

Automatic Washing for Two Wheeler

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Abstract - *The purpose of this system is to develop automatic two wheeler washing system. A motorcycle washer includes a frame, drive belt assembly, drive system, hoses, nozzles. The drive belt assembly includes a drive belt, a pair of pulley and two pairs of belt gears. The drive system includes a motor. A whole assembly includes frame to support a vehicle. At both side of the frame two pipes are pivoted on the bearing with help of two supports at both corner of frame. The two pair of the belt are used for rotating two pulleys which is connected to one of the motor another one is connected to at the end of the pipe. For cleaning the bottom side of motorcycle we are using two pipes which are situated at the bottom of the frame which is having ex-pintable mechanism which is consist of long screw and two coupling which are connected to the both pipes, this system is driven by motor. The vehicle which is being washed is placed on the ramp on the main stand of the vehicle so that there no need of any external support since the pressurized water is passed through the pipes which are being used in this frame. We have tried to minimize it according to the device list which will be definitely helpful for our project. (Size 10 & Italic, cambria font)*

Key Words: Ball bearings, Straight-Bevel gears, AC motor, Galva nize pipes, equal an opposing Linear Lead Screw mechanism, Oscillating mechanism for pipe, Direction controller valve, Frame, Nozzle.

1. INTRODUCTION

In today's world development with need of advanced application. To meet such application Automatic bike washing system is considered a business which is not viable, but however over a period of time the two wheeler bike population has gone up and not just the people who can't afford cars use bike but also people who like biking has hobby. People are really passionate about their bikes two wheelers and want them clean always. Unlike automatic car wash equipment automatic bike wash business work on volume as normally a bike owner shall not pay as much as car wash customer would pay for the car. This does not affect profitability as the amount spend per bike is also lesser than the car of washing a car. We offer following type of bike two wheeler washing system. It is an entry level bike wash

system. It is an automatic two wheeler washing system however it contains basic soap spray under chassis wash, and high pressure spray of water. This is suited for small town where numbers would be lesser and the operator wants to invest in automatic two wheeler system less initially. Our automatic two wheeler washing system which contains various cycles like pre wash, engine wash spray, high pressure oscillating, under carriage wash etc. the chemical are directly close into the water adding to water convince. This is best suited for busy areas where customers appreciate quality and way the vehicles are washed. Different improvement in the vehicle manufacturing and communication technology fields given importance to following things:

- The main focus is on washing the bike automatically within 2 minutes
- safety, over comfort

Intention of proposed system is to provide inexpensive, easy, flexible vehicle washing system that is well suited with all vehicles manufactured. This system brings awareness in working hours and increases the efficiency in work and provides high level. We are working on integrating automatic foam dispensing which is done manually at present. Now one wouldn't expect a bike washing machine to conserve water. But while designing we keep our mind that conservation of this precious resource should be top priority.

1.1 Goals and Objectives

Goals of the system is to minimize the labour work and washing time of two wheeler. Getting your motorcycle cleaned is not an easy task. Whether we decide to do it yourself or give it to a washing center, each option comes with its own set of problem. If washing of bike is done by your own, you could option for an electrically powered high pressured washer. Although quite a few options are available in the market, they retail from around Rs 15000 which does make them expensive once, time investments. However they need both an electrical and a water connection to function. Also being a high pressure unit, one has to operate with almost care and precaution. 2 And at washing centre, you will have to not only wait for your turn but also supervise

the entire process so those hard to reach spot are clean properly. Either way it will take at least 45 min. to complete the wash and additionally, a substantial quantity of precious water will also be consume. So we have different method of getting a motorcycle cleaned and washed.

Objectives:

- Manuel system is converted by automatic system. item High pressurize wateris used to clean the vehicle.
- Pipe movement mechanism plays an important role to cover the both RHS and LHS sides of bike.
- Frame Provides well support to the whole system.
- Reciprocating piston pump provides high pressure to the water to work system efficiently.
- Improving driver behavior.

2. PROBLEM STATEMENT

Many reported problems impact vehicle usage and varied driving conditioning therefore there is need to focus on this issues to improve quality and cleanliness of vehicle. The two wheeler models surveyed in this study were classified into scooter and motor cycle. Scooter include two model segments: economy and executive while motor cycle include five model segments: economy, executive, upper executive, premium, and premium plus. Since the study finds that 80 percent of two wheeler owners use their vehicle for daily commuting average about 40 km per day. Given this high usage, nearly 1/3 (27percent) of two wheeler users have problem of dirt, dusty motorcycle and cleanliness problem of motorcycle. As we all know that in service station the time required for cleaning the vehicle is more. Since automatic washing of two wheeler is the best option. The pressurised pipe handled by the washer man caused may be dangerous, as the pipe is having high back pressure. As the water is the more precise source on earth, In manual washing system, wastage of water is occurred more.

2.1 Methodology

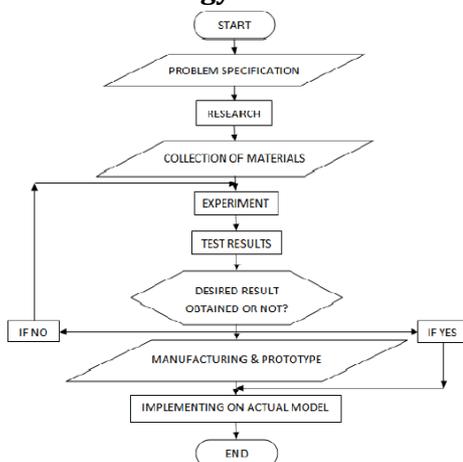


Fig -1: Flow of the system

3. PROPOSED SYSTEM

In this section we introduce our system and make it automatic bike washing system for better enhancement. The basic idea of this system is that, we need to design automatic washing for vehicle within very less time. The block diagram of the system to be prepared for the proposed work is shown in fig.2.2.

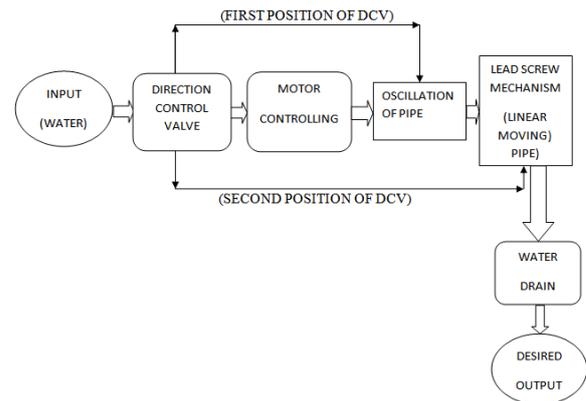


Fig -: 2.2 Block diagram of proposed system.

The working principle of automatic washing of two wheeler washing system is that, the vehicle is placed in the wash bay and park in the centre of the whole system where the ramp is fixed. This ramp is specially designed to sustain the load of any kind of two wheeler. The motorcycle is parked on the ramp with the help of main stand, the whole system is in rectangular form having a length of 3.15 m and width of 3 m and this system having the height of 1.5m the whole frame is welded and the vertical bars are used to support the pipes at the height of 1.5m. the system is also consist of two pipes which are at bottom of the ramp which are having linear equal and opposite motion provided by using duel thread lead screw mechanism this mechanism is driven by a motor. The high pressurized spray of water is strike on the vehicle for cleaning it. Since the pipe which are at the height of 1.5m having an oscillating motion at both the side which covers the entire surface area of the motorcycle (LHS, RHS). here is also a perpendicular pipe in front of motorcycle to wash from FV of vehicle. The bottom side of two pipes are having equal and opposite linear motion to wash the vehicle from bottom side of vehicle and also the machine. This whole system consist of 5 to 6 no of pipes which are directly connected to the 4/2 direction control valve and the flow of pressurize water is controlled according to the requirement. To run the whole washing system the high pressure reciprocating pump (positive displacement) is used, the maximum pressure crated by this pump 4000 psi ,an the maximum flow rate is 10,000 rpm. Since the pump specification may vary according to the requirement of the quality of washing.

3.1 Component Design

Design of automatic washing of two wheeler system. Various components used for this system are as follows.

1. AC Motor



Fig:- AC Motor

An AC motor is an electric motor driven by an alternating current. The AC motor commonly consists of two basic parts: an outside stationary stator having coils supplied with alternating current to produce a rotating magnetic field and an inside rotor attached to the output shaft. Producing a second rotating magnetic field may be produced by permanent magnets, reluctance saliency, or DC or AC electrical windings. Less commonly, linear AC motors operate on similar principles as rotating motors but have their stationary and moving parts arranged in a straight line configuration producing linear motion of rotation.

2. Direction Control Valve

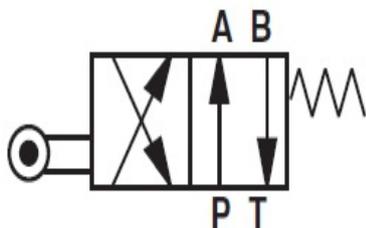


Fig:- Direction Control Valve

Direction control valves are one of the most fundamental parts in hydraulic machinery as well as pneumatic machinery. They allow fluid flow in to different paths from one or more sources. They usually consist of a spool inside a cylinder which is mechanically or electrically controlled. The movement of the spool restricts or permits the flow. Thus it controls the fluid flow. The direction control valve can be classified as follows:

Number of ports: ports that will be counted shall be external ports only for ex 3/2 DCV.

Number of positions: including the normal and working positions which a valve spool can take there are types like two positions, three positions and proportional valve.

Actuating methods: the actuating methods will be manual, spring, electrical, pneumatic, and hydraulically.

Manual operated: manually operated valves work with simple levers or paddles where the operator applies force to operate the valve. Spring force is sometimes used to recover the positions of valves.

3. Reciprocating Pump



Reciprocating Pump

Fig:- Reciprocating Pump

A reciprocating pump is a class of positive displacement pumps which includes the piston pump, plunger pump and diaphragm pump. It is often used where a relatively small quantity of liquid is to be handled and where delivery pressure is quite large. In a reciprocating pump, the chamber in which the liquid is trapped is a stationary cylinder that contains the piston or plunger. Reciprocating pumps move the fluid using one or more oscillating pistons, plungers, or diaphragms while valves restrict fluid motion to the desired direction. Pumps in this category range from simplex with one cylinder to in some cases quad cylinder or more. Many reciprocating type pumps are duplex or triplex cylinder. They can be either single acting with suction during one direction of piston motion and discharge on the other direction.

4. Nozzles



Fig:- Nozzle

A spray nozzle is a precision device that facilitates dispersion of liquid into a high pressure spray. Nozzles are used for three purposes: they are to distribute a liquid over an area, to increase liquid surface area, and to create impact force on a solid surface. A wide variety of spray nozzle applications use a number of spray characteristics to describe the spray. A spray nozzle can be categorized based on the energy inputs used to cause atomization, the breakup of the fluid into drops. Spray

nozzle can have one or more outlets. The nozzle which is being used in our system is most widely used type of spray nozzle it is more energy efficient at producing surface area than most other type. As the fluid pressure increases the flow through the nozzle increases and the drop size decreases. Many conjunction of single fluid nozzle are used depending on the spray characteristic desired. We have selected high pressure at spray nozzle which provides high and uniform impact capabilities. Even spray pattern eliminates the need to overlap patterns from adjacent nozzles.

4. CONCLUSIONS

Here we are providing a unique system which is robust enough to automatic washing of two wheeler within 2 minutes. This prototype will help to perform Bike washing automatically results in high quality end product. Thus it will be User-friendly and capable to wash multiple bike at a time. Also require less man power, time and no pollution. The washing bay has a few oscillating nozzles for spraying water under the chassis and over the body of motorcycle.

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