ARADEX

Reference Report:

Multi-Energy-Dozer

Key facts

- 19t total weigh
- Transition from pure diesel to electric
- Change with minimized impact
- Greatly reduced energy consumption
- Electro-mechanical traction + electro-hydraulic functions

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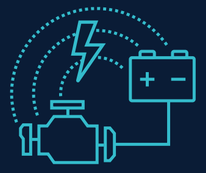
/ The Challenge

To create a multi-energy dozer with electrified drivetrains and 3 solutions for energy supply



Pure battery
Pure battery for special working conditions like inner city work

Diesel-electric
Diesel-electric serial-hybrid as fast solution with around 30% fuel savings

Hydrogen
Hydrogen version for future

New energy solution with minimized impact to the whole structure of the dozer.

/ The Project

Multi-energy-solution

A 19-ton dozer was changed from a pure diesel-hydraulic machine to a multi-energy-solution as a fully modular machine with 3 models:

- A.S.A.P.: Pure battery version for example for inner city application
- Serial hybrid, with downsized combustion engines, for Diesel, LNG or later hydrogen
- Future-ready: Serial hybrid, based on fuel cells

Project analysis

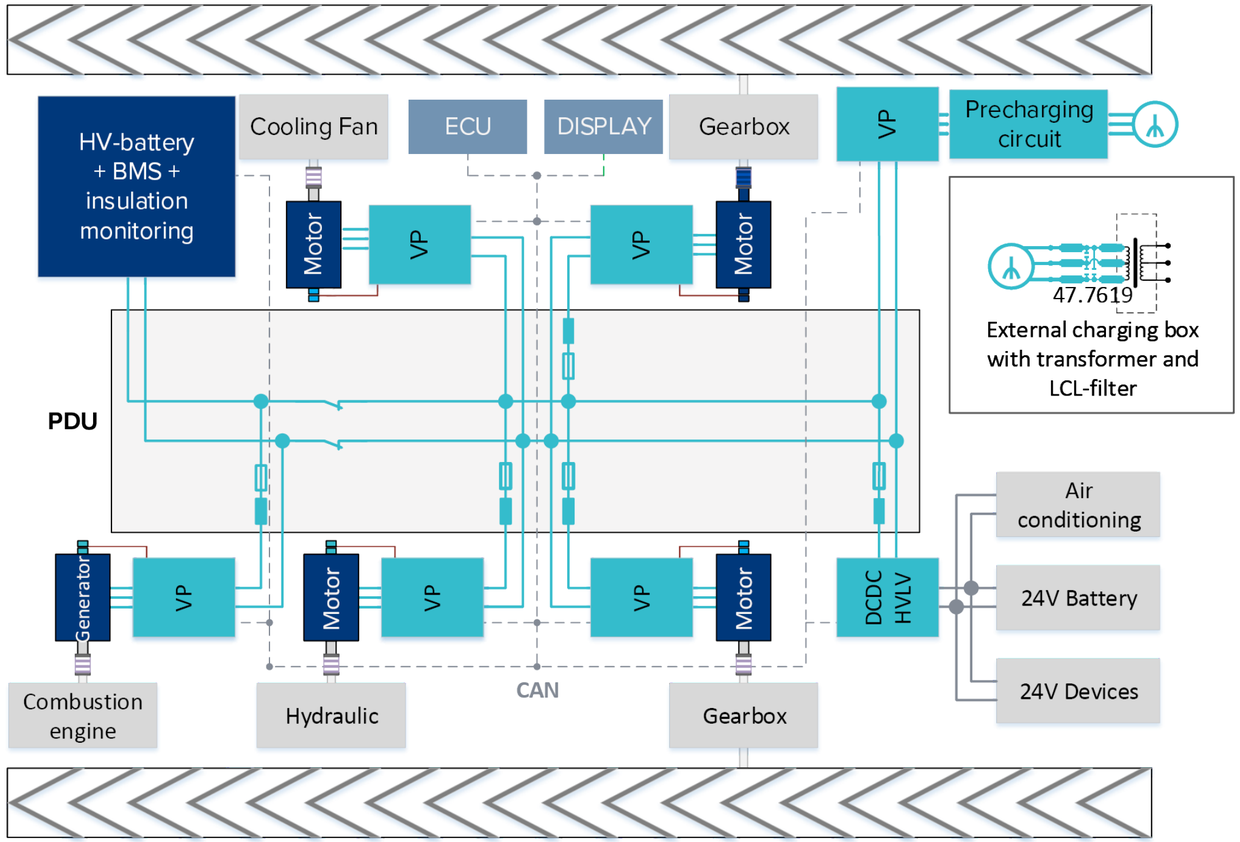
The project analysis together with customer and according to typical fields of application generated following conclusions:

- To reduce energy consumption, the chain drives were shifted from hydraulic motors to an electromechanical solution.
- The remaining hydraulic functions could be optimized to the working functions ... no hydraulic propulsion drives required.
- Analysis of the expected power demands leads us to a greatly downsized combustion engine for the serial hybrid solution.

/ The Solution
Electro-mechanical propulsion

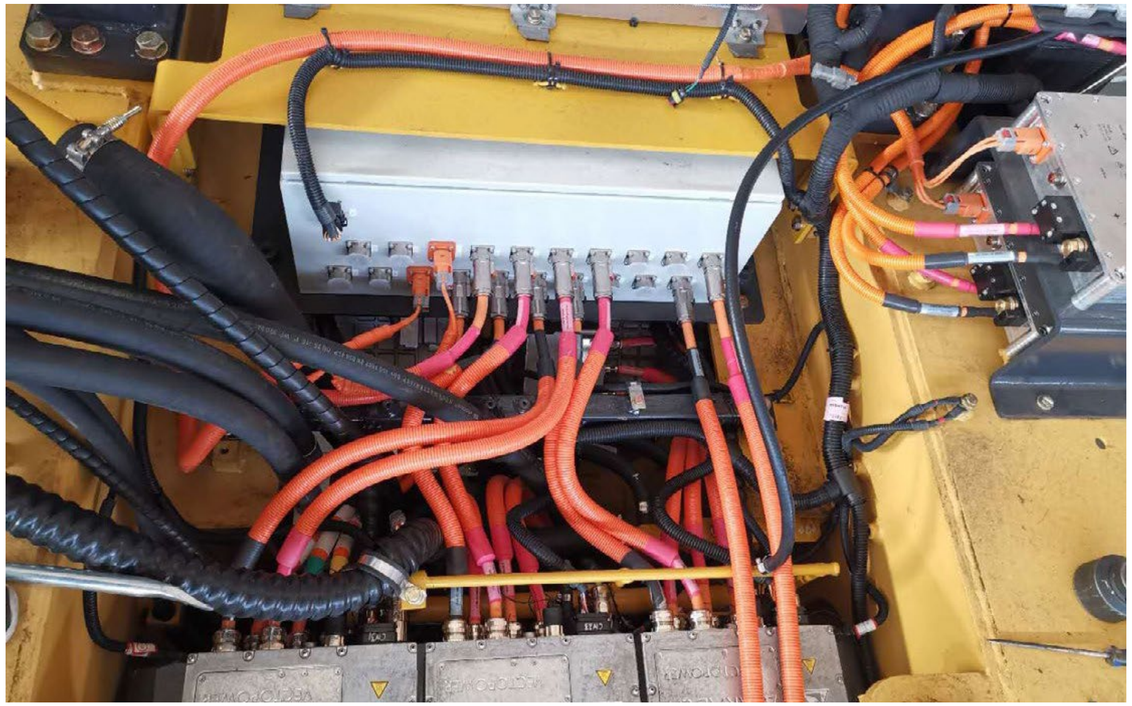
All high voltage components were delivered by ARADEX:

- All HV components
- Including PDU
- HVLV-DC/DC for 24V
- HV dimensioning
- Cooling dimensioning
- Modular concept for battery, combustion engine, fuel cell...



/ The Solution
Building a “duplicate” machine

→ Electric chain drives without changing the existing gearboxes!



→ Tailored PDU with HV wiring and VECTOPOWER inverters

/ The Solution

Digital commissioning under pandemic rules

Lorch, Germany → Jining, China

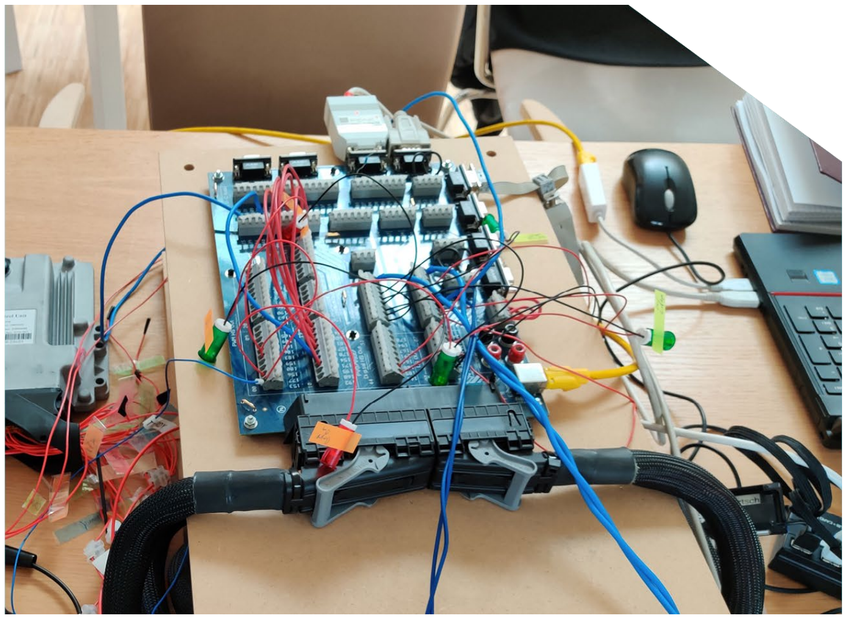
We decided on a hybrid commissioning:

- One VECTOPOWER-trained engineer from WEICHAI New Energy at Jining
- 3 engineers in Lorch
- With "duplicated“ hardware in Lorch
- By Using all our software-tools of diagnostic, analysis and commissioning

/ The Solution

Building a “duplicate” machine

We built a scaled down "duplicate" of the system, working with 48V
and the actual components such as inverters, ECU, wiring-harness, etc.



Lorch, Germany

/ The Result

Successful commissioning over distance

After 3 weeks of intensive work the dozer moved for the first time.

- For the following weeks we kept our machine- "duplicate“ at ARADEX to support our customer with maximum efficiency.
- In this way, we were able to successfully realize the complete commissioning over the distance.
- ARADEX now generally offers all kind of commissioning support: on-site, fully digital, hybrid..... Depending on application and customer´s demands

/ Challenge us
Review of your application

Challenge us with your application, your demands and your ideas!

+ Our engineers can work out or support the project planning for your application.
+ You receive the result as an electronic document: cornerstones of your project regarding electrification or hybridization including dimensioning done by our experienced project engineers.
+ Contact our sales team for more information.

Thanks for your attention!

Optimized usability and performance for the best e-mobility

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