Unit 1 Introduction

Part 1 History

Railway was the first form of mass transportation on land and until the development of the motorcar in the early 20th century it had an effective monopoly on land transport. Railway companies in Europe and the United States used streamlined trains since 1933 for high speed services with an average speed of up to 130 km/h (81 mph) and top speed of more than 160 km/h (99 mph). Both streamlined steam locomotives and high-speed EMUs were used for high speed services.

In 1957, the Odakyu Electric Railway in Greater Tokyo launched its Romancecar 3000 SE. This set a world record for narrow gauge trains at 145 km/h (90 mph), giving Japanese designers confidence that they could safely and reliably build even faster trains at standard gauge. Desperate for transport solutions due to overloaded trains between Tokyo and Osaka, Japan, the idea of high speed rail was born.

The world's first contemporary high volume capable (initially 12 car maximum) "high-speed train" was Japan's Tōkaidō Shinkansen, which officially opened in October 1964, with construction having begun in April 1959. The 0 Series Shinkansen, built by Kawasaki Heavy Industries, achieved maximum passenger service speed of 210 km/h (130 mph) on the Tokyo-Nagoya-Kyoto-Osaka route, with earlier test runs hitting top speed in 1963 at 256 km/h.

In Europe, high-speed rail started during the International Transport Fair in Munich in June 1965, when DB Class 103 hauled a total of 347 demonstration trains at 200 km/h between Munich and Augsburg. The first regular service at this speed was the TEE "Le Capitole" between Paris and Toulouse with specially adapted SNCF

Class BB 9200 locomotives.

At present, the world has a total of around 10,700 kilometers operational high-speed rail, including about 2,000 kilometers in Japan and about 1,900 kilometers in France.

Part 2 Definition

There are a number of different definitions for high-speed rail in use worldwide and there is no set standard. Additionally, lower speeds can be required by local constraints.

In the United States high-speed rail is defined as having a speed above 110 mph (180 km/h) by the United States Federal Railroad Administration.

In Japan high speed Shinkansen lines use standard gauge track rather than narrow gauge track used on other Japanese lines. These travel at speed in excess of 260 km/h (160 mph) without at-grade crossings.

In China there are two grades of high speed lines. Firstly slower lines that run at speed of between 200 and 250 km/h (120 and 160 mph) and have freight as well as passenger trains. Secondly, passenger dedicated high speed rail lines operate at top speed of up to 350 km/h (220 mph).

Part 3 Classification

Chinese trains are divided into various classes according to their speed, identified with different letters and numbers. Passenger trains are numbered by a capital Chinese phonetic letter followed by numerals. The letters refer to different classes of trains：

G-High-Speed Electric Multiple Units (EMU) Train, Gaotie in Chinese

Self-developed bullet train “Fuxing”, whose name means “The rejuvenation”, is the first bullet train designed and manufactured by Chinese engineers. Fuxing is the Chinese name of the standard EMU in China. It is developed by China Railway Corporation. It has completely independent intellectual property rights and reaches the world advanced level.

The code CR is more advanced than the CRH series. The three levels are CR400/300/200. The figures indicate the highest speed per hour, while the continuous speed corresponds to 350, 250 and 160, respectively. They are suitable for high-speed railway, fast railway and inter-city railway. The early two models were the Red Dragon CR400AF and the Golden Phoenix CR400BF. Fuxing No. CR400 is up to 400 kilometers per hour, and the standard speed is 350 kilometers per hour.

C-Intercity EMU Train, Chengji Lie Che in Chinese

This is also the fastest EMU train in China, but runs for short travel distance between two nearby cities, such as the 120-kilometer's Beijing – Tianjin Intercity Railway.

D-Electric Multiple Units (EMU) Train, Dongche in Chinese

These trains are also called Hexiehao or bullet trains in China. The designed top speed is 250 km/h. These trains have been widely used for serving fast and frequent transport throughout the whole nation.

Z-Direct Express Train, Zhida in Chinese

The top speed of Z-trains is 160 km/h, which is the most efficient transport for long-distance travel except of the EMU trains. Generally, Z-trains have non-stop on the way, but some of them have several stops. Some Z-trains are equipped with only soft-sleepers and soft-seats.

T-Express Train, Tekuai in Chinese

The T-trains have limited stops on the routes, mainly in these major cities. The highest speed is 140 km/h. Almost every T-series of train is equipped with soft-sleeper, soft-seat, hard-sleeper and hard-seat.

K-Fast Train, Kuaiche in Chinese

The top speed of K-trains is 120 km/h, having more stops than the T-trains. The K-series of trains is equipped with air-condition and the four classes of train berths.

Accommodation Fast Train, Pukuai in Chinese

These trains' numbers are identified with four digits. Its highest speed is 120 km/h but runs slower than the K-train as a result of more stops on the way. Currently, a few of Accommodation Fast Trains are not equipped with air-condition.

Accommodation Train, Puke in Chinese

With the highest speed of 100 km/h, this kind of train should be the slowest train, having as many stops as possible. The trains are also numbered with four digits. Most of the trains don't have air-condition at all.

Commuter Train, Tongqinche in Chinese

These trains are specially taken by railway staffs, so they are not opened to public passengers.

L-Temporary Train, Linke in Chinese

This series of L-trains are in operation only during the peak travel time, such as Chinese Spring Festival and the National Holiday. These trains will not be listed in

the official fixed train schedule. It is not advised to take L-trains if you have other options as they are routinely subject to delays.

Y-Tourist Train

Y-trains are for the convenience of tourist and their destinations are the popular sights. For example, there are EMU Y-trains departing from Beijing North Railway Station to suburban Yanqing County, which is a transfer station to Badaling Great Wall.