

STEPS TO SET-UP REDUCTION

Objective: One-piece flow production

Strategy: Systematically eliminate the "rocks in the water" which prevent flow

Goal: Make set-ups a non-issue in the flow of material.

Key image to keep in mind: You are the doctor and the equipment is the patient. You want the patient "opened" for the shortest time possible and you never leave its side - OR- an Indy 500 pit-crew keeping the car functioning during the race.

Step 1: Separate internal from external set-up



Internal: any time the machine must be stopped to perform a set-up task

External: any set-up task that can be performed "off-line" while the machine is running

30-50% improvement can usually be found in this step alone.

With people who know the set-up, list the tasks in sequential order. Example:

Stop machine

Find tools

Find fixture

Loosen bolts

Remove bolts

Remove fixture

Locate next fixture

Insert bolts

Adjust fixture

Tighten bolts to 20ft-lbs

Highlight all tasks which can be defined as "external."

Step 2: Convert internal set-up tasks to external tasks

Examine the purpose of each internal task and become creative on how to shift it to an external task. For example,

Internal task	Purpose of task	Is it absolutely essential to perform the task <i>on</i> the machine?
adjust fixture	to make parts to print	No. Notch fixture for positive alignment when attached to machine.

Step 3: Streamline all tasks required to perform the set-up

For example, turning bolts numerous times is wasteful! Possible alternatives to eliminating all but one bolt turn:

1. Leave bolts in table and put pear-shaped holes in mating part.
2. Leave bolts in table and use 'C-shaped' washers
3. Shave 3 sides of bolt and hole for slip-in-and-turn capability