

Perfecting the Megacar:

# Electric transmission – Koenigsegg’s new agenda

Four engines. A hybrid drivetrain. 1 500 horsepower. But no gearbox. Swedish race car manufacturer Koenigsegg keeps on surprising. When presenting their latest model in Geneva recently, plenty of industry eyebrows were raised. As always.

First came the record breaking CC8S and CCR models. Next in line was CCX – Koenigsegg’s first model to be truly recognized all over the world. This immensely popular Roadster Hypercar combined the best of racing and leisure use, with its detachable hardtop roof and amazing luggage space.

A few years later, the Agera Hypercar hit the streets, paving the way for the One:1 model which would take the racing fans by storm. The world’s first “Megacar” featured exactly one megawatt of power – 1 360 hp – and reached the dream ratio of one horsepower per kilo car.

And now, along comes Regera. Visually, sharing some DNA with its famous predecessors, yet completely different. As usual within Koenigsegg, the thinking is lateral. And the result both impressive, extreme and astonishing.

## A hybrid from scratch

Technical Director Jon Gunner is notably proud as he guides his Autodesk visitors around the



Craftsmanship and attention to detail is everything at Koenigsegg. Images: Leif Johansson.

workshop floor in Koenigsegg’s modest former hangar outside Ängelholm in southern Sweden. He even allows a sneak peek into the prototype room.

“We threw out all the preconceived ideas of hybrids and sports cars and started from a clean slate. And finally someone understood how to produce a hybrid for true performance”, he says, nodding his head towards the creative innovator himself, Christian von Koenigsegg – who is presently occupied with an intense test of the new, stow-away wing system.

“Christian is a true innovator”, Jon Gunner explains, smilingly. “He constantly comes up with the most amazing and crazy ideas, which ultimately becomes my job to realize”.

## Complete electrical redesign

The new hybrid car called for a lot of amazing ideas. Instead of the traditional gearbox it was equipped with direct drive, providing a tremendous take-off and an unprecedented torque. Four engines, three electrical and one traditional combustion engine, combine the best of both worlds. And as a further result, the entire electrical architecture – the nervous system of the car – had to be completely transformed.

“Previously, most cables were connected to one single point. The new solution is a distributed system with several different power nodes, which saves a lot of weight and makes the wiring less extensive”, says Jon Gunner.

## In search of speed

At Koenigsegg, speed is the target at all times. And not just for the car itself. Speed of development is also a must. The team is currently in-sourcing resources, to further enhance production flexibility. In these efforts, Autodesk solutions have played an integral part.

“Outsourcing is often a slow and inadequate path where changes take forever to implement. We do

a lot of reverse engineering with very late design changes, this calls for real control and flexibility in-house”, Jon Gunner explains.

## Seamless electrical engineering

Following a careful benchmark study, Autodesk Inventor and AutoCAD Electrical was found to be an ultimate software for Koenigsegg, even allowing some integration with their regular Catia platform. Mixing CAD platforms might not be a standard industry solution, but it works well for the efficient engineering team at Koenigsegg. The smart solutions of the Product Design Suite now take the intricate electrical structures from 2D schematics into full flare 3D, visualized in Inventor models “translated” from Catia origins.

“Autodesk was the only provider that could take us seamlessly through the electrical design process. This full package 3D solution makes us more dynamic and optimized”, Jon Gunner says.

## Precise out-data

At Autodesk’s reseller Cadcraft, sales engineer Daniel Marcus is keen to promote Koenigsegg’s way of working.

“Only few companies use this clever software integration to its full potential. To do schematics in 2D and routing in 3D provide very precise out-data, saving time and material and enhancing quality for the production team”, he says.

In the engineering department, Christian von Koenigsegg meets up once again. With the Regera just launched, he is keen to showcase all the news. What is his favourite feature?

“No doubt the direct drive”, he replies. “It represents a complete new frame of mind. Now and again you stumble upon a car that makes normal cars feel prehistoric. I am hoping this will be one of them.”



Every part tailor made and handled with the utmost care – left, the superlight forged pistons, right, assembly of body parts.

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Koenigsegg



Koenigsegg’s latest model Regera marks the dawn of a complete new thinking regarding performance.



Christian von Koenigsegg studies the 3D routing of the electrical system in Inventor with electrical engineer Christoffer Lind.



Jon Gunner is happy to present Regera, the latest Megacar.

## Koenigsegg’s technical leadership

Koenigsegg truly is a company at the forefront of development and production technology. A few examples are:

**3D printing.** In the efforts both to save weight and to produce in-house, many interior details are 3D printed before upholstery and leather/cloth covering.

**New materials and production methods.**

The exhaust pipe of the new Regera is made of titanium which is 3D printed into one single part – one of the biggest ever.

**Carbon fiber chassis, body and rims.**

For weight reasons, carbon fiber has become the standard material for most parts. The rear hood of the new Regera represents one of the world’s most complex and probably the largest carbon fiber hollow component ever produced in one single part.

**Green technology.** Koenigsegg was the first “green” extreme car manufacturer with the release of the biofuel CCXR in 2007.

The One:1 also runs on E85 biofuel, race fuel or normal gasoline and the Regera, as mentioned, is a hybrid.

[Watch the movie about Koenigsegg!](#)

## Autodesk Key Software:

**Product Design Suite** – an entire software suite developed to meet the manufacturing company’s diverse needs. At Koenigsegg, the use of AutoCAD Electrical integrated with Inventor has been key to a most successful electrical development, also producing important data for the in-house production of tailor-made cable harnesses. Inventor is also used to develop the powertrain.