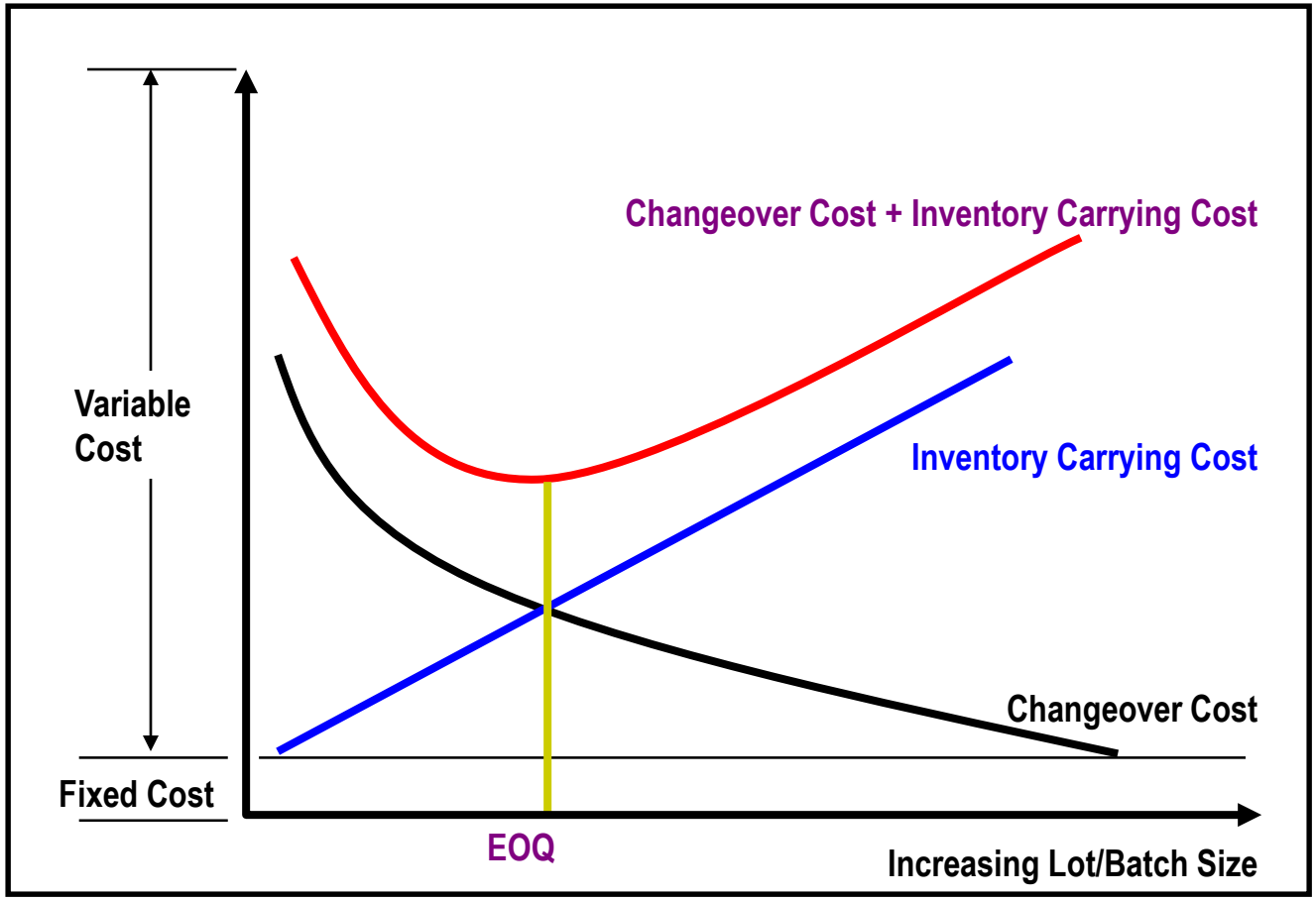
SETUP REDUCTION / QUICK CHANGEOVER

Setup Time Drives Batch Size:

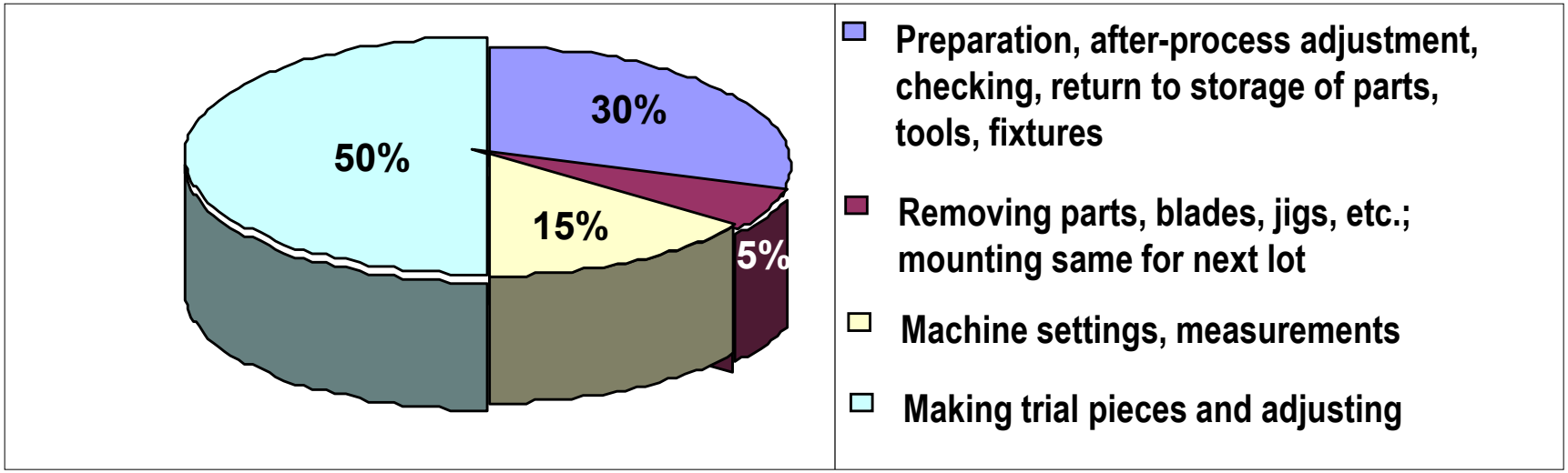
The Economic Order Quantities (EOQ) model determines the most economic lot/batch size for a production run.

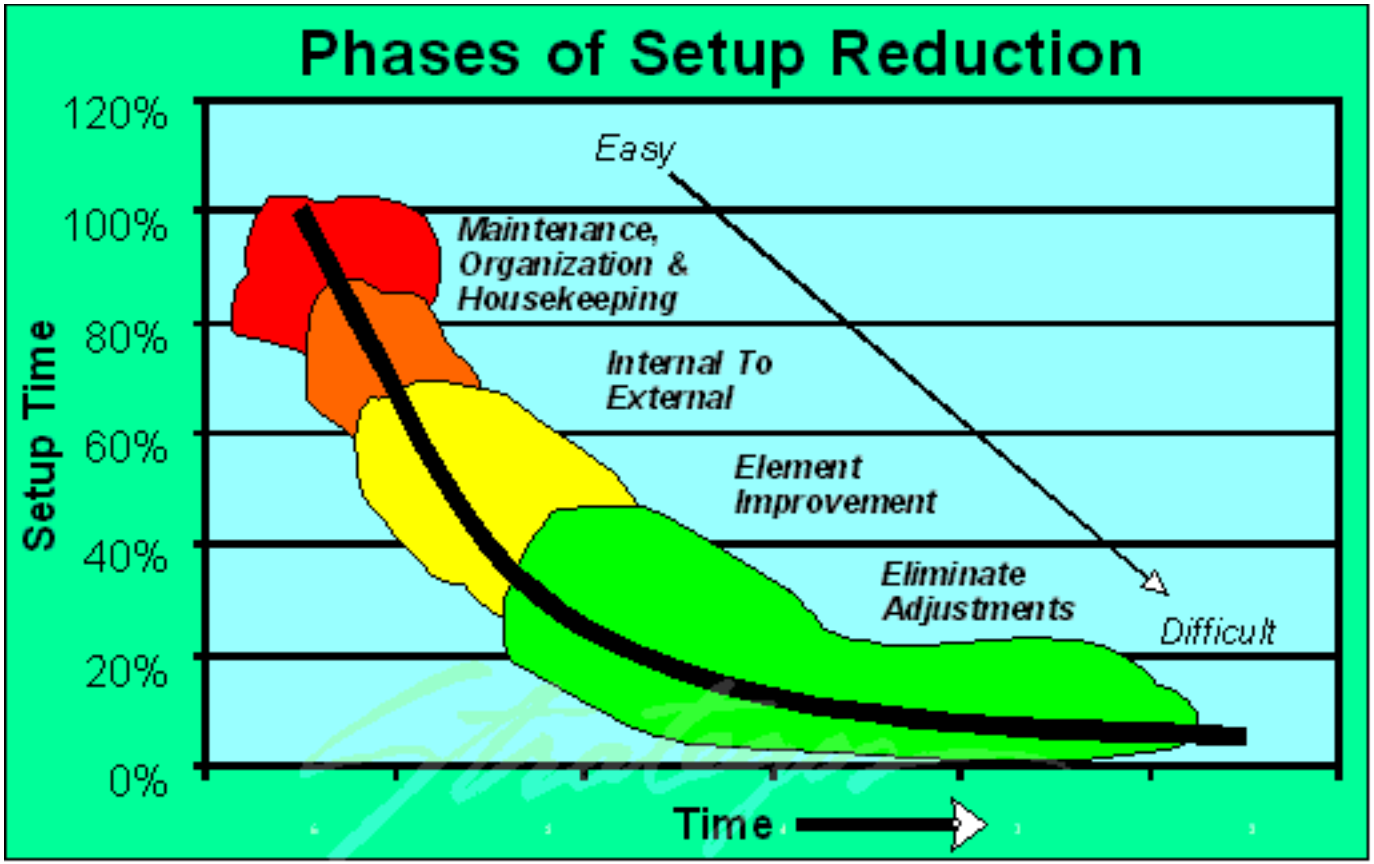


Setup Reduction or Quick Changeover

- <u>Definition:</u> ***Minimizing the time from last good piece of the current product run to first good piece of the next (different) product run.***
- **STEPS IN A CHANGEOVER: (1) Preparation; (2) Remove/Install Tooling; (3) Change Machine Settings; (4) Make Trial Pieces & Adjust.**

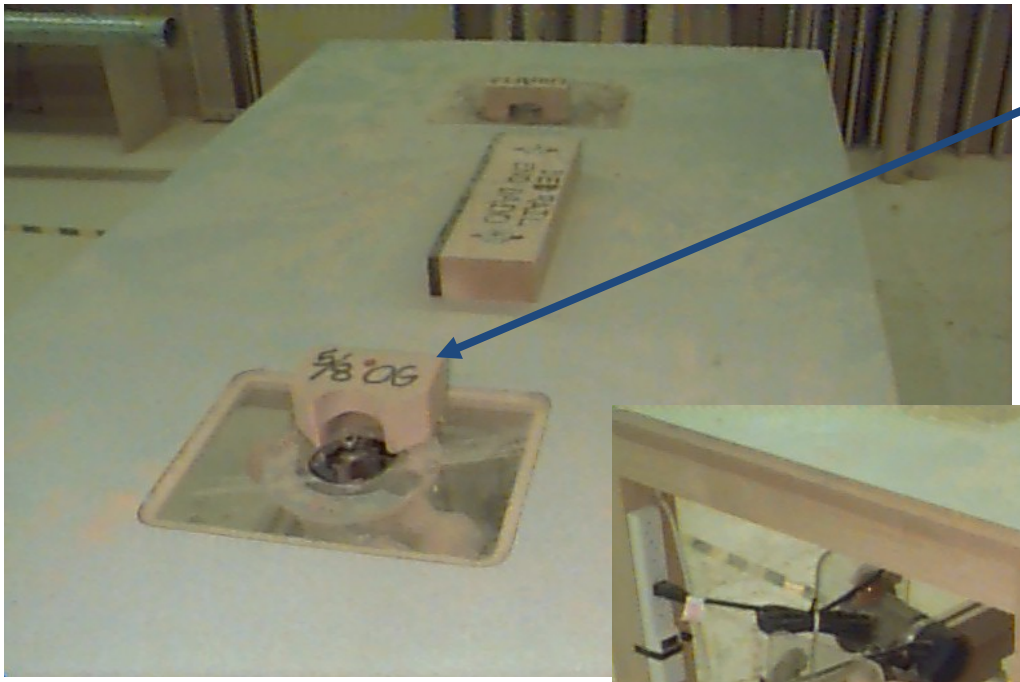
Percent of time of changeover



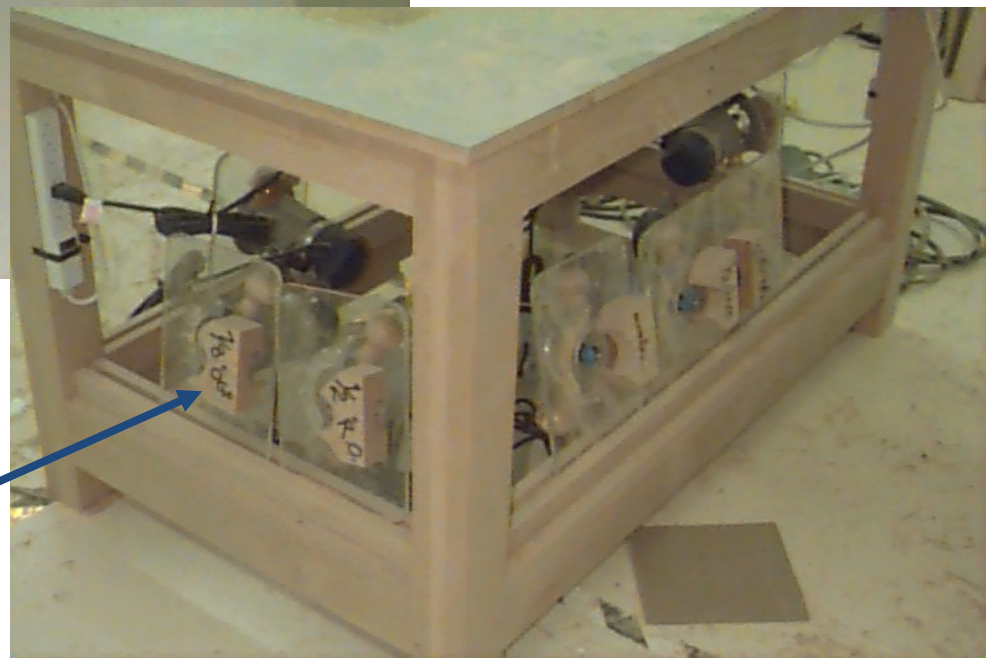

Phases of Setup Reduction
120%
100%
80%
60%
40%
20%
0%
Setup Time
Easy
Maintenance, Organization & Housekeeping
Internal To External
Element Improvement
Eliminate Adjustments
Difficult
Time

Quick Changeover: Visual Controls

Quick Changeover



Clearly labeled cutter size and style



All regular router cuts needed in this workcell stored at router table.

Three Stages of Quick Changeover

1. Separate Internal and External Setup

2. Convert Internal Setup to External Setup

3. Streamline Internal and External Elements

Setup Reduction

Stage 1: Separate Internal and External Setup

Separate Internal and External Setup

Convert Internal Setup to External Setup

Streamline Internal and External Elements

Setup Reduction

- Develop and implement changeover checklists.
- Perform function checks on parts and tools before changeover
- Isolate transportation of tools, parts, and materials.

Stage 2: Convert Internal Setup to External Setup

Separate Internal and External Setup

Convert Internal Setup to External Setup

Streamline Internal and External Elements

Setup Reduction

- **Prepare operating conditions in advance**
- **Standardize functions**
- **Use intermediary jigs**

Stage 3: Streamline Internal and External Elements

Separate Internal and External Setup

Convert Internal Setup to External Setup

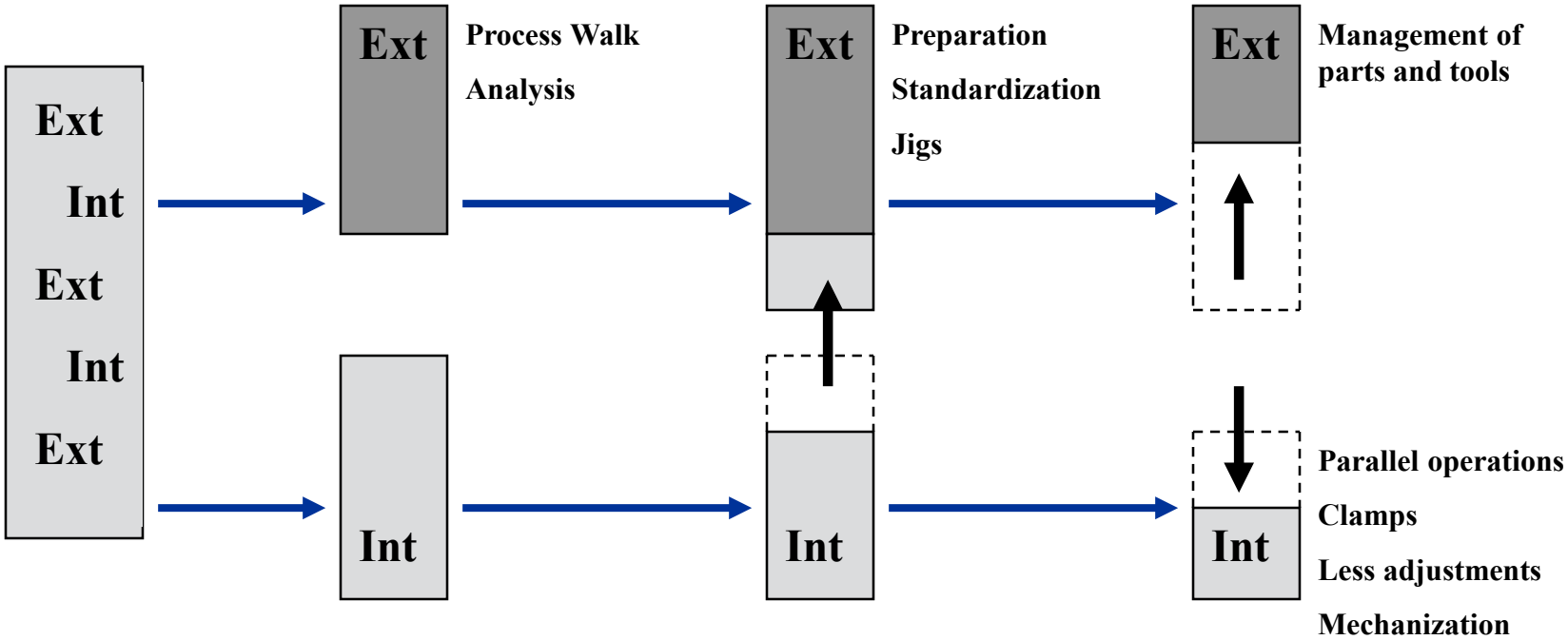
Streamline Internal and External Elements

Setup Reduction

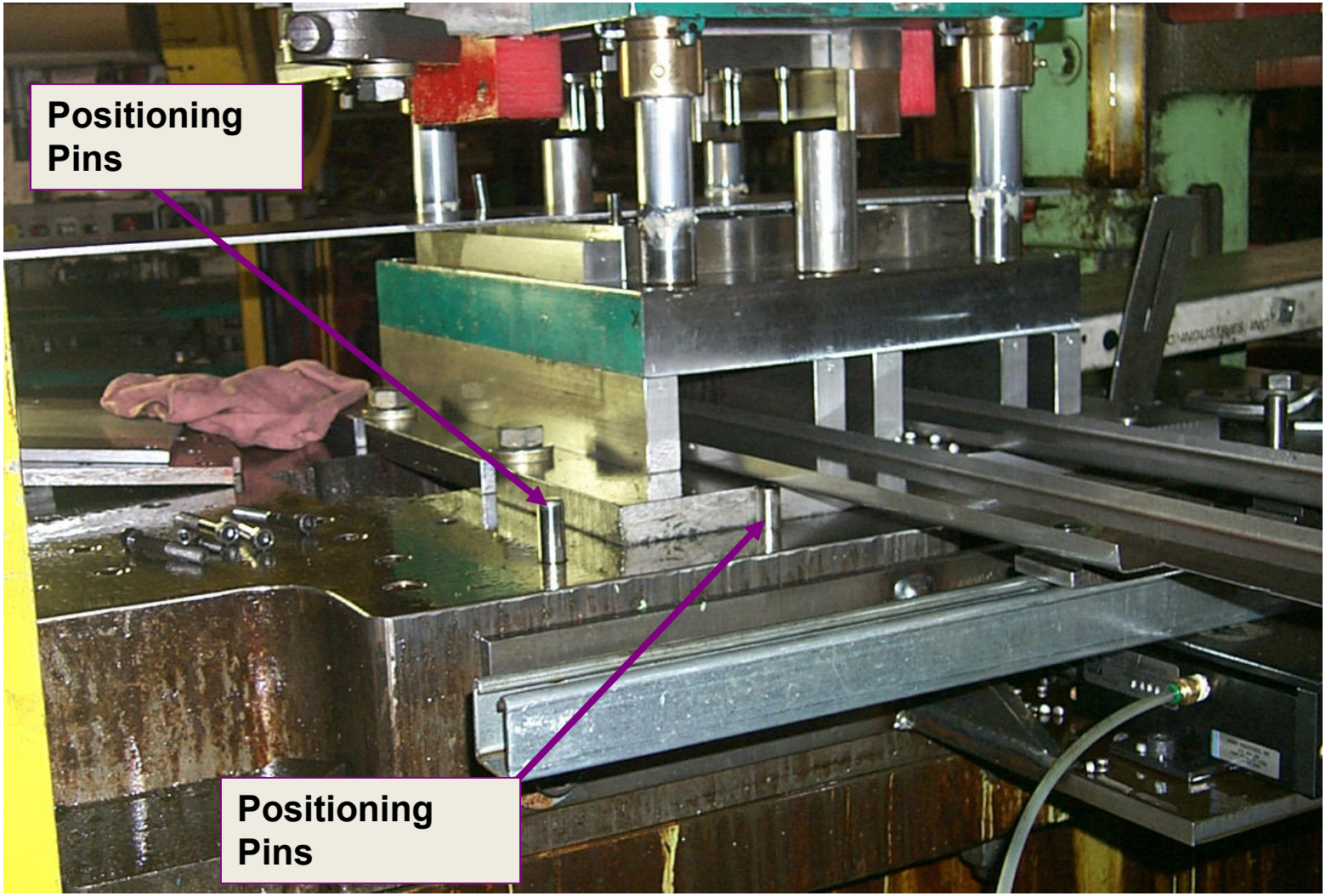
- Implement parallel operations
- Eliminate the need for adjustments
- Use functional clamps
- Mechanize functions

Transition Steps to Quick Changeover

Preliminary	Step 1	Step 2	Step 3
Internal and External Setup not differentiated	Separate Internal and External Setup	Convert Internal Setup to External Setup	Streamline all aspects of Setup operations

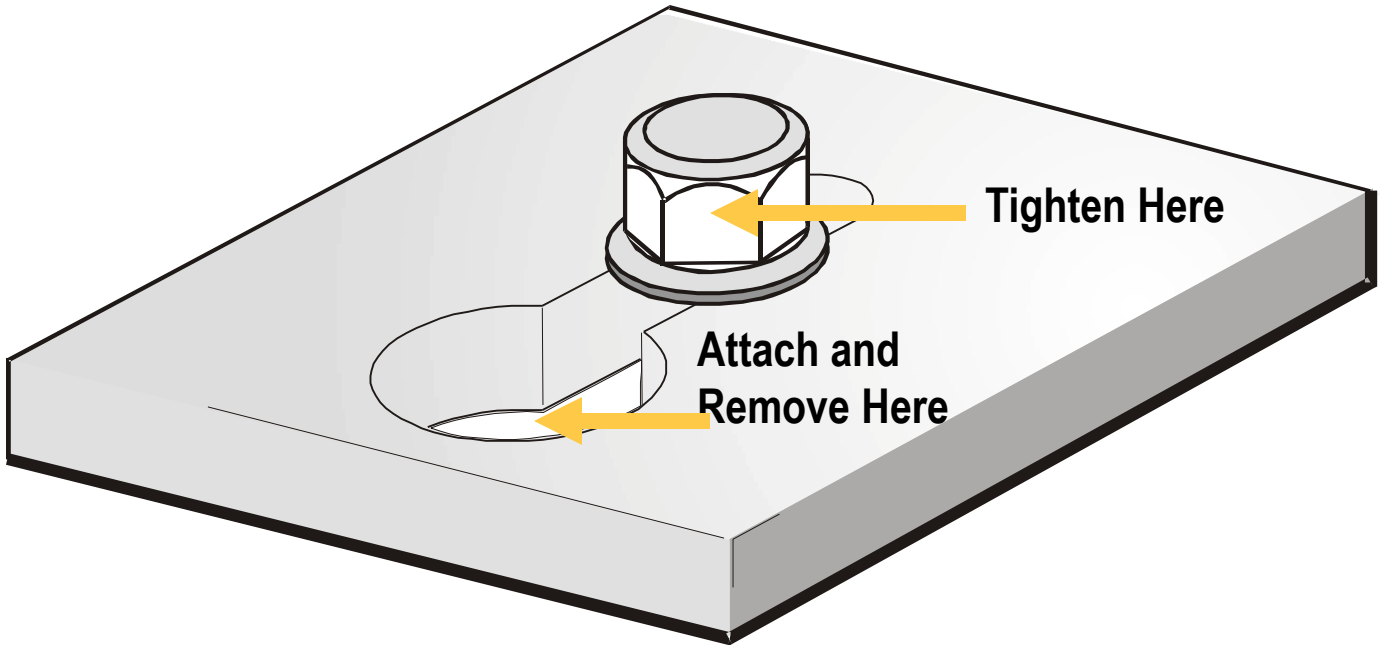


No/Low Cost Solution: Positioning Pins



No/Lo Solution: One-Turn Methods

Pear-Shaped Hole Method



Other Functional Clamps