

January–December 2015 · \$20.00 / ERA Tour of Traction in Japan

HEADLIGHTS



Headlights

January–December 2015

Volume 72, Number 1–12

The Magazine of Electric Railways

Published since 1939 by the ERA



Electric Railroaders' Assoc., Inc.
P.O. Box 3323
Grand Central Station
New York, NY 10163-3323

Staff

Editor and Designer

Sandy Campbell

Associate Editor

John Pappas

Photographers

John Pappas, Ron Yee,
Michael Glikin,
Asahi Shimbun, Wikipedia

Printer

Innovative Technologies in Print

Membership

Headlights is sent free to all ERA members. Join today to get your copy of the next issue at ERAUSA.ORG/JOIN

Back Issues

Digital copies of *Headlights* can be ordered at ERAUSA.ORG/HEADLIGHTS/ORDERFORM

Contact Us

To contact the ERA, visit ERAUSA.ORG/CONTACT

Copyright © 2016 ERA
All Rights Reserved
Published February 2016



MIX
Paper from
responsible sources
FSC® C016529

TRACTION IN JAPAN

(Front and back covers)
On the island of Shikoku, in the northern city of Matsuyama, a streetcar on loop line 2 waits patiently for the passage of an inter-urban on the Takayama Line at Otemachi Crossing.

Both operations are part of the same company, Iyotetsu, which undoubtedly makes the coordination at two level crossings much smoother than it would be otherwise.

MAY 16, 2014

(Right) Passengers on JR West's Osaka Loop Line stare at their electronics, much as they do elsewhere in the world.

MAY 19, 2014

Welcome to Japan, a railfan's paradise! Not much gets into print in English regularly on the traction scene in Japan. This special issue of *Headlights* provides a modern day pictorial survey of the surviving streetcar systems of Japan as seen by ERA members during a comprehensive tour in May 2014. It is an essay of the places visited and the systems seen and ridden.

- 6** Tokyo
- 16** Other Electric Traction Around Tokyo
- 23** Enoshima
- 26** Mount Fuji and the Hakone Tozan Railway
- 32** Toyama
- 36** Fukui and Takaoka
- 41** Japanese Alps: Tateyama Tunnel Trolleybuses
- 42** Okayama
- 46** Hiroshima
- 52** Nagasaki
- 56** Kumamoto
- 58** Kagoshima
- 60** Matsuyama
- 65** Kochi
- 72** Kyoto
- 79** Osaka
- 82** Wakayama Electric Railway
- 84** Hakodate
- 87** Sapporo
- 91** Japan Streetcar Systems





TRACTION IN JAPAN

Text and photography by John Pappas

Additional photos by Ron Yee where noted

This is the view you'll see when you exit just about any streetcar of any age in Japan. The Japanese traction industry uses a "pay-leave" system of fare collection like the one at left. The universal bright orange fare machines seen here collect coins and bills, make change, issue tickets and validate smart cards. They also assure a queue of people waiting to pay and get off.

Japan... Land of the Rising Sun. The Old Dragon. The Mysterious East. A place full of surprises, incongruity and inscrutability. Also super high-speed trains, electric railways and interurbans. And streetcars.

Despite the major move in the 1960s and 70s to rid its cities of streetcars, (readers are referred to "Sayonara Streetcar" by Ralph Forty, *Interurbans Special 70*, published in 1978) 20 Japanese systems still continue to operate and give every appearance of planning for at least a medium term future. In May 2014, the ERA organized a tour of 18 of those systems, along with cultural sites, commuter rail rides and long distance train travel with the aim of introducing this country of great contrasts to our members. Some 43 of them came along.

This issue is not a railfan's guide to Japanese traction. Such a work would be highly desirable, but will have to wait for an individual who has the time to do the enormous research required just to get each system's roster correctly stated. Also "traction" should refer to the myriad of Japanese interurbans, light railways and subways, as well as streetcars. As is true with Switzerland, the lines often blur between the three modes.

A word about the table and technical details at the end of the article. They were primarily gleaned from "Japanese Streetcars, An Active Roster," a highly illustrated book published by the Japanese Tourist Bureau, but all in Japanese. Items such as number of cars and route mileage were checked against current figures as they were available on various websites. Otherwise, the figures reflect the 1999 conditions at the time the book was published. Low-floor cars have since been added to most of the systems, so the car totals have undoubtedly changed, although retirement of older equipment probably brings the figures close to what is shown. Consider the table a useful chart for comparison purposes.



Tokyo ranks 19th on the list of the world's largest cities, but number one in terms of urban area population (37 million). It has the expected attendant crowds and high rise development, but somehow the Japanese seem to do it in a less hectic, less ugly fashion. There is also observable care and thinking in urban design and that includes balancing road space with railway and other rail transit expansion.



Two views of the Tokyo urban scene. At top is the famous Ginza at night. While still Tokyo's version of Times Square, newspaper articles speak of newer places that now form the center of their older teen and young adult night life.

At left is a view from the Yurikomome Waterfront Line station showing a traffic flyunder as one of the methods to shoehorn more vehicle movement into heavily confined spaces. The fact that it was a holiday is probably the reason the streets are relatively empty.

At right, the exterior of the beautifully maintained 19th Century architecture of the main Tokyo railway station. Incidentally, this is NOT the biggest station in Tokyo. That distinction belongs to Shinjuku, located on the west side near the center of government and several corporate headquarters.



TRACTION IN JAPAN



Tokyo once had a major tram system, but it became a victim of increasing automobile traffic and the expanding subway network. Since 1965 one

line remains... the 7.6-mile Arakawa Line. Most of the route is on double-track private right-of-way, including "back alley" as seen here near the outer

terminal at Minowabashi. One way running time is 53 minutes. The line is an odd 4' 6" (1372 mm) gauge, which is found on a couple of other systems in Japan.



(Top) A little over $\frac{1}{4}$ mile of route is in mixed traffic, hence its official designation under Japanese regulations as a streetcar line. This is the view of southbound 7031 passing under the Keihin Tohoku line at Oji. The 7000s are the mainstay of the line and were built in 1954 and remodeled to one-man configuration in 1978.

(Middle) An interior view of 7019 shows a layout that is mostly standard across the Japanese traction industry. Bench seats are the norm. The device by the motorman's cab is a covered over fare machine, as illustrated on page 4. Smart cards are available on the vast majority of streetcar systems, but appear to have only moderate penetration with the riding public.

(Bottom) There is a surprising bountiful supply of written English everywhere in Japan to help guide your way, although you won't find many of the locals who speak it. This sign provides an informative, geographically correct overview of the Arakawa line and its many connections with stations and intersecting lines labeled in English below the Japanese characters.

TRACTION IN JAPAN





Newer cars can also be found, although unlike many other streetcar systems, the Arakawa Line has no articulateds. As a result, service is very frequent, from five to seven minutes throughout the day. The 10 8800 series cars are the newest on the line, built in 2009 by Alna.

Two PCCs made it to Japan, both went to Tokyo. One is preserved here on a plinth at the carhouse adjacent to the Arakawashakomae station. The car has been restored and features displays in the interior. There is no mistaking those three foot pedals, the classic "Johnson Bar" or the row of toggle style gang switches.

TRACTION IN JAPAN



The value of operating heritage cars has not been lost on the Japanese streetcar industry. Unfortunately, there is not much of a supply remaining. Car 9002 (above) is reminiscent of New Orleans' efforts to hide the air conditioning condenser and other roof-mounted equipment behind a very false-looking deck roof. The car was actually constructed in the 2007.

The 8500s (top right) are another primary class that fills out the majority of the car requirements on the line. They date from 1990. Both sides of the Arakawa Line along its last mile or so feature a bountiful planting of roses, which were in full bloom during our visit.

Tokyo also has the Setagaya Line (bottom right), which is classified as streetcar, but more properly functions as light rail (all private right-of-way, high platform loading). This is a former branch line of the Tokyu Railway empire and operates a little over three miles on the southwest side of

Tokyo using articulated cars. It shares its 4' 6" gauge with the Arakawa Line, but the two lines are miles apart. A total of 10 cars are available for use, built by Tokyu Car in 1999. The present owner, Tokyu Corporation operates railways, department stores and has a majority interest in Japan Air Lines.

It is not affiliated with the Tokyu Car Corporation which built the Buffalo, New York LRVs, the Cleveland heavy rail cars and the bodies for the Boeing SLRVs. That company is now owned by JR East.



TRACTION IN JAPAN



Car 306, above, leaves the typical intermediate station at Miyanosaka. Cars are painted in different all over colors. Service is offered every six minutes during the day and every four to

five minutes during peak hours. At right, the northern terminal is at Shimo-takaido, where the line shares a covered connection with the Keiô

suburban line. Car 308 has dropped passengers off on the right side platform and is now loading on the left. This separated passenger arrangement appears to be used to a great extent

around Japan to squeeze a bit more efficiency out of operations at termini. The south end of the line connects with Tokyu Railway's Den-en-toshi Line at Sangen-jaya Station.



Serving as a permanent display at Miyanosaka Station, 601 (above) shows off the design of the previous generation of cars. The EER stands for Enoshima Electric Railway, its owner from build year 1970, which followed the line's takeover from Tokyu, to 1999 when the new LRVs began arriving.

Other Electric Traction Around Tokyo



The busy pace of the tour did not allow for official exploration of Tokyo's extensive subway system, nor its even larger suburban network operated by different Japan Railways (JR) companies and private railways. But there was free time to do some exploring and at least gain an insight as to how much information there is to try and absorb.

There are 13 subway lines operated by two companies. Tokyo Metro, which despite its name is privatized, operates nine lines, while the metropolitan government-owned Toei Subway operates four (as well as the Arakawa Streetcar and bus lines). All are identified by letters, usually corresponding to the name of the line, and a distinctive color. There is a

consistent station numbering scheme which aids tremendously in navigating the system and all stations are labeled in English in addition to the Japanese characters. The Japanese are also consistent in naming rail lines and that practice extends to long distance train lines and the Shinkansen high speed network.

It would take another issue to fully do justice to the subway and commuter rail system and that will have to wait until another time and probably another visit. But to just give a feel of the enormity of the system and its ridership, consider that the 13 lines carry upwards of 8.7 million daily riders on 188.4 miles of route. Compare that to the 5.5 million of New York's subway system... no slouch in its own right.



The TOEI Shinjuku Line operates these handsome, stainless steel cars in sets of eight, which were manufactured by several builders, including Hitachi, Kawasaki and Kinki Sharyo. The 4' 6" gauge line is 14.6 miles long, opened in 1978 and extended several times since then. In common with six other subway lines, it features inter-working with a suburban line, in this case the private Keiō network. The subway operator gets replaced by a Keiō train operator (at Shinjuku station in this instance) and the train continues to a suburban destination

(Sasazuka on the Keiō New Line). Such coordination would be unthinkable in many parts of the world, including the U.S. Control trailer 10-270 was delivered by Alna Koki in December 1997.

The interior of the Shinjuku cars (above) is typical of all subway fleets: perimeter seating with plush cushions and open vestibules between cars. Although not seen here, the Shinjuku Line is reportedly operating at 157 percent of its designed loading standard at present during peak periods. That is despite a 1-minute 50-second headway, the most frequent on the subway network.

The Tokyo Metro Marunouchi Line (right) is the second oldest of the subway routes (1954, after the 1927 Ginza Line). It is 17 miles long and standard gauge, making it incompatible for through running with any of the suburban railways, as is also the case with the Ginza Line. Yotsuya Station, shown here, is located along one of four stretches of above ground running. The O2 series six-car trains were introduced in 1988 and feature Automatic Train Control. The half-height platform doors were added in 2009 and their use is spreading across the subway system.



TRACTION IN JAPAN



The Yamanote Line is as much a part of the Tokyo commuting scene as the subway system, but is owned and operated by East Japan Railway (JR East). It forms a rail belt around the metropolis' central area. The 21.4-mile bi-directional loop line

serves 29 stations and operates service as close as 2.5 minutes at peak times, in the process serving 3.7 million people a day. This is a good example of how lines blur between subways and commuter rail. As with the majority of the traditional

Japan rail system, it is 3' 6" gauge. The view at top is at the key station on the line, Shinjuku, which is Tokyo's heaviest in terms of train movements and people served. This E231-500 series train dates from 2002.

The design of the commuter train further morphs into regional and longer distance trains. This Tokaido Line set above also uses the E231 series, but in addition to the commuter cars, it features two double deck cars with Green Car

(First Class) amenities, including forward facing seats and commodious seat spacing. The ERA tour used this train to travel to Kamakura for our visit to the Enoshima Electric Railway.



The Toyo Rapid Railway offers an example of a private company operating a Tokyo area rail line and one who hosts through-running with the Tokyo Metro Tozai subway line. This 10 car set was built by Hitachi in 2006 and is near identical in design to a series in use on the Tozai Line. Here it has run through to the west end of the Tozai Line at Nakano Station.

Typically in Japan, private railways often also own department stores. The Odakyu Railway operates from a surface area of the sprawling Shinjuku Station, which causes it to encounter several grade crossings until it reaches an elevated right-of-way some distance away. But its department store occupies prime multi-floor space in the west side of the station where passing railway riders can be easily enticed into combining travel with shopping.



TRACTION IN JAPAN



Besides rail, the Tokyo area is home to no less than four monorail lines. One of the oldest and most used is the Tokyo Monorail, which operates from a connection with the TOEI Subway's OEDO and the JR Yamanote Lines at Hamamatsucho to Haneda Airport's multiple terminals. It is Tokyo's second and primarily domestic air facility. The line is 11.1 miles long and



RON YEE



features local, "Rapid" and "Haneda Express" service uniquely and deftly scheduled on the same beam without benefit of passing facilities. It is an example of how precise operation of a well designed schedule can provide an optimum use of a fixed facility. Service averages every four minutes for much of the day (as represented by the various trip colors on the schedule shown at left).

The line dates back to the 1964 Olympics and the cars are reminiscent of Seattle Monorail's Alweg straddle beam design, although the original equipment was replaced by this 1000 series train starting in 1989. They also operate at faster speeds, up to 50 miles per hour. The ride is surprisingly good at that speed.

TRACTION IN JAPAN



There is also an automated, rubber-tired guideway line that serves the artificial island of Odaiba in Tokyo Bay. One of the key scenic features of the Yurikomome Waterfront Line is a 270 degree circular climb onto the lower deck of the Rainbow Bridge, seen in the top background. The line has grown to 9.1 miles with 16 stations. The trains have expanded to six cars, the newest of which was introduced in 2009 (as shown) and a newer series this year. It is a must for the railfan for the scenery, the architecture (the Fuji TV headquarters building is enveloped by the guideway in the lower photo), the mix of development and the study of how the Japanese have restored human scale to the sea front. A return to central Tokyo can be via a transfer to the Yurakucho Line subway.

Enoshima



The Enoshima Electric Railway (also referred to as Enoden) is another Japanese private railway, but has the look and feel of an interurban. It operates 6.2 miles from Kamakura Station on the main Tokaido Line of JR to the small city of Fujisawa. Most of the line is single track on private right-of-way, with one short section of street running near Enoshima, but that doesn't mean it's a sleepy operation. The operators manage to squeeze a 12 minute headway out of the limitations of the plant, with the help of five passing sidings and often carry standing loads, especially on weekends and holidays. The ERA group arrived during the so-called Golden Week celebrations and experienced the heavy riding on our first weekend.

Enoshima Electric Railway is also into the old-timey look with the faux roof applied. Set 50+10 was built in 1997 to commemorate the 95th Anniversary of the line and is seen

arriving at the Fujisawa terminal. Face masks are popular throughout Japan and are considered proper for people who are experiencing some form of communicable disease.

