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Traffic Reducing Hydraulic System

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Abstract: ***India is one of the rapidly developing economies in the globe. The average earnings of Indians is flourishing and thereby the wide variety of privately owned automobiles is also rising. Consequently traffic manage issues are arising. Hydraulic Jack device established in Footpath for decreasing traffic in Case of Emergency. It is one of great quick fix solution to administer the traffic. Roadway paving substances, below regular running situations, are subjected to diverse forces. Motor cars, of necessity, have at least one set of using wheels which exert tractive forces on the floor of the paving. The outstanding wheels do not at all exert this tractive impact but simply roll on the floor of the paving.***

India, is a rustic with the 0.33 biggest avenue network within the global. inside the year 2019, approximately 295.8 million vehicles wandered their way via those roads. And amidst this herd, are 10,017 ambulances in an urgency to attain hospitals with sufferers fighting for his or her lives. Indian government information indicates, about 30% of on-street deaths are brought about due to behind schedule ambulances. Additionally, more than 50% of heart assault cases attain medical institution past due because of vehicle jams. With India's dashing populace and financial system, and those with their personal automobiles, extended signals and limitations for emergencies, our project Hydraulic traffic reduce system goals to lessen such casualties. through offering hydraulic jack beneath the footpath such that in case of emergency; motors could make their manner thru the traffic, at some stage in indicators effectively. as regards to slow traffic actions at the same time as making way for emergency sirens this manner might be definitely effective and a formidable approach towards assisting the improvement of the nation.

Keywords: Hydraulic Jacks, Traffic Congestion, Traffic, Emergency, Ambulance, Footpath.

I. INTRODUCTION

One of the number one demanding situations has been traffic congestion. Congestion on roadways started to hinder the secure and efficient flow of transportation as vehicular traffic expanded. Congestion may have an immediate effect on emergency reaction cars. To keep away from this, we advanced the Hydraulic TRS idea for easy and green vehicle motion. traffic congestion has been one of the primary issues. As vehicular traffic started to boom the congestion on streets started to hamper the secure and efficient movement of traffic. traffic congestion may also directly have an effect on the manner of the emergency. So, to keep away from these we've introduced the concept of Hydraulic TRS for easy and efficient motion of automobile. India is a country with the 0.33 biggest road chain on the earth. in the year 2019, about 295.8 million cars wandered their manner via these roads. And amidst this herd, are 10,017 ambulances in an urgency to attain hospitals with sufferers combating for their lives. Indian authorities information shows, approximately 30% of on-street deaths are induced because of delayed ambulances. additionally, more than 50% of cardio vascular cases reach health facility past due due to traffic. With India's dashing population and financial system, and those with their private motors, extended alerts and boundaries for emergencies, our project Hydraulic traffic reduce system goals to lessen such casualties. via supplying hydraulic jack beneath the foot path such that in case of emergency; cars could make their way thru the traffic, during indicators effortlessly. with regards to gradual traffic moves at the same time as making way for emergency sirens this manner could be surely powerful and a ambitious method closer to helping the improvement of the nation.

Nowadays scenario is humans on earth are rapidly improved and according to that the number of cars on the street is likewise multiplied. therefore, the hassle of traffic control is springing up particularly for emergency motors; the concept behind this paper is to put into effect a gadget which could without difficulty manage the traffic and facilitates for the emergency vehicles to attain at their vacation spot. This scheme is based absolutely on computerized smart manage. Right here the purpose is to reduce the latency of emergency motors with minimal or much less disruption to everyday traffic flow is possible. but, there is nevertheless problem for an emergency car to skip pass near the traffic junction. The emergency motors could not be going as fast as it is able to. So, to overcome that hassle we must find the new techniques. occasionally even though there is no traffic then also humans ought to wait due to the fact there's a positive time restrict of traffic signal. So, avenue users need to wait till the traffic sign turned to green light. therefore, we must locate new methods which resolve this trouble.

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II. LITERATURE REVIEW

The following research presents innovative advancements in hydraulic traffic reduction systems:
Traffic congestion is a major challenge for India, one of the world's fastest-growing economies, as highlighted by
Ashwini Bhave (2022). With a large population and increasing private vehicle ownership, immediate solutions are necessary. The proposed Hydraulic Traffic Reduction System allows footpaths to be raised vertically during emergencies, enabling vehicles to clear a path. This design effectively addresses traffic issues while being cost-efficient in critical situations.
Chanakya K. Tummewar (2021) stresses the need for traffic management as income and vehicle ownership rise in India. The hydraulic jack system installed in footpaths is an innovative solution for traffic control during emergencies.
Akash Pawar (2022) notes the pressing issue of peak-hour congestion in metropolitan areas. The Hydraulic Traffic Reduction System can be a game-changer, allowing vehicles to bypass congestion by raising footpaths during peak times.
Darshan Shingane (2022) emphasizes the importance of effective emergency vehicle access in India, which has a vast road network and numerous vehicles. Delayed ambulances contribute to 30% of on-road fatalities, making the Hydraulic Traffic Reduction System crucial for improving emergency response.
Md. Aaquib (2022) advocates for a redesign of footpaths to accommodate both vehicles and pedestrians using hydraulic jacks, enhancing road safety and effectively reducing congestion in urban areas.

III. METHODOLOGY

Parts used in the Project

1) Hydraulic Cylinder (Syringes)
2) Motor
3) Wires
4) Power Source (Battery)
5) Pipes
6) Plywood
7) Cardboards

Figure No. 1 Working Of Mechanism

Our concept is firmly anchored in the hydraulic jack system, leveraging the core principles of hydraulics.
Principle of Hydraulics : Hydraulics operates according to Pascal's Law.
Pascal's Law : A change in pressure at any point within an enclosed fluid at rest is transmitted uniformly to all points in the fluid.
Working of a Hydraulic Jack :
Inside a hydraulic jack, we find two platforms: one with a smaller area and the other with a larger area. The jack is designed as a tube filled with a uniform fluid. It features two pistons (P1 and P2) connected at each end of the tube. The cross-sectional area of piston P1 is A1, while that of piston P2 is A2. When force (F1) is applied to P1, pressure is generated, and in accordance with

Pascal's Law, this pressure is transmitted uniformly. Consequently, piston P2 moves upwards. The power of a hydraulic lift lies in its ability to convert a small force applied at a smaller location into a much larger force. This relationship is mathematically expressed as: [F2 = PA2]

Where: -

(F2) is the resultant force,

(A2) is the cross-sectional area.

We can also express it as: [F2 = (F1/A1)A2]

Here, (P = F1/A1) (with pressure (P) generated by force (F1) over area (A1)).

Thus, we derive: [F2 = (A2/A1)F1].

This equation clearly shows that the applied force is amplified by the ratio of (A2/A1).

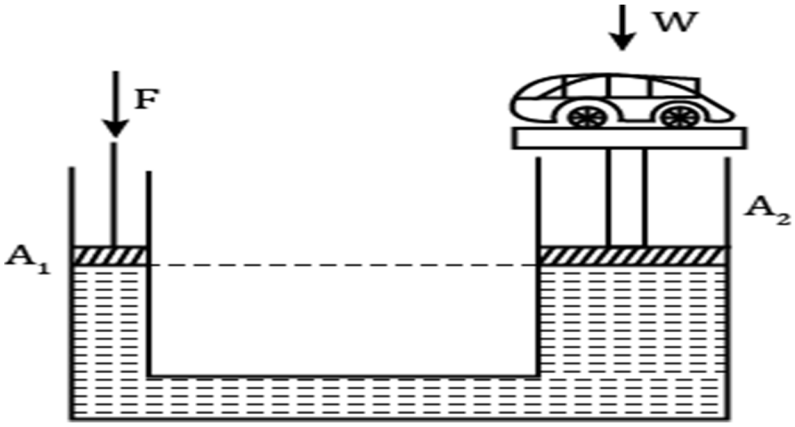

Figure No. 2 Working Of Hydraulic Jack

Figure No. 3 Demonstration of hydraulic jack in footpath

Pascal's Law ensures that the input force is magnified significantly. At its core, hydraulics stands as the liquid parallel to pneumatic, which addresses gases. Fluid mechanics provides the robust theoretical framework for hydraulics, emphasizing the practical engineering applications that harness the properties of fluids. When strain is exerted on one end of the cylinder, the liquid strain is efficiently transmitted to the other end. In emergency situations, the footpath can be lowered to the road level, enabling vehicles to pass over effortlessly and clear the way.

Figure No. 4 (a) Prototype Model Image

Figure No. 4 (b) Prototype Model Image

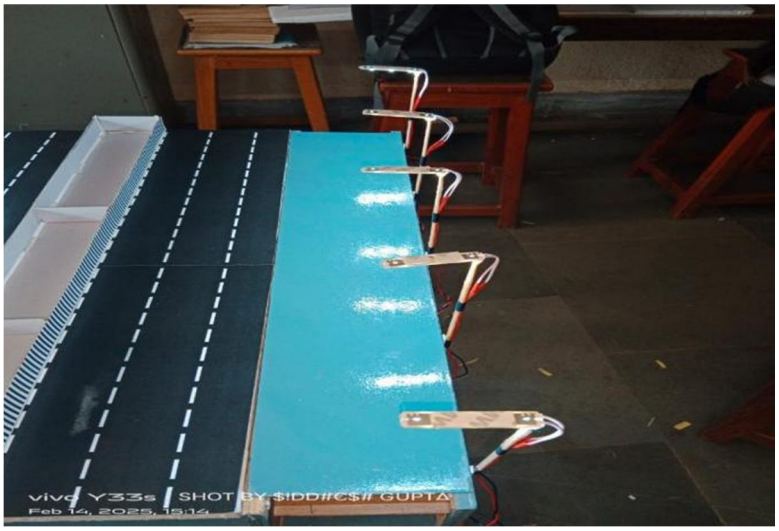

Figure No. 4 (c) Prototype Model Image

IV. CONCLUSION

Traffic congestion has been a global problem and the primary reason is inadequate road capability to serve the existing number of automobiles on the road. Traffic congestion is a global hassle that wastes time and power at the same time as also polluting the environment. identification of congestion is the first step in figuring out the best technique for avoiding it. Congestion is divided into numerous classes to make it simpler to understand. The hassle of traffic congestion can be caused by a variety of things. There are several alternatives for handling traffic congestion. Regularity measures and financial measures are related measures for traffic management which have been proposed. Get admission to and parking management, as well as price regulations, are examples of regularity measures. By way of adopting the hydraulic traffic reducing system into our new constructed road. It minimizes the traffic in volatile situations. It speeds up traffic flow. We can use footpath as an additional lane in case of emergency. It reduces traffic congestion and make smooth flow of traffic. It saves the lives of humans. It saves the time delay and it additionally assist to save our cost and gas consumption. So, the overall use of this mechanism will clear up many issues associated with traffic congestion and people safety. HYDRAULIC traffic reduce system is a technique which is not famous in our country, but when implemented the device in our country it may benefit us in future.

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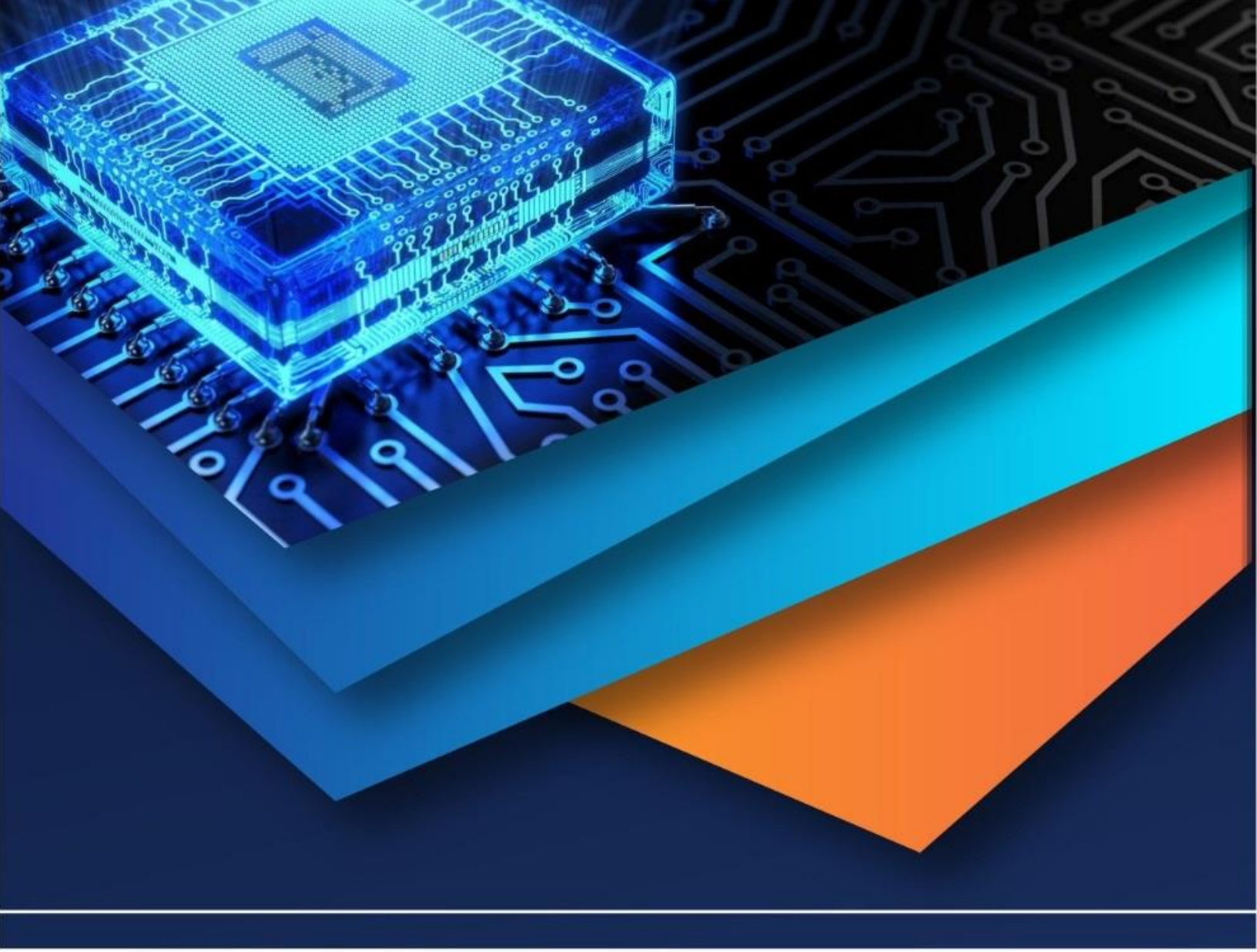

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