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Garbage In Garbage Out

When a problem arises all too often, we look at the machine first instead of collecting all the data to accurately diagnose a problem. We are going to look at some of the variables and some case examples from the input side.

Taped parts

Parts taped out of specification can cause allot of errors.

Some of the problems we have encountered:

- Tape delaminating
- Bent parts
- Taping outside of specification
- Parts not centered
- Mylar too much pull force
- Mylar not enough pull force

Off all these problems the most common we are seeing now is the tape delamination and bent parts. A bad reel of components can have real adverse effect on production.

Tape delamination

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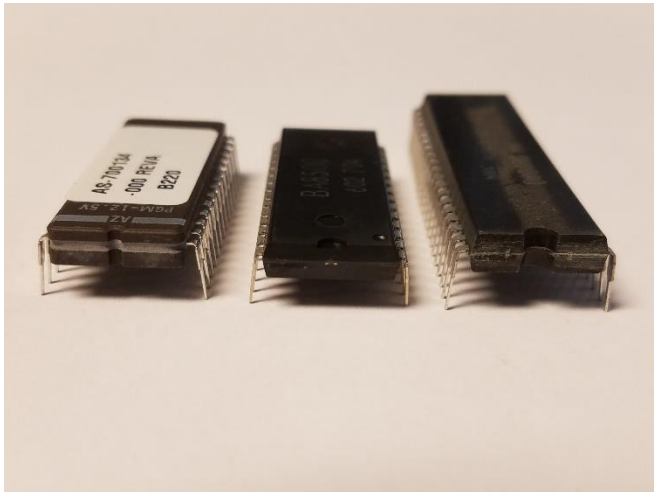
Lead composition

Component leads can have a large effect on machine performance.

- Soft leads
  - Soft leads tend to deform while being inserted
  - Poor forming
  - Mis Insertions
- Stiff leads
  - Can cause damage to tooling
  - Poor forming
  - Lead can spring back after being clinched
- Plating
  - Soldering problems



Not all IC's are the same

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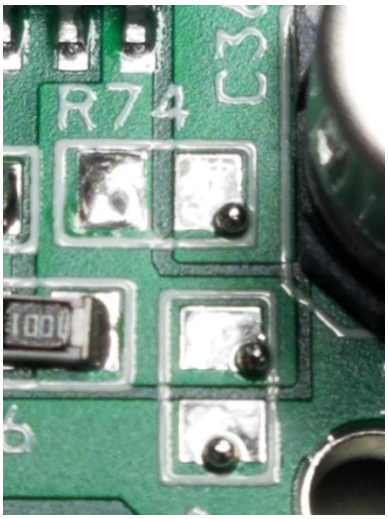
Circuit board

Often overlooked, the Circuit board can cause allot of problems.

Several of what we have seen over the years:

- Secondary drill holes
  - These are usually tooling holes that are drilled after the primary holes for components are drilled. Secondary drills are not accurately aligned to the primary causing registration problems. Even though vision and pattern correction can be used to correct alignment. Improper registration of the board can still lead to problems.
- Solder mask
  - Not registered properly
  - Covering pads
  - Delamination
- Contamination
  - I have found this with HASL. I chased a problem with solder balls. After trying different solder paste and oven profiles, I finally switched board vendors. Problem solved. I was told either the thickness of the pads or contamination in the solder caused the problem.
- Silk screening
  - From one of my customers. They had found that the lettering of the silk screening was too thick causing a void under the stencil and excess solder paste would get under the stencil causing a solder ball.



Board defects

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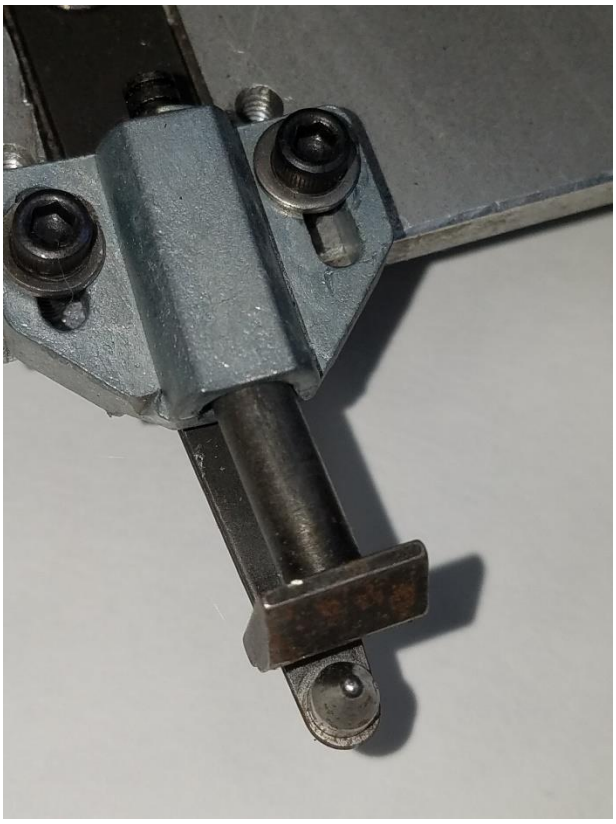
Fixturing

Locating your work accurately. Over time tooling will wear. Tooling pins, springs dowel pons can all create looseness in the system. If your work moves during assembly defects will occur.

Parts you should regularly inspect:

- Tooling pins
  - There should be no more than .001 clearance between the pin and the board.
- Hold down springs
- Fixture locating holes
- Fixture bushings
  - Drill bushings or locating bushings



Locating pin