



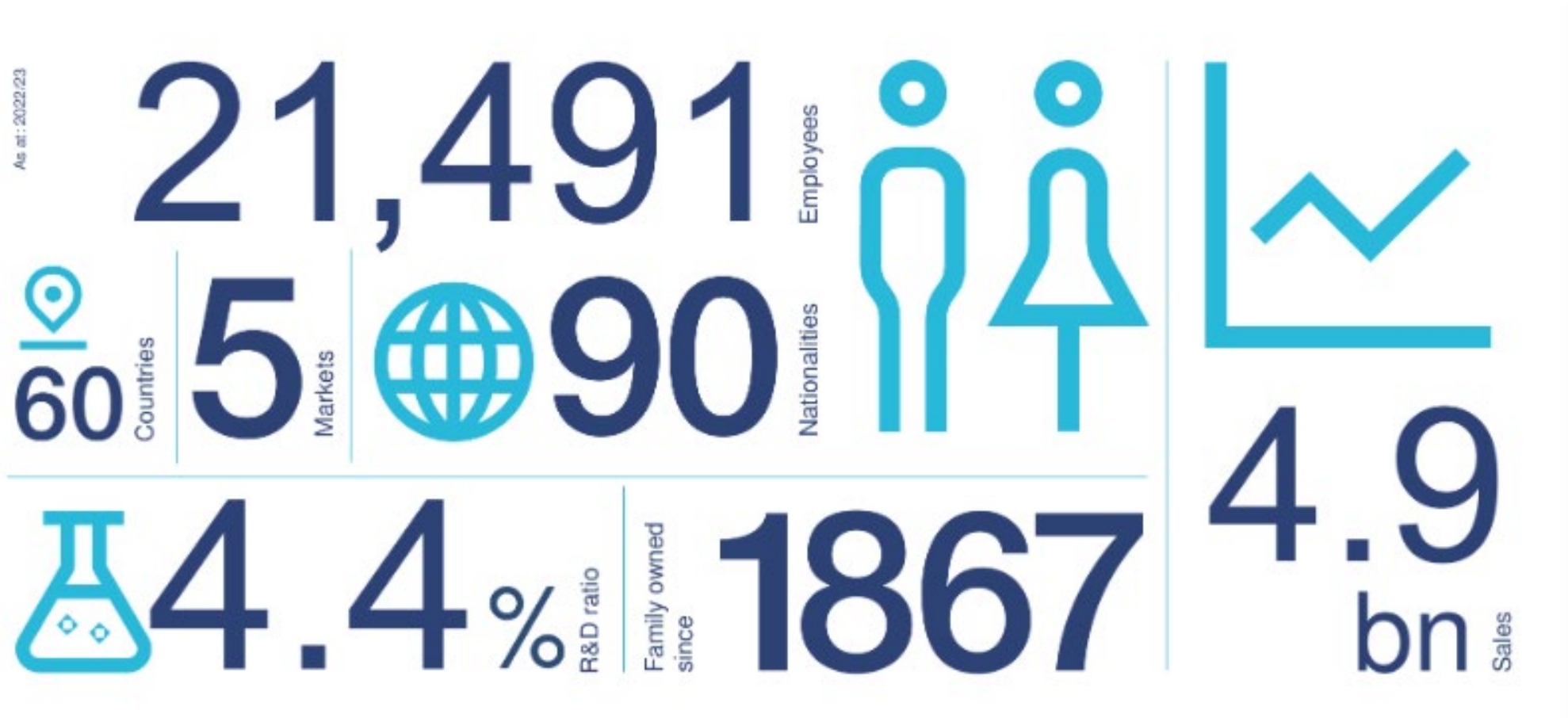
Drive New Ways

The CargoFlex by VOITH — a DAC in Service

Voith at a Glance

Figures

VOITH



Three Divisions

A well positioned company

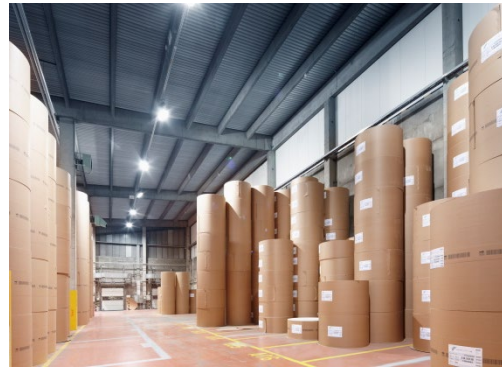
VOITH

Voith Group



Hydro

Complete system
supplier of hydro
power technologies



Paper

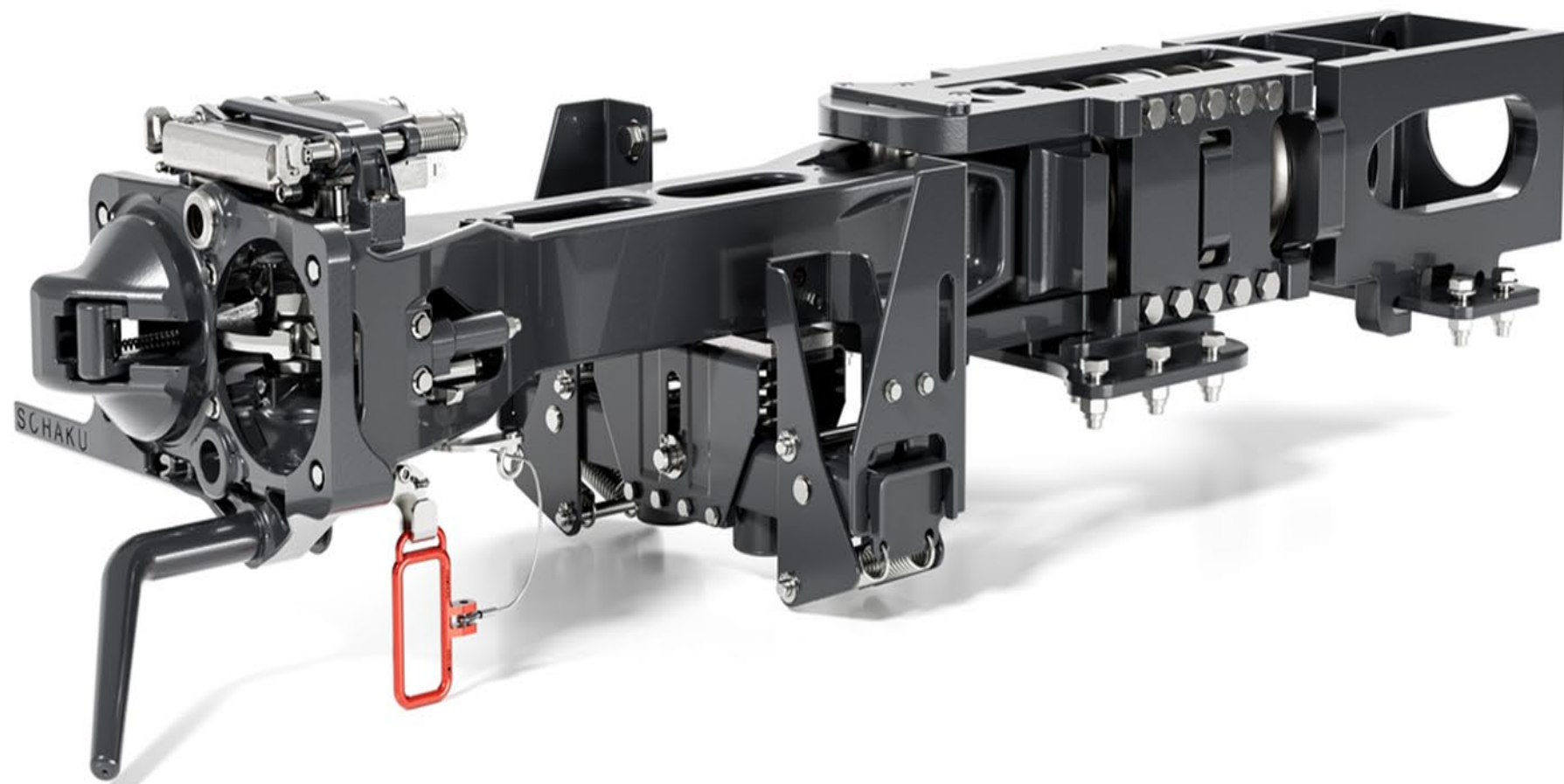
Partner and pioneer
in paper industry



Turbo

Intelligent drive
systems and solutions

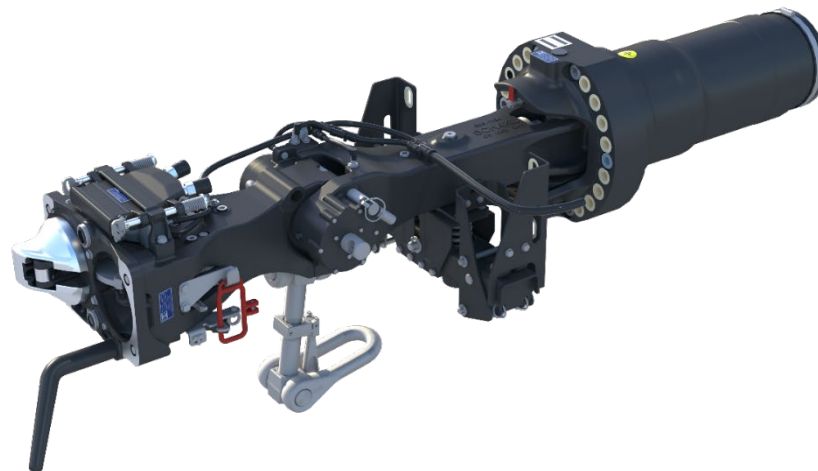
CARGO FILEX



DAC for rail freight transport

CargoFlex and CargoFlex Hybrid

VOITH



2016

2018

2019

2020

2021

2022

2023

2024

2025



Need for optimization

Lack of staff



2016

2018

2019

2020

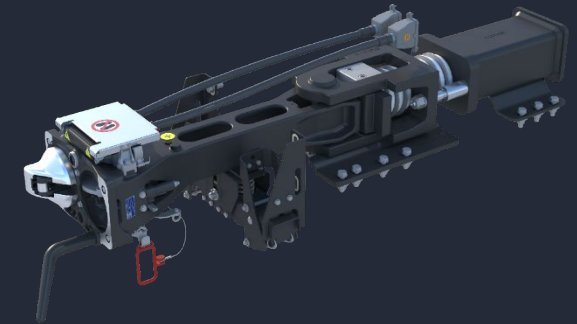
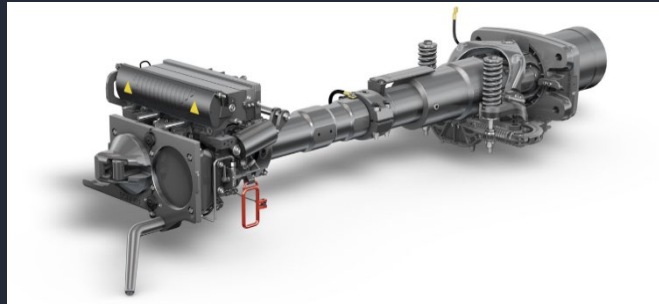
2021

2022

2023

2024

2025



Adaptation of proven system in passenger traffic

First presentation to public at Innotrans

2016

2018

2019

2020

2021

2022

2023

2024

2025



Start of first commercial traffic in Switzerland

25 locos and 230 waggons

2016

2018

2019

2020

2021

2022

2023

2024

2025



DAC4EU starts testing several Coupler Systems to find the best solution for Europe

2016
2018
2019
2020
2021
2022
2023
2024
2025



Press Release
21 September 2021

European Digital Automatic Coupler: first step towards one type selection

Today, the Supervisory Board of the European DAC Delivery Programme, on a proposal of the Programme Board, has adopted a decision on the selection of the future Europe-wide Digital Automatic Coupling (DAC) standard coupler head design for European rail freight transport. This decision is a milestone in the process that, during the next phases, will lead to the final design of the selected coupler head, ensuring interoperability and operational performance free of royalties/licenses.



Voith received 20 of 20 points

Scharfenberg Coupler is chosen as European Standard

2016

2018

2019

2020

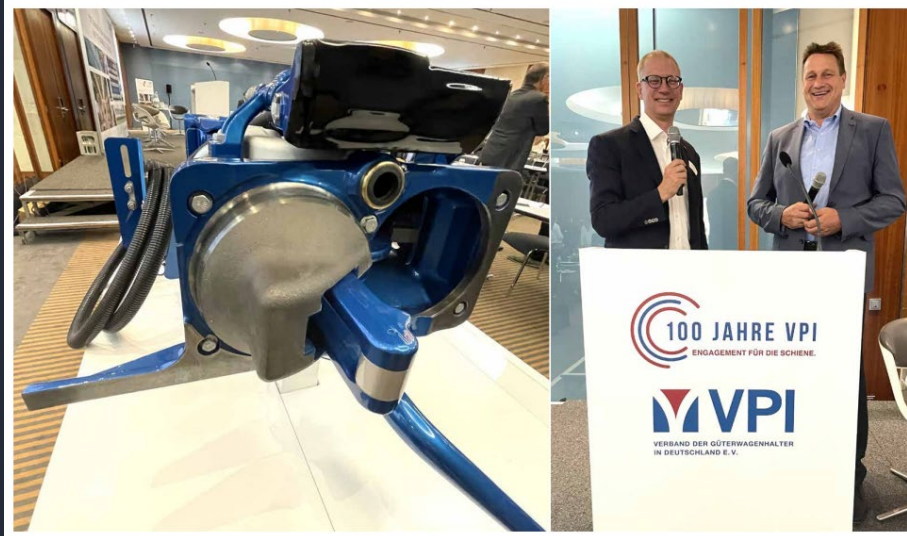
2021

2022

2023

2024

2025



DAC as one of the main topics
within freight train markets

2016

2018

2019

2020

2021

2022 - 2024

2023

2024

2025



Demonstrator Train running through Austria, Swiss, Serbia, Hungary, Poland, Czecheslovakia, France and Luxembourg.

2016

2018

2019

2020

2021

2022

2023

2024

2025



Presentation of shunting coupler at
TransportLogistic Fair

2016

2018

2019

2020

2021

2022

2023

2024

2025



First Order of Erdemir steel company, Turkey



2016

2018

2019

2020

2021

2022

2023

2024

2025



Voith E-coupler chosen as new
European Standard

2016

2018

2019

2020

2021

2022

2023

2024

2025



Presentation of new Hybrid Coupler for Locomotives

2016

2018

2019

2020

2021

2022

2023

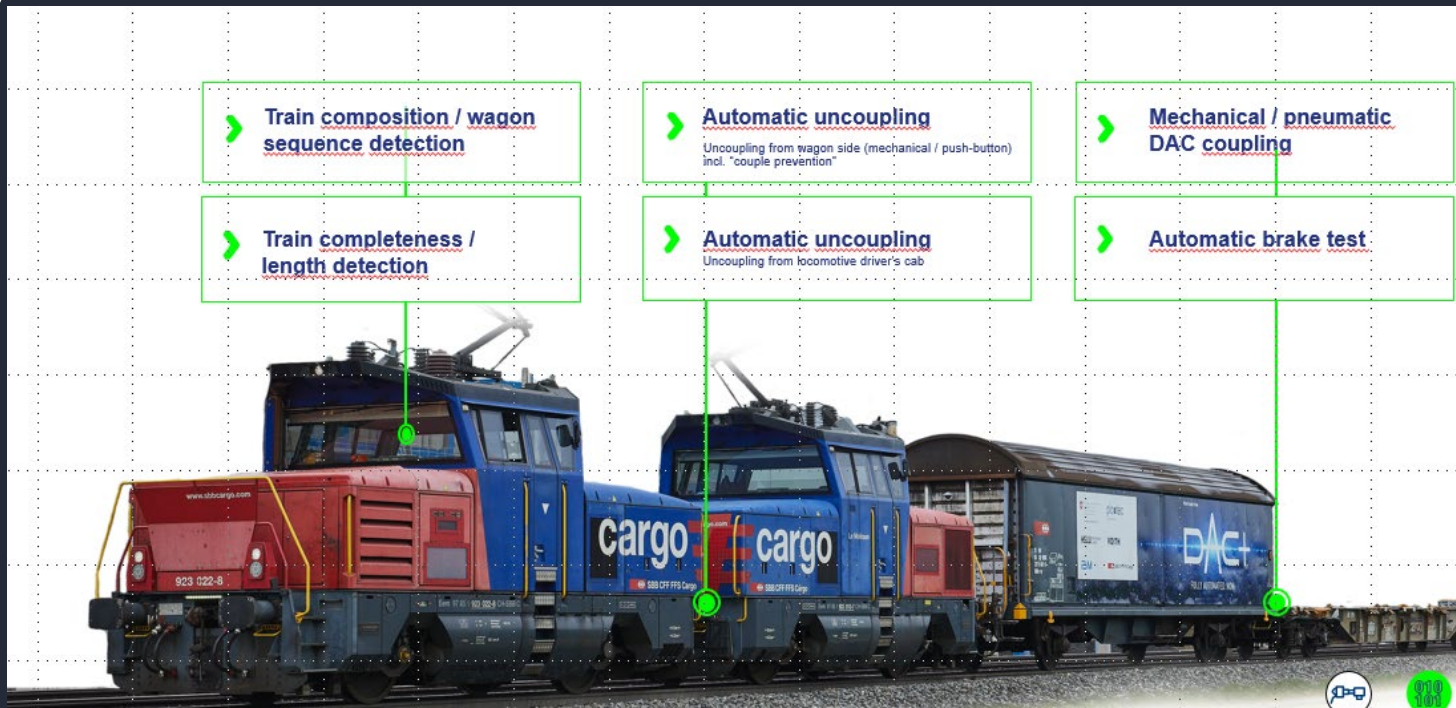
2024

2025



Tests of Hump yard operation

2016
2018
2019
2020
2021
2022
2023
2024
2025



DAC Basic Package was announced by European
Dac Delivery Program

2016

2018

2019

2020

2021

2022

2023

2024

2025

Voith will supply several FP5Trans4M-r trains with couplers for waggons and locomotives

CargoFlex

Design overview waggon

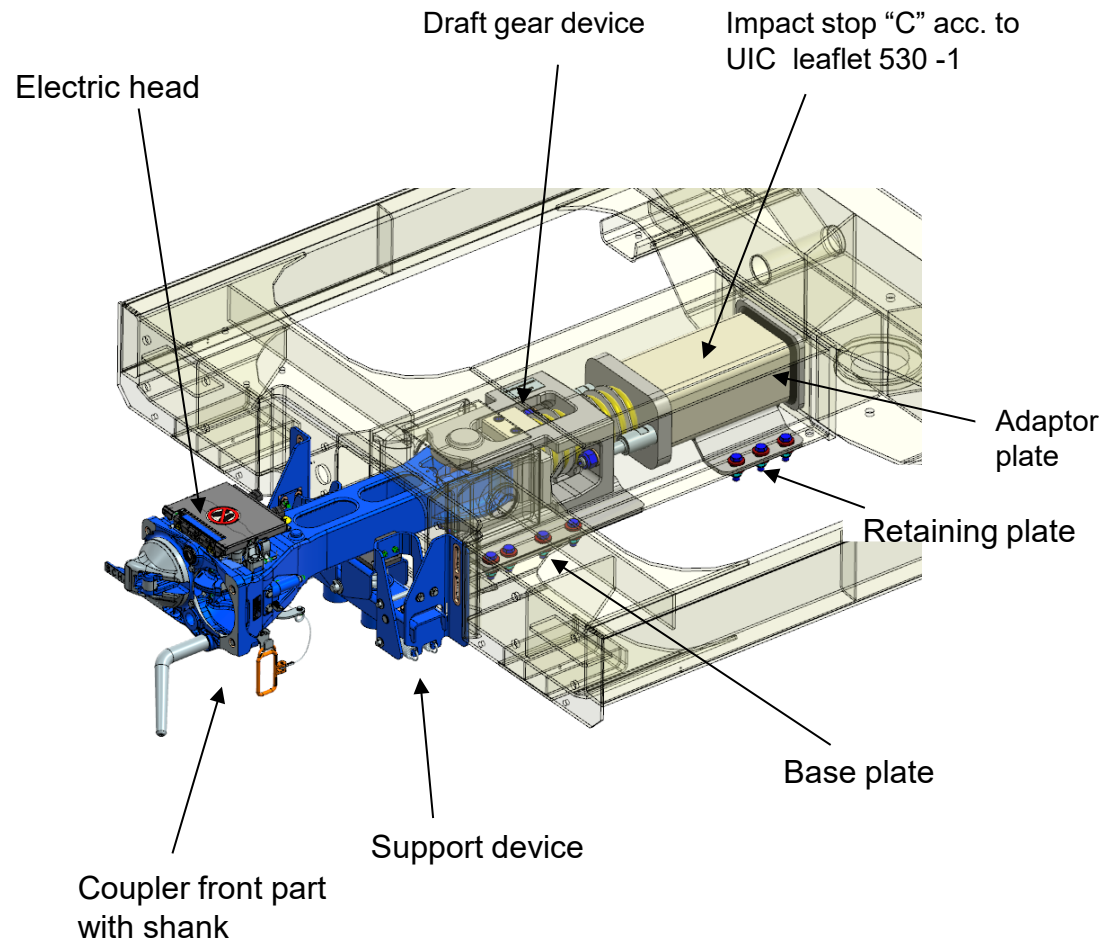
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CargoFlex

Installation to UIC 530-1

VOITH



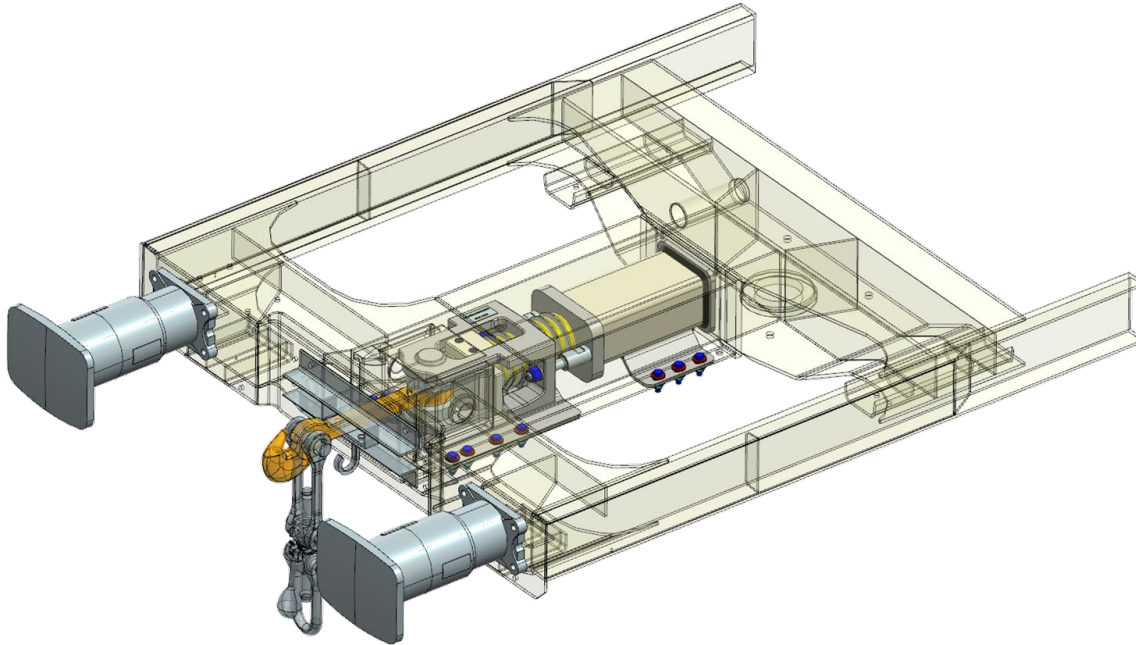
UIC 530-1 installation pocket with CargoFlex coupler

The CargoFlex consists of a coupler front part, an articulation/suspension device and a draft gear device.

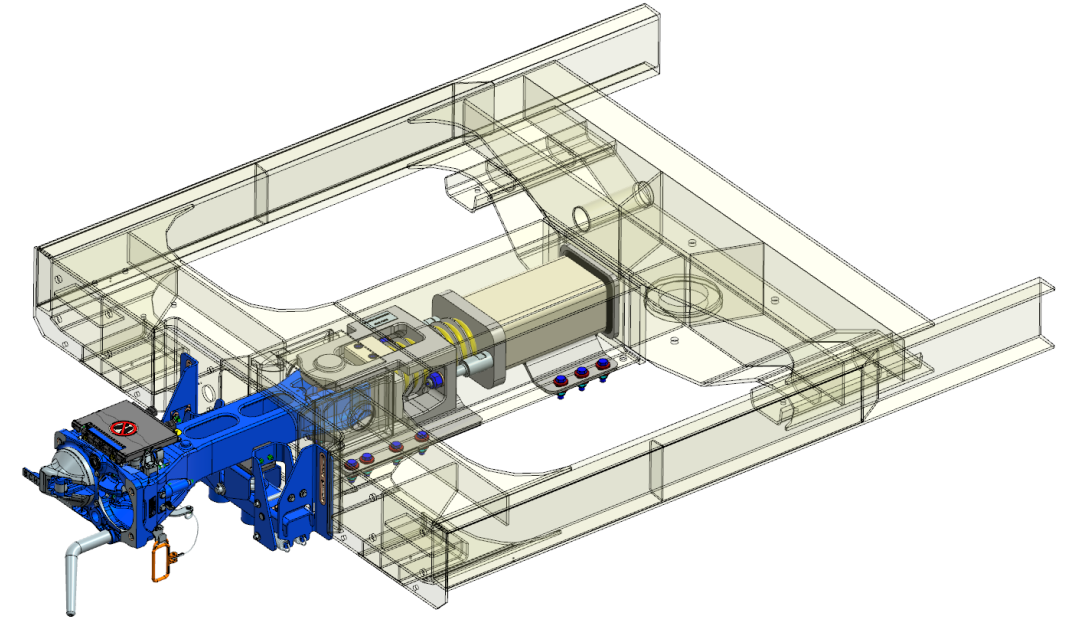
Side plates (impact stops) will be required in case there will be not buffer stops.

Cooperation for DAC draft gear:

VOITH & **AXTONE**



Installation phase 1 Dac Ready



Installation phase 2

Support for industrial customers

Voith Center of Competence in Kiel

VOITH



Only supplier with competence of locomotives

DAC

The vision - creating an intelligent system

VOITH



CargoFlex

+



Digital Backbone

=

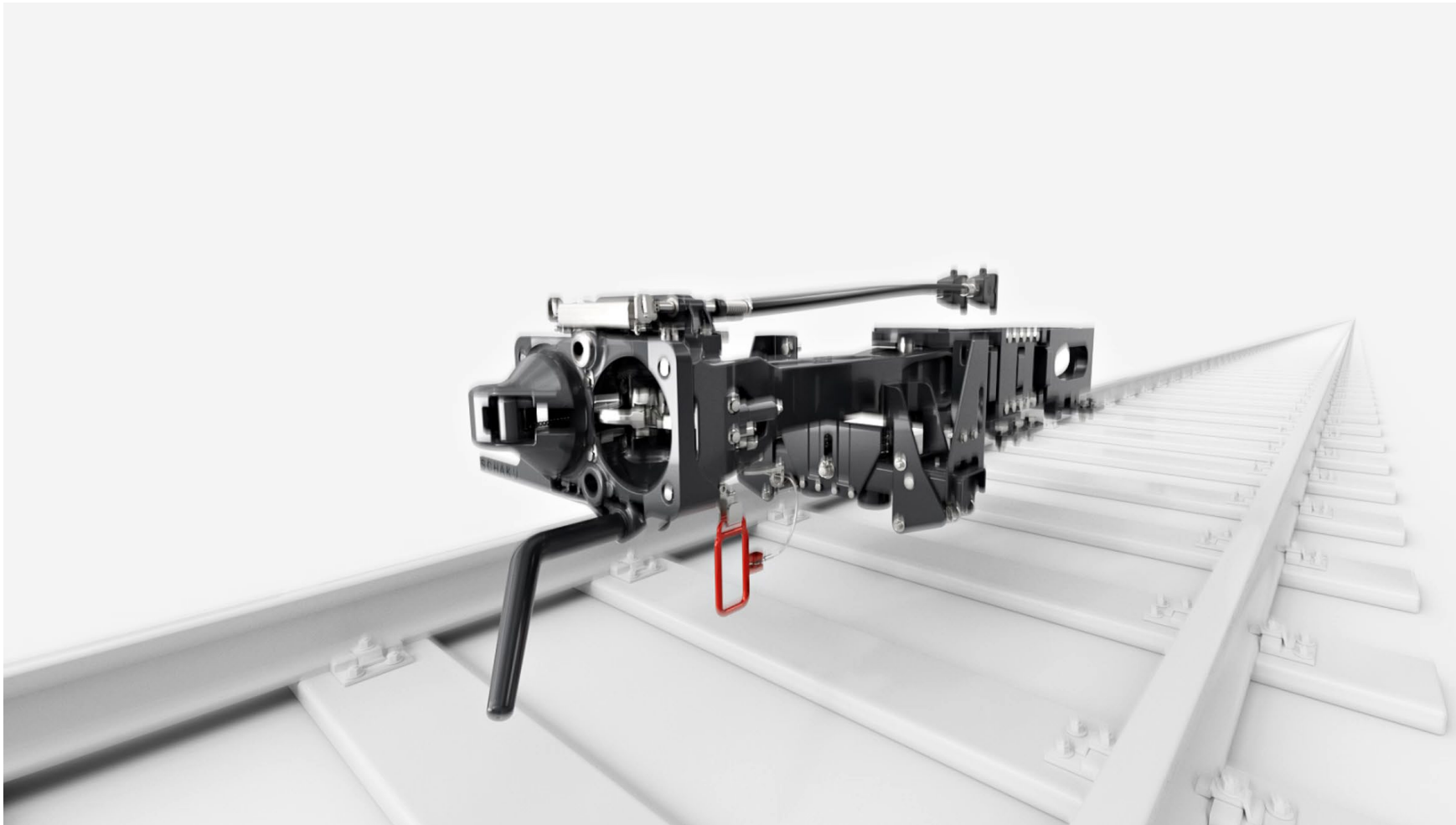


Intelligent Train and System

DAC

The “D” of the DAC

VOITH



Functions



DAC Basic Package

All-new functions

VOITH



Train composition + train length detection



Automatic uncoupling

Uncoupling from wagon side (mechanical / push-button)
incl. "couple prevention"



**Mechanical / pneumatic
Power & Data coupler**



Train integrity (light)

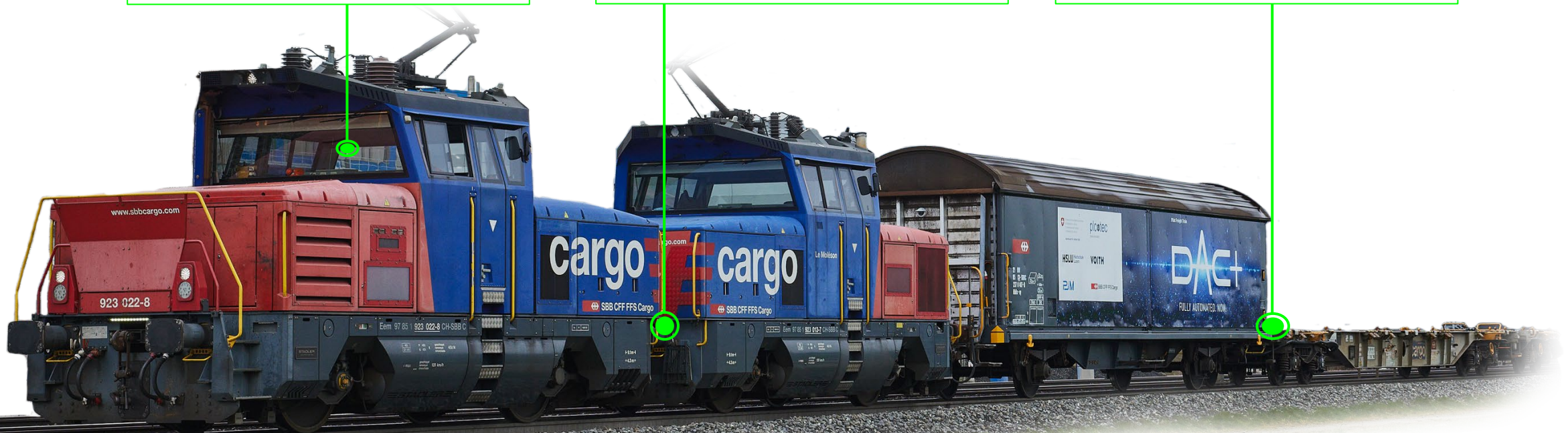


Automatic uncoupling

Uncoupling from locomotive driver's cab



Automatic brake test



Functions

Mechanical, pneumatic, power & data coupling

VOITH



CargoFlex performs fully mechanical coupling. It also supports many new digital functions via automated coupling of brake lines and e-couplers.

- Standardized interface
- Fast and safe data transfer
- Continuous energy supply

Functions

VOITH

Train composition + Length + Integrity (light)



Feature indicates the train set-up and length by computing the order of all wagons. It sends the information to the train- and infrastructure control system.

Prerequisite for many DAC train functions (e.g. ABT, Remote Uncoupling, Train Integrity).

- Always know exact train set-up with consecutive train length.
- Part of ETCS-III solution that will enable “moving blocks”.
- Enabler for “one men operation”



Functions

Automatic brake test

VOITH



Train prepared to leave in minutes, with results visualized on display. No need for inspection walks. Automation boosts safety and efficiency.

- Optimized train preparation: from 40 to ~5 minutes for a 400m train*
- Fewer staff required: from 2 to 1 person*
- Faster round trips
- Reduced standstill time

*Values from PJM Automated Brake Test used at SBBC

Functions

Uncoupling: DAC manual, DAC 4.5, and DAC5

VOITH



Manual uncoupling



Uncoupling by Push button



Remote Uncoupling

Functions

VOITH

Prevent coupling mode (buffer position)



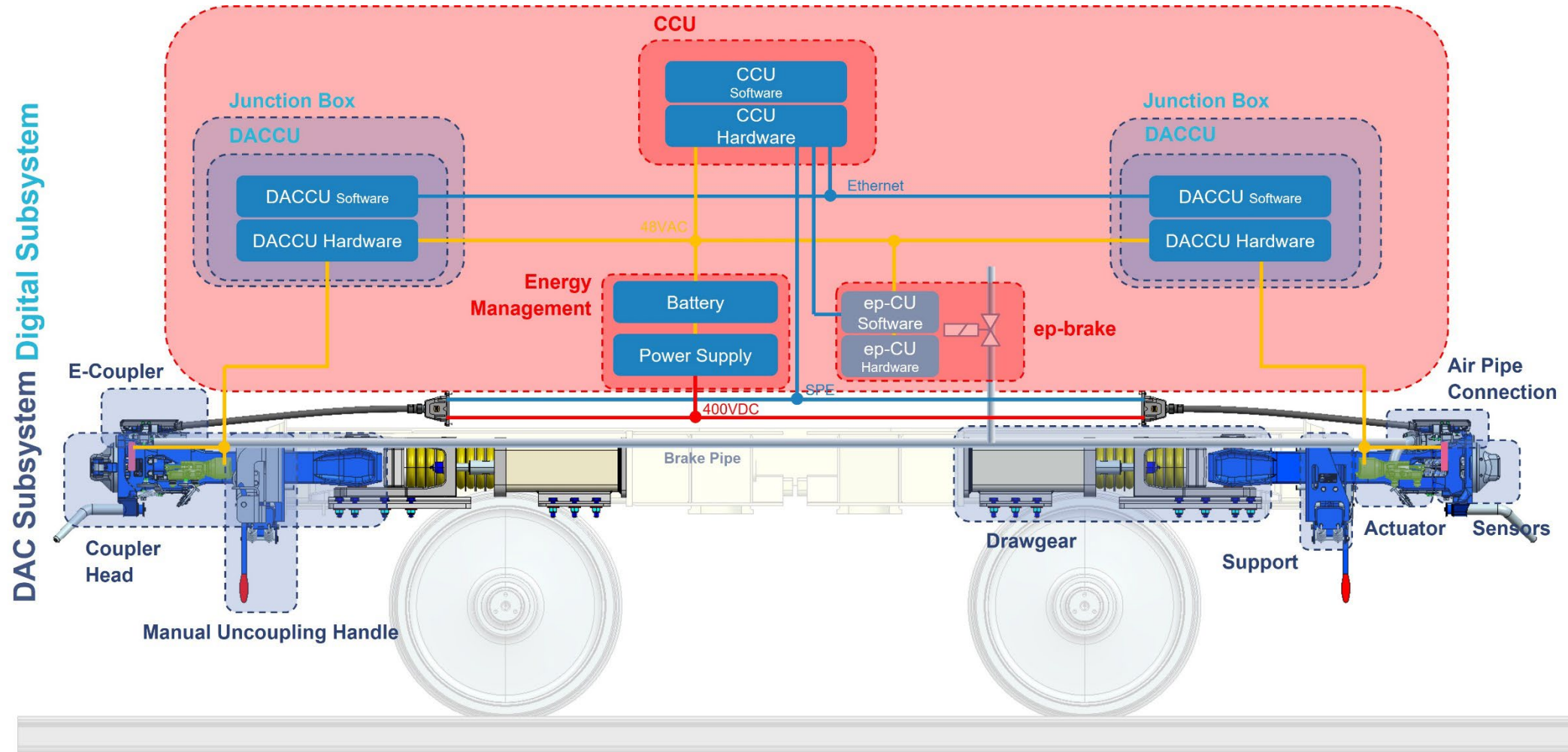
When shunting on hump, only front plate profiles are connected. Coupling process is prevented, e-coupler stays retracted with safety lid closed.

- Contacts are safe from environment
- Less wear on contacts
- Less wear on e-coupler mechanism

Functions

Impact on your wagon architecture

VOITH



Thank you!