

Speed Breaker Pumping System For Watering Roadside Plantation

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ABSTRACT

Trees and plants are vital as they give us oxygen, store carbon, stabilize the soil and give life to world's wild life. They also provide us with the materials for tools and shelter. Governments and many NGO's plants millions of small plants every year but watering them is really a time consuming and expensive process, because of which most of the plants dies before they get converted in to trees / stainable plants. Many governments abroad have automated the watering process for road side plantation using electric pumps, which requires huge amount of energy and supervision at gross. GHMC also spends millions of rupees on watering road side plantation. The system uses the energy of moving vehicles which is lost when the vehicle hits speed breaker. In this research paper fabrication of a speed breaker pumping system for watering road side plantation and tested by varying the stroke length for maximum discharge. By optimising the process parameter stroke length for maximum discharge found to be at 50mm.

Keywords : Trees, Automated, Water Speed Breaker, Pumping

I. INTRODUCTION

Trees and plants are vital as they give us oxygen, store carbon, stabilize the soil and give life to world's wild life. They also provide us with the materials for tools and shelter. Governments and many NGO's plants millions of small plants every year but watering them is really a time consuming and expensive process, because of which most of the plants dies before they get converted in to trees / stainable plants. Many governments abroad have automated the watering process for road side plantation using electric pumps, which requires huge amount of energy and supervision at gross. GHMC also spends millions of rupees on watering road side plantation. As a part of our project dissertation we are planning to fabricate a speed breaker pumping system for watering road side plantation. The system uses the energy of moving vehicles which otherwise gets lost when the vehicle his speed breaker.

In the present scenario watering road side plantation is becomes a major need to grow the trees The government as planted many trees on the name of mission HARITHARARAM but watering those plants with traditional methods involves lot of human work and is an expensive process so by the use of the speed breaker arrangement watering of plants become easy and effectively in this process when the vehicle move on the speed breaker then with the help piston and cylinder arrangement under the speed breaker the water is get sucked from tank and pump to the plants on either side of the road with the help of connecting pipes, springs etc.

The basic principle of pumping system is reciprocary motion of piston during the first stroke the water gets sucked from the tank during the second stroke the water is pumped to the plants which are on either side of the road.

II. METHODS AND MATERIAL

SPEED BREAKER PUMPING SYSTEM CONSISTS OF FOLLOWING PARTS

1. Speed Breker
2. Reinforcement Plates
3. Piston Cyllinder Arramnment
4. Springs
5. Frames
6. Connecting Pipes
7. Non-Return Valves

FABRICATION OF SPEED BREAKER PARTS



Figure 1. Fabricated Speed Breaker

- Take a mild steel pipe of diameter 56mm and length 700mm
- Cut the pipe into two equal halves over length side so that the speed breaker is formed
- The diameter of the speed breaker is 28mm and length is 700mm.
- Now with the help of grinding machine de-rust the speed breaker.
- Thus the speed breaker is fabricated.

FABRICATION OF REINFORCEMENT PLATES



Figure 2. Fabricated Reinforcement plates

- Take a circular plate of diameter 56 mm and thickness 10mm.
- Now mark a line exactly making it into two equal halves of diameter 28mm.
- Now these two semicircular plates are grinded on their surfaces to obtain good surface finish Hence these plates act reinforcement plates which are welded to the speed breaker.

FABRICATION OF CYLLINDER BORE



Figure 3. Fabricated Cylinder bore

- Take a circular cylinder of diameter 28mm.
- The length of the cylinder is 100mm.
- Now take the bore of same diameter.
- This bore is welded to the bottom of the cylinder which contains two hole one is foe inlet and other is for outlet.
- To this bore two elbows are welded using fillet weld.

FABRICATION OF SPRING GUIDES



Figure 4. Fabricated Spring Guides

- Take a circular pipe of length 400mm.
- Now cut the pipe into four equal halves which acts as spring guides.
- These will protect the springs for dislocating

FABRICATION OF FRAMES



Figure 5. Fabricated Frames

- Take angle rod and cut it into the required dimensions.
- Now weld the angle rods to form a rectangular frame of dimensions 100*700mm
- Thus frames are formed according to the dimensions required. Now make another frame of dimensions 700*250mm

ASSEMBLY AND FABRICATION OF PARTS.

- Now the piston cylinder arrangement is welded to the frames under the speed breaker.
- The elbows on the bottom of the cylinder and the pipe are connected to those elbows for inlet and outlet.
- Now the inlet pipe is connected to the tank which contains water.



Figure 6 . Assembly Of Speed Breaker

III. RESULTS AND DISCUSSION

By varying the stroke length from 40-80 mm the maximum discharge of water was found to be at stroke length 50mm.

Stroke length – 50mm

Bore diameter – 75mm

Area = $3.14 * 0.075 * 0.075$

0.004415 metersquare or 0.22 lit

Number Of cylinders =2

Water flow per strokes = $2 * 0.22$

= 0.44 lit

= 440 ml

Hence when a bike passes through a speed breaker Quantity of water pumped to the plants is 440 ml or 0.88lit.

IV. CONCLUSION

- It can be implemented at metropolitan cities
- Arrangement of whole setup is easier
- The stored water could satisfy the needs of plants
- There is no need of electricity

The whole process aim to supply water to the plants another side of the road without human interaction

V. REFERENCES

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