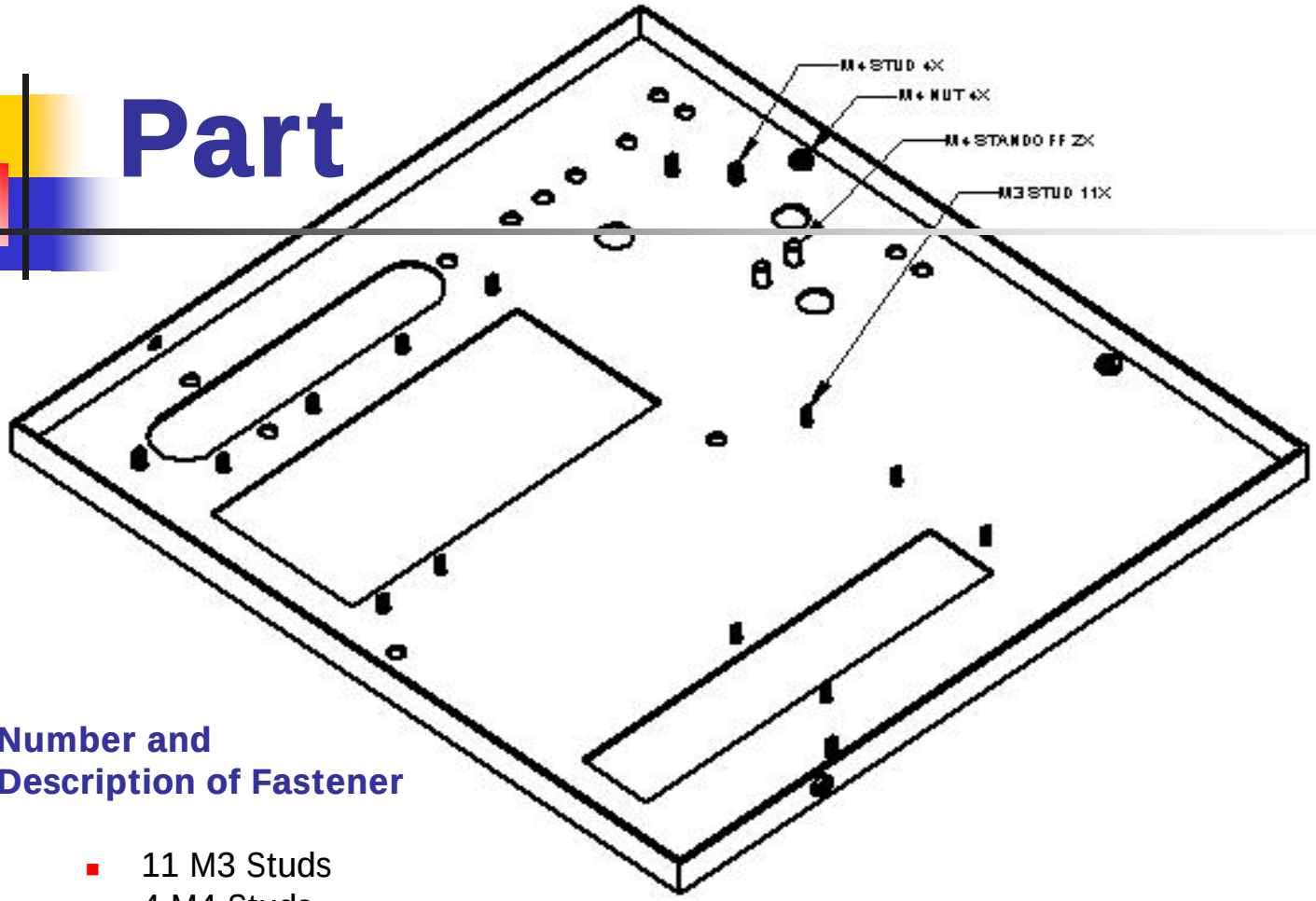
824 WT Time Study and Cost Justification

Part



Number and Description of Fastener

- 11 M3 Studs
- 4 M4 Studs
- 2 M3.5 Standoffs
- 4 M4 Nuts
  - 21 Total (4 types of fasteners)

Haeger A Subsidiary of Phillips Corporation	MATERIAL: 14-01486 SCALE: 1:1	PART NO : 15-01486-II
TITLE: CUSTOMER DEMONSTRATION PART		
THE DATA AND INFORMATION CONTAINED HEREIN IS PROPRIETARY, CONFIDENTIAL AND THE TRADE SECRET PROPERTY OF HAEGER, INC. COPYING OR TRANSFERRING OR USING THE DATA AND INFORMATION CONTAINED HEREIN WITHOUT THE WRITTEN PERMISSION OF HAEGER, INC. IS EXPRESSLY FORBIDDEN.		DWG. NO : 15-01486-II

Method of Fastener Insertion (Repeat Job)

WT

- M3 studs automatically inserted
- Remainder inserted manually

Set Up

Call up program
Install auto tool for M3 stud
Install 4 lower tools in the TIS
Run parts on machine

HP6 or any manual machine

- Insert all fasteners manually

Set Up

Set up first tool for M3 studs
Run all parts on machine
Set up tool for M4 studs
Run all parts
Set up tool for M3.5 standoffs
Run all parts
Set up tool for M4 nuts
Run all parts

Time for Producing 6 Parts

WT

Machine set up	3 min.
Auto Insert 11, M3 studs (11 x 3 sec. x 6)	3.30 min.
Manually insert 4, M4 studs (4 x 6 sec. x 6)	2.40 min.
Manually insert 2, M3.5 SO	1.20 min.
Manually insert 4, M4 Nut	2.40 min.
Part Handling (10 sec. x 6)	1 min.
Turret Rotation (1 sec. x 4 pos. x 6)	0.4 min.
Total Time	**13.7 min.**

HP6 or any manual machine

Machine set up	1.5 min.
Manually insert 11, M3 studs (11 x 6.7 sec. x 6)	7.7 min.
Machine set up	1.5 min.
Manually insert 4, M4 studs	2.8 min.
Machine set up	1.5 min.
Manually insert 2, M3.5 SO	1.4 min.
Machine set up	1.5 min.
Manually insert 4, M4 Nut	2.8 min.
Part Handling (10 sec. x 4 handlings x 6)	4 min.
Total Time	**24.7 min.**

Time for Producing 50 Parts

WT

▪Machine set up	3 min.
▪Auto Insert 11, M3 studs (11 x 3 sec. x 50)	27.5 min.
▪ Manually insert 4, M4 studs (4 x 6 sec. x 50)	20 min.
▪ Manually insert 2, M3.5 SO	10 min.
▪ Manually insert 4, M4 Nut	20 min.
Part Handling (10 sec. x 50)	8.3 min.
Turret Rotation (1 sec. x 4 pos. x 50)	3.3 min.
Total Time	**92.1 min.**

HP6 or any manual machine

▪Machine set up	1.5 min.
▪Manually insert 11, M3 studs (11 x 7 sec. x 50)	64.2 min.
▪ Machine set up	1.5 min.
▪ Manually insert 4, M4 studs	23.3 min.
▪ Machine set up	1.5 min.
▪ Manually insert 2, M3.5 SO	11.7 min.
▪ Machine set up	1.5 min.
▪ Manually insert 4, M4 Nut	23.3 min.
Part Handling	33.3 min.
Total Time	**161.8 min.**

Profit and Return on Investment

Time Saved using 824 WT (24.7 – 13.7 = 11 min.)	44.5%
Time Saved Per Month (160 hours x 44.5%)	71.2 hours
Hourly Labor Rate	$30.00
Saving Per Month (71.2 hours x $30.00)	$2,136.00
Monthly Lease Cost of Machine	$738.00
Net Monthly Increased Profit	**$1,398.00**
Return On Investment	**17 months**

Haeger
Creating Hardware Insertion Profit Centers

Comparison of Investment and Manufacturing Costs

- Material
- Punching
- Bending
- Inserting
- Fasteners

Machine and Labor Costs

Process	Machine Cost $	Leasing $ Cost / month (5 yr lease, factor .01968)	Hourly Labor Rate $	Total Cost per month $
Punching	305,000	6,002	40.00	**$12,402**
Bending	95,000	1,870	35.00	**$7,470**
Inserting HP6	0	0	25.00	**$4,000**
Inserting WT	37,500	738.00	25.00	**$4,738**

Manufacturing Costs for 6 parts

WT

Sheet Metal Materials Cost	$16.38
*Punching Operation	$21.32
**Bending Operation	$9.34
Inserting Operation	$6.85
Cost of Fasteners	$3.06
Total Cost	$56.95
Total Cost Per Part	$9.49

* =Punching Time for 6 parts=16.5 minutes
** =Bending Time for 6 Parts=12 minutes

HP6

Sheet Metal Materials Cost	$16.38
Punching Operation	$21.32
Bending Operation	$9.34
Inserting Operation	$10.29
Cost of Fasteners	$3.06
Total Cost	$60.39
Total Cost Per Part	$10.07

Summary & Conclusions

- Currently the (HP6) insertion is only process where the part is handled multiple times
- The Insertion department is the only place in the total manufacturing process not utilizing technology
- When the parts reach the Insertion department they have substantial added value and scrapping them because of missing or misplaced fasteners is expensive
- The 824 WT provides a 45% increase in productivity and the added benefit of improvement in quality
- This % increase is not possible on any other process for such a small investment

Time for Producing 6 Parts

OT

▪ Machine set up	17.00 min.
▪ Auto Insert 11, M3 studs (11 x 4 sec. x 6)	4.40 min.
▪ Manually insert 4, M4 studs (4 x 4 sec. x 6)	1.60 min.
▪ Manually insert 2, M3.5 SO	0.80 min.
▪ Manually insert 4, M4 Nut	1.60 min.
Part Handling (10 sec. x 6)	1 min.
Tool Change Time (8.5 sec. x 3 pos. x 6)	2.55 min.
Total Time	**27.95 min.**

OT & WT Comparison with Different Quantities

	WT	OT	WT	OT
	6 part batch quantity		**50 part batch quantity**	
Machine Set Up	2.7 min.	17 min.	2.7 min.	17 min.
20, M3 Studs	6 min.	8 min.	50 min.	66.67 min.
15, M4 Studs	9 min.	6 min.	75 min.	50 min.
12, M3.5 S.O.	7.2 min.	4.8 min.	60 min.	40 min.
15, M4 Nuts	9 min.	6 min.	75 min.	50 min.
Part Handling	1 min.	1 min.	8.33 min.	8.33 min.
Tool Change Time	0.4 min.	2.55 min.	3.33 min.	21.25 min.
Total Time	**35.30 min.**	**45.35 min.**	**274.36 min.**	**253.25 min.**

NB. On a long run the time for manual insertion on the WT will not remain at 6 seconds. If it only increases by 2 seconds per fastener it would add **70 minutes** to the total time for 50 parts on the WT. The larger the part the more difficult and time consuming it is for manual insertion--especially to position it.