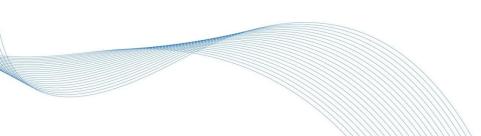


Volvo wheel loaders Body and frame project



Volvo division earth moving equipment:

- Haulers
- Excavators
- Graders
- Wheel loaders





Actual project(s)

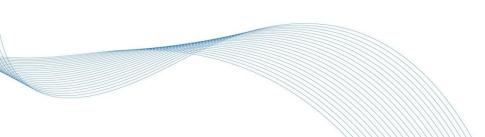
New model of cabin and powertrain.

- Cabin:
- Kit of rear fender(S) L&R and top hood.
- Powertrain:
- Superstructure



Fender:

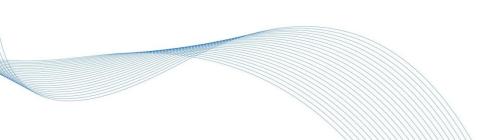
- Two models, long and even longer.
- Left and right.
- Mfg in Finland, transported by road and ferry 650km.
- Part is painted and delivered in sequence.
- A and B-surfaces





#### Hood

- •Two models big and bigger.
- Mfg in Finland, transported by road and ferry 650km.
- Part is painted and delivered in sequence.
- A and B-surfaces



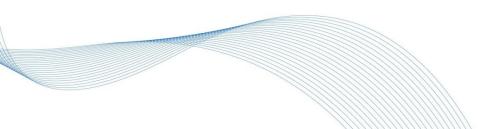


Packaging requirement:

## One box holding one hood and two fenders(kitpacked)

- One box –one dunnage
- Flatpackable and resuable

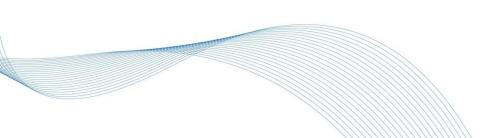
No need for additional pck material such as plastic, paper or foil.





#### Solution

- •2-p box with integrated EPP profile dunnage.
- Multigrooved, double shaped foam allow two models to fit.
- 2700x1200x1621external dimensions.
- ■1200€/box in serial production.

































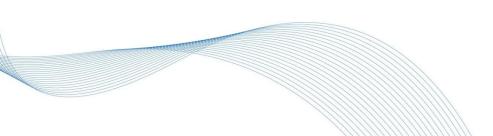
#### Superstructure

- Two models, bulky and akward
- Part made of UHS steel and incorporated into vehicles structure and holds fex fuelsystem and emission control system.
- Safety issue
- Painted and delivered in sequence.
- 800km road transport.



Packaging requirement:

- •One box holding either big or grandiose part
- One box –one dunnage
- Flatpackable and resuable
- No need for additional pck material such as plastic, paper or foil.

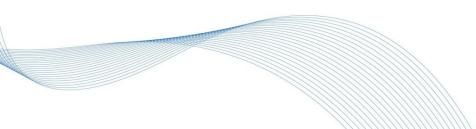








- Average geometry footprint copied from both models.
- Part kept in place and secured by bottom cut out, right short side contact, left short side contact surface contact and lid contact.

















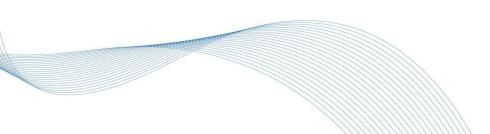






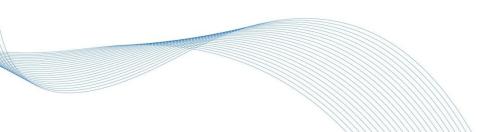
#### Why Clip-Lok?

- How could we win such a big project(Except extraordinary sales skill, lovely timing and taking part of an excellent development department).
- Lean
- Transport economy
- Return on investment



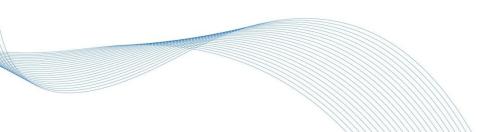


- Frederick Winslow Taylor wrote the "Scientific Management" which inspired Henry Ford to create a production system.
- Post 2nd Ww the japanes turned their military production into civil using the HF philosofy and creating TPS, Toyota production system.
- 1979 MIT defined LEAN as measure during surveys and as a comparsion between different automotive producers.
- The concept has been known to public since 1988.



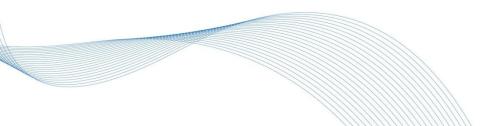


- Lean manufacturing or Lean production, which is often known simply as "Lean", is a production practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target of elimination.
- Working from the perspective of the customer who consumes a product or service, "value" is defined as any action or process that a customer would be willing to pay for.
- Basically, lean is centered around creating *more value with less work*.



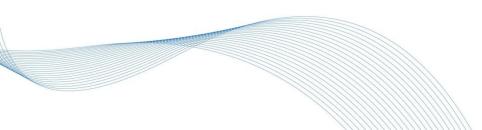


• Whats in Lean for Clip-Lok for this project(s)?





 The implementation of Lean depends on application, however in Volvos case, they choosed to expand with Clip-Lok due to the following reasons:

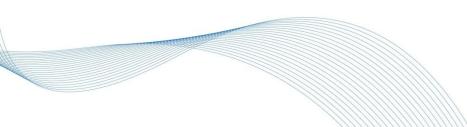




#### Flatpackable and reuseable

 FPH is only 320mm allowing 9 boxes in a megatrailer.







#### Accessability

 The CL system allows the operators to walk into the box and have easy access to the parts(this affect both supplier as well as the assembly parts).

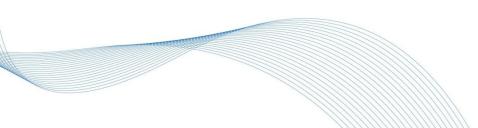




#### Package tolerance

 The use of AUV:s requires high packing tolerance.

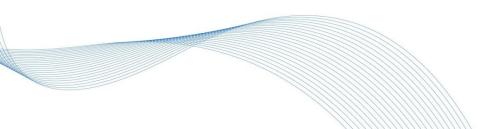






#### Racking system

All boxes fits the racking system on the line...





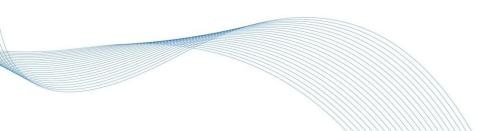
# Clip-Lok SimPak® One box – one dunnage





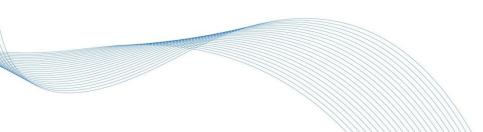
Competetion, oh yes...

 Mainly from other box mfg:s, but also from Volvo logistics who's renting out packaging





- VLC:s clients:
- Volvo group
- Volvo passenger car
- Ford
- Subcontractors to Volvo
- GM and clients competetive or non-attached to Volvo at all.

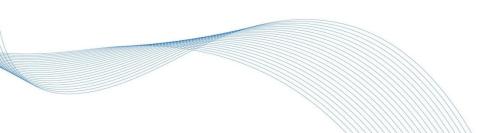




#### Packaging variety

 Have a huge number of different types of packages in their range like pallets, combitainers, steelracks, plastic trays, fixtures and dunnages.

Everything can be rented out to more or less anyone.





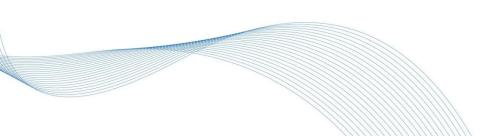
- **Volvo logistics**
- •How do they make their profit?
- For every trip the "asset" makes their client pay a transaction fee.
- The transaticion fee varys depending on the destination.
- Their getting hold of everything through a complex reporting system.



VLC System disadvantage:

Ongoing transaction fees

- Different items, like foam, pallets, lid and other inserts are separated from each other.
- Not possible to create boxes strictly tailor made in lower volumes





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- Conclusion:
- Several automotive players in the market use a similar system.
- The CL system can be competive towards those despite their high purchase volumes.
- The buisness key is 100% optimizing and a proper feasability.