Feature

Recycling can give an old truck a new lease of life

A truck straight off the factory assembly line may not be quite as new as it seems. One-third of the vehicle's total weight consists of recycled metals. At least this is the case with Volvo Trucks. The Swedish manufacturer's production system embraces the recycling of old trucks, whereby old becomes new in a sustainable process that benefits both economy and ecology.

The gate slides up slowly and a 2002 Volvo FH 460 Euro 3 rolls into the workshop. The truck has covered about a million kilometres and its active days are now over. Here at the Volvo Truck Center just outside Göteborg, trucks like this are dismantled down to their last nuts and bolts and their materials recycled.

"The biggest advantage of this approach, from both environmental and personal perspectives, is that the materials live on," says sales representative Mikael Olofsson as he surveys the workshop and the truck that is about to be stripped down to its smallest components.

The newly arrived truck will continue to be useful. Its best parts will be sold on the used vehicle market. All materials removed from the truck that cannot be sold will be put into containers marked separately for iron, aluminium, brass, copper, plastic, combustible and so on. All parts that are too worn out will be sent away for melting or incineration, to be re-used in the form of new products or district heating. Nothing goes to landfill.

Volvo Trucks works hard to reduce the company's environmental footprint, and has applied a carefully thought-out recycling strategy since the mid-1990s.

"We have to consider the environment, our resources and future generations," says Volvo Trucks' environmental affairs director Lars Mårtensson. "What is more, there are sound financial reasons for the customer to recycle the truck. We try to aid that process as much as possible, for instance by providing detailed instructions with each truck on how it is to be recycled."

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Every Volvo truck is designed and built at the factory to take account of what will happen on the day the truck is withdrawn from service. “We tailor the technology needed for subsequent dismantling and recycling into the design and production of new trucks. For example, we use plastic rather than metal clips to attach wires and hoses, since metal clips take far longer to remove,” explains Lars Mårtenssson.

The materials used are also carefully selected. “The challenge is to balance usage demands against recycling properties. For some purposes, plastics that can be melted down are more suitable than plastics that are incinerated, while for other purposes the opposite applies,” explains Lars Mårtensson.

In terms of weight, roughly 50 percent of the wrought iron used in a new truck comes from recycled metal, while an impressive 97 percent of the cast iron is recycled metal. Since it takes less energy to manufacture products from recycled material than from new raw materials, the environmental gains are considerable. Moreover, recycling also has financial advantages. If, for instance, there is a shortage of certain metals and prices rise, recycling becomes even more important. At present, just over 90 percent of a scrapped Volvo truck is recycled. When a Volvo FH is scrapped, more than nine tonnes of various materials are recovered for recycling.

The newly arrived Volvo FH is carefully inspected by Kenneth Olsson and Jimmy Gustavsson in the dismantling workshop.

“We’re primarily looking for oil leakage, but we also look for other easily identifiable faults. This panel is damaged.”

All dents and rusty panels are marked with a large yellow arrow and the truck’s ID number before the dismantled parts are placed in a container that is also marked with the vehicle’s ID number. Every single part that can be sold must be traceable back to the exact truck model, year of manufacture and production series.

Simply speaking, the trucks are dismantled from the front to the rear. Jimmy and Kenneth get to work immediately. To take this particular truck apart, they have to struggle with the bolts because rust is holding them securely together. The bolts usually need to be heated with a welding torch to get them to work loose. The noise is sometimes deafening.

“We sometimes have to fight them a bit, but we always win!” laughs Jimmy as he drops a red-hot, smoking bolt onto the floor.

It takes the team six to seven days to dismantle a truck and clean all the parts that are to be sold on. In all, the workshop takes in about 30 to 40 trucks a year.

The cab of this Volvo FH is judged to be in good condition. It will be cleaned up and resold. Cabs older than ten years, however, are seldom saved. Instead, they are melted down to make new metal components.

Everything on and around the cab is first removed. Kenneth attaches a hose to the small refrigerant reservoir and transfers the gas to a cylinder that is carefully weighed to verify that the reservoir has not leaked.
"Draining off the refrigerant is perhaps the most important part of the whole dismantling operation, because it is so environmentally hazardous. Here we can see that 880 grams of refrigerant remains, which is OK considering the truck's age," he explains.

The toxic-green glycol and engine oil drain off into two containers placed below the vehicle. All environmentally hazardous fluids are poured into sealed tanks that are put in the yard outside and will later be sent for destruction.

After the cab has been lifted off using a roof-mounted traversing crane, all its interior fittings are removed. Seats, steering wheel, wall and roof panelling and all electronic components are removed and sold individually, if they are in good enough condition. The rest is recycled.

After the cab, it is time for the gearbox to be removed, followed by the truck's 12-litre engine.

"We often send gearboxes and rear axles for renovation, but engines are often regarded as too expensive to rebuild. Instead, we clean them thoroughly. They look good, we're really proud of them," says Kenneth, showing us some of the spotless engines awaiting new customers.

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Facts about environmental benefits:
According to Volvo Trucks' Environmental Product Declaration calculator, a recycled truck reduces carbon dioxide emissions by just over four tonnes. This is because it takes less energy to manufacture new products from recycled materials than from entirely new raw materials.

If a Euro 3 truck were replaced by a Euro 5 truck that consumes almost eight percent less fuel, particulate emissions would also be cut by 80 percent. Moreover, the more

modern truck would also release 86 tonnes less carbon dioxide during its lifetime than its older counterpart.

This corresponds to more than 20 return air trips between Stockholm in Sweden and Bangkok. A trip of this kind is calculated to produce emissions corresponding to four tonnes of carbon dioxide equivalent. A carbon dioxide equivalent is a measurement of greenhouse gas emissions. This measurement takes account of the fact that different greenhouse gases have different greenhouse impacts, and specifies how much carbon dioxide can be emitted to produce the same climate impact as all the other greenhouse gases put together during the course of a given journey.

The Volvo Trucks Environmental Product Declaration calculator can be found at Volvotrucks.com:

http://www.volvotrucks.com/TRUCKS/GLOBAL/EN-GB/VALUES/ENVIRONMENT/FOOTPRINT_CALCULATION/Pages/Calculator.aspx

Captions:

T2010_1059:
Lars Mårtensson, Volvo Trucks' Environmental Director

T2011_1069
The Volvo Truck Center in Kungälv, Sweden has been dismantling trucks since 1988. There are plenty of used truck cabs in storage. A good cab is easy to sell and turnover can be high.

T2011_1068
Kenneth Olsson removes the roof spoiler. It is cracked and will end up in the metal container. The first step is to remove everything on and around the cab. With the spoiler on the roof, the cab would be too tall to be lifted off.

T2011_1067
Some bolts have to be cut off. The rust on this FH requires the use of a saw and a welding torch.

T2011_1066
Making the cab ready to be lifted off is what takes most time. Many parts have to be removed first. But now it's time for lift-off. Jimmy Gustavsson (left) and Kenneth Olsson (right), guide the cab to ensure it does not strike against and damage the radiator and engine.

T2011_1065
Once wires, hoses and pipes, nipples, clamps and clips have been removed, it's time to lift out the gearbox and engine. Last out are the beams, axles and brake callipers.

T2011_1064
The yellow notes indicate the content of the container, e.g. rocker arm shafts, camshafts, flywheel casings or wiper blades.

T2011_1063
Engines in reasonable condition are stripped of their alternator, starter motor, AC compressor, servo pump, radiator fan, air compressor and clutch before all the openings are sealed with red plugs and the engine is thoroughly cleaned before being sold.

T2007_1757, T2010_1263:
Every Volvo truck is designed from the ground up to take account of what will happen on the day the truck is withdrawn from service. Volvo uses materials with good recycling properties and chooses fasteners that facilitate dismantling.

Direct link to images:
http://icp.llr.se/CumulusE_Z/VTC_ImageGallery/Login2.jsp?assets=T2010_1059;T2011_1069;T2011_1068;T2011_1067;T2011_1066;T2011_1065;T2011_1064;T2011_1063;T2007_1757;T2010_1263.tif

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Images are available in the Volvo Trucks image bank http://imagegallery.vtc.volvo.se/.

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