

# REGINA

## Queen of Trains



Reliability and Comfort promoting Economy

**BOMBARDIER**

# ◁ Reliable, Proven, Comfortable – World Class Performance ▷

A train with a difference has been forging a reputation on the railways of Scandinavia in recent years – the **BOMBARDIER\* REGINA\***. Designed for optimum performance and reliability in the harsh climatic conditions of the Nordic regions, this train has become a mainstay of rail traffic in its native Sweden, and is fast becoming a popular export too.

Every day, fleets of *REGINA* trains are proving their dependability as they transport tens of thousands of passengers in comfort and style on commuter, regional and intercity routes throughout Sweden and into Norway. And now, *REGINA* technology is transforming services on high speed passenger routes in China too. The Chinese Ministry of Railways is taking delivery of 40 CRH1 trainsets, each with 8 cars, which have a total standard capacity of 670 people. More than 1,200 cars have been sold to Sweden and China. Most CRH1 trains are allocated to intercity routes on the line between Guangzhou and Shenzhen in Guangdong Province. The enduring success story of *REGINA* is creating an enviable profile that is rapidly becoming a worldwide phenomenon.

#### **A single solution, a multitude of uses:**

##### **Commuter to regional, inter-regional and intercity**

Today's railway companies require high levels of flexibility from their trains, with the potential to operate on various routes, with minimal modification. Bombardier recognises that different operations necessitate different features and facilities, but a common requirement is reliability. *REGINA* has been developed to achieve this balance by providing maximum flexibility, combined with dependable performance, wherever the train will operate.



#### **Versatile technology:**

- Originated from a 2-car train and extended with middle cars
- Speed up to 250 km/h
- Suitable for regularly stopping regional services, or longer distance, high speed routes
- Fast reliable service
- Efficient, on-time, problem-free trains
- Proven components
- Comfort assured



### Attracting passengers to rail

*REGINA*'s spacious design features a uniquely wide car-body, which ensures capacity of the train can be maximised, without compromise to comfort. A typical 3+2 or 2+2 with added comfort seat configuration means passengers can relax comfortably in full size seats, with space for luggage as well. With *REGINA*'s capacity to carry as many passengers as a double-deck EMU, operators can maximise the effectiveness of their operations. Key components are proven and modular, so that operators can feel confident in the reliability and availability of their fleet.

### Designed with the needs of passengers foremost

*REGINA* has been developed specifically with a view to appealing to passengers' requirements – for comfort and functionality:

- Spacious, airy interior
- Comfortable seating
- Flexible facilities:
  - Buffets, luggage provision, space and comfort for longer distance routes
  - Wide doors and vestibules for ease of access and egress on shorter distances
- Large adaptable interiors easily accommodate wheelchairs, pushchairs, or bicycles
- A vestibule with low floor entrance incorporating a lift, facilitates access for passengers with restricted mobility
- Air-conditioning throughout, including drivers' cab
- High reliability assures punctual services

Since investing in its fleet of *REGINA* trains in 2001, Swedish rail authority Västtrafik has seen a strong increase in the number of its passengers with annual double digit percentage increase in ridership. Customer satisfaction with *REGINA*'s high level of comfort is an important reason for this impressive growth.

"It's wonderful that we have succeeded in attracting so many people with these very comfortable, reliable trains and – with motorists leaving their cars at home to take the train - this is good news for the environment too", says *Mårten Ignell, Västtrafik*.

"In our latest procurement of new Intercity vehicles, SJ decided to conclude contract with Bombardier Transportation. Bombardier was chosen due to their capability to short delivery time and their willingness and ability to work with us as a partner, during the whole lifetime of the vehicle. The EMU *REGINA* was chosen due to its demonstrated high availability in revenue service, also in winter conditions, as well as due to its possibility to meet the high comfort demands from passengers on long distance service in combination with high speed and short stops", explains *Claes Broström, SJ*.

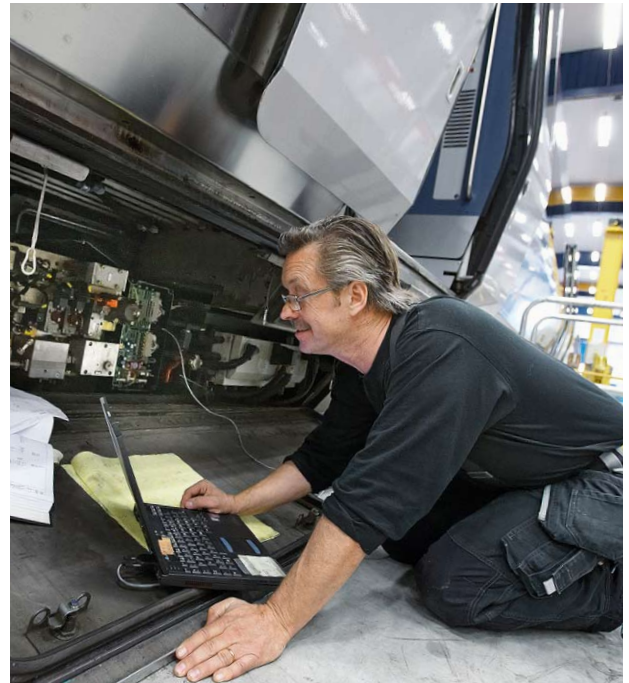


# Assured Availability by Bombardier A Lifetime Partner

**At Bombardier, we recognise that customer relationships begin well in advance of a train being designed, and continue long after it is delivered. That's why we have built a comprehensive national support network for our REGINA fleets, giving customers the ability to access whatever services they require to ensure ongoing performance of our trains.**

As a demonstration of our approach to customer support, we invested in our first dedicated site for REGINA maintenance in Västerås as early as 2002. With REGINA trains now operating on all major routes in Sweden, three additional depots in Göteborg, Gävle, Nässjö complement our premier site, and ensure a rapid local response. Our commitment to continuous improvement means that these satellites have excelled in delivery, and contribute to the reciprocal evolution of a best-in-class approach.

In its worldwide operations, Bombardier has gained a strong reputation as a full service provider. Whether customers require our expert technical support, or simply the confidence of knowing they will have the spare parts they require, when they need them, Bombardier can assist. With an extensive global logistics network and the benefit of long term relationships with system suppliers we can provide support with material sourcing, or equipment overhaul.



REGINA has been designed for ease of maintenance and maintainability, whether by the operator, or its chosen maintenance provider.

Bombardier provides both vehicles and maintenance support as a complete package to its customers for several REGINA fleets, with contractual commitments for availability. Our fleets have achieved, and in many cases exceeded, the targets that we have committed to – a testimony to both the reliability of our trains and our appreciation of their maintenance needs.



From the outset, *REGINA* trains were designed to withstand the harsh Scandinavian winter climate at a speed of 200 km/h. As part of the design process, potentially temperature sensitive components, such as traction equipment, were mounted in well-protected positions in the underframe, shielding them from the ambient environment.

Originally conceived for Scandinavian operating conditions, the design of *REGINA* is inherently robust. Years of invaluable operation in winter conditions from Kiruna in the North to Ystad in the South of Sweden has enabled further fine-tuning of the design. In addition to delivering a state-of-the-art new product in terms of reliability and availability, focus has been given to reducing operation and maintenance costs. Altogether, this ensures a well proven 'ready to operate' and reliable train, delivered to a minimum Life Support Cost.

"By ensuring high vehicle availability in revenue service – last year as high as 99.8% - Bombardier has contributed greatly to the passenger growth we have experienced since 2001, when the *REGINA* service was launched in our region", pointed out *Mats Eklund, X-Trafik*.

"We have operated *REGINA* on several stretches in the north of Sweden, both between Östersund and Sundsvall and between Umeå and Luleå. As the operator who has run the train in probably the most extreme winter conditions, we are very pleased with the performance of the vehicle. We are especially impressed by how quickly and efficiently Bombardier has handled the maintenance of these vehicles in Gävle and that it is possible to operate a single train in daily revenue service in the far north of Sweden with very high levels of availability", says *Gunnar Wulff, Veolia*.



# ◁ REGINA – a Train For the Future ▷

With a clearly established profile and market reputation, *REGINA* has already earned its place as a benchmark for rail vehicle performance. But the success story does not end here. *REGINA* is undergoing developments to further improve its potential, establishing its position as a train for the future.

One of the most significant challenges facing the rail sector today is that of sustainable mobility in the context of global climate change. In the interests of social and economic development, travel has become an essential feature of everyday life. Whether travelling for business, or leisure, passengers high expectations of comfort, punctuality, speed and convenience. For the sake of the environment, rail has to be the number one choice of the travelling public.

From the outset, *REGINA* was developed with environmental credentials as a defining criterion. With almost the whole train recyclable and with high levels of energy efficiency, coupled with low noise and vibration, *REGINA* was destined to play an important role in the future of sustainable mobility. It is highly fitting, therefore, that *REGINA* is now the subject of the Swedish Banverket Gröna Tåget “Green Train” project, aimed at developing a new generation of high speed trains that meet the special technical requirements in the Nordic countries.



## Speedrecord on regular tracks

On September 15, 2008 the Gröna Tåget (Green Train) *REGINA* set a new Swedish speed record of more than 300 km/h. This was a major milestone for the *REGINA* platform, which, during regular traffic in Sweden, currently operates at a maximum speed of 200 km/h. The tests conducted confirm that the *REGINA* vehicles are, in fact, capable of speeds up to more than 300 km/h on regular tracks.



## eco<sup>4</sup>

### **ECO4 – Energy, Efficiency, Economy and Ecology**

*REGINA* forms part of Bombardier's *ECO4*\* environmentally friendly technologies. Addressing the growing challenges among operators to reduce Energy consumption, improve Efficiency, protect the Ecology while making sense Economically, *ECO4* is the concrete validation of Bombardier's declaration - *The Climate is Right for Trains*\*.

### **Green Train Project – New ECO4 technologies:**

- *BOMBARDIER*\* *EBI*\* Drive 50 driver assistance system to guide drivers to minimise energy consumption through optimised driving style
- *BOMBARDIER*\* *MITRAC*\* Permanent Magnet Motor, reducing motor weight

### **REGINA's environmental credentials:**

- *REGINA* is recyclable
- High capacity ensures that fewer trains are required to provide services
- Regenerative braking, results in energy saving wear
- Minimal noise – both internally and externally
- *BOMBARDIER*\* *FLEXX*\* *Compact* bogie minimises track wear



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Learn more about our commitment to sustainable mobility on: [www.theclimateisrightfortrains.com](http://www.theclimateisrightfortrains.com)

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