



Clip-Lok SimPak[®]

Volvo wheel loaders
Body and frame project

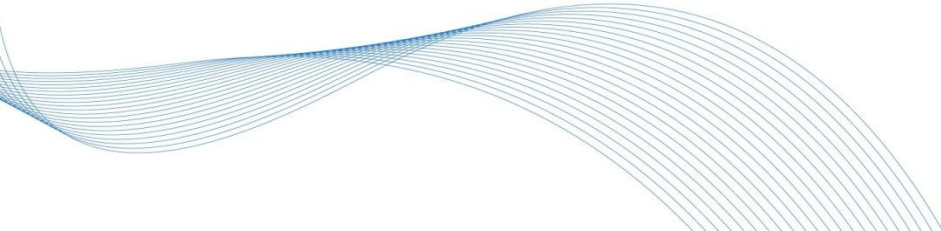
Automotive

Volvo division earth moving equipment:

- Haulers
- Excavators
- Graders
- Wheel loaders

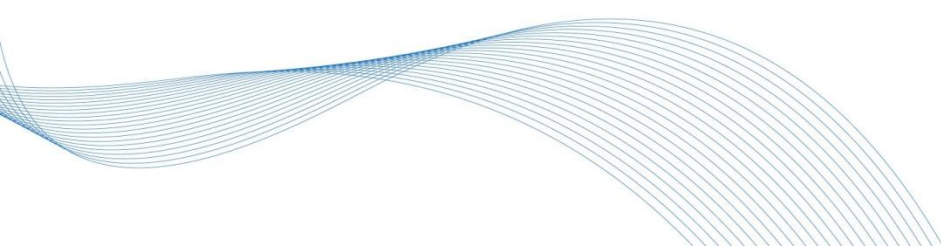
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Actual project(s)

- New model of cabin and powertrain.
 - Cabin:
 - Kit of rear fender(S) L&R and top hood.
 - Powertrain:
 - Superstructure
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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
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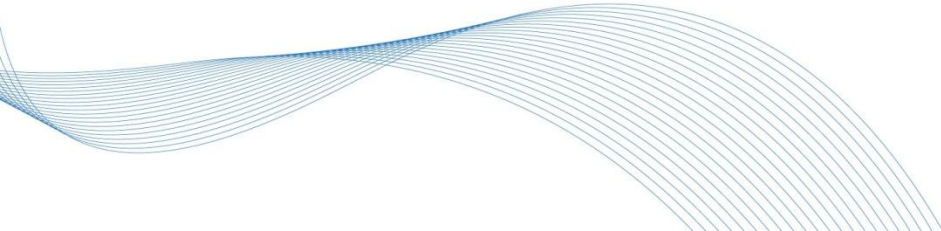
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Hood

- 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

Automotive

Packaging requirement:

- One box holding one hood and two fenders(kitpacked)
 - One box –one dunnage
 - Flatpackable and reusable
 - No need for additional pck material such as plastic, paper or foil.
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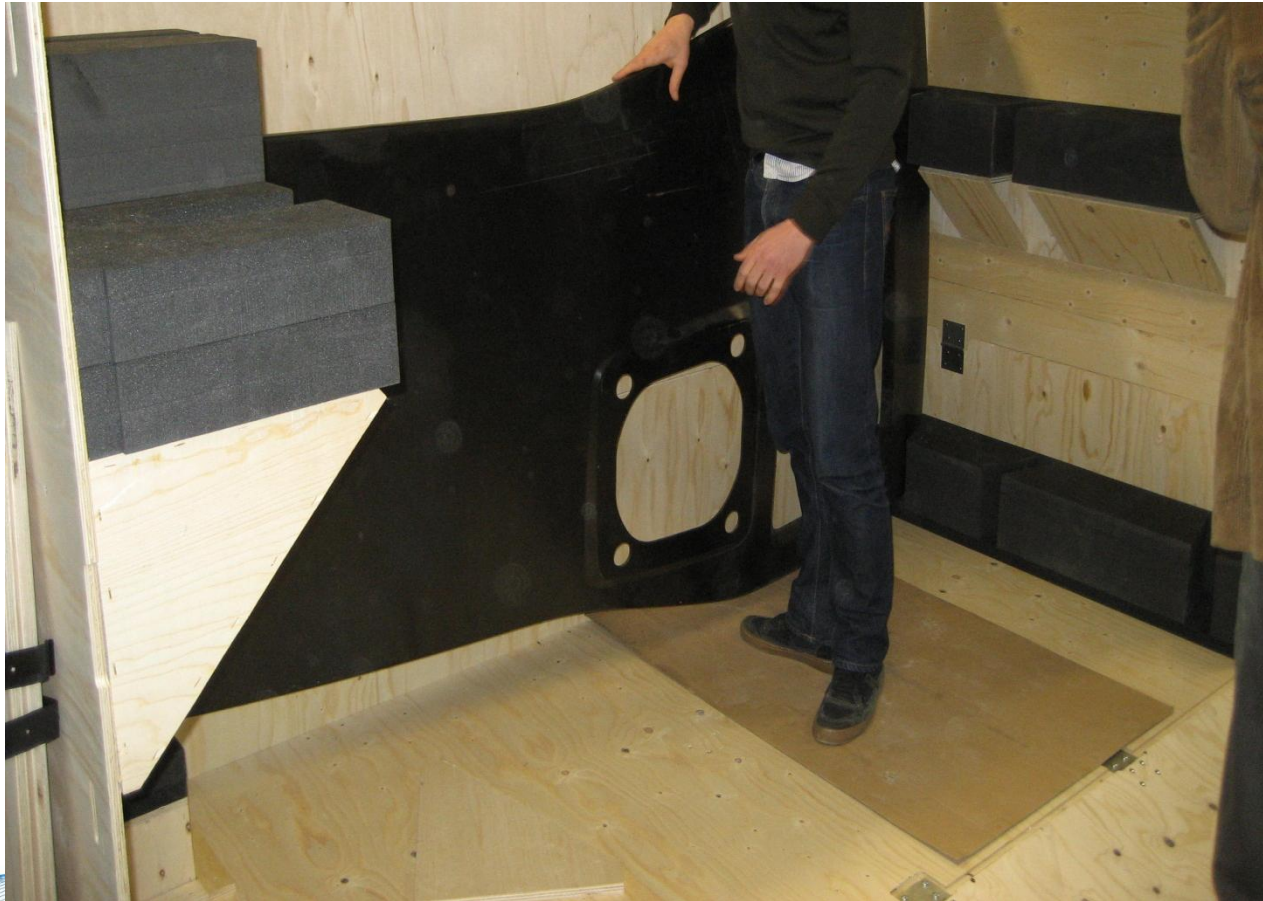
Solution

- 2-p box with integrated EPP profile dunnage.
- Multigrooved, double shaped foam allow two models to fit.
- 2700x1200x1621 external dimensions.
- 1200€/box in serial production.

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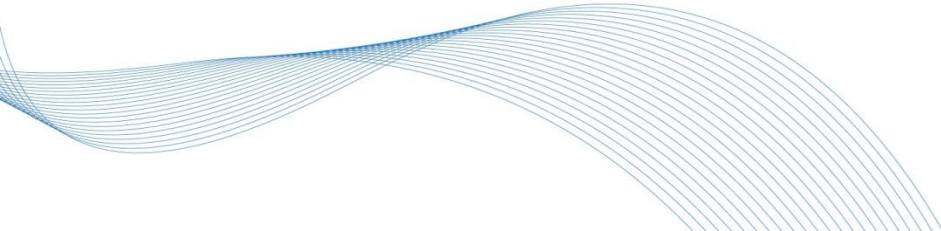


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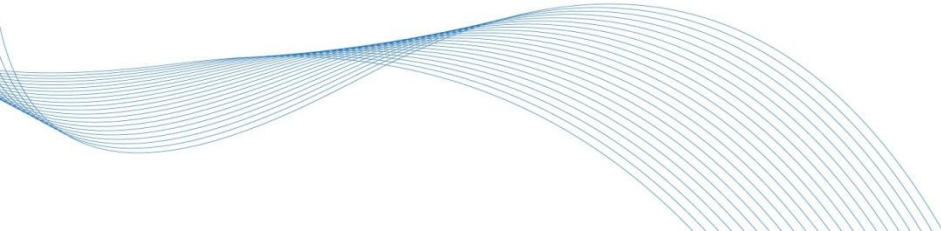
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Superstructure

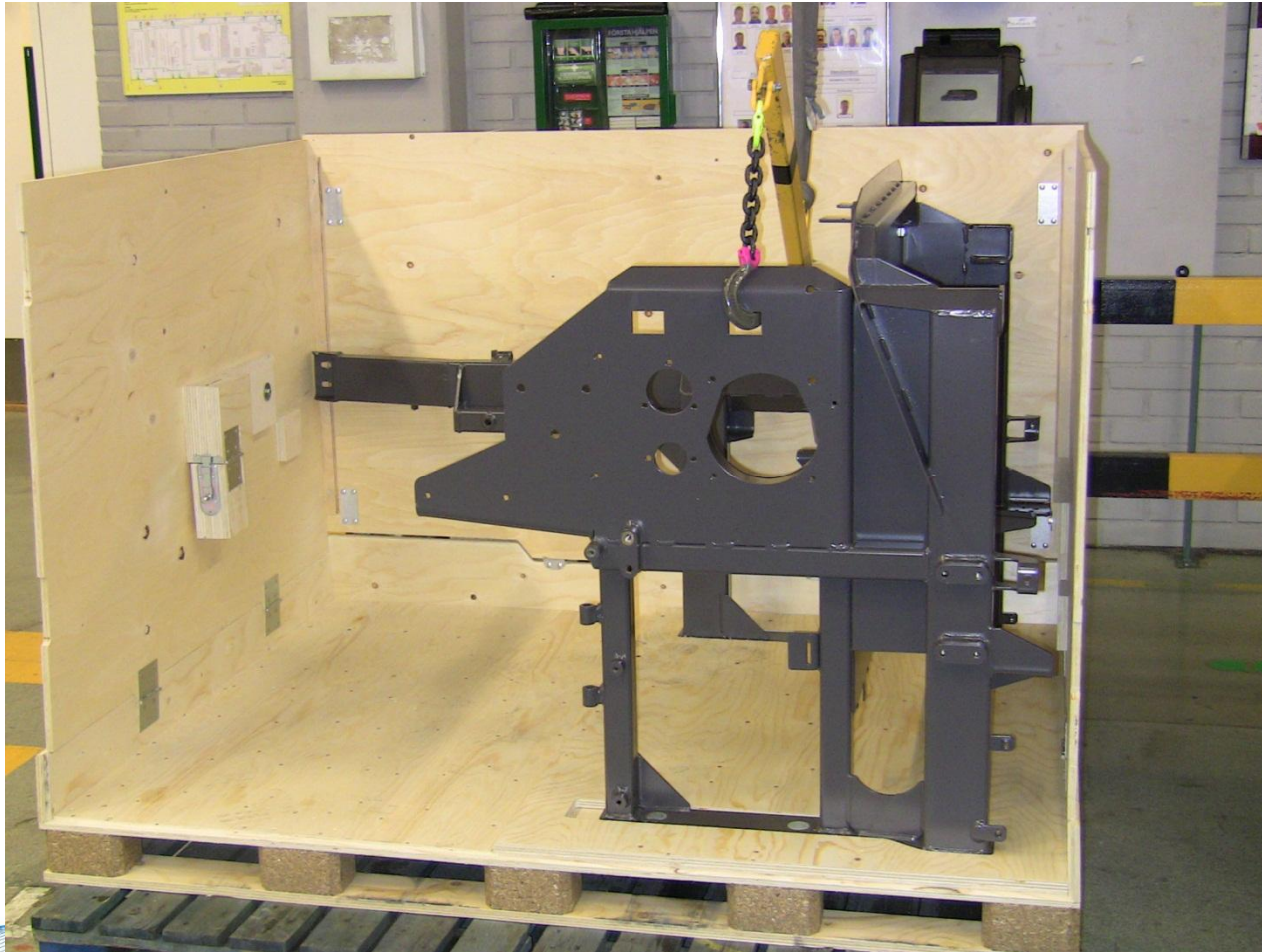
- Two models, bulky and awkward
 - Part made of UHS steel and incorporated into vehicles structure and holds flex fuelsystem and emission control system.
 - Safety issue
 - Painted and delivered in sequence.
 - 800km road transport.
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Automotive

Packaging requirement:

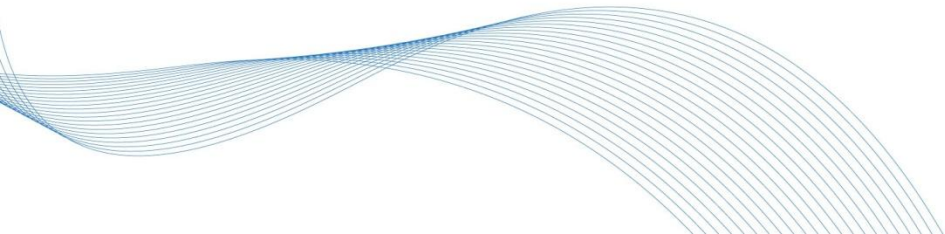
- One box holding either big or grandiose part
 - One box –one dunnage
 - Flatpackable and reusable
 - No need for additional pack material such as plastic, paper or foil.
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- Average geometry footprint copied from both models.
- Part kept in place and secured by bottom cut out, right short side contact, left short side contact surface contact and lid contact.



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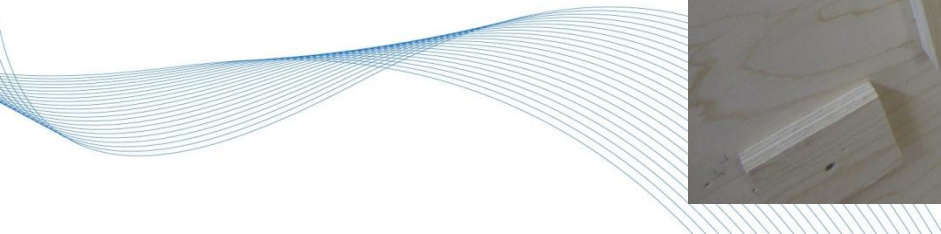
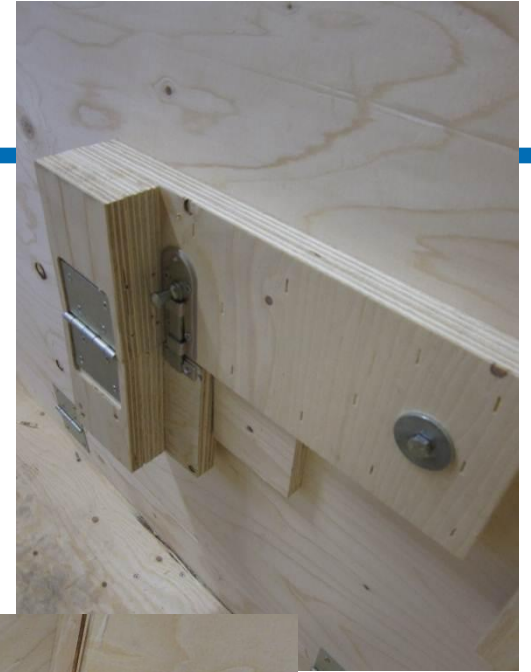
Automotive



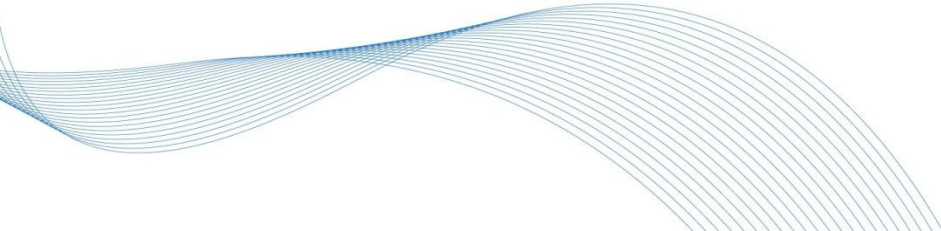
Automotive



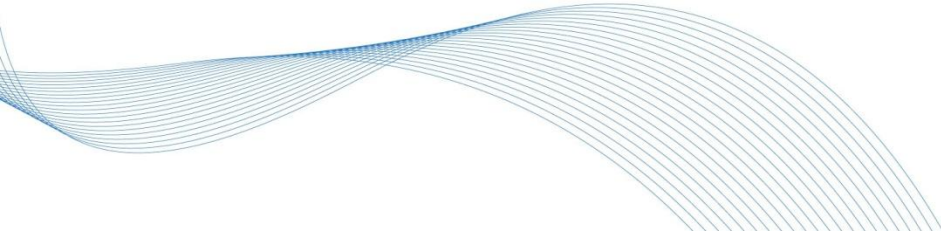
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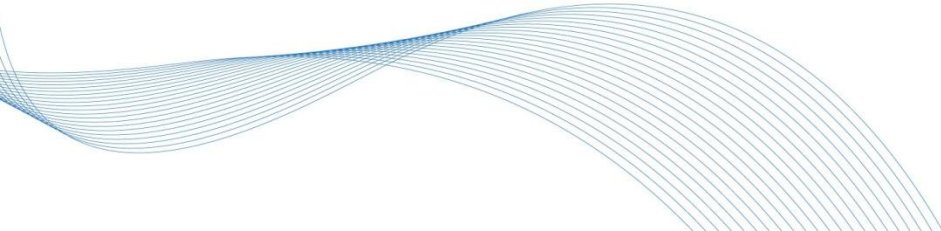
Why Clip-Lok?

- 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
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Lean production

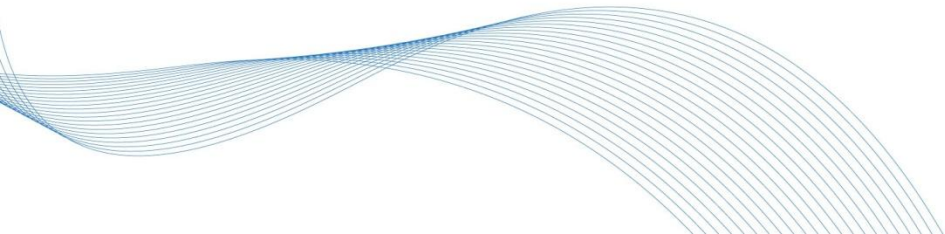
- Frederick Winslow Taylor wrote the "Scientific Management" which inspired Henry Ford to create a production system.
 - Post 2nd Ww the japanes turned their military production into civil using the HF filosofy and creating TPS, Toyota production system.
 - 1979 MIT defined LEAN as measure during surveys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

- **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*.
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Lean production

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

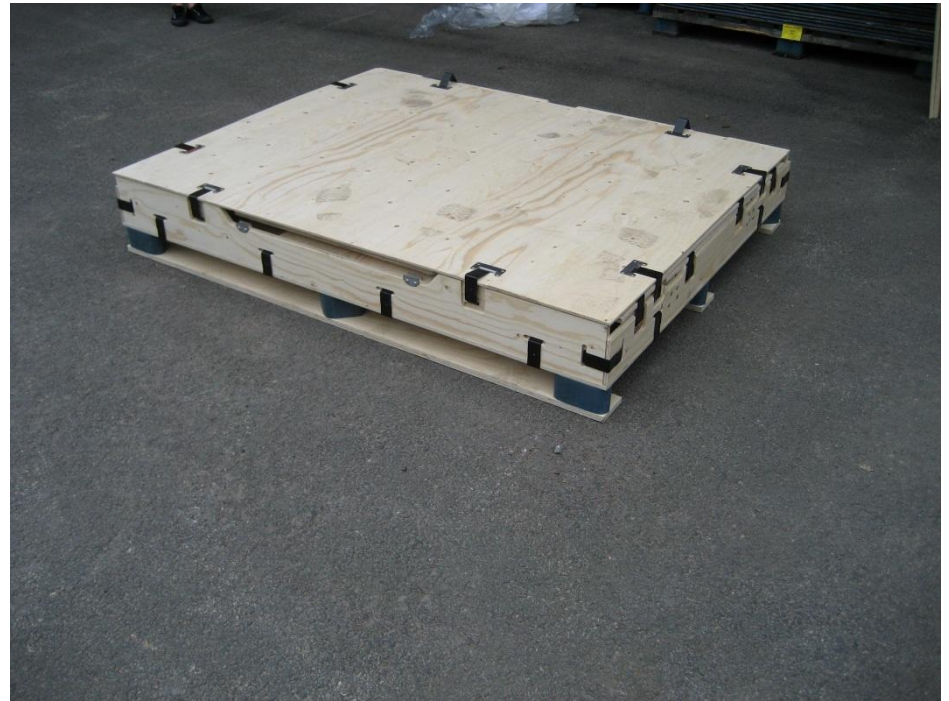


Lean production

- 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.



Accessibility

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



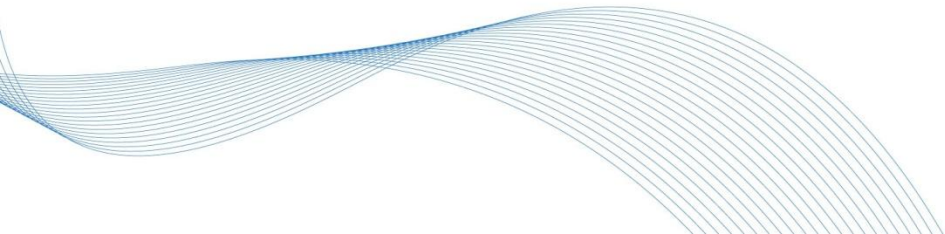
Package tolerance

- The use of AUV:s requires high packing tolerance.



Racking system

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



One box – one dunnage



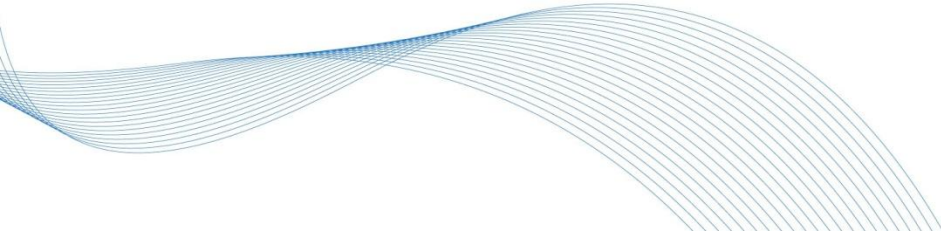
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Competetion, oh yes...

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

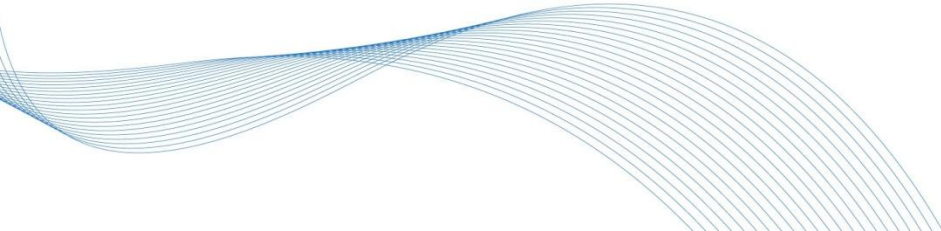
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VLC:s clients:

- Volvo group
 - Volvo passenger car
 - Ford
 - Subcontractors to Volvo
 - GM and clients competitive or non-attached to Volvo at all.
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Automotive

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.
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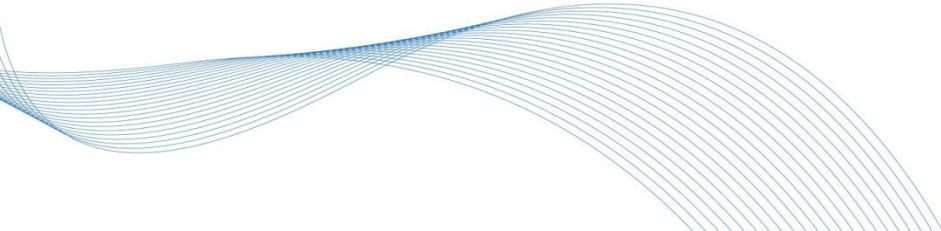
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Volvo logistics

- How do they make their profit?
 - For every trip the "asset" makes their client pay a transaction fee.
 - The transaction fee varies depending on the destination.
 - They're getting hold of everything through a complex reporting system.
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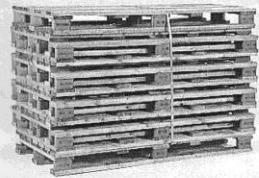
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VLC System disadvantage:

- 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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Automotive

9 LASTPALL AV TRÄ, TYP H



Konstruktör	Ritnings nr	Material					
VTAB	E-009	TRÄ					
Märkning	Typ						
VOLVO	LASTPALLAR						
Ansvariga	Köpare	Ägare	Utveckl	Distri	Frakt	Handl	Kostn. bärare
VTAB	VTAB	VTAB	VTAB	VTAB	VTAB	VTAB	VTAB
Lagerplats, tomt emb							
OUTSIDE							
Packningsätt, tomt emb							
H-PALL, BUNTAR A 10 ST.							
VARANNAN UPPÖCHNED FÖRUTOM ÖVERSTA							
Dimension	Enhet	Packsats					
Längd i mm	1805	1805					
Bredd i mm	820	920					
Höjd i mm	151	1150					
Volym i m3	0,223	1,910					
Vikt i kg	35,000	350,000					
Anmärkning							
VARIERANDE							
Art per emb	Fordonstyp	Förpackn ref nr					
-	-	10009					
Reg datum	Sen ändring	Utg datum					
1985-07-31	1996-10-23						
Anmärkning							
BANDAS MED 1 BAND TVÄRS BUNTEN							

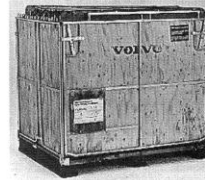
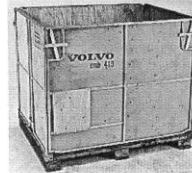
21 PALLKRAGE AV TRÄ, TYP L



Konstruktör	Ritnings nr	Material					
VTAB	E-021	TRÄ					
Märkning	Typ						
VOLVO	PALLKRAGAR						
Ansvariga	Köpare	Ägare	Utveckl	Distri	Frakt	Handl	Kostn. bärare
VTAB	VTAB	VTAB	VTAB	VTAB	VTAB	VTAB	VTAB
Lagerplats, tomt emb							
OUTSIDE							
Packningsätt, tomt emb							
50 L-KRAGAR PÅ 2 L-PALLAR.							
5 STUVAR A 10 KRAGAR							
Dimension	Enhet	Packsats					
Längd i mm	1220	2000					
Bredd i mm	815	1225					
Höjd i mm	195	700					
Volym i m3	0,190	1,720					
Vikt i kg	10,000	550,000					
Anmärkning							
VARIERANDE							
Art per emb	Fordonstyp	Förpackn ref nr					
-	-	10021					
Reg datum	Sen ändring	Utg datum					
1985-07-31	2002-04-06						
Anmärkning							
BANDAS MED 2 BAND TVÄRS BUNTEN							

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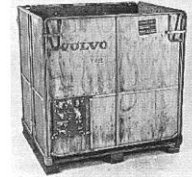
419 COMBITAINER



Konstruktör	Ritnings nr	Material					
VTAB	-	METALL					
Märkning	Typ						
VOLVOEMB 419	COMBITAINERS						
Ansvariga	Köpare	Ägare	Utveckl	Distri	Frakt	Handl	Kostn. bärare
VTAB	VTAB	VTAB	VTAB	VTAB	VTAB	VTAB	VTAB
Lagerplats, tomt emb							
VTA, GH0, DF05-E							
Packningsätt, tomt emb							
C419-9							
16 GAVLAR + 16 SIDOR I EN UPPFÄLLD C419.							
Dimension	Enhet	Packsats					
Längd i mm	1630	1680					
Bredd i mm	1220	1220					
Höjd i mm	1200	1460					
Volym i m3	2,390	2,990					
Vikt i kg	55,000	545,000					
Anmärkning							
VARIERANDE							
Art per emb	Fordonstyp	Förpackn ref nr					
-	-	10419					
Reg datum	Sen ändring	Utg datum					
1985-08-26	1993-04-21						
Anmärkning							
KOMB. MED F-PALL OCH EMB 236							

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422 COMBITAINER



Konstruktör	Ritnings nr	Material					
VTAB	-	METALL					
Märkning	Typ						
VOLVOEMB 422	COMBITAINERS						
Ansvariga	Köpare	Ägare	Utveckl	Distri	Frakt	Handl	Kostn. bärare
VTAB	VTAB	VTAB	VTAB	VTAB	VTAB	VTAB	VTAB
Lagerplats, tomt emb							
VTA, GH0 OUTSIDE							
Packningsätt, tomt emb							
C422-9							
16 GAVLAR + 16 SIDOR I EN UPPFÄLLD 422.							
Dimension	Enhet	Packsats					
Längd i mm	1630	1680					
Bredd i mm	1220	1220					
Höjd i mm	1400	1660					
Volym i m3	2,780	3,380					
Vikt i kg	60,000	590,000					
Anmärkning							
VARIERANDE							
Art per emb	Fordonstyp	Förpackn ref nr					
-	-	10422					
Reg datum	Sen ändring	Utg datum					
1985-08-26	1993-04-21						
Anmärkning							
KOMB. MED F-PALL OCH EMB 236							

Automotive

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