

Dwarj Rail*

Ashish Shrivastva, Electronics & Communication Dept., Ajmer Insititute of Technology, Ajmer, INDIA
(Author)

E-mail: mr.ashishshrivastva@gmail.com

ABSTRACT

The paper entitled "Dwarj Rail" is about a new generation high-speed rail engine. Transportation plays a key role in today's 'fast moving' life so that we, the humans, can reach our destination instantly. According to my research (to the best of my knowledge), such project is not available globally. Its most fascinating fact is the speed because it may attain a speed of about (700-950) km/h. Also there will be an advanced braking installed in it which may bring the train from the state of motion to the state of rest within few minutes with very less effect of glide. More details about the project has been discussed in further sections.

1 INTRODUCTION

1.1 OVERVIEW

As mentioned above, the paper entitled "Dwarj Rail" is about a new generation of rail engine. The word "Dwarj" has been derived from two Sanskrit words: "dve-" meaning "two" and "-urja" meaning "energy". Thus, Dwarj Rail is a type of rail engine that will operate on two energy sources and these energy sources are renewable making it eco-friendly.

In today's scientific era, life has become so fast that all of us want to get our work done quickly. To fulfill such requirements in this 'fast-moving' life, there are many discoveries being made. For example: E-mail (to transfer information instantly), cell phones (communication with anyone located anywhere in the world within few seconds), etc. Among these "transportation" plays an important role to fulfill such requirements.

1.2 HISTORY

Transportation can be of several types, e.g. roadways, railways, airways, seaways, etc. Railways are considered as the fastest, cheapest and safest mode either to travel or transfer luggage from one place to another.

In this regard, many countries (like China, Japan, Taiwan, Germany, UK, France, and Italy) discovered new technologies and still working on such technologies to fulfill the above mentioned requirement, i.e. high speed rail engines. As you are aware that now a days, railways are not limited to tracks only. The technology is so developed that it operates on magnetic tracks (known as Maglev), etc.

On 3 April 2007, the world speed record for conventional high-speed rail is held by the V150, a specially configured and heavily-modified version of Alstom's TGV which clocked 574.8 km/h (357.2 mph) on a test run on tracks. On 3 December 2003, the world speed record for Maglev is held by Japanese experimental MLX01 is 581 km/h (361 mph) [information

source: Wikipedia].

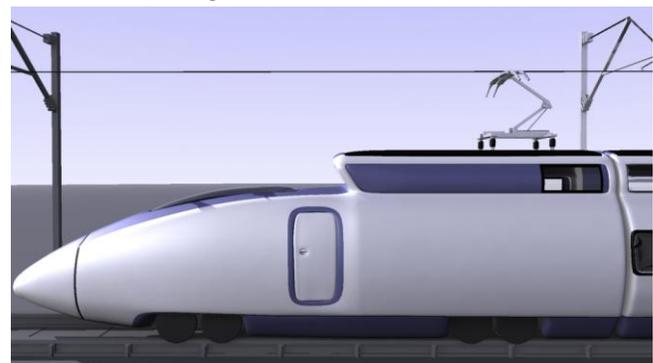
1.3 PROLOGUE

Keeping this vision, I, Ashish Shrivastva from INDIA, designed a new version of a high-speed rail engine that will run on tracks. This engine is globally unavailable according to the best of my knowledge. The engine has been designed according to all the aspects favoring to the environment. It has been designed to make it faster, eco-friendly economical and most importantly safest way of transportation. The engine will utilize power from two renewable energy sources simultaneously.

2 STRUCTURE

Now coming to its structure, the engine has very compatible design. It has been kept very simple. The rail engine has sleek design. Most importantly the structure has an aerodynamic design so as to reduce the resistances opposing its motion, thus increasing its speed and will have very low air-resistance.

Fig 1: Side view of locomotive



As stated earlier, the locomotive will have an incredible speed range of about (700-950) km/h, thus, challenging the

aircrafts with respect to speed. This assumption has been made at the beginner's stage, and therefore, require practical performance for its valid certification.

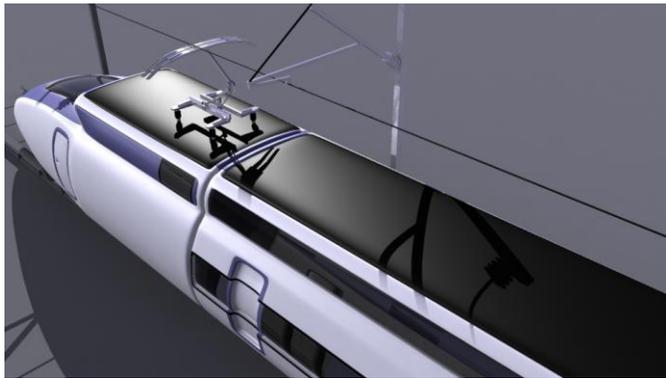


Fig 2: Top (from back) view of locomotive

3 BOGIES

Bogies are also known as car or coach (in some countries). They are of two types: steerable bogies and non-steerable bogies.

In non-steerable bogies, a pair of train wheels is rigidly fixed to an axle to form a wheel set. Normally, two wheel sets are mounted in a bogie, or truck as it is called in US English. Most bogies have rigid frames.

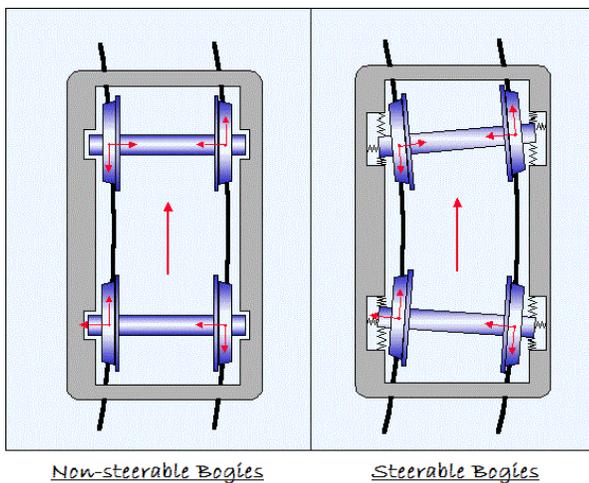


Fig 3: Comparative view of steerable bogies & non-steerable bogies. [Image credit: www.railway-technical.com]

While steerable bogies incorporate a form of radial movement in the wheel set to overcome some of the mechanical problems of the rigid wheel set mounted in a rigid bogie frame.

Besides speed, passengers seek comfort as well (thus, needed fast and comfortable transportation mode). So to meet this requirement, the structure has been designed in such a way so as to reduce jerk while traveling. In this regard, the Copyright © 2012 SciResPub.

steerable bogies have been proposed to install in it.

4 BRAKING SYSTEM & COUPLERS

Since the speed range of the rail engine is extremely high, therefore, there must be strong braking system that can be used in emergency situation as well. To overcome, a new type of braking system will be installed in it. This braking system will stop the train from its top speed to the state of rest within few minutes. This braking system has been named as ALT braking system.

Couplers are the parts of the part of the train that connects two adjacent bogies together. In Dwarj, a new type of coupler will be installed. This coupler will work on the push-pull principle.

The key feature of this coupler will be that it will automatically eject whenever an accident occurred tries to derail the locomotive. This means that whenever accident takes place and tries to derail another then the coupler will automatically be ejected so as to prevent other bogie from derailing with respect to it.

5 CONCLUSION

From all the above discussion following points about DWARJ RAIL can be concluded:

- ✓ Rail engine based on dual renewable energy sources.
- ✓ Globally not present or available till date, according to the best of the author's knowledge.
- ✓ Speed range about (700-950) km/h [according to theoretical assumption].
- ✓ Independently motored axle wheels.
- ✓ Will have steerable bogies to make journey comfortable and jerk-free.
- ✓ Installed with couplers based on "push-pull" principle.
- ✓ Advanced braking system technology, specially for emergency situation.

DISCLAIMER

The author would like to specially mention that he is the sole author of the work "Dwarj Rail" and is not copied. However, proper reference has been mentioned wherever required from where the information has been taken. The author is not responsible for any similarity resembling to a work being performed by someone else. If it somehow happens, it will be only a co-incidence. Author will not be responsible for any such incidence under any circumstances.

-Author

ACKNOWLEDGMENTS

There are some of the people who have directly or indirectly contributed to this research work, whether they knew it or not:

Mr. Madhupendra Shrivastva, Er. Sagar Saxena, Dr. Alok Pandey, Er. Sachin Chauhan, Mrs. Anita Puri, Mr. Naresh Sethi, Mr. Atul Hakim, Mrs. Neelam Mehta, Er. Vivek Saxena, Mr. Ganga Shankar, Mr. Abhishek Kakkar, Mr. Sanjay Gurjar, Dr. Vijya Singh Shekhawat, Mr. Amit Mathur, Mr. Jim Christensen,

and I would like to specially mention

Mr. Manish Jaiswal

whose encouragement and enthusiasm drove me to proceed with this research work.

-Author

REFERENCES

- Mr. Manish Jaiswal, Advisor, New Delhi, INDIA.
- Mr. Jim Christensen, NASA Contractor, USA
- Er. Sagar Saxena, Chemical Engineering Dept. MANIT, Bhopa, M.P., INDIA.
- Mr. Amit Mathur, Professor, Gujarat University, Gujarat, INDIA
- Er. Vivek Saxena, Assistant Professor, AIT Ajmer, Rajasthan, INDIA