

Introduction of the “N700-I Bullet”

Changing Society through High Speed Rail
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Tsutomu Morimura
Central Japan Railway Company

The “N700-I Bullet”



“N700-I (I :International) Bullet”

The “N700-I Bullet ” is a total “High-Speed Railway System”. The system comprises not only the N700-I rolling stock, a derived model of the N700 optimized for overseas operations, but the entirety of the Tokaido Shinkansen system—a system that has provided safe and stable operations in Japan for over 45 years.

FAST

Energy Efficient

Environmentally Friendly

Safe

Importance of Integrated Management of the “High-Speed Railway System”

JRC has secured the safety and the high quality of the Tokaido Shinkansen through the integrated management of both the hardware and software that make up the system.

Integrated Management of the “High-Speed Railway System”

Hardware

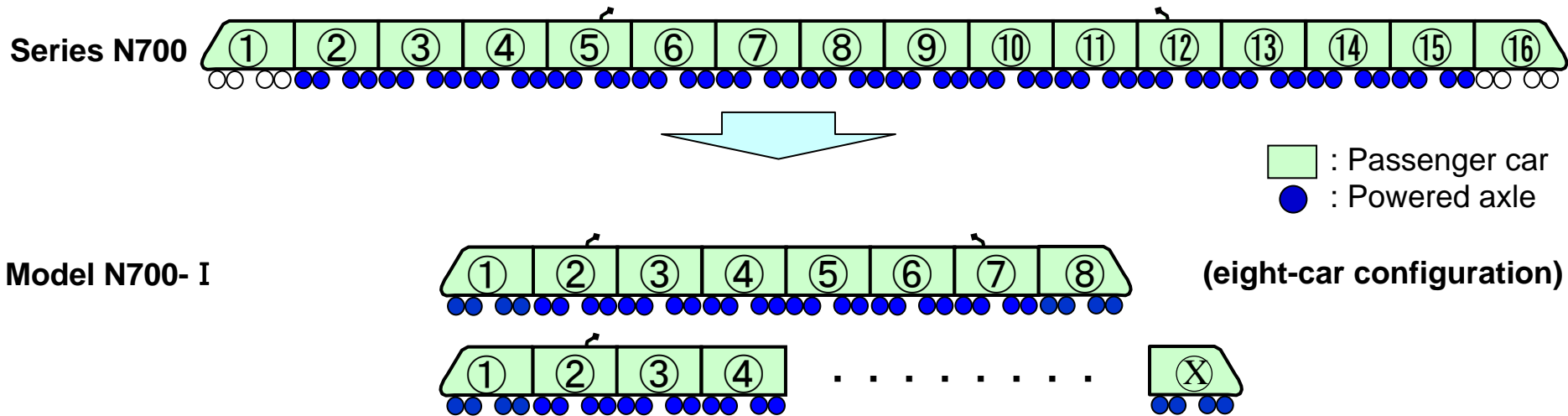
- Rolling stock
- Ground facilities and tracks
- Power and signal facilities
- Disaster prevention facilities
- Protective facilities

Software

- Safety promotion structure
- Employee Education and Aptitude
- Maintenance
- Operation management

Specifications of N700-I

The N700-I basic configuration is scalable for a 6 to 15 car configuration, capable of being for corridor-specific transportation construction plans.

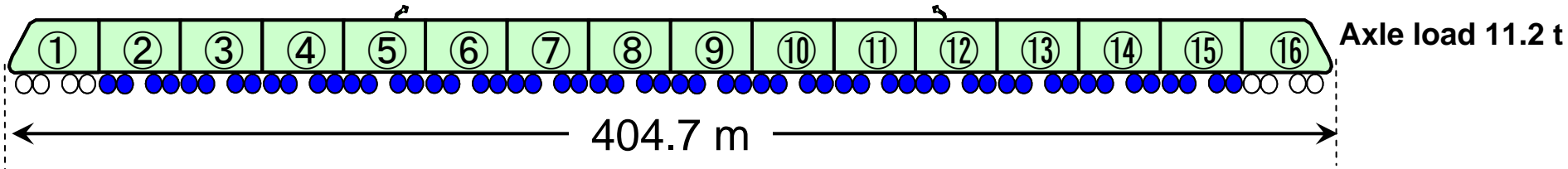


The configuration length can be freely changed, even extended after deployment in response to increasing transport demands; due to the distributed traction system, train performance does not vary significantly regardless of the configuration length.

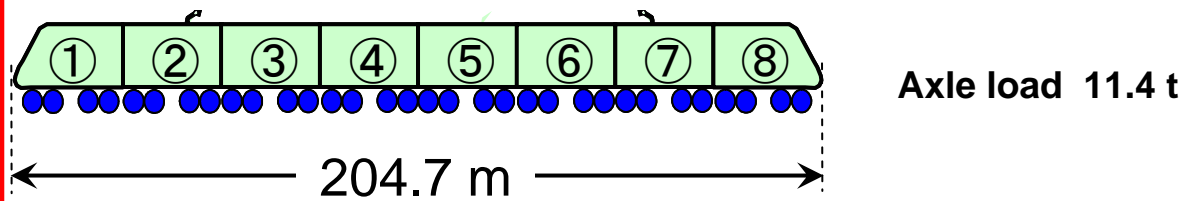
N700-I (eight-car configuration)		
Electrical system		AC25kV, 60Hz
Basic formation	Configuration	8M (100%AC regenerative brake)
Capacity	Seating capacity	636
Speed	Maximum cruising speed	330 km/h(205mph)
	Starting acceleration	3.2 km/h/s
Output	Total power output	9,760 kW (305 kW x 32)
Train set Length		204.7m
Train set Weight (Full passenger capacity)		365t

Comparison of N700-I and other HSRs (Axle Load) ⁶

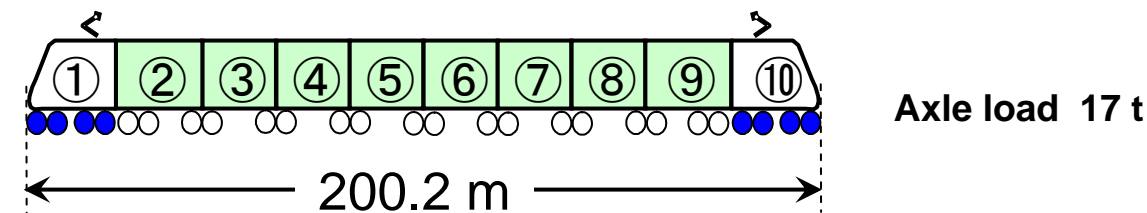
Series N700



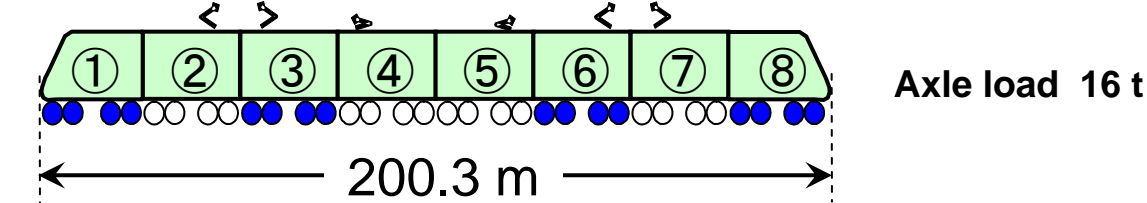
N700-I (eight-car configuration)



TGV-POS






ICE3



■ : Passenger car
● : Powered axle

Comparison of N700 and other HSRs (specifications) ⁷

【Specifications】

			
Rolling stock type	Series N700	TGV-POS	ICE3
Maximum speed (km/h)	330 (205mph) (Cruising: 300 (186mph))	320 *(199mph) (Cruising: 320(199mph))	330 *(205mph) (Cruising: 320(199mph))
Trainset weight ⁽¹⁾ (Full passenger capacity) (t)	715	423 **	465 ***
Axle load (Full passenger capacity) (t)	11.2	17 *	16 *
Trainset length (m)	404.7	200.19 *	200.32 *
Rolling stock width (m)	3.36	2.904 *	2.95 *
Passenger capacity (people) ⁽²⁾	1323	357 *	413 *
Output (kW) ⁽³⁾	17,080 (305kW × 56)	9,280 (1,160kW * × 8)	8,000 (500kW * × 16)

* Source : "World High Speed Rolling Stock," UIC High Speed website

** Source : " Les rames TGV POS de la SNCF", Chemins de Fer No.504,2007/3, P5-16

*** Source : " High-Speed Railways of the World (Rolling stock)", JREA 2005 VOL.48 No.4,P46-53

Calculated from the specifications for the comparison of the performances.

Output per weight (kW/t) ^{(3) / (1)}	23.9	21.9	17.2
Weight per seat (t / Seat) ^{(1) / (2)}	0.5	1.2	1.1

Why Choose a Dedicated Passenger Rail System?

A dedicated, closed passenger rail system with full grade separations as well as segregation of passenger and freight traffic offers the optimal passenger rail experience

- Key to ensuring safety
- Allows for optimization of rolling stock dimensions for passenger service
- Allows for optimization of track specifications (e.g., curve radius, cant and gradient) for passenger service and safety
- Allows for optimization of the system for efficient, safe and stable transportation with a unified rolling stock configuration
- Allows for superior conditions for tracks maintenance and safety

Result: In Japan, a super efficient system that delivers passengers on time and with maximum safety—no passenger injuries or deaths in 45 years of operation

The “N700-I Bullet” (Tokaido Shinkansen) has been perfected through four decades of research, development and operation, as a “High-Speed Railway System”, optimized for:

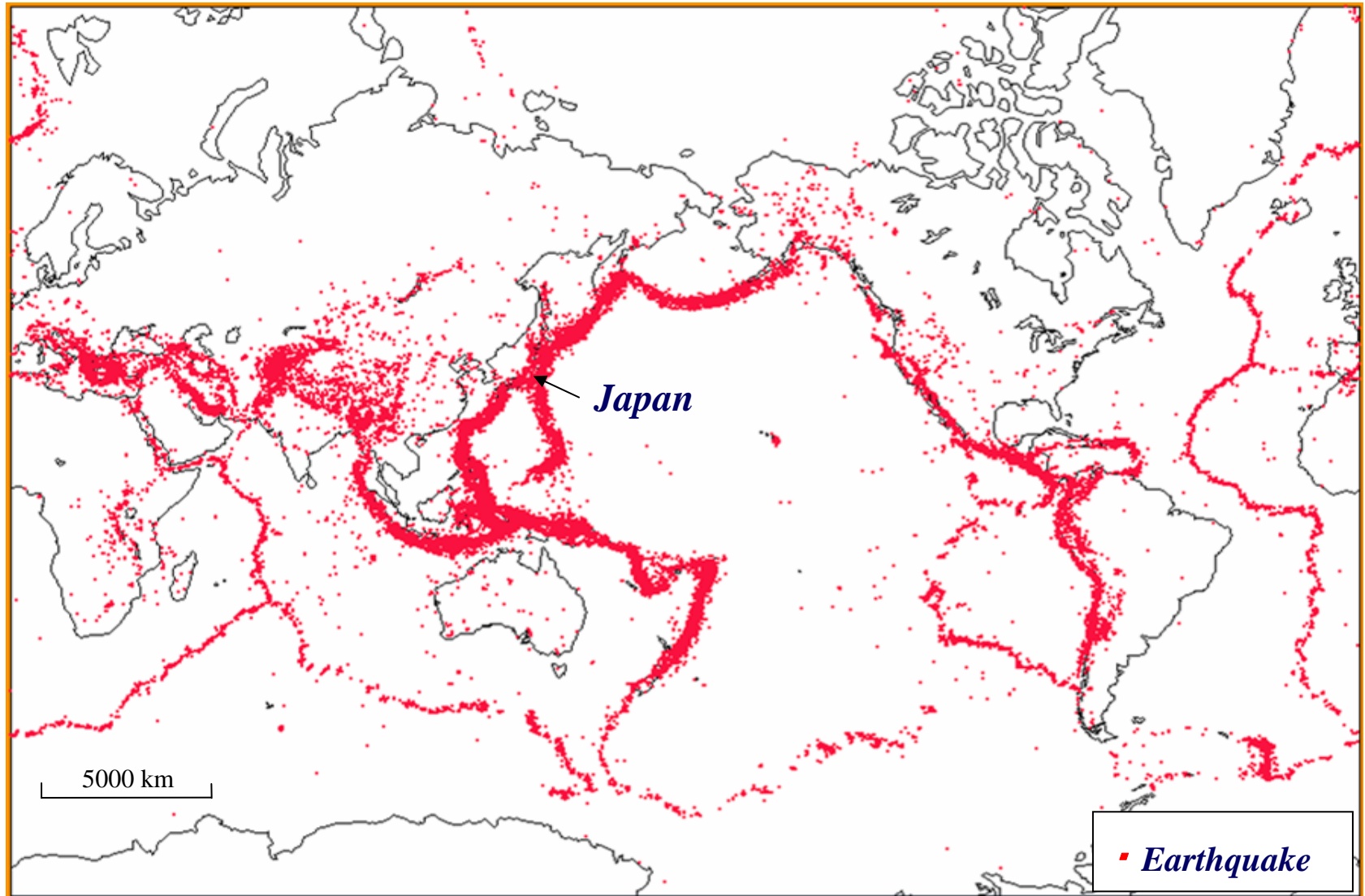
- High-speed, efficient Transportation
- Low Energy Consumption
- Low carbon emissions
- Safety and Punctuality

The N700-I Bullet is now ready for deployment and operation worldwide

JRC's Countermeasure against Earthquake (Komaki R&D Center)

Distribution map* of earthquakes (Magnitude > 4.0)

- Earthquake zone is limited in the world
- Japan has wide experience in approach against earthquake



* Source : (figure) Originated by United States Geological Survey

I Strengthening of structures

Prevent derailment by minimizing damage to ground structures and tracks during earthquake

II Countermeasure against Derailment (Duplicated Countermeasures)

Operating train may derail, even without there being significant damage to ground structures and tracks.

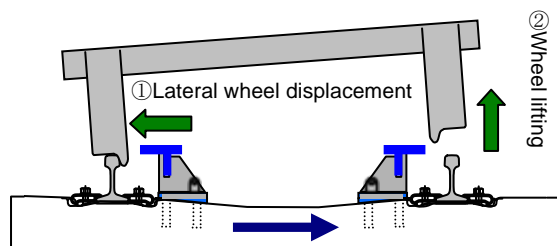
1. Countermeasure against Derailment

2. Countermeasure against Post Derailment

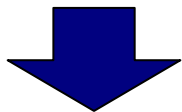
Mechanism of Derailment and Anti-derailing Guard Rails

- Anti-derailing Guard Rails prevent train derailment by controlling the horizontal displacement movement of the vehicle due to rocking derailment, especially caused by an earthquake.

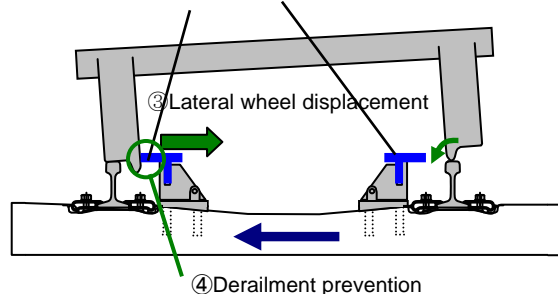
Mechanism of Derailment



Mechanism of rocking derailment



Anti-Derailing Guard Rails



Mechanism that prevents derailment

Anti-Derailing Guard Rails



Service time



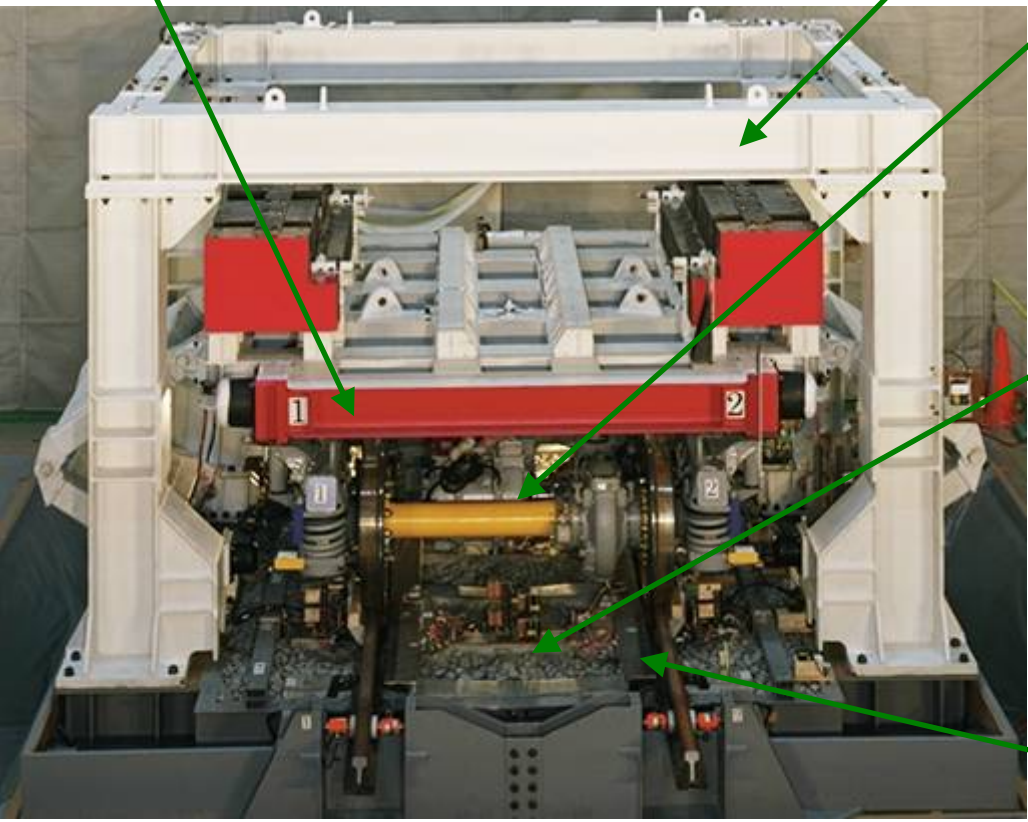
Turned over rails for track maintenance work

○ Testing effectiveness on actual bogie on ballast tracks (Real scale Test)

[Testing device]

Car body

Protective device



Series N700 Bogie



Ballast tracks with Anti-derailing Guard Rails



Anti-derailing Guard Rail