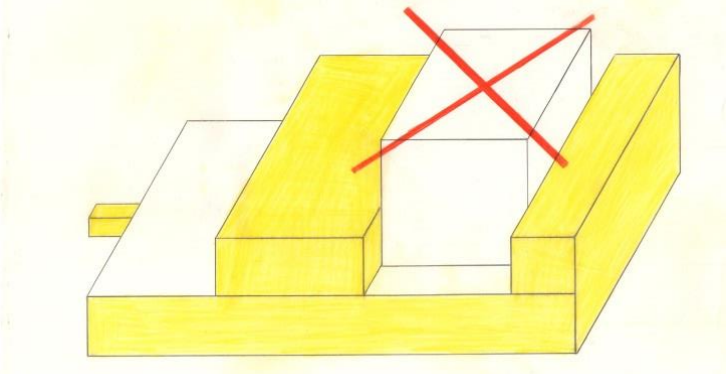
A VISE FIXED TO A MACHINING CENTER TABLE IS A SIN AGAINST EFFICIENT PRODUCTION OF MACHINED PARTS.



MUCH TIME IS LOST FOR TOOL CHANGE AND WORK HANDLING.

ASSUME THE FOLLOWING CONDITIONS FOR THE FOLLOWING CHARTS

1. **Seven tool changes are required for each face of a part.**
   Seven times seven second tool changes=.82 minutes for each face.

2. **Time to stop the machine, open the doors, relocate a part, close the doors and start the machine is .75 minutes**

3. **Pallet switch time is .75 minutes**

4. **Part change time while pallet is off the machine is .5 minutes**

5. **Cutter setup time for each method is 5 minutes**

6. **Tool change and work handling time is considered.**
   Programming and cutting time is not considered for this study.

Three setup methods are considered:

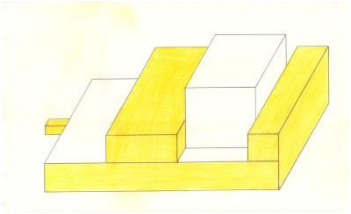
1. **A SHOP VISE fixed to the machining center table (Setup time =2 minutes)**

2. **An INSTANT SETUP FLAT PALLET (Setup time= 6 minutes)**

3. **An INSTANT SETUP ROTARY LOG PALLET (Setup time=3 minutes)**

THIS CHART REPRESENTS A PART MACHINED ON SIX SIDES

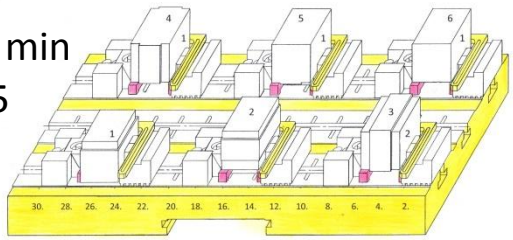
EXAMPLE #1 The part is clamped one side at a time by a SHOP VISE



A. Change the part in the vise that is on machine
   Machine time .75 min times 6---------- 4.5 minutes
   Operator time----------4.5
B. Tool change time for seven cutters for 6 faces
   Machine time .82 times 6----------4.92 minutes
   Since the cycle time is so short, the operator
   must stay at the machine during the cycle------ 4.92

TOTAL MACHINE AND OPERATOR TIME-------- **18.84 MINUTES**

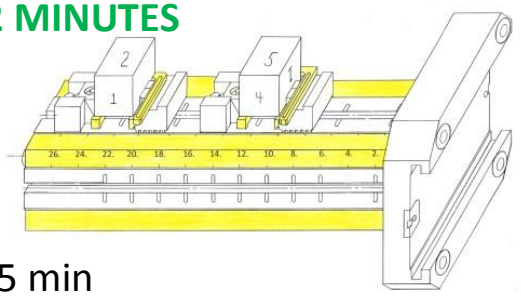
EXAMPLE #2 Each side of the part is clamped by an
INSTANT SETUP FLAT PALLET.



A. Machine time to switch the pallet----------.75 min
   Operator time ----------.75
B. Clamp parts on the pallet while it is
   off the machine
   Machine time----------.00
   Operator time .5 times 6----------3.0 min
C. Change 7 cutters one time----------.82 min
   Since cycle time is longer the
   operator can do other things----------.00

TOTAL MACHINE AND OPERATOR TIME—--**5.32 MINUTES**

EXAMPLE # 3 Two parts are clamped by an
INSTANT SETUP ROTARY LOG PALLET.



Six sides of the part are completed each cycle.

A. Machine time to switch pallet----------.75 min
   Operator time----------.75
B. Clamp two parts, off machine
   Machine time---------- .00
   Operator time .5X2----------1.00 min
C. Change 7 cutters
   Machine time---------- .82min
   Operator time----------.00

Total machine and operator time----------**3.32 minutes**

THIS CHART REPRESENTS MULTIPLE PARTS MACHINED ON THREE SIDES

NUMBER OF PARTS	1	2	4	6
SHOP VICE				
NUMBER OF CYCLES	3	6	12	18
WORK HANDLING, MACHINE	2.25	4.50	9.00	13.50
OPERATOR	2.25	4.50	9.00	13.50
TOOL CHANGE, MACHINE	2.46	4.92	9.84	14.76
OPERATOR	2.46	4.92	9.84	14.76
TOTAL TIME PER PART (minutes)	**9.42**	**9.42**	**9.42**	**9.42**
FLAT PALLET SYSTEM				
(Maximum 6 parts on a pallet)				
NUMBER OF CYCLES	1	1	2	3
PALLET SWITCHING, MACHINE	.75	.75	1.50	2.25
OPERATOR	.75	.75	1.50	2.25
OFF MACHINE WORK HANDLING				
MACHINE	.00	.00	.00	.00
OPERATOR	1.50	3.00	6.00	9.00
TOOL CHANGE, MACHINE	.82	.82	1.64	2.46
OPERATOR	.00	.00	.00	.00
TOTAL TIME PER PART (minutes)	**3.82**	**2.66**	**2.66**	**2.66**
ROTARY LOG PALLET SYSTEM				
CYCLES	1	1	1	1
PALLET SWITCHING, MACHINE	.75	.75	.75	.75
OPERATOR	.75	.75	.75	.75
OFF MACHINE WORK HANDLING				
MACHINE	.00	.00	.00	.00
OPERATOR	.50	1.00	2.00	3.00
TOOL CHANGING, MACHINE	.82	.82	.82	.82
OPERATOR	.00	.00	.00	.00
TOTAL TIME PER PART (minutes)	**2.82**	**1.66**	**1.08**	**.89**