



Series
N700

ENGLISH VERSION

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[14E]
1307

FUNDACION
de los FERROCARRILES
ESPANOLES
SANTA ISABEL, 44
28012 - MADRID



**Maximum speed of 300km/h —
Faster, More Comfortable and Superior Quality
The next-generation Shinkansen, the “Series N700” will transform
the future of people, railway and the Earth**

Based on the high potential of the current high-tech “Series 700” train that operates on Japan’s major transport artery, the next-generation Shinkansen, the “Series N700”, will now make its debut with significantly enhanced speed, comfort and energy performance, that will make major contributions to the effort to counter global warming. It features upgraded on-board amenities to facilitate the diverse needs of passengers, both business and leisure. To ensure that each and every passenger can relax in comfort, the train incorporates cutting-edge technology to provide a high level of riding comfort. The Series N700 Shinkansen train, jointly developed by JR Central and JR West, is sure to meet all your expectations.

Concept of the “Series N700”

Quality interior space
offers relaxing and calming
passenger environment

- Enhanced riding comfort and quietness
- Upgraded facilities of First Class “Green Car”
- Improved comfort for regular cars
- Non-smoking seats only
(smoking allowed only in specified areas)

The best high-speed
on-board office

- Substantial increase in the number of power outlets for mobile devices
- Large table that accommodates a laptop computer
- Comfortable communications environment for mobile phones
- Wireless Internet connectivity
(Service will be launched in the Tokaido section from the spring of 2009.)

Services to provide
added comfort

- Larger on-board information display
- Large multipurpose room
- Expanded luggage racks
- Enhanced security

Summer of 2007: Debut of the “Series N700” on the Tokaido and Sanyo Shinkansen lines.

Technological Overview

Advanced technology that integrates high speed, quality riding comfort and environmental compatibility at a high level.

Distinctive design and numerous innovative systems realized through intensive research.

The Series N700 will pioneer the future of high-speed railways.

Under the development concept: the "latest, fastest and best rolling stock for direct operation on the Tokaido and Sanyo Shinkansen", the Series N700 takes form to evolve the high-performance Series 700 into a more ideal design. The best of our technologies have been brought together to achieve the distinguished goals of improving train performance at the maximum speed of 300km/h, providing comfortable on-board space, enhancing environmental performance, and promoting energy conservation.

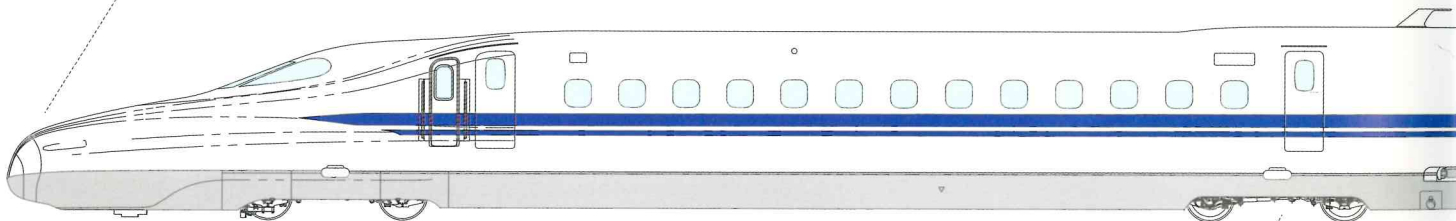
Fastest cutting edge rolling stock

- First use of the body inclining system
- Improved acceleration performance
- Train control and communication network



● Nose shape (Aero Double-Wing)

First rolling stock designed with the latest optimizing technology (Genetic Algorithm), normally applied in aircraft development. The technology has led to the development of a new nose shape with optimum aerodynamic properties.



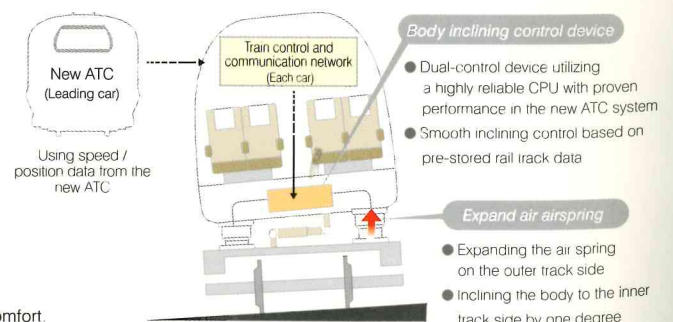
● Bogie skirt

All bogies have been covered with a bogie skirt to reduce external noise from the undercarriage. It uses highly resilient, recyclable lightweight CFRP. It provides efficient sound-shielding effect and offers ease of maintenance.

Body inclining system

An innovative system that enables travel through curves at the maximum speed while maintaining riding comfort.

The new ATC system provides information on train locations with high precision. The Train Control and Communication Network System transmits the data digitally to all 16 cars simultaneously. The air-spring based body inclining system is a structurally simple and lightweight system that feeds and extracts air to and from the air-springs to control the rolling angle of the train body. These systems have been combined to enhance speed performance at curves. This state-of-the-art technology has been used for the first time in Shinkansens to improve riding comfort.



Series N700

[Fastest cutting-edge rolling stock]

① Maximum speed

270km/h for the Tokaido Shinkansen section and 300km/h for the Sanyo Shinkansen section

② First use of the body inclining system in Shinkansen

The system allows to travel at the maximum speed of 270km/h at curves, currently subject to speed restrictions. (Tokaido Shinkansen section)

③ Improved acceleration performance

The time required to reach the maximum speed of 270km/h has been dramatically reduced from 300 seconds for the Series 700 to 180 seconds for the Series N700.

[Superior comfort]

① Enhanced riding comfort

The high-performance model of the semi-active suspension system is installed on all cars. The body inclining system reduces frequency of acceleration and deceleration at curves, while the new ATC system adopts a single-step braking system (Tokaido Shinkansen section) to provide smooth braking. These systems are combined to substantially improve riding comfort in both lateral and longitudinal directions.

② Quiet passenger cabin

The Series N700 is the first Shinkansen to feature cover-all hoods, achieving external noise reduction and vestibule quietness.

③ Improved passenger comfort

The Series N700 features a range of innovative technologies for on-board comfort, such as the latest air-conditioning system and ergonomically optimized seat designs.

[Greater environmental compatibility]

① Light weight rolling-stock and noise reduction

The Series N700 adopts the latest technologies, such as cover-all hoods between cars and mechanisms reducing undercarriage noise.

From the perspective of countering global warming, the cars have been designed to reduce weight by methods such as employing lighter interior fittings, and reducing the amount of on-board wiring.

② Energy conservation

The Series N700 saves energy substantially by optimizing its nose shape, using cover-all hoods to reduce running resistance, reducing body weight and employing the regenerative brake system to cover all electricity needed for braking. In addition, the use of the body inclining system reduces the frequency of acceleration and deceleration for a greater energy conservation effect.

Superior comfort

- Advanced semi-active suspension system on all cars
- Expanded use of the double-skin body structure
- Noise-absorbing floor structure
- Cover-all hood
- Noise reduction of under-floor equipment
- Reduced acceleration / deceleration frequency at curves
- Adopting the new single-step braking ATC system (Tokaido Shinkansen section)

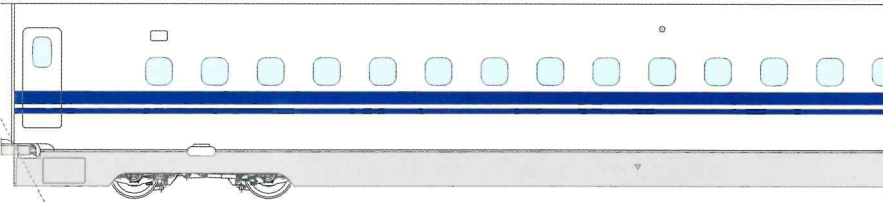
Superior environmental compatibility

- Reduction of running resistance (Optimized nose shape, use of cover-all hood, etc.)
- Lightweight
- Reduced acceleration / deceleration frequency at curves
- Adopting the new single-step braking ATC system (Tokaido Shinkansen section)
- Expanded application of regenerative brakes
- Smoothed roof, sides and under-floor structure



● Low-noise pantograph

The streamlined pantograph has a windshield cover that encases the middle hinge and air piping to further reduce the level of noise. The pantograph head is structured so that it ensures the collection of power even when the body is being inclined.



● Cover-all hood

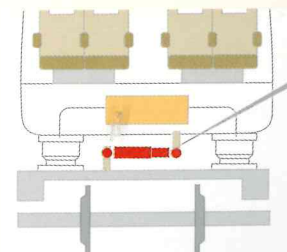
All coupling sections between cars are covered with the cover-all hood to reduce both external and internal noise. It enhances cabin or indoor quietness and further reduces external noise.

Advanced semi-active suspension system

This technology substantially reduces vibrations at high-speed operation for riding comfort.

The Series N700 has adopted a continuously variable system that enables more sophisticated vibration control, in place of the conventional multi-step system, and it has been installed on all cars.

It provides optimum control in any given situation to deliver a higher level of vibration-control performance. This new system adopts high-speed CPUs, and it conducts advanced and detailed computer processing at 10 times the speed of the previous system to provide superior riding comfort. Further, since tunnel sections and open sections have different optimum control parameters, the Series N700 uses high-precision position / track data to determine whether the train is in tunnels or open sections, and switches control parameters accordingly for better passenger comfort.



Semi-active damper

- Gradual shift method for higher vibration-control performance

Environmental Performance

The Series N700 features the optimum solution: uses 19% less electricity (compared to the Series 700) and addresses the issues of speed and environmental performance at the same time.

The Series N700 aimed to reduce energy consumption by 10% despite having a 30% greater power output than the Series 700.

By introducing the latest and refined technologies, such as (1) technologies to reduce running resistance, (2) body inclining system, (3) lightweight technology and (4) power regeneration technology, the Series N700 has successfully surpassed the initial target to achieve "19% less power consumption than the Series 700". The substantial reduction in power consumption and CO₂ emission enhances Shinkansen's environmental superiority, and contributes significantly to the effort to counter global warming.

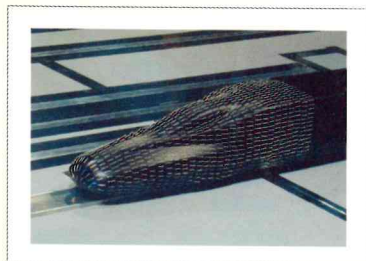


Latest technologies featured in the Series N700 with advanced energy performance

① Reduction of running resistance

The body and undercarriage are designed in a thoroughly streamlined shape through the use of the aerodynamically superior nose shape, cover-all hoods and bogie skirts to reduce air resistance by 20% compared to the Series 700. This has successfully reduced running resistance, which is the most significant factor affecting energy performance.

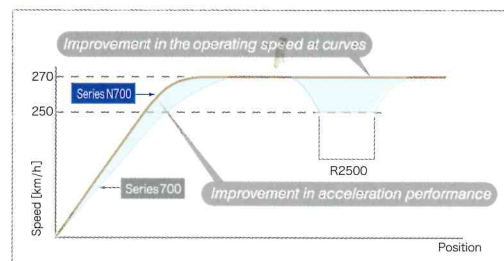
Wind tunnel test of the nose shape



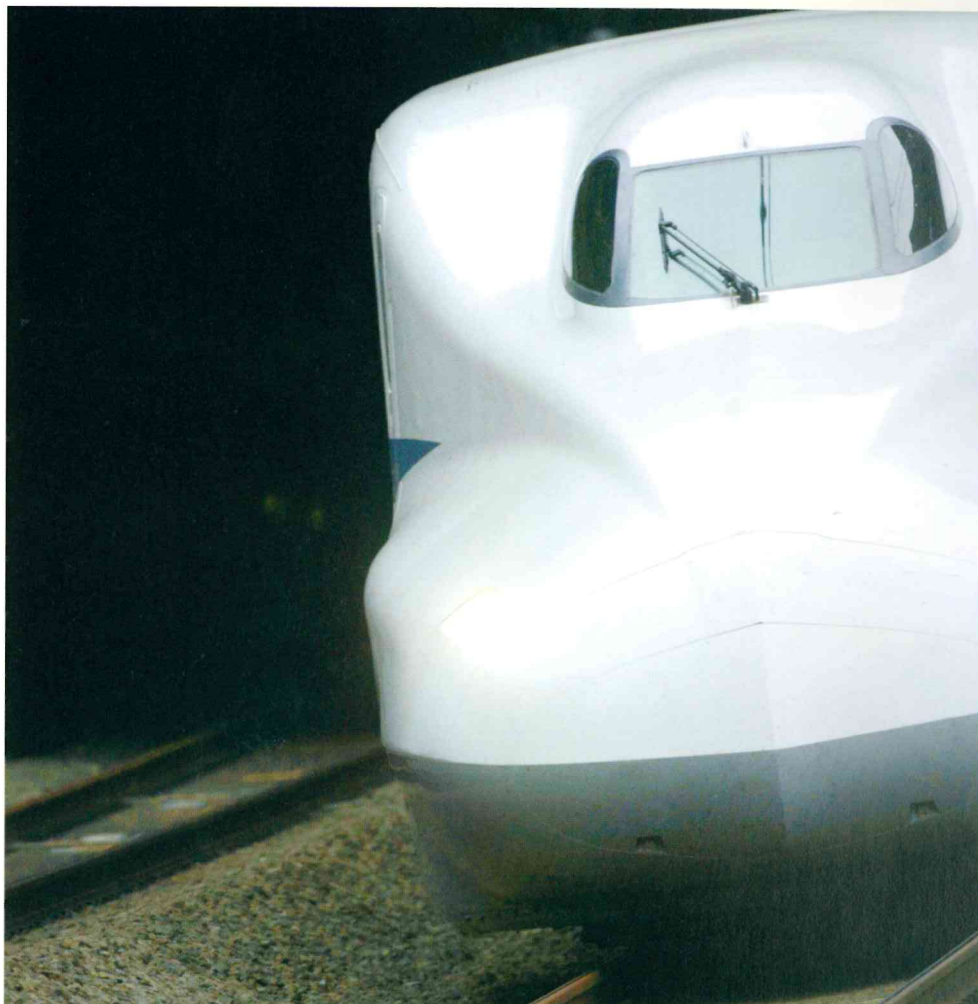
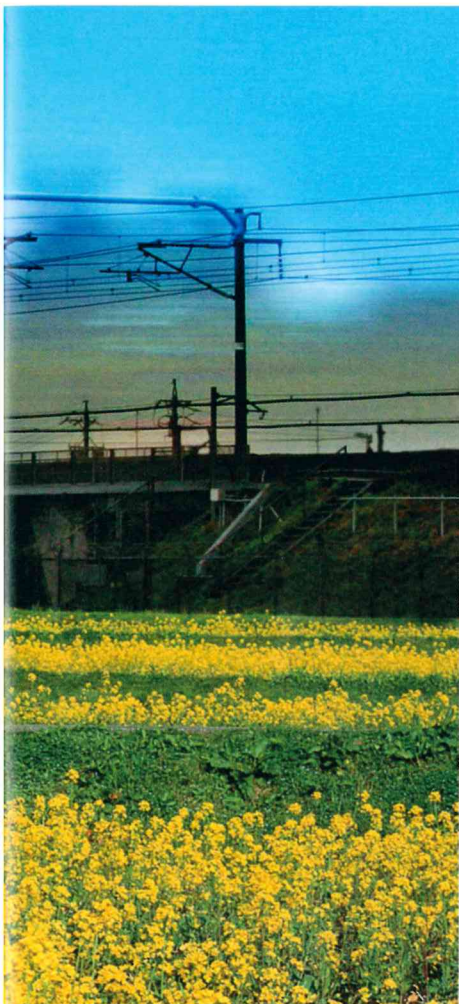
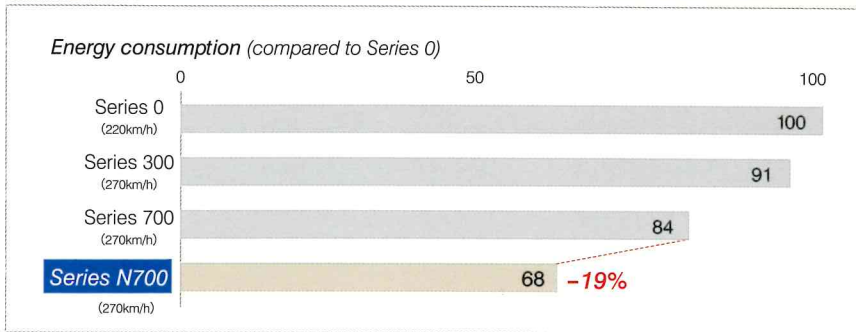
② Body inclining system

Several latest technologies have been combined to develop the body inclining system, which successfully reduces the frequency of acceleration and deceleration, and substantially cuts down on energy consumption.

Operation pattern of the Series N700



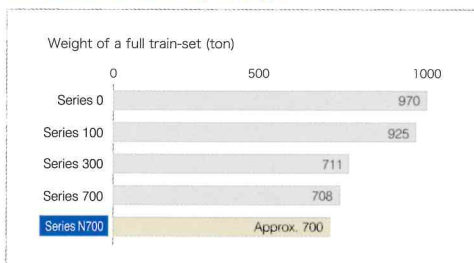
Comparison of energy consumption by Shinkansen train sets



③ Lightweight technology

The Series N700 has been developed in dedicated pursuit for reducing its weight, using the double-skin body structure made of aluminum alloy and bolsterless bogies. This has made a major impact on reducing energy consumption.

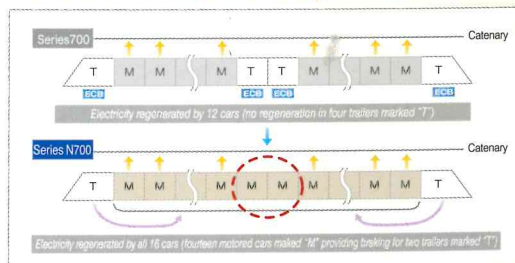
Comparison of train weight by type



④ Power regeneration technology

The number of cars equipped with regenerative brakes in a 16-car configuration has been increased from 12 (Series 700) to 14. The Series N700 employs a system in which the regenerative brakes on 14 cars cover all the braking power required in normal operation, so as to promote the recycling of electrical energy.

Increase in the number of cars with regenerative brakes





Premium Quality

Quality interior space offers relaxing and calming passenger environment

Both First Class “Green Cars” and Regular Cars offer enhanced riding comfort, providing relaxation and serenity to passengers as if they were in their own living room.

Passengers may want to take a nap, to continue working, or to relax. On-board space needs to be functional and, above all, comfortable. In addition to the already well-recognized quietness in passenger cabins, the installation of cover-all hoods between cars provides quietness in vestibules equivalent to that of the passenger cabins of the Series 700.

The Series N700 delivers riding comfort and quietness, promising a quality Shinkansen journey for all passengers.



Silent and Comfortable

The Series N700 seeks further riding comfort and quietness.

It features the advanced semi-active suspension system on all cars, employs cover-all hoods for the first time in Shinkansens, and adopts the body inclining system to reduce the frequency of acceleration and deceleration.

In addition to these technological aspects, it has been designed under the basic concept of "comfortable cabin environment for all passengers" to provide functionally superior, elegant and serene on-board space.

First Class "Green Cars"

Providing an elegant, yet relaxed cabin environment

Cabins are coordinated in elegant natural tones that are easy on the eyes.

Fluorescent lights are provided in the shade of incandescent lights, with coverings in the tone of Japanese "washi" paper for a luxurious feel.

Auxiliary lights on the underside of the luggage racks provide a serene cabin environment.

The "elegant, yet relaxed cabin environment" satisfies even the most discerning VIP passengers.

Also, the newly developed ergonomic seats ensure that passengers can sit back in comfort on their long journey.



Thin ceiling lights that give a passenger cabin a sense of space and openness

In passenger cabins, lighting is provided in a single line running through the ceiling center to give an added sense of openness.

Light covers in the Japanese Washi paper design and the use of edge rings have also enhanced the sense of serenity.

The elegant lights, easy on the eyes, make a Shinkansen journey a pleasant experience.

Auxiliary LED lights that create a serene atmosphere

Ceiling lights are complemented with auxiliary LED lights on the underside of luggage racks. They help generate a serene and quality atmosphere.



High-quality digital music in the audio service on "Green Cars"

Passengers can enjoy music programs in high-quality digital sound.



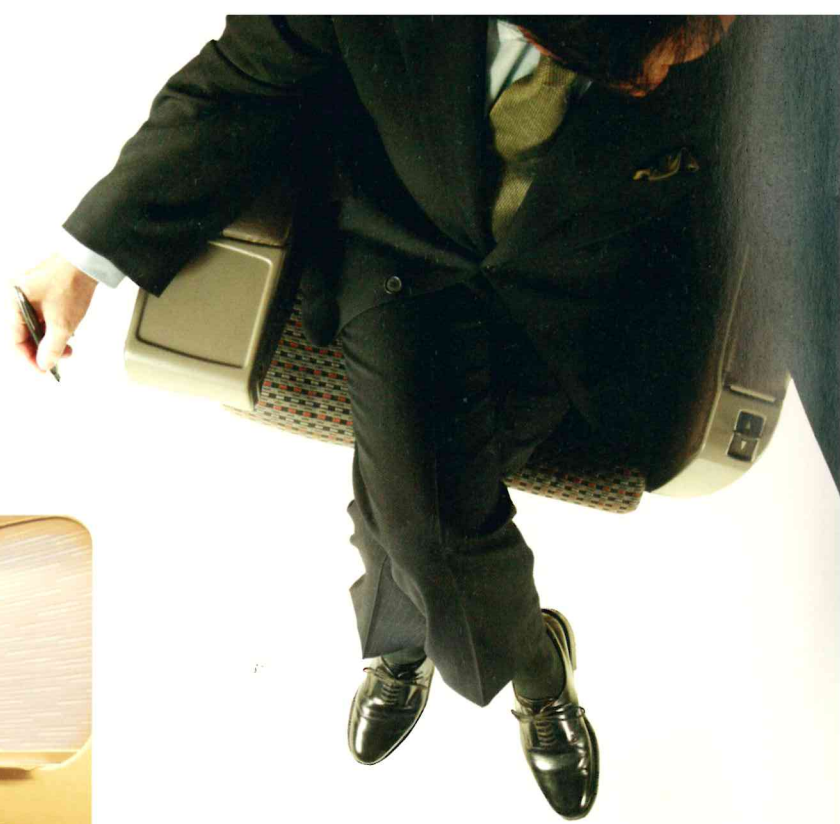


"Green Car" Entrance Vestibule that looks more like a hotel lobby

Boarding passengers are welcomed by the spacious and elegant vestibule. It easily accommodates passengers with large luggage.

Gentle seating comfort with excellent body support that makes a long train journey comfortable

The Series N700 features highly functional reclining seats, ergonomically designed to address the needs of passengers on a long journey who may want to work, dine, read or sleep.



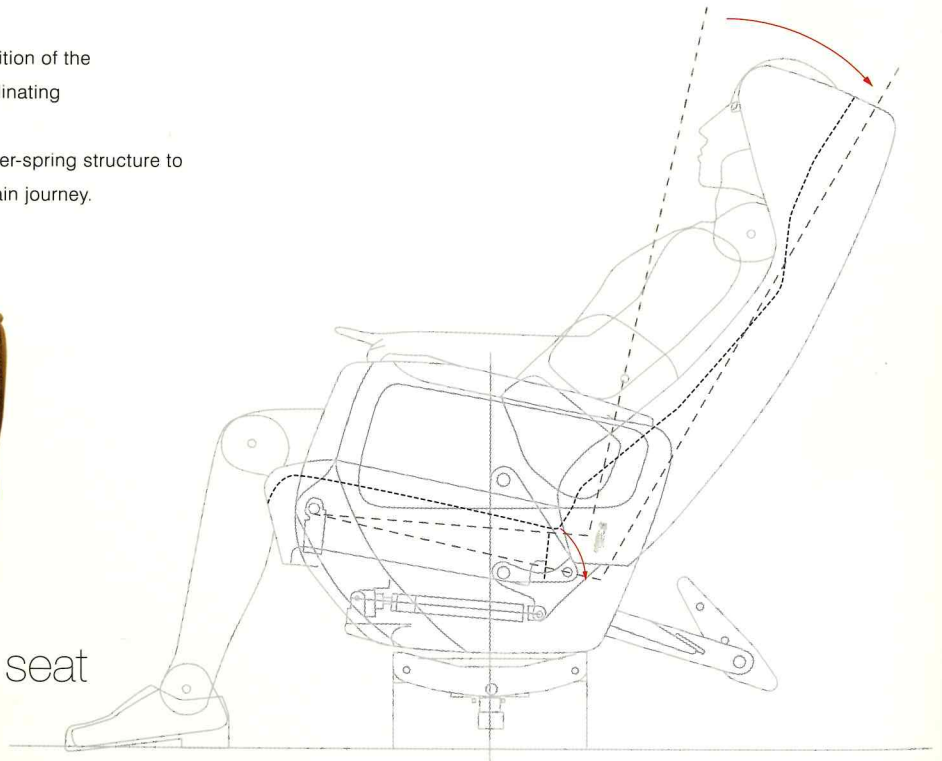
“Synchronized comfort seats”

The “Synchronized comfort seats” maintain the position of the lower back support in any reclining angles by coordinating the movement of both the seat and the backrest.

Seat cushions are upgraded with the composite inner-spring structure to ensure superior riding comfort throughout a long train journey.



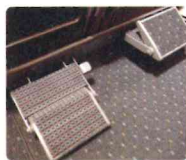
Synchronized comfort seat





High-intensity LED reading light

The LED reading lights are built into the seats.



Footrest

The footrest employs an easy-to-use freely adjustable system for passenger comfort.



Pull-out side table

The side table, stored in the arm rest, can be pulled out as needed.



Sliding backrest table

The table comes in a larger size, and can be slid.



Inner armrest table

The inner armrest is also equipped with a table that can be used when required.



Leg warmer

Each seat is equipped with leg warmers.



Hand grip

The hand grip has been installed on seats to make it easier for passengers to walk along the aisle.



Reclining lever

The air-assist mechanism uses pressurized air to help easily bring a reclined seat to the upright position.



Audio panel

The audio panel helps Green Car passengers enjoy audio services.

Reclining mechanism

Easing stress on the back, lower back and thighs

The pivoting point for the backrest is positioned to fit the natural movement of a human body, to eliminate the discomfort of feeling as if the back is being pulled, or the problem of having to correct the sitting positions frequently.

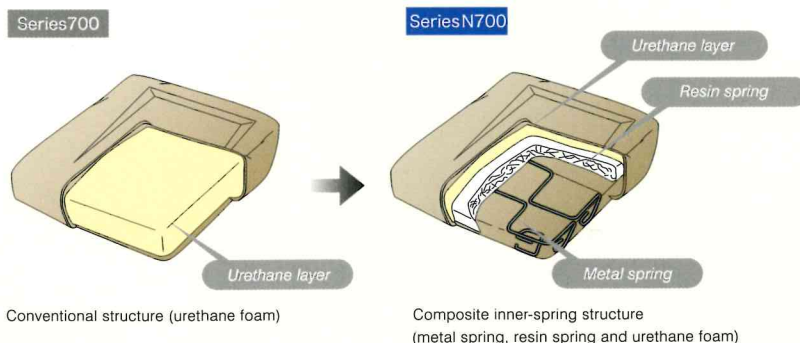
The pivoting point for the seat is placed closer to the front edge, near the back of the knees, to provide stable support and eliminate any uncomfortable pressure on the thighs.

Seat structure

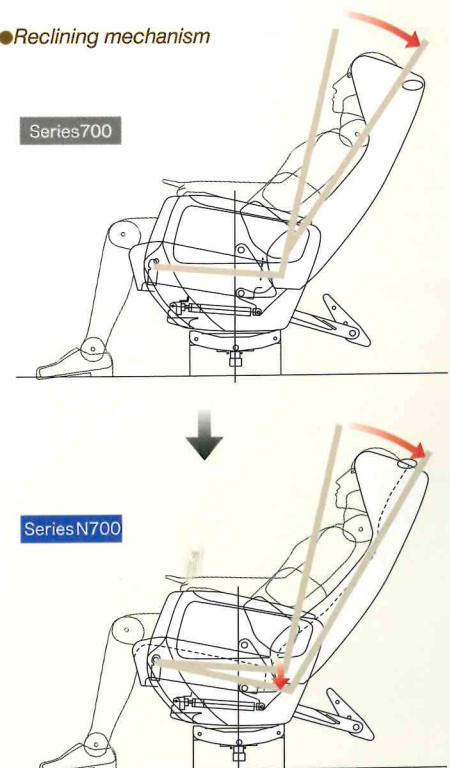
Enhanced holding and fitting properties

The conventional urethane structure has been replaced with the composite inner-spring structure that combines lightweight metal wire springs with high surface rigidity resin springs with resilience and urethane foam. The structure provides firm support, incomparably stable resilience and a deep cushioning effect.

● Seat structure



● Reclining mechanism



Regular Cars

The bright and open feel in the cabins help passengers relax through their journey.

Regular Cars have soft lighting positioned in the center, and is designed with gradation-patterned interior to offer a casual and gentle atmosphere.

With careful attention to details, such as the use of composite-spring cushioned seats and thin ceiling lights, that reflect the design philosophy for "Green Cars", a "cabin environment with a bright and open feel" is successfully delivered.



Chic and elegant entrance vestibule

The entrance vestibule for Regular Cars has the air of a sophisticated hotel. Similarly to the "Green Car" vestibule, it boasts a wide area to accommodate passengers with large luggage.

Expanded seat size

All seats, except for the middle section of a three-seater, have been widened by 10mm. They adopt the newly-developed composite inner-spring structure for cushioning, like in the "Green Cars".



Gentle and Clean

Furnished with smoking rooms to provide a smoke-free comfortable passenger cabin.

The Series N700 has introduced smoking rooms to achieve separation of smoking areas.

An on-board environment which is both passenger and environment conscious is provided through such features as the latest ventilation system that simultaneously maintains fresh air, adjusts temperatures at a comfortable level, and promotes energy conservation.



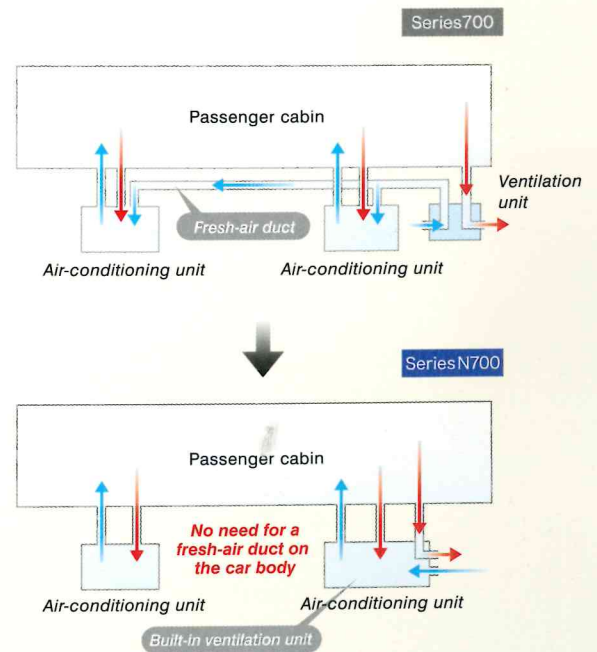
All seats have been made non-smoking, smoking rooms are provided in separate areas

(In Cars No.3, 7, 10 and 15)

Each smoking room is equipped with the latest photocatalytic air purifier, developed by the Komaki Research Center of JR Central. The automatic door provides access to the room while ensuring that smoke and odor do not escape into passenger cabins, in an active effort to prevent passive smoking.

New air-conditioning and ventilation system

The Series N700 has introduced a total heat exchanger, which facilitates ventilation and conducts heat exchange with fresh air, to achieve energy conservation in a more compact and lightweight unit. Further, the development of a new air-conditioning system ensures sufficient cooling capacity even at the height of summer, while maintaining cabin air freshness at all times.





For Business

The best high-speed on-board office

The Series N700 offers miscellaneous on-board facilities and a comfortable mobile computing environment

A large table accommodates a laptop computer.

Other measures that provide strong support to businesspersons who want to make efficient use of their travel time, include substantially increasing the number of outlets and building the optimum environment for mobile computing.



All seats in Green Cars (200 seats) are equipped with an outlet for mobile devices.

It facilitates the use of a computer and charging of mobile phones, as an efficient support for businesspersons.

The Series N700 offers a high-speed on-board office for businesspersons who travel around the major artery of Japan.



Substantial increase in the number of outlets on Regular Cars

Outlets have been placed at window seats as well as the front and rear seats (total of 533 outlets). They can be used to power a computer or charge mobile phones.



Comfortable mobile communications environment

The vestibules with an enhanced level of quietness allows for comfortable mobile phone communications.



Backrest table expanded to accommodate a laptop computer

To meet the needs of passengers who wish to use a computer on board, the Series N700 features large backrest tables, expanded to accommodate a laptop computer.

The tables on "Green Cars" also feature a sliding mechanism.



Delivering on-board Internet connectivity

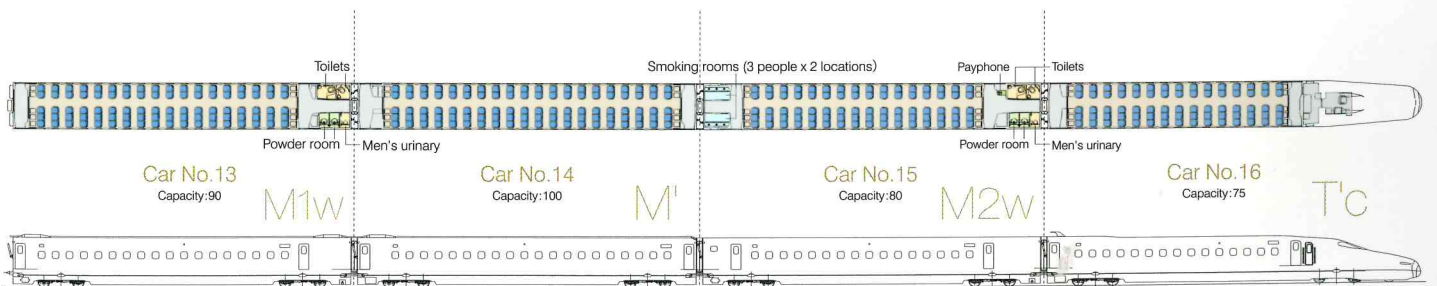
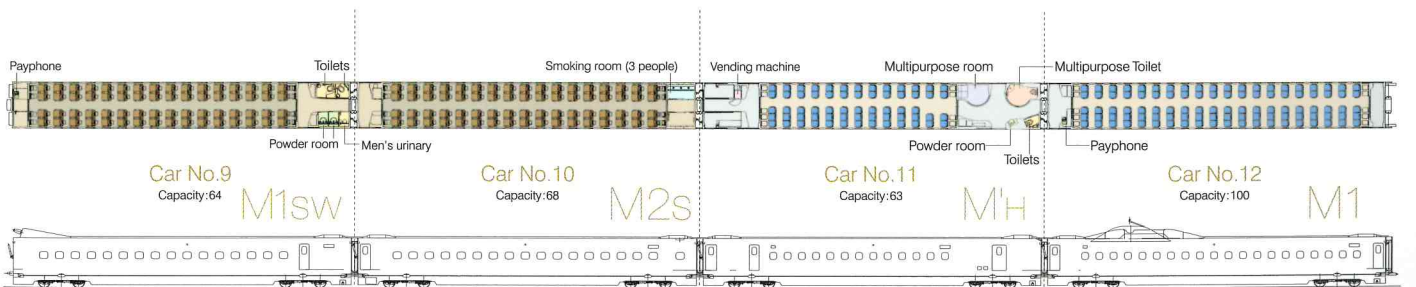
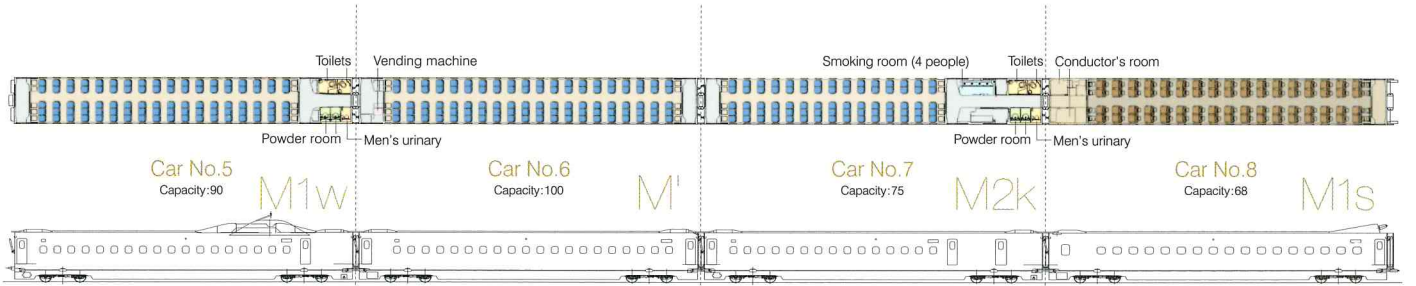
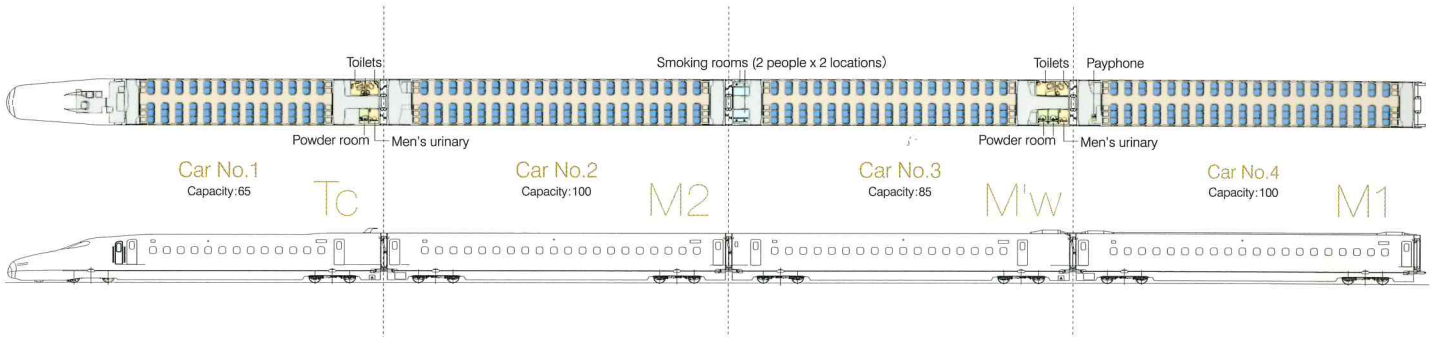
The Series N700 will offer high-quality Internet connectivity, available even during high-speed train operation.

(The service is to be launched for the Tokaido Shinkansen section in the spring of 2009.)

Specifications

		Series N700	Series 700	
□Basic formation	Configuration	14M2T	12M4T	
	Unit configuration	4 cars per unit	(Same as left)	
□Capacity	Seating capacity	1,323 (Green Car: 200, Regular Car: 1,123)	(Same as left)	
□Maximum speed	Maximum speed (Tokaido)	270km/h	(Same as left)	
	(Sanyo)	300km/h	285km/h	
	Operating speed at curves (R2500m)	270km/h	250km/h	
	Starting acceleration (Tokaido)	2.6km/h/s	1.6km/h/s	
	(Sanyo)	2.6km/h/s	2.0km/h/s	
□Output	Total power output	17,080kW	13,200kW	
□Weight	Total weight (at capacity)	Approx. 700tons	708t	
□Dimensions	Car length (Middle car)	25,000mm	(Same as left)	
	(Leading car)	27,350mm	(Same as left)	
	Car width	3,360mm	3,380mm	
	Car height (Middle cars)	3,600mm	3,650mm	
	(Rear end of the leading car)	3,600mm	3,650mm	
	(Front end of the leading car)	3,500mm	3,650mm	
□Leading car	Nose shape	Aero Double-Wing	Aero Stream	
	Nose length	10.7m	9.2m	
□Bogie	Bogie structure	Bolsterless bogies	(Same as left)	
	Equipment for riding comfort	Advanced semi-active suspension system (all cars)	Semi-active suspension system (7 cars)	
	Body inclining system	Air-spring mechanism (1° inclining)	—	
□External equipment	Hood between cars	Cover-all type	Sides only (partitioned)	
	Destination display	Large full-color LED	Text	
□On-board amenities (Green Cars seats)	Seat width	480mm	475mm	
	Reading light	High-intensity LED (built into each seat)	Halogen lamp (under luggage racks)	
	Leg warmer	Installed	—	
	Backrest table	Installed (with a slide-out mechanism)	Installed	
	Pull-out side table	Installed	(Same as left)	
	Footrest	Installed (freely adjustable system)	(Same as left)	
	(Regular Car seats)	Seat width (middle seat in rows of three)	460mm	(Same as left)
	(others)		440mm	430mm
	Cushion	Composite inner-spring structure	Urethane foam	
(Other amenities)	Smoking rooms (Cars No. 3, 7, 10 and 15)	Installed (6 locations) * All seats are non-smoking	—	
	Outlet for mobile devices (Green Cars)	All seats (200)	Available on some train-sets	
	(Regular Car)	Window seats, front and rear seats (553 outlets)	Available on some train-sets	
	On-board Internet service	Under consideration for Tokaido Shinkansen Section	—	
	Restroom (in odd-number cars)	2 western-style toilets + 1 men's urinary	1 western-style toilet, 1 Japanese-style toilet, 1 men's urinary	
	Multipurpose toilet (Car No.11)	2.66m ² (Ostomate-accessible)	2.35m ²	
	Multipurpose room (Car No.11)	2.78m ²	2.24m ²	
	On-board information display system	Large multi-color LED	LED	
	Surveillance cameras	Installed (60)	—	

Configuration



Green Cars: 200 passengers
 Regular Cars: 1,123 passengers
Total: 1,323 passengers

