costs.
- Minimize the manufacture of defective tablets and thereby boost productivity.

### What is J-Hook?

A punch tip wear pattern that is a leading cause of tablet capping, lamination and poor friability.



A manufacturer whose SOPs require routine cleaning, inspection, repair, lubrication, and careful handling and storage of punches will discover that these maintenance practices are an inexpensive way to ensure the consistent production of high-quality tablets and thus improve the company's bottom-line.



The following are J-hook basics for press operators and other tablet manufacturing staff.

### WEAR CAUSES J-HOOKS

Over time punches and other compression tools lose their luster and develop nicks, scratches, and/or J-hooks. Wear from abrasive products and even the smallest contact between the upper punch tip and the die during entry can create J-hook on punches.

Tooling wear and J-hook can result from worn punch guides. The same type of wear also can be the result of improper die installation. Tools such as die driving rods, a die insertion tool, and present torque wrenches are all great instruments to prolong die pocket wear, which will increase tool life and maintain tablet quality.

“ Typically the first area of the punch to wear is the land, the flat and narrow area at the tip’s perimeter. With wear, the tip becomes very thin and is more susceptible to damage.”



**BILL TURNER**  
Technical Service Manager  
Natoli Engineering Company

When the land erodes, the upper punch is very susceptible to the formation of J-hook. However, J-hooks can form on both the upper and lower tips if the conditions are right. Inspection of upper and lower punch tips is essential.

### REGULAR INSPECTION AND MAINTENANCE CAN HELP PREVENT AND MINIMIZE J-HOOKS

Like all manufacturing tools, compression tools should be inspected on a defined schedule. Visual inspection for deteriorated outer tip edge and/or J-hook is important. An inspector can simply drag their fingernail from the inside of the cup out to the outer edge and if a J-hook is present, his or her nail will catch on the hook. If the J-hook is light, it can be removed by polishing. In addition, polishing restores the cup’s mirror luster.

“ A clean, smooth surface will release product better, produce better finished tablets, and reduce problems during production.”



**DAVE PERRY**  
Assistant Plant Manager  
Natoli Engineering Company

A factory-trained staff member should be given the responsibility of repairing and refurbishing punches with J-hooks.

Natoli recommends the large unsewn cotton buff wheel, rather than the drag finisher, as the best method to polish punches. Using a drag finisher will not effectively or efficiently restore land to the punch, nor will it help the tool perform as new. And as it doesn't restore land, it will not correct issues such as capping and laminating.

“ Proper hands-on training is essential. You have to get a feel for the amount of pressure that's required.”

A large unsewn cotton buff wheel effectively eliminates J-hook and restores land to punch.



**BEFORE**



**AFTER**