A RESEARCH ON MAGNETIC LEVITATION TRAIN

ABSTRACT:

In this research paper we have discussed about introduction ,motivation.benefits of maglev train ,longevity,safety,guidance,current progress and conclusions about maglev train.

1.INTRODUCTION

Maglev trains move quietly and very smoothly than any other trains in the world.And these trains does not depend on traction and friction which allows their acceleration and deceleration to be more fast than other trains.Also weather has no effect on them.Leviation power needed by this train is also a very small amount than overall power energy.however most of power is needed in overcoming air resistance.These trains move in continuously increasing high speed.Also these trains have advanced and efficient technology.

2. MOTIVATION

Maglev innovation employments capable magnets to lift, center and impel the prepare along a guideway. The magnets — made with a titanium amalgam cooled to short 452 degrees Fahrenheit — are built into the prepare. They associated with other magnets within the guideway dividers.It is in track, derailments are improbable: the assist the vehicle gets from its track, the more grounded the attractive drive pushing it back. No flagging or moving parts to go off-base, with all the trains voyaging at the same rate. Envision the impact on commuting and by expansion the economy. They are less costly to function and keep up, since the nonattendance of rolling friction means that parts don't wear out rapidly (as do, for occurrence, the wheels on a ordinary railcar).It is the method decreases grinding and permitting higher speeds.Maglev trains create no discuss contamination amid operation, since no fuel is being burned.the prepare create nearly no sound making the ride smoother for the travelers.

3. BENEFITS OF MAGLEV:

The most obvious attraction of maglev trains is that they'll travel faster than traditional rail trains. the sole commercial high-speed maglev, the Shanghai Maglev, is now the fastest train living. It travels over 50 mph (80 kph) faster than the fastest high-speed wheel-rail (320-kph Hayabusa, 2013). And it's only the primary. the shortage of friction between the train and also the guideway removes many limits that bound traditional trains. Maglev will only get faster from here (Luu, 2005). There are other, more subtle qualities that also make maglev attractive:

Longevity: Conventional wheels and rails undergo an excellent deal of stress over time. they need to get replaced and repaired periodically to stay functional. In maglev, there's no contact between train and guideway, so there's substantially less wear-and-tear. The lifespan of maglev parts are appropriately for much longer because of this fact (Powell, 2003). Economically, this is often quite a incentive, as repair and maintenance are costly and time-consuming activities.

Safety:

It'd seem counter-intuitive that these trains are safer, as they travel such a lot faster than their wheeled counterparts. it's true nevertheless. Maglev trains are near impossible to derail (Luu, 2005). it might take something like complete guideway collapse to part a train from its track. Additionally, weather isn’t much of an issue. Since the trains don’t depend on friction for movement, snow, ice, and rain cause little to no effect (Luu, 2005). Finally, it's easy to elevate the guideways. If the trains are running on tracks ten feet above the bottom, there's a smaller chance of collision with an object on its path (Luu, 2005).

Energy Efficiency: Another advantage of levitation is that these trains don’t lose any energy to friction. this provides them a bonus in efficiency (Wang 2010). Energy consumption is important to the success of a transit. Much of the value of operating one goes to paying for power. Therefore this come on efficiency is incredibly important. However, while maglev trains are more efficient, they're currently not substantially more efficient than modern high-speed rail. They do, though, have the potential to be far superior during this category.

Environmental Impact: Maglev trains can make tighter turns than high-speed rails can. this permits guideways to be built which may navigate terrain far better (Wang 2010). The paths are often engineered to own as little effect on the environment as possible. Guideways also take up less area than rails do (Wang 2010). This further reduces environmental impact. And, as noted before, guideways are easily elevated off the bottom (Luu, 2005). Plants and animals alike are safer with the the train traveling above them, and not barreling by right next to them.

Noise Pollution: When considering a transportation project, noise (within reasonable bounds) isn’t as large a priority as economy or safety. However, noise reduction continues to be considered a positive feature. Maglev trains are quieter than contemporary trains, so this can be another point in their favor (Wang, 2010)

4.GUIDANCE:

The attractive levitation (maglev) prepare could be a kind of promising transportation framework that replaces wheels by electromagnets and suspends on the guideway through non-contact electromagnetic force.Train levitation speed reaction recreation appears that the maglev prepare with blended H 2/H4 with Territorial shaft arrangement controller contains a littler speed as compared to the maglev prepare with model-reference controller. In 1987, the levitation of lasting magnet over superconductors got to be much less demanding and common. Based on the ghastly powers, attractive heading have been created for different sorts of applications, such as-maglev prepare, vitality capacity flywheel. It was watched that for indistinguishably shaped bearings, strength and solidness were the same for hub and outspread magnetization and it may well be utilized for gadgets in attraction.The suspending taken a toll is approximately 1000 W/t.

5.CURRENT PROGRESS:

Almost every combination of static magnets does not get to be in stable state.so,a dynamic magnetic field is essential for achieving stabilization.These magnetic systems depends on active electronic stabilization to continuously measure the bearing difference which controls the electromagnetic current.Changing magnetic fields is essesntial forall Led systems which creates currents and also these provides passive stable movements.

For maglev trains to fly,stabilization of pitch,roll and yaw is essential and is possible by magnetic technology.

China and japan has already build prototypes of these trains.Whereas japan has made a 100km maglev railroad and is thinking to make another 100km road.

As faster travels saves a lot of time which concludes to great impact on improving other parts of life,Japan wants to be a part of it as soon as possible.

6.Conclusion :

Magnetic levitation trains have lots of applications and advantages like they're fast exceeding the speed of 300 mph . it's no fuel consumption , cost is cheaper than flights , faster , effective , less maintenance . employed in transport both passenger and goods , no fuel used , less noise , takes less space than conventional trains. These trains consume very less energy compared to standard trains. They require no large engine quite stuff as they run using linear motors . They Move plenty faster than normal trains because they're not littered with ground friction ; they might only have air resistance or drag resistance . they're incompatible with existing rail lines because they have separate track to levitate , unlike the traditional high-speed trains .Initially the value is extremely high but it's going to decrease in near future .

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