ITW Automotive

Air Flow Management

Narodné fórum produktivity
ITW Slovakia, Bytča
Ing. Dušan Brtáň

06.10.2022

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Air Flow Management

Bytča – plant introduction

Location: Bytča, Slovakia.

Production space: 4500 m²
Warehause : 4100 m²

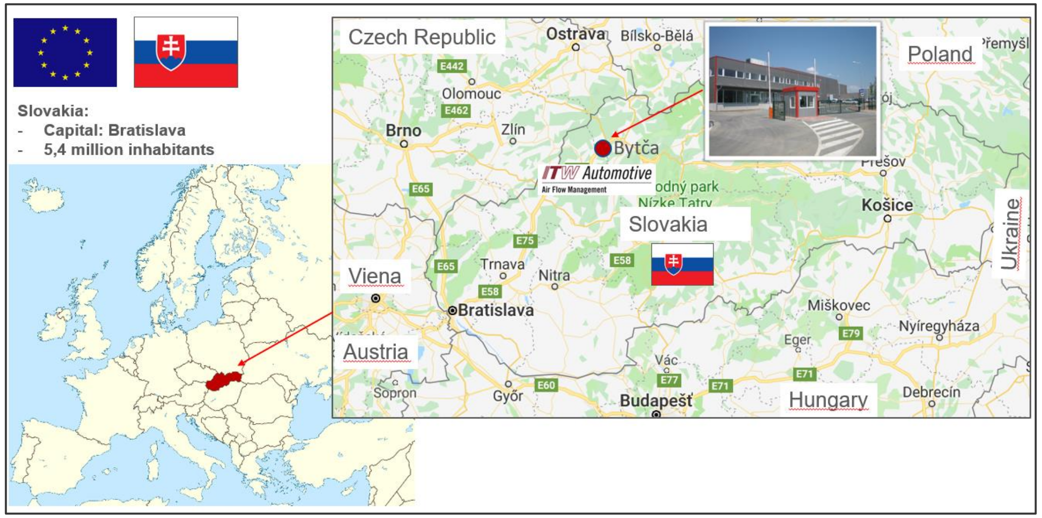
Established in 2006, **acquired by ITW in Jul. 2016.**

Employees: 350

Certifications: IATF 16949,
ISO 14001

Products: Air Registers

Main Customers:
- Daimler
- FCA
- Renault
- Dacia



Capabilities:

- ➢ Injection molding - 45 presses (50 to 500 tons, 1K&2K)
- ➢ Assemblly line - (semi automatic / High - automatization / manual)
- ➢ Gluing
- ➢ Tampo-printing
- ➢ Hot stamping
- ➢ GWK technology

Customers:

Injection Shop

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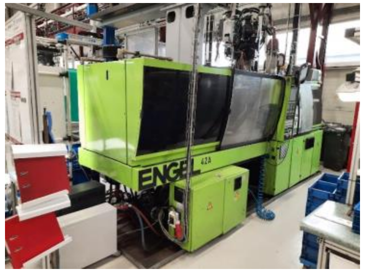

Tonnage	Brand	1k/2k	Count
6t	Babyplast	1K	4
50t	Arburg	1K	1
	Fanuc	1K	1
100-150t	Arburg	1K	2
	Engel	1K	1
	Engel	1K	1
	Engel	2K	2
	Zhafir	1K	2
	Fanuc	1K	1
200t	Zhafir	1K	3
	Arburg	1K	1
	Arburg	2K	1
	Demag	1K	1
250t	Fanuc	1K	2
	Zhafir	1K	2
	Arburg	2K	4
	Demag	1K	1
300t	Arburg	1K	1
	Zhafir	1K	4
	Arburg	1K	1
400t	Arburg	1K	2
	Zhafir	1K	2
500t	Fanuc	1K	1
	Zhafir	1K	1
	Arburg	1K	2
	Engel	1K	1
		Total	45

2x Central feeding
24/7 production
45 IMMs 6-500t
1K/ 2K
11 GWKs

Hotstamping

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- Chrome/aluminium foil aplication on plastic surface
- 6 hotstamping machines for Daimler, RSA and PSA projects

Tampoprinting and glueing

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- Tampoprint machine for FCA projects (Jeep and Fiat 500)
- Glueing machine for Jeep projects

Assembly

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- 16 assembly lines
- 24/5 production
- Flexible manual / semi automatic and automatic assembly lines
- ergonomic workplace designed
- components feeding from back side – operators concentrate only for assembly process

- flexible assy jig for different versions of products

- Focusing for prevention approach, first released part, boundary samples, PY samples and verification, PLC

- EoLT – air leak test, components presence, version, part identification

Production LAYOUT - ITW BYTCA

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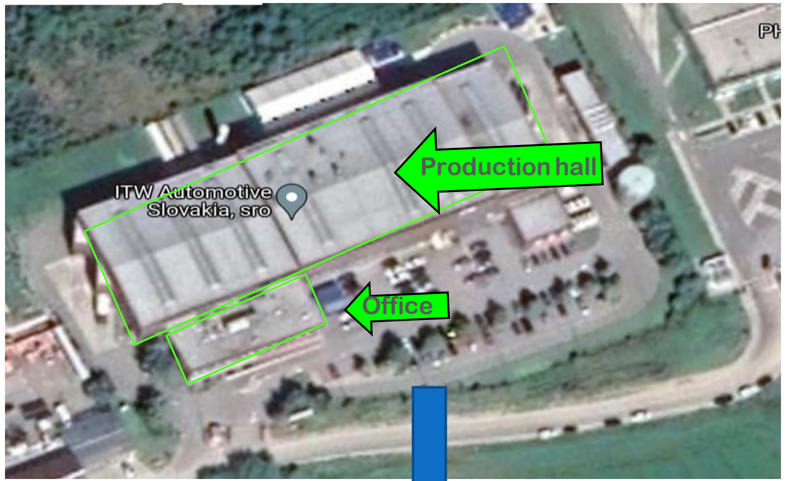

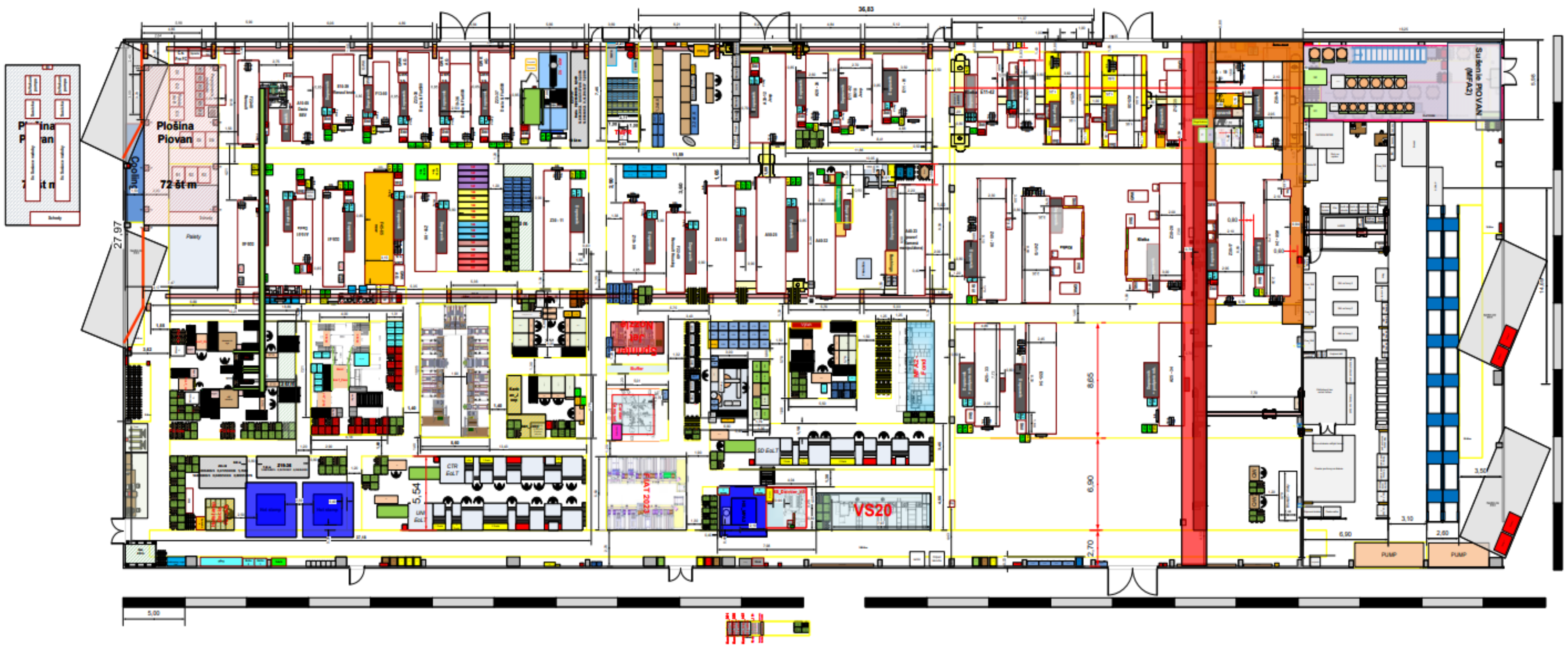

- 80s hall 4000 m2
- Warehouse 4000 m2
- 20s hall 1000 m2

Interior Components

MFA2 / Mercedes Benz A/B class

Interior Components
VS30 / Mercedes Benz Sprinter

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Interior Components
312MCA / Fiat 500



Interior Components Jeep 520 / Jeep Renegade

Projekt Dacia XJI

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Project Renault XJF

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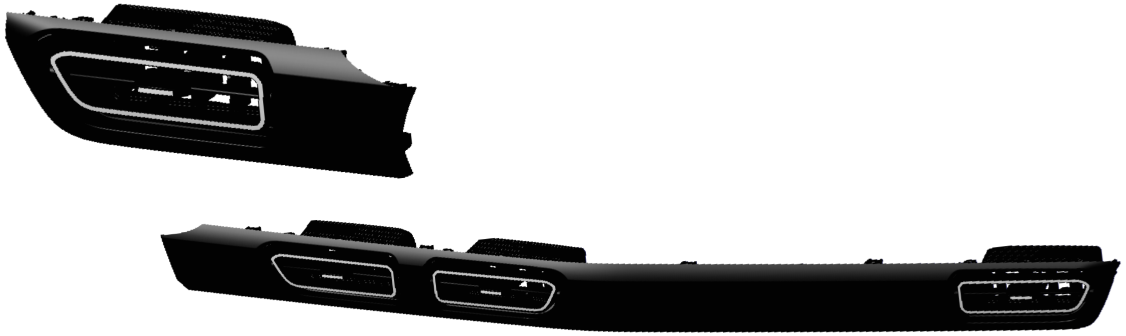

Interior Components
B618 / Citroen C3

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Interior Components
VOLVO Truck FH project

Lay out 06/2022

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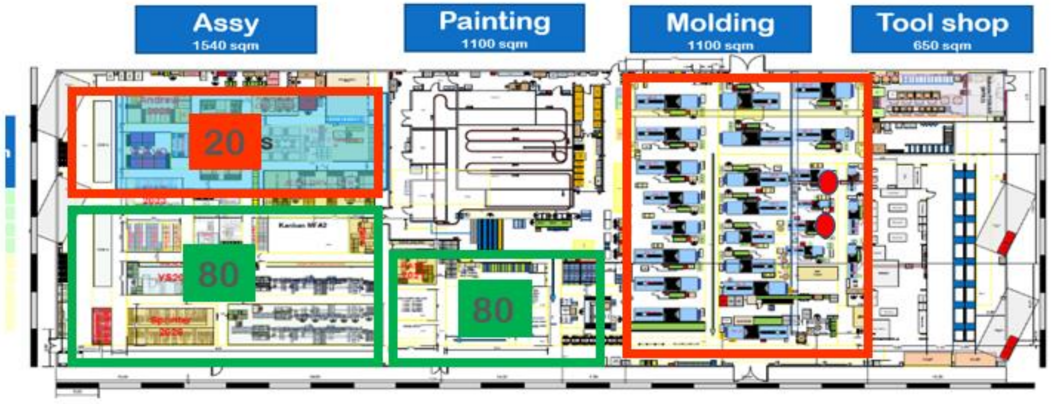
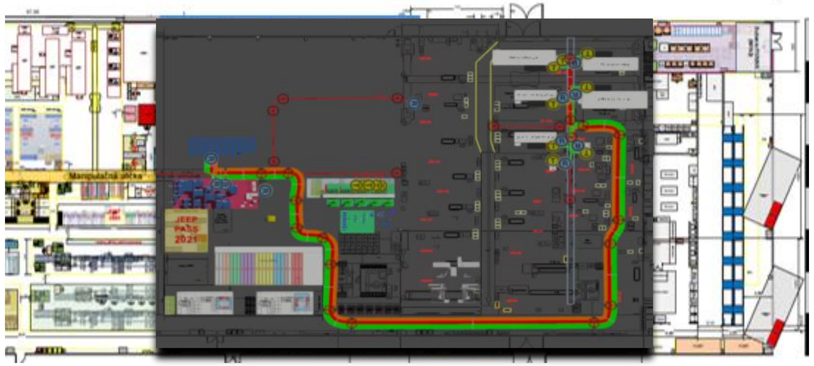
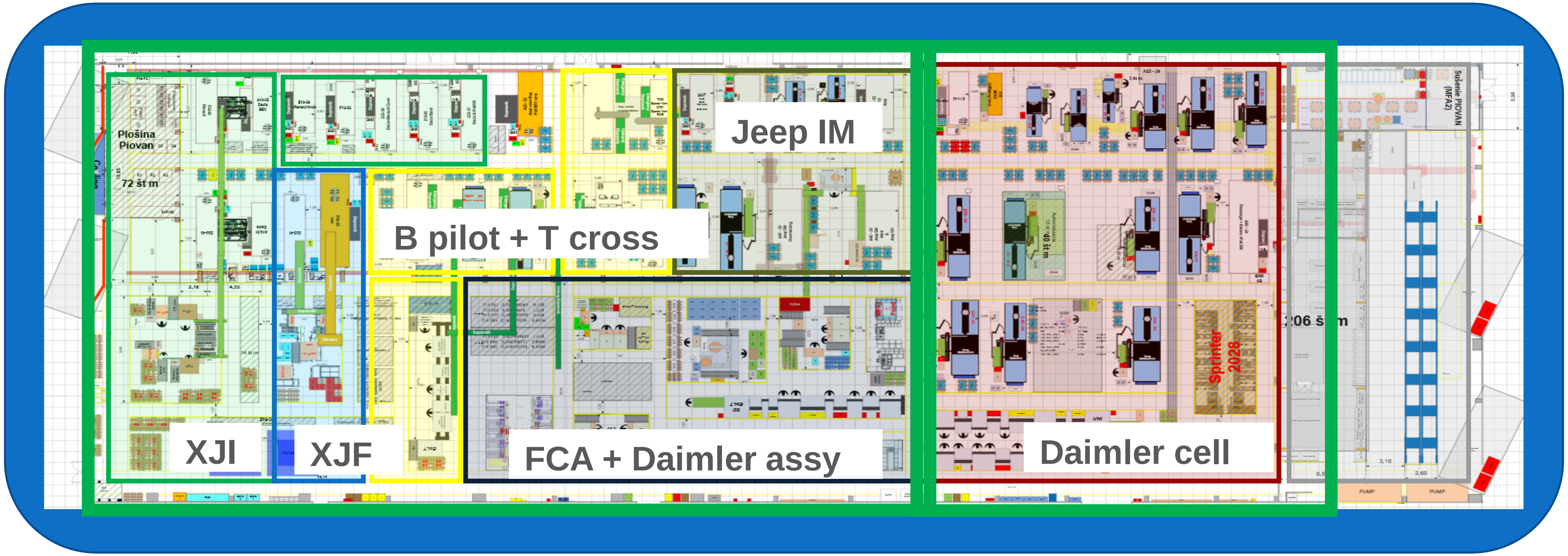




Identify 80 and 20, PLS



Manufacturing concept - Full potential path

E V O L U T I O N

WAY TO FULL POTENTIAL - Manufacturing concept in AFM for A/R

- **1st step:**
  - <u>**Assembly automatic station**</u>
    - Dacia XJI / B segment
    - Rear vanes set

2020-2021 ✓

- **2nd step:**
  - <u>**Modular automatic station**</u>
    - T cross / Crafter / Tayron (CQA)
    - Rear vanes set

2022 – manufacturing in progress

- **3rd step:**
  - <u>**Universal full-automatic concept/stations**</u>
    - 4 different clusters

2022-2023 – development in progress

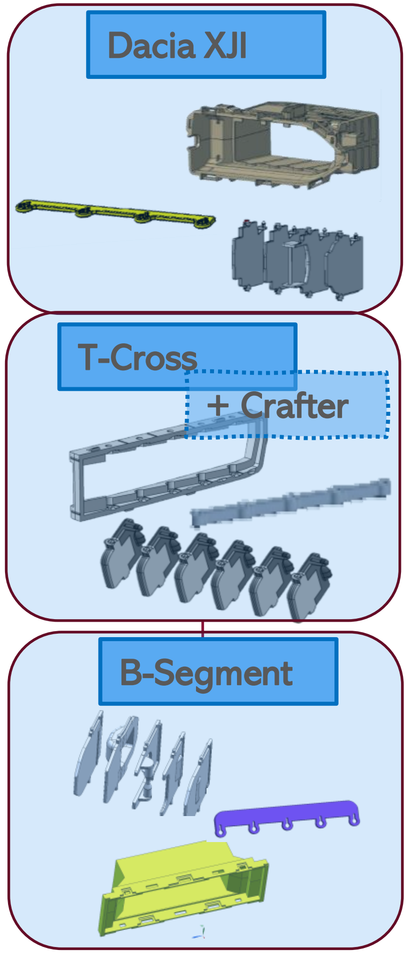
Assembly automatic station

Modular product Design → Modular assy equipment

Cluster 1 – Rear vanes set modular desing

Cluster 2 – Front vanes

Cluster 3 – Knob



2 lines:
Utilization 87%

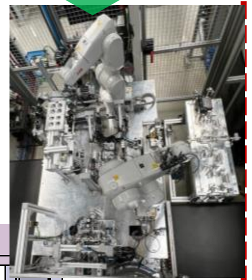
1 line:
Utilization:
- T-Cross 54%
- T-Cross + Crafter CTR 67% (+ Crafter SD ~ 83%)

1 line:
Utilization 87%

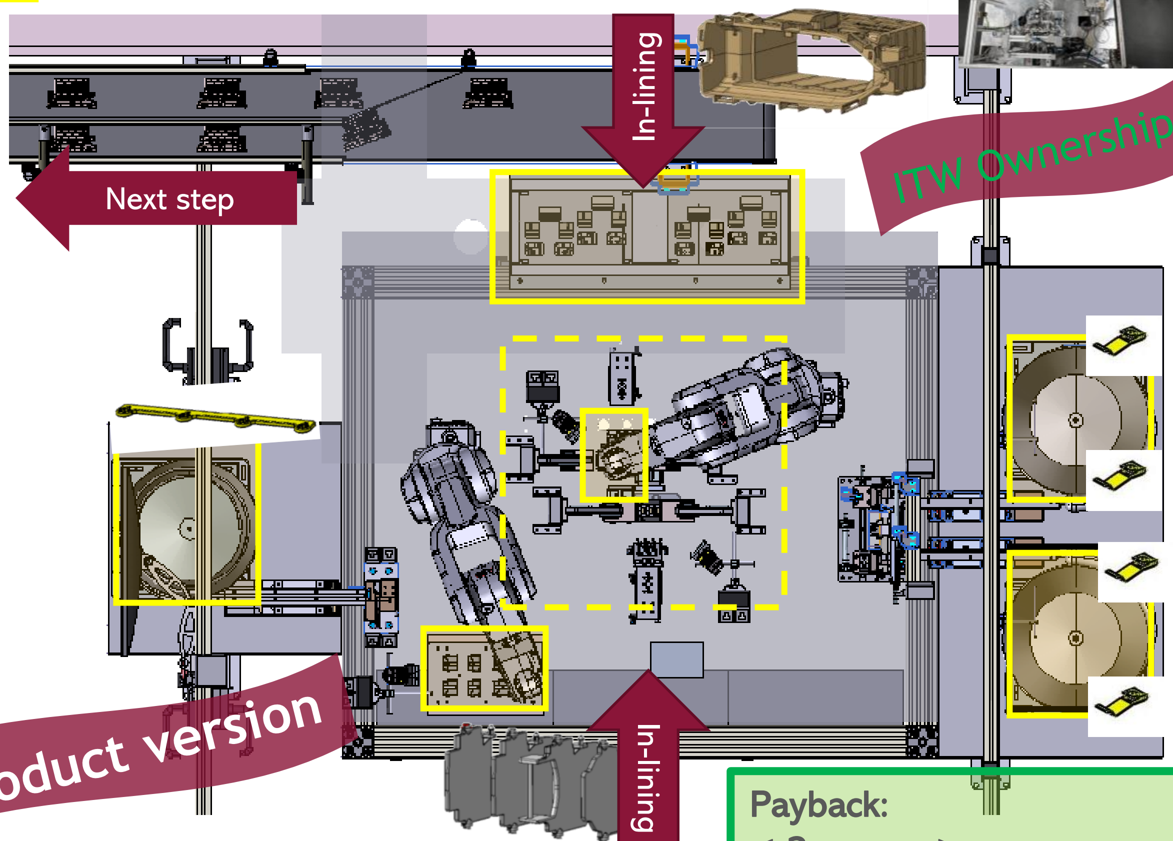
1st Step - Dacia XJI

PILOT project - SOP Q1/22

Outcome comparison	FROM	TO
Investment	60k € (semi-auto)	185k € (auto)
Assy lead time – 1 car / set	128 s (4x operator)	0 s
DIR labour cost €/year (170k sets)	**62k €**	**0k €**



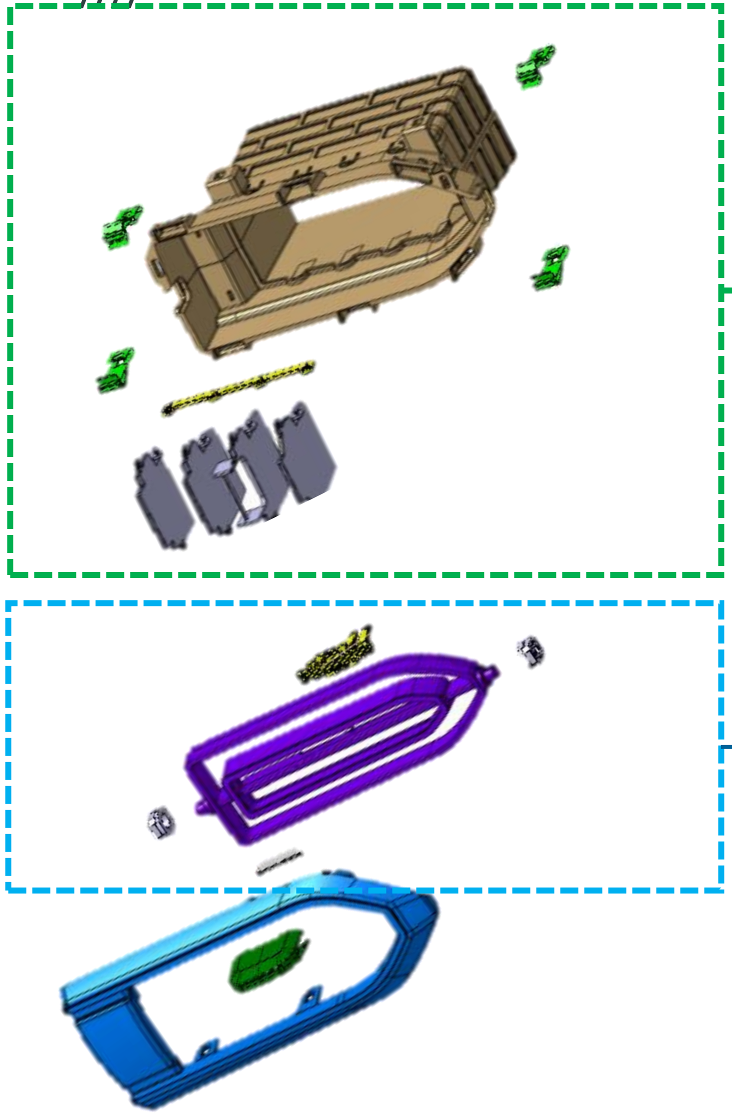
Exchangable nests, grippers for the future – new potential CQA



CC % improved

Payback:
< 2 years =>
≥ 680k air registers / year

Assembly Clusters- 80/20 analysis



Process steps - Example Dacia XJI	Number of op. in carset	Standard carset time (s)	80/20
REAR vanes - 4x vanes + linkbar+ housing + 4x clips	4	128	39%
KNOB set + silicon pad + barell + fork	4	68	60%
FRT vanes/Barrel - 2x Bearing + barell + housing	4	60	78%
Subassy housing + cover LAT	2	26	86%
Subassy housing + cover CTR	1	22	93%
Packaging LAT	2	10	96%
EoLT LAT	2	6	98%
Packaging CTR	1	5	99%
EoLT CTR	1	3	100%
		328	

Semi-auto

4 Clusters defined:

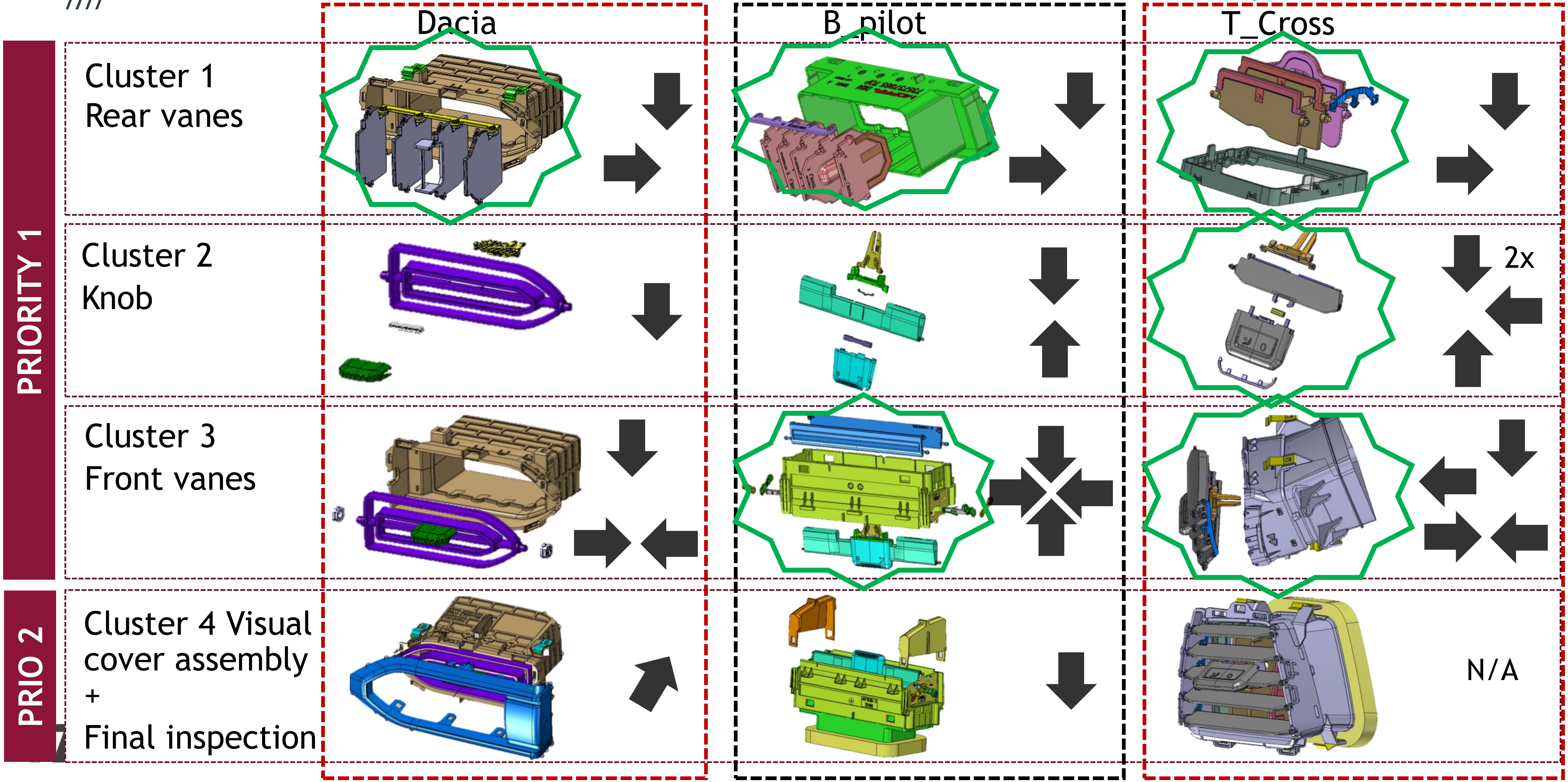
- Rear vanes set + clamps
- Knob vane
- Front vanes
- Visual cover + final inspection

PRIO 1 - 80s

PRIO 2 - 20s

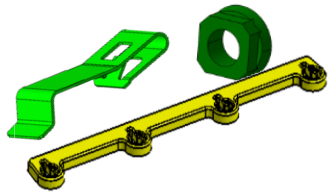
Modular assembly concept - Inputs

Assembly direction
Building blocks

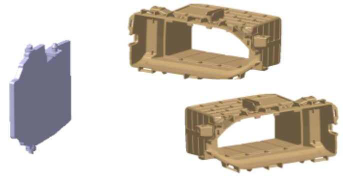


Evaluation on component base

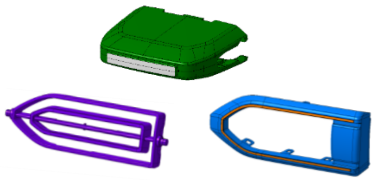
Small components



Large components



Visual components



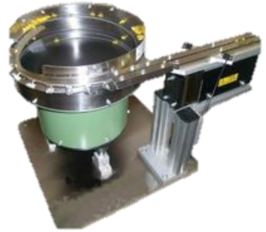
- Speed - C/T
- Cost
- Changeover (time, cost)
- Energy consumption
- Availability
- Change of prod. program
- Packaging
- Quality
- Ergonomics - Noise
- Layout & Area

Sequence of operations into assembly steps

Feeding system

VISION SYSTEM

VIBRATION FEEDER SYSTEM



IMM

Manipulation

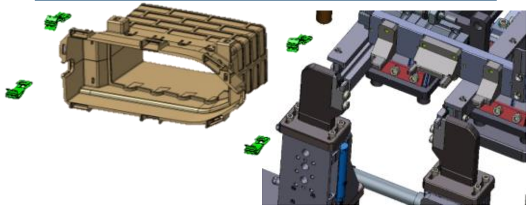
Manipulator

Robot

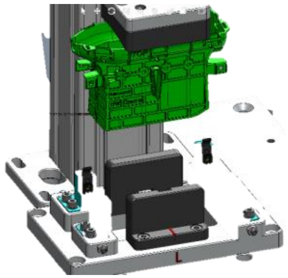
Assembly

Overmolding

Assembly to part



Assembly in nest



Univesral / Modular assembly concept

Ďakujem za pozornosť