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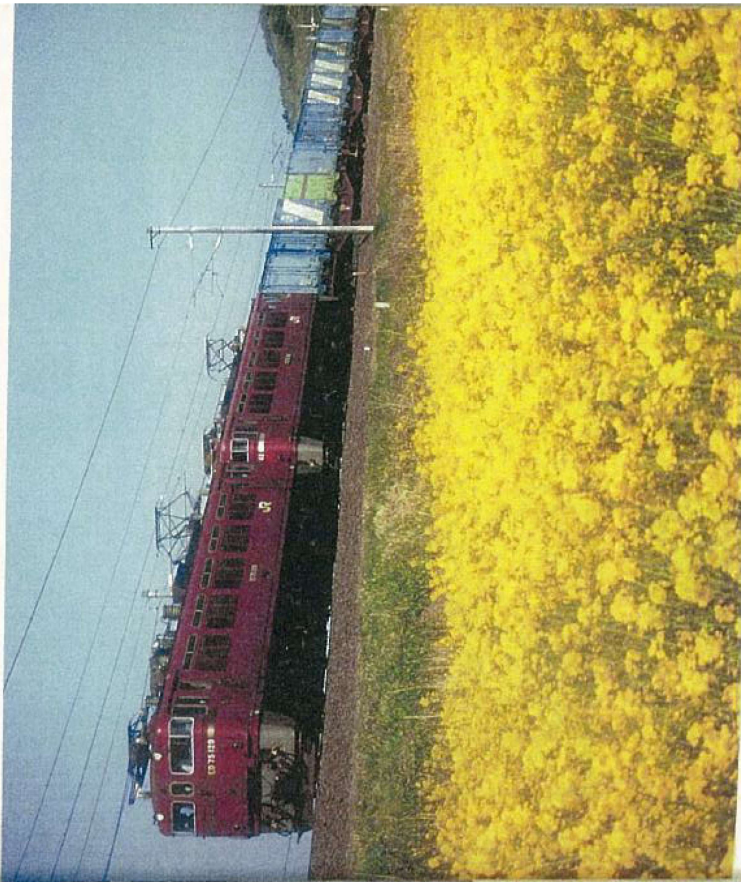
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# Japan Train Operation Association Magazine March 1995

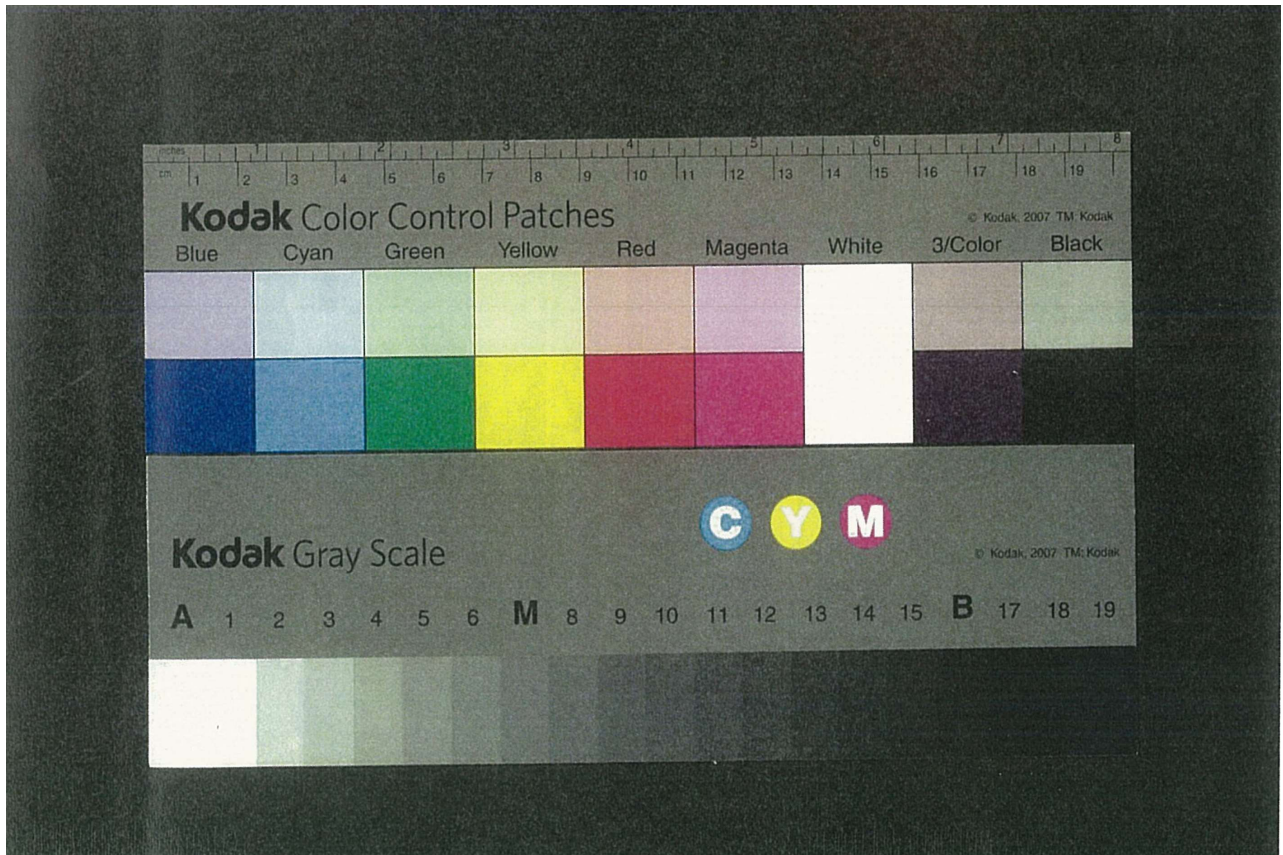
Special number on through service

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JAPAN TRAIN OPERATION ASSOCIATION



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[Ear Day (a pun on "March 3")]  
 \* Special number on through service

==== \* Special edition =====

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Frontispiece: Tobu Railway 9050 Series Railroad Car  
 Housing and Urban Maintenance Public Corporation Model 9100 Railroad Car  
 Cut: IKEDA, Moritoshi, YASUDA, Junichi

Cover: Freight Liner going through a field of rapeseed (honorable mention in cover photograph contest)  
 Picture taken by: Kochi Endo (individual member, Sendai)  
 Photo date and location: May 8, 1993, JR East Tohoku Main Line, between Kiiashirakawa and Higashishirashi  
 Camera: Nikonmat F1/Film: Fuji Chrome Bellow/Aperture: f4 to 5.6/  
 Shutter: 1/500









(28)

and a [CFC-free] cooling medium is used in order to deal with environmental problems. The GTO drive device adopts a system without a pulse transformer, for smaller size and lighter weight, and for signal transmission from the microprocessor amplifier, optical fiber is used, which offers superior noise insulation and high-voltage insulation, for better reliability. A modulation pulse number switchover system is adopted in order to reduce the unpleasant electromagnetic sounds and changes in timbre caused during pulse mode modulation upon startup. This makes it possible to suppress the transient torque fluctuations that occur when pulse mode switching is done, and produces better riding comfort as well.

Used for the main motor is a 150-kW high-output induction motor, in consideration of the high acceleration on the Tokyo Metro lines and the high travel speed on our company's lines. Also, by choosing the same VVVF devices and main motors as in the 20050 series, it has been possible to reduce the need for spare parts.

(2) Brake equipment  
 What is adopted for the brakes are all-electric command electromagnetic straight-through air brakes with supplementary air brakes also used for regenerative braking. Four types of brakes are provided: off valve type ordinary brakes, emergency brakes, safety brakes, and suppression brakes. They are made up of parts such as a brake controller, a brake command unit, a brake control device, an electromagnetic amplifier, and a brake relay. The brake controllers are of non-contact type, which improves operability, and a brake command unit is provided under the floor as the output unit. In the ordinary brake, normally three pressure-applying command lines are controlled by a digital command with a pure binary ON-OFF choice, providing seven levels of braking. In the emergency brake, normally two pressure-applying lines, + and -, are pulled through in reciprocation, to prevent touching together and to improve reliability. The safety brake, which normally is made up of pressure-applying circuitry, is constituted independently of the ordinary and emergency brake systems, and only if this is impossible after operation of the emergency brake does it operate automatically/independently in each car as a backup brake. For improved reliability, as brake monitoring circuitry, various circuits are provided for detection of braking failure, detection of failure

release the brake, a function for forcibly releasing the brake if it fails to be released, and the like.

(3) Motor-driven air compressor  
 What was adopted for the motor-driven air compressor is a low-noise air compressor that runs on an AC 220 V power source and employs a shim-type three-phase induction motor having easy startup control. Using a shim-type motor is meant to improve reliability and serviceability. Reliability is also improved because an after-cooler and demineralizer are both provided, and the brake is supplied with compressed air, without a drain.

(4) Auxiliary power unit  
 Adopted for this device is an IGBT (insulated-gate bipolar transistor) type SIV control element. It is made up of an inverter, a starter, a reactor transformer box, etc. The inverter part can be made smaller, lighter, and simpler because with the IGBT element being of the voltage drive type, the gate control power is low and the circuitry can be simplified. It can be turned on and off at high frequency and thus the output waveform is nearly a sine wave, allowing the waveform rectification circuitry to be simplified, and being a molded element, it can be built in to easily make a cooling structure. The starter is of the type in which the job of cutting off the current in an accident is done by a thyristor, so the circuit breaker is no longer responsible for blocking large currents, and therefore a small electromagnetic contactor can be used, allowing a smaller size. The magnetic noise of the transformer is reduced by inserting a filter for inverter output waveform rectification in a prior stage of the output transformer inside the reactor and transformer box.

A power receiving and supplying device is a device that supplies power only to the important loads from the normal side when due to a breakdown of an SIV device, power is supplied semi-automatically by operating a power receiving and supplying switch that is provided behind the operator's seat.

(5) Displays and automatic broadcasting equipment  
 The destination displays on the front and side that display the type of train and the destination have changed from the former motor-wound type to the high-brightness LED type, for better visibility. To save energy and prolong useful life, the destination displays on the side have been given the function of automatically turning off their display between stations, where the need for such display is questionable.

As an in-car guidance device, a nine-inch liquid crystal monitor is provided above the side doors in each car; visually, they provide improved service by displaying the destination, the type of train, the stations the train will stop at, and other information. Consideration has been given to making this monitor easy to see from the seats as well, by mounting on the lintel in sections reinforced plastic (FRP), and tilting it at an angle of 30 degrees from the vertical.

The broadcast device is of automatic broadcast type, besides the basic broadcasting of announcements about the destination, the stations where the train stops, and information about changing trains, it also broadcasts warnings when the emergency brake operates. Also, the broadcast device adopts an automatic volume control system that can vary the loudness to correspond to changes in the background noise, making it possible to make announcements at the right volume for the noise inside each car. The opening and closing of doors is given a relatively large weight among matters concerning the safety of passengers and the railroad car, and consideration has been given to further reducing accidents when doors are opened and closed; functions have been added with which, when the doors are closed,

(6) Emergency reporting device  
 Besides putting two emergency reporting devices of the same buzzer type as previously in each car, an interactive emergency reporting device has been put in the wheelchair area, making it possible to communicate with the crew. In this operating method, upon pressing a reporting button (with a clacker plate) in the reporting device, an emergency reporting buzzer sounds in the caller's car and in the crew compartment. Then, upon pressing a confirmation button on the report receiving device in the crew compartment, the buzzer stops, a communication display light lights up, and two-way communication can be conducted. Resetting when the conversation has ended can be done from the crew compartment.

(7) Platform cars  
 A bolsterless platform car having no bolsters was made, to lighten the weight and provide maintenance-free operation. A Z-link type pulling device was adopted, to improve riding comfort.

In the axle-box suspension, two horizontal flat springs are attached above and below between the axle-box and the platform car frame, and with the proper degree of left-right rigidity, with respect to the front-rear rigidity, excellent properties can be maintained. In addition, U-shaped shock absorbing rubber can suppress front-rear and left-right rocking while maintaining high-speed stability

8. Conclusion  
 The 9050 series railroad car was introduced on operating rail lines in December of last year. We expect that providing passengers with these pleasant cars will enhance the image of Tobu Railway. And we hope that everyone will continue to favor us with their patronage. Finally, we wish to express our gratitude to everyone in the supervisory agencies and in related positions for their guidance

(Japan Train Operation Association Magazine, March 1995)

and unstinting efforts in the design and production.  
 (Toshiya Yoshino, Car Section, Operation Car Department, Tobu Railway (Ltd.))

**Housing and Urban Maintenance Public Corporation**  
 The Model 9100 Railroad Car

1. Introduction  
 The Housing and Urban Maintenance Public Corporation, together with beginning operation on part of the corporation's second-period line in spring of 1995 (planned) (a 4.7-km stretch between Chiba-Newton Central station and Insei Makinohara station), has created a new type of railroad car, the model 9100 (double 8 car train, totaling 16 cars). The new car is affectionately called the "C-Flyer". The C is the first letter of Chiba-Newton, Comfortable, Clean, and Culture and the like, and "Flyer" means a rapid train or express train.

It was designed and produced to enhance the image of Chiba-Newton and to provide functions as a railroad car in the pursuit of convenience and comfort. Since the public corporation railway began operations in 1964 between Komuro and Chiba-Newton Central (4.0 km) we have worked to ensure transportation for the residents of Chiba-Newton, and in November 1992 we are beginning construction of a new line between the sections that are now in operation.

2. Basic design concept  
 The model 9100 railroad car was designed with the following points in mind.  
 (1) Enhancing the image of Chiba-Newton  
 (2) Because maintenance and other operations will be entrusted to the Hokuso Development Railway, the underfloor and other equipment will be shared with the Hokuso model 7300.

(3) Nonslip service will become possible among the Hokuso, Keisei, Toei Asakusa, and Keihin express lines.  
 (4) Labor and energy will be saved, and high reliability will be achieved.  
 (5) Riding comfort will be improved, and noise will be reduced.

3. Train composition and main specifications  
 With an eight-car 6M/2T fixed train composition, the performance is as follows.

- (1) Acceleration: 3.5 km/h/s
- (2) Deceleration: 4.0 km/h/s normally, 4.5 km/h/s in an emergency
- (3) Designed maximum speed of car: 120 km/h







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4. bears the seal/stamp of **Ryouichi YAGI, Notary Public**

Certified

5. at **Osaka**

6. **JUL. 21. 2016**

7. by **the Ministry of Foreign Affairs**

8. No. **5597**

9. Seal/stamp:




10. Signature:

*Naomi Asano*

**Naomi ASANO**

**For the Minister for Foreign Affairs**

Notary Public Office

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## Certification of Translation

Translator's Declaration: September 7, 2016

I, Mark Spahn, hereby declare:

That I possess advanced knowledge of the Japanese and English languages. My qualifications are as follows:

- over 35 years as a Japanese-English translator, focusing primarily on technical and legal documents, including four years in-house at the law offices of Baker & McKenzie in Tokyo
- Master's degree in Electrical Engineering/Computer Science from the University of Utah
- computer programmer at Computer Task Group
- co-author of "Japanese Kanji & Kana: A Complete Guide to the Japanese Writing System," Tuttle Publishing, 1981, 1997, 2011, 2012
- co-author of "The Kanji Dictionary" (a 47,000-entry bilingual dictionary, well known as the Spahn-Hadamitzky dictionary) Tuttle Publishing 1996, 1998, 2002.

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