



## Construction of new double-decker carriages

### Data and facts

On the instructions of the end client, the operating speed of the double-decker carriages was to be increased from 140 km/h to 160 km/h, implemented for tunnels of up to 20 km, and preparations made for future operation with an electric locomotive with more carriages.

### Requirements

Bombardier wishes to integrate the new installed components into the existing basic structure, and to include improvement proposals from IPO-A and IPO-B carriage construction in the new wagons by the processing of ECR. Furthermore, an increase in the mass should be avoided as far as possible, and the client must be notified of any changes in mass.

The following work packages have been derived based on the requirements of the end client:

- Operating speed 160 km/h
- Installation of magnetic track brakes and associated components
- Electropneumatic brakes and associated components
- Tunnels up to 20 km
- Passenger alarm EP/emergency brake request and associated components

- Extension of fire protection
- Integration of reinforcement of the basic structure
- Emergency stop function for HVAC ventilation
- Operation with an electric locomotive and more carriages
- Extension of train diagnostics to include the locomotive
- Incorporation of control/generator car equipment

### Implementation

- Preliminary investigations
- Installation investigations
- Design of mechanical components
- Implementation of electrical specifications
- Technical calculations

### Customer benefits

There was close on-site collaboration with the client. Bombardier was able to utilise the expertise of CE cideon engineering, enabling it to achieve a high-quality production of the first basic structure in a very short space of time.

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