



ASSEMBLY LINE

353 STATIONS

763 TEAM MEMBERS

28 shifts → 2 x 384 team members

CYCLE TIME = 57 sec

$(353 + X) \times 57 \text{ sec} \approx 360 \times 1 \text{ hr}$

≈ 6 HRS

KAMRANT

300 x 57 sec

1,0,5 HR

5,5 HR

- 0,5 HR

TRANSPORTATION TIME

- 0,5 HR

COASTING / UNLOADING

- 1 HR

58 x 57 sec

~ 1 HR

3,5 HR.

## FINAR ASS 1.

A TEAM MEMBER  $\rightarrow$  12 ANTON PULLS / SWIFTS  
30 T.M. IN FINAR 1.

$$12 \times 30 = 360 \text{ ANTON PULLS / SWIFTS}$$

$$1 \text{ SWIFT} = 525' - 45' - 2 \times 15' = 450'$$

$$\text{EVERY } \frac{450}{360} = 1.25' \text{ ANTON PULL}$$

~~#~~ LINE STOPS IN FINAR 1

$$30 = 1 \times 30 \text{ PER SWIFT}$$

$$\text{EVERY } \frac{450}{30} = 15' \text{ LINE STOP IN FINAR 1}$$

Risk Ratio  $\triangleq$  30%  $\rightarrow$  idle 10% of 450'

$$= 45'$$

A typical stop =  $\frac{45'}{30 \text{ stops}} = 1.5'$

Cost of a stop of 1 minute ??

$$\approx 1 \text{ CAR} \quad \boxed{15.000 \text{ €}}$$

in overtime

MARGIN 17% of 18.500 = 3.145

FR2 -  $\rightarrow 1,500 \times 1' \times \frac{17\%}{60'} \times 40 \text{ people} = 17\text{€}$   
for 1 minute

AFTER  $\approx$  20 min.

$$1,500 \times 1 \times \frac{17}{60} \times 384p \approx 1700\$$$



AFTER A FEW HOURS

$$1,500 \times \frac{17}{60} \times 2000p = 8500\$$$

MISSING PARTS  
MATERIAL FLAW  
WAS INVERT 50.000 \$ TOOL FOR KES  
DON'T UNDERSTAND  
BUT I TRUST SIKIRBY.

5 WHYS

~~HOOK BREAKS~~  
+ SOLVED  
NOT IN JAPAN → LACK OF STANDARD PROCURES  
IN ASSEMBLY → LACK OF TRAINING ASSEMBLY

QUALITY CONTROL DEPARTMENTS:

→ QUALITY MANAGEMENT SYSTEM  
MANUAL

WORKS. WHY?

DISTANCE OF MATERIAL HANDLING : LAYOUT LINE

DEFECTS DON'T RECOVER PROBLEMS IN FA 2  
→ ASSEMBLY

↳ ASSEMBLY

EITHER KES IS NOT THE PROBLEM

OR KES DOES BAD IMPRESSION

OR IT HAPPENS IN TRANSPORTATION.

STRUCTURAL DESIGN PROBLEM

BAD SEATS → RE. ORDER → DISRUPTION OF THE NORMAL FLOW

↓  
PROBLEM GROWS

KANIBAN IS THE PROBLEM ??  
↳ SIDE TRACK FOR SEATS

WHAT IS A SECRETT ??

~~STOCK OF SEATS.~~

ONLY REAR SEATS ASSEMBLY ?

A SPECIFIC TEAM IN ASSEMBLY ?  
↳ TRAINING

WHY ARE SEATS MISSING ? → KFF

NO 'CONNECTION', PROBLEM SOLVING  
RETURN KFF & TOYOTA

① NEAR → NOT TOO FAR THE LINE

└─ we know the problem  
└─ we can fix it later  
└─ takes too long to correct

YOU?



② CAUSES SCARS PROBLEMS  
WHAT WOULD YOU DO?



# DON'T STOP

{

\* Cost OR THE STOP  $\Rightarrow$

TIME

\* If it is cheaper to solve

( TIME FOR REPAIR )

CHEAPER OFF-LINE

\* IF NOT A LINE "PROBLEM" REPAIR TO TIME -

\* } MINIMIZE  $\rightarrow$  STOP  
BREAKING  $\rightarrow$  DON'T STOP

OBJECTIVES

COST REDUCTION  
THE ELIMINATION  
OF WASTE

= DEVIATES FROM  
THE NEEDS

PRINCIPLES

JUST-IN-TIME  
PRODUCE WHAT  
IS NEEDED  
WHEN NEEDED  
IN QUANTITY  
NEEDED

TOOLS

SMALL PIECE  
FLOW  
→ FORD = 1

HEIJUNKA  
MIXED ASSEMBLY

KATAHAN

CONDITIONS  
TAKES TIME

→ SET UP TIME  
CON

SMED  
" SINGLE MINUTE  
EXCHANGE " DIES.

= NOT ADDING  
VALUE  
↳ defect

→ JIDOKA  
MAKE PROBLEM  
SELF - EVIDENT

CULTURE OF

NO BLAME  
MASTER-TRAINER  
" INSTRUCTIONS " PROBLEM SOLVING  
CULTURE

→ IN-LINE QUALITY  
CONTROL

5 WHYS.

5 S

KAIZEN = CONT.  
IMPROVEMENT

CLINIC

VISUAL  
MANAGEMENT

MOVING  
LINE  
POKA YOE  
MISTAKE  
PROOF  
ATTENTION

GO TO THE  
FLOOR  
ATTITUDE TO  
GO & SEE

" GOOD " PEOPLE  
TRAINING

INVESTMENT IN  
SYSTEMS/PEOPLE

RELIABILITY IN  
SUPPLY

→ LIMITED #  
SUPPLIERS

LINE WITH SUPERVISOR