

FABRICATION OF PNEUMATIC IMPACT ABSORBING BUMPER

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INTRODUCTION

The Technology of pneumatics has increased gigantic significance in the field of working environment justification and mechanization from antiquated timber works and coal mines to present day machine shops and space robots. It is in this way imperative that professionals and specialists ought to have a decent learning of pneumatic system, air worked valves and adornments. The aim is to design and build up a control system in light of astute electronically controlled car guard actuation system is called "Creation OF SHOCK ABSORBING BUMPER". We have joy in presenting our new venture, which is completely prepared by Photo electric sensors circuit and Pneumatic guard enactment circuit. This system comprises of Ultrasonic sensor, Control Unit, Pneumatic guard system. The Ultrasonic Sensor is used to recognize the obstruction. There is any obstacle closer to the vehicle (inside 4 feet), the control banner is given to the monitor start system. The pneumatic watch system is used to guarantee the man and vehicle. This guard initiation system is just enacted just when the vehicle speeds overabundance of 60kmph. It is an authentic venture which is completely prepared and intended for Automobile vehicles. This structures an indispensable piece of best quality. This item experienced strenuous test in our model and it is profitable.

Keyword: Vehicle Bumper, Pneumatic Absorber, Ultrasonic Sensor, bumper activation system

NEED FOR AUTOMATION

Robotization can be accomplished through PCs, water power, pneumatics, apply autonomy, and so on. of these sources, pneumatics frame an alluring medium for minimal effort mechanization. The principle points of interest of every single pneumatic system are economy and effortlessness. Mechanization assumes a critical part in large scale manufacturing. For large scale manufacturing of the item, the machining operations choose the succession of machining. The machines intended for creating a specific item are called exchange machines. The parts must be moved naturally from the receptacles to Various machines consecutively and the last segment can be put independently to package. Materials can likewise be over

and again exchanged from the moving transports to the work place and the other way around. These days all the assembling procedure is being atomized with a specific end goal to convey the items at a quicker rate. The assembling operation is being atomized for the accompanying reasons. To achieve mass production

- To reduce man power
- To increase the efficiency of the plant
- To reduce the work load
- To reduce the production cost
- To reduce the production time
- To reduce the material handling
- To reduce the fatigue of workers
- To achieve good product quality

- Less Maintenance

LITERATURE SURVEY

Study of rear-end crashes finds head injuries from rear-facing child seats by KATHERINE SHAVER

The review, distributed in the October issue of the Journal of Traffic Injury Prevention, found that a newborn child measured crash-test sham enlisted genuine head wounds when its back confronting auto situate pitched forward — around the back of the vehicle — in backside crash tests. Test recordings demonstrate the highest point of the auto situate and the sham's uncovered head being tossed into the back of the vehicle situate in which the auto seat was appended. The assessed head wounds were more serious, the review found, when the auto seat was appended by means of the vehicle seat's lower "Hook" grapples contrasted and safety belts.

Introduction to welding and joining of advanced high-strength steels (AHSS) - M.Shome, M.Tumuluru

Propelled high-quality steels (AHSS) created and popularized in the previous decade are intended to help car organizations meet light-weight prerequisites without trading off inhabitant wellbeing necessities. These steel evaluations are relied upon to overwhelm the material partake in autos, particularly in body-in-white applications, within a reasonable time-frame. These steels have an astounding mix of high quality and malleability, and henceforth are formable. AHSS levels require extraordinary contemplations and a comprehension of their welding conduct for effective usage in car development. This part gives an outline of the basic sorts of AHSS evaluations in current business utilize and the different joining procedures utilized as a part of the car business.

Optimal placement of relay nodes in wireless

Hashim.A.Hashim,B.O.Avinde, M.A.Abido

Conveying sensor hubs arbitrarily more often than not produces beginning correspondence gap even in exceedingly thick systems. These correspondence openings can't be completely killed notwithstanding when the arrangement is done in an organized way. In either case, the subsequent between hub separations may debase the execution of the system. This paper proposes an upgraded sending calculation in view of Artificial Bee Colony (ABC). The ABC-based organization is ensured to augment the lifetime by enhancing the system parameters and obliging the aggregate number of conveyed transfers. Reproductions approve the adequacy of the proposed procedure under various instances of issue multifaceted nature. Comes about demonstrate that the proposed approach enhances the system lifetime impressively when contrasted with arrangements announced in the writing, for example, Shortest Path 3-D lattice Deployment (SP3D) calculation.

Automated pneumatic bumper is a new idea based on pneumatic suspension systems – Yogesh.

The point is to outline and build up a control system in view of insightful electronically controlled car guard enactment system is called "Programmed PNEUMATIC BUMPER". We have joy in presenting our new venture, which is completely prepared by Photo electric sensors circuit and Pneumatic guard enactment circuit. This system comprises of Ultrasonic sensor, Control Unit, Pneumatic guard system. The Ultrasonic Sensor is utilized to identify the obstruction. There is any obstruction nearer to the vehicle (inside 4 feet), the

control flag is given to the guard initiation system.

SELECTION OF PNEUMATICS

"Pneuma" originates from Greek and means breather wind. The word pneumatics is the investigation of air development and its wonders is gotten from the word pneuma. Today pneumatics is fundamentally comprehended to implies the use of air as a working medium in industry particularly the driving and controlling of machines and gear. Pneumatics has for some significant time between utilized for completing the least difficult mechanical assignments in later circumstances has assumed a more essential part in the improvement of pneumatic innovation for robotization. Pneumatic systems work on a supply of compacted air which must be made accessible in adequate amount and at a weight to suit the limit of the system. At the point when the pneumatic system is being received surprisingly, be that as it may it wills to be sure the important to manage the topic of compacted air supply. The key some portion of any office for supply of compacted air is by means utilizing responding compressor. A compressor is a machine that takes in air, gas at a specific weight and conveyed the air at a high weight. Compressor limit is the genuine amount of air compacted and conveyed and the volume communicated is that of the air at admission conditions in particular at air weight and ordinary encompassing temperature. The compressibility of the air was initially researched by Robert Boyle in 1662 and that found that the result of weight and volume of a specific amount of gas. The standard composed as $PV = C$ (or) $P_1V_1 = P_2V_2$. In this condition the weight is the total compelled which for nothing is

around 14.7 Psi and is of valor fit for keeping up a section of mercury, almost 30 inches high in a common indicator. Any gas can be utilized as a part of pneumatic system yet air is the generally utilized system now a days.

PNEUMATIC COMPONENTS AND DESCRIPTION

THE PNEUMATIC CYLINDER:

Pneumatic chamber (once in a while known as air barrel) is mechanical gadgets which utilize the force of compacted gas to deliver a constrain in a responding direct movement.

Like water powered barrels, something powers a cylinder to move in the fancied heading. The cylinder is a circle or barrel, and the cylinder pole exchanges the constrain it creates to the protest be moved. Builds once in a while want to utilize pneumatics since they are calmer, cleaner, and don't require a lot of space for liquid stockpiling.

Since the working liquid is a gas, spillage from a pneumatic chamber won't dribble out and taint the environment, making pneumatics more alluring where cleanliness is a necessity. Once incited, packed air goes into the tube toward one side of the cylinder and, henceforth, bestows drive on the cylinder. Therefore, the cylinder gets to be dislodged.

ELECTRONIC COMPONENTS AND DESCRIPTION

PHOTOELECTRIC SENSOR

A photoelectric sensor, or photo eye, is an equipment used to discover the distance, absence, or presence of an object by using a light transmitter, often infrared, and a photoelectric receiver.

PNP output

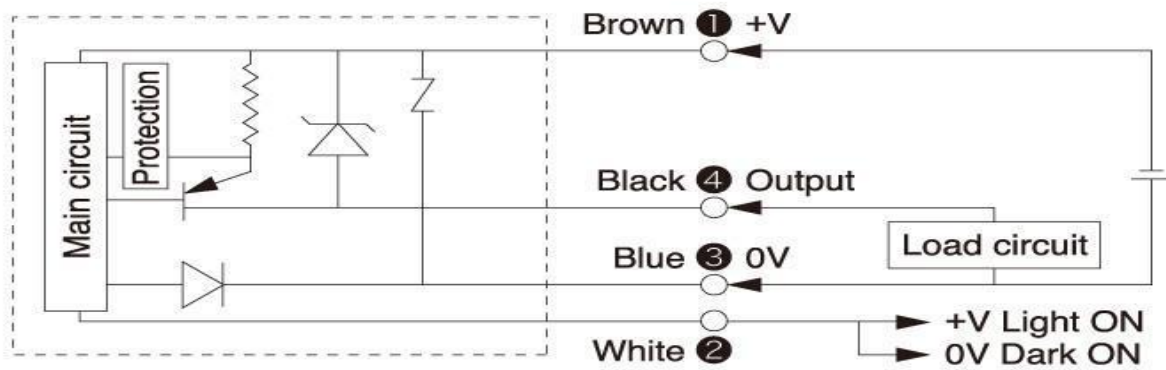


Fig 5.1. Photoelectric Sensor Working

They are largely used in industrial manufacturing. There are three different useful types: opposed (through beam), retro-reflective, and proximity-sensing (diffused).

TYPES

Remote photoelectric sensors utilized for remote detecting contain just the optical parts of a sensor. The hardware for power info, intensification, and yield exchanging are found somewhere else, ordinarily in a control board. This permits the sensor, itself, to be little. Additionally, the controls for the sensor are more available, since they might be greater.

At the point when space is limited or the earth excessively unfriendly notwithstanding for remote sensors, fiber optics might be utilized. The fiber optics are latent mechanical detecting segments. They might be utilized with either remote or independent sensors. They have no electrical hardware and no moving parts,

and can securely pipe light into and out of unfriendly situations.

SENSING MODES

A closeness detecting (diffused) plan is one in which the transmitted radiation must reflect off the question keeping in mind the end goal to achieve the recipient. In this mode, a question is identified when the recipient sees the transmitted source as opposed to when it neglects to see it. As in retro-intelligent sensors, diffuse sensor emitters and beneficiaries are situated in a similar lodging. Yet, the objective goes about as the reflector, so that recognition of light is reflected off the unsettling influence protest. The emitter conveys a light emission (regularly a beat infrared, unmistakable red, or laser) that diffuses taking all things together

headings, filling an identification region. The objective then enters the zone and redirects some portion of the pillar back to the recipient. Identification happens and yield is turned on or off when adequate light falls on the beneficiary.

Difference between Modes

Table 5.1 Advantages and disadvantages of photoelectric sensor

Name	Advantages	Disadvantages
Through-Beam	<ul style="list-style-type: none"> <input type="checkbox"/> Most accurate <input type="checkbox"/> Longest sensing range <input type="checkbox"/> Very reliable 	<ul style="list-style-type: none"> <input type="checkbox"/> Must install at two points on system: emitter and receiver <input type="checkbox"/> Costly - must purchase both emitter and receiver

Reflective	<input type="checkbox"/> Only slightly less accurate than through-beam <input type="checkbox"/> Sensing range better than diffuse <input type="checkbox"/> Very reliable	<input type="checkbox"/> Must install at two points on system: sensor and reflector <input type="checkbox"/> Slightly more costly than diffuse <input type="checkbox"/> Sensing range less than through-beam
Diffuse	<input type="checkbox"/> Only install at one point	<input type="checkbox"/> Less accurate than through-

WHEEL SPEED SENSORS

A wheel speed sensor or vehicle speed sensor (VSS) is a type of tachometer. It is a sender device used for reading the speed of a vehicle's wheel rotation. It usually consists of a toothed ring and pickup.

Road vehicles

Wheel speed sensors are in anti-lock braking systems in conjunction with the Electronic Stability Control system.

Rotary speed sensors for rail vehicles

A hefty portion of the subsystems in a rail vehicle, for example, a train or numerous unit, rely on upon a dependable and exact rotational speed motion, now and again as a measure of the speed or changes in the speed. This applies specifically to footing control, additionally to wheel slide insurance, enlistment, prepare control, entryway control et cetera. These undertakings are performed by various turning speed sensors that might be found in different parts of the vehicle.

Speed sensor disappointments are visit, and are essentially due to the greatly brutal working conditions experienced in rail vehicles. The applicable models determine point by point test criteria, however in down to earth operation the conditions experienced are regularly significantly more extraordinary, (for example, stun/vibration and particularly electromagnetic similarity (EMC)).

Rotary speed sensors for motors

In spite of the fact that rail vehicles infrequently do utilize drives without sensors, most need a rotating speed sensor for their controller system. The most widely recognized sort is a two-channel sensor that outputs a toothed wheel on the engine shaft or gearbox which might be devoted to this reason or might be as of now present in the drive system.

Current Hall impact sensors of this sort make utilization of the rule of attractive field balance and are appropriate for ferromagnetic target wheels with a module between $m = 1$ and $m = 3.5$ (D.P.=25 to D.P.=7). The type of the teeth is of optional significance; target wheels with involute or rectangular toothing can be checked. Contingent upon the distance across and teeth of the wheel it is conceivable to get in the vicinity of 60 and 300 heartbeats for each upheaval, which is adequate for drives of lower and medium footing execution.

This kind of sensor typically comprises of two Hall Effect sensors, an uncommon earth magnet and fitting assessment gadgets. The field of the magnet is balanced by the passing target teeth. This tweak is enrolled by the Hall sensors, changed over by a comparator stage to a square wave flag and opened up in a driver organize.

Shockingly, the Hall Effect changes incredibly with temperature. The sensors' affectability and furthermore the flag counterbalance in this manner depend

broadcasting live crevice as well as on the temperature. This additionally particularly lessens the greatest admissible air crevice between the sensor and the objective wheel. At room temperature an air crevice of 2 to 3 mm can be endured without trouble for an average target wheel of module $m = 2$, yet in the required temperature scope of from -40°C to 120°C the greatest hole for compelling sign enrollment drops to 1.3 mm. Littler pitch target wheels with module $m = 1$ are frequently used to get a higher time determination or to make the development more minimal. For this situation the most extreme conceivable air hole is just 0.5 to 0.8 mm.

For the plan build, the noticeable air crevice that the sensor winds up with is fundamentally the consequence of the particular machine configuration, however is liable to whatever limitations are expected to enlist the revolving speed. In the event that this implies the conceivable air crevice needs to exist in a little range, then this will likewise confine the mechanical resilience's of the engine lodging and target wheels to counteract flag dropouts amid operation. This implies by and by there might be issues, especially with littler pitched target wheels of module $m = 1$ and disadvantageous blends of resilience's and outrageous temperatures. From the perspective of the engine producer, and significantly more so the administrator, it is in this manner better to search for speed sensors with a more extensive scope of air crevice. The essential flag from a Hall sensor loses plentifulness forcefully as the air crevice increments. For Hall sensor makers this implies they have to give most extreme conceivable pay to the Hall flag's physically instigated balanced float. The ordinary method for doing this is to gauge the temperature at the sensor and utilize this data to repay the counterbalance, however this comes up short for two

reasons: firstly in light of the fact that the float does not shift straightly with the temperature, and also on the grounds that not even the indication of the float is the same for all sensors.

A few sensors now offer a coordinated flag processor that endeavors to adjust the balance and abundancy of the Hall sensor signals. This remedy empowers a bigger most extreme passable air crevice at the speed sensor. On a module $m = 1$ target wheel these new sensors can endure an air crevice of 1.4 mm, which is more extensive than that for routine speed sensors on module $m = 2$ target wheels. On a module $m = 2$ target wheel the new speed sensors can endure crevice of as much as 2.2 mm. It has likewise been conceivable to especially expand the flag quality. Both the obligation cycle and the stage uprooting between the two channels is no less than three circumstances as steady even with fluctuating air crevice and temperature float. Likewise, notwithstanding the mind boggling hardware it has additionally been conceivable to expand the interim between disappointments for the new speed sensors by a variable of three to four. So they not just give more exact signs, their flag accessibility is likewise fundamentally better.

A contrasting option to Hall Effect sensors with apparatuses are sensors or encoders which utilize [magneto resistance]. Since the objective wheel is a dynamic, multi shaft magnet, air holes can be much bigger, up to 4.0 mm. Since magneto resistive sensors are point delicate and abundance uncaring, flag quality is expanded over Hall sensors in fluctuating crevice applications. Additionally the flag quality is considerably higher, empowering [interpolation] inside the sensor/encoder or by an outside circuit.

Motor encoders with integrated bearings

There is a point of confinement on the quantity of heartbeats achievable by Hall sensors without coordinated course: with a 300 mm distance across target wheel it is ordinarily unrealistic to get past 300 heartbeats for every insurgency. In any case, numerous trains and electric various units (EMUs) require higher quantities of heartbeats for appropriate operation of the footing converter, for example when there are tight limitations on the footing controller at low speeds.

Such Hall Effect sensor applications may profit by inherent orientation, which can endure an air hole many requests of size littler in view of the significantly lessened play on the real sensor rather than that of the engine bearing. This makes it conceivable to pick a significantly littler pitch for the measuring scale, directly down to module $m = 0.22$. In like manner, the magneto resistive sensors offer considerably higher determination and precision than Hall sensors when actualized in engine encoders with coordinated heading. For much more prominent flag exactness an accuracy encoder can be utilized.

The useful standards of the two encoders are comparable: a multichannel magneto-resistive sensor examines an objective wheel with 256 teeth, producing sine and cosine signals. Arctangent insertion is utilized to produce rectangular heartbeats from the sine/cosine flag periods. The accuracy encoder additionally has abundance and balance redress capacities. This makes it conceivable to additionally enhance the flag quality, which significantly enhances footing control.

Speed sensors on the wheel set Bearing less wheel set speed sensors

Bearing less speed sensors might be found in practically every wheel set of a rail

vehicle. They are mainly utilized for wheel slide assurance and typically provided by the producer of the wheel slide insurance system. These sensors require an adequately little air hole and should be especially dependable. One extraordinary element of rotational speed sensors that are utilized for wheel slide security is their coordinated checking capacities. Two-wire sensors with a present yield of 7 mA/14 mA are utilized to distinguish broken links. Different plans accommodate a yield voltage of around 7 V when the flag recurrence drops beneath 1 Hz. Another technique utilized is to recognize a 50 MHz yield motion from the sensor when the power supply is intermittently regulated at 50 MHz. It is likewise normal for two-channel sensors to have electrically separated channels.

Occasionally it is necessary to take off the wheel slide protection signal at the traction motor, and the output frequency is then often too high for the wheel slide protection electronics. For this application a speed sensor with an integrated frequency divider or encoder can be utilized.

Wheel set pulse generator with integrated bearing

A rail vehicle, especially a train, has various subsystems that require a different electrically isolated speed flag. There for the most part are sufficiently neither mounting places nor is there adequate space where isolate beat generators could be introduced. Multichannel beat generators that are rib mounted onto the bearing shells or fronts of wheel sets offer an answer. Utilizing various bearing less speed sensors would likewise include extra links, which ought to ideally be kept away from for open air hardware since they are so helpless to harm, for example from flying track weight.

Optical sensor

From one to four channels can be executed, each channel having a photograph sensor that outputs one of at most two flag tracks on an opened plate. Encounter demonstrates that the conceivable number of channels achievable by this procedure is still insufficient. Various subsystems thusly need to manage with circled through signs from the wheel slide security gadgets and are in this way compelled to acknowledge, for example, the accessible number of heartbeats, despite the fact that a different speed flag may well have a few focal points.

The utilization of optical sensors is across the board in industry. Lamentably they do have two major shortcomings that have constantly made it exceptionally hard to motivate them to work dependably over various years, in particular – the optical segments are to a great degree vulnerable to soil, and – the light source ages too rapidly.

Indeed, even hints of earth extraordinarily decrease the measure of light that goes through the perspective and can bring about flag dropout. These encoders are in this way required to be extremely all around fixed. Advance issues are experienced when the beat generators are utilized as a part of conditions in which the dew point is passed: the focal points haze and the flag is every now and again interfered.

The light sources utilized are light-discharging diodes (LEDs). Be that as it may, LEDs are constantly subject to maturing, which over a couple of years prompts to a detectably decreased pillar. Endeavors are made to adjust for this by utilizing unique controllers that bit by bit increment the current through the LED, however lamentably this further quickens the maturing procedure.

Magnetic sensor

The guideline utilized as a part of examining a ferromagnetic measuring scale attractively does not display these inadequacies. Amid many years' involvement of utilizing attractive encoders there have been events when a seal has fizzled and a heartbeat generator has been observed to be totally canvassed in a thick layer of brake tidy and other earth, however such heartbeat generators still worked superbly.

Truly, attractive sensor systems cost more than optical systems, yet this distinction is narrowing quickly. Attractive Hall and magneto resistive sensor systems can be imbedded in plastic or preparing material, which increments mechanical unwavering quality and wipes out harm from water and oil.

Wheel speed sensors can likewise incorporate hysteresis. This stifles any unessential heartbeats while the vehicle is at a stop.

Beat generators developed as per this rule have been effectively field tried by a few rail administrators since the start of 2005. The sort test determined in EN 50155 [1] has likewise been effectively finished, so that these heartbeat generators can now be conveyed.

Wheel set pulse generators with integrated bearings for inside-journal bogies

Inside-diary intruders make specific requests on the beat generator fashioner in light of the fact that they have no bearing spread on the end to fill in as the premise from which the turn of the wheel set shaft could be enrolled. For this situation the beat generator must be mounted on a pole stub joined to the wheel set and fitted with a torque converter associated with the bogie casing to keep it from turning.

The extreme vibration in this location leads to a considerable load on the pulse generator bearing, which, with this method of installation has to carry not only the relatively small mass of the pulse generator shaft but that of the entire pulse generator. When we consider that bearing life reduces with at least the third power of the load we can see that a reliable and durable pulse generator for such a situation cannot merely be adapted from the more common standard pulse generator for outside-journal bogies merely by fitting and intermediate flange or similar construction. It really is necessary to have a pulse generator with a modified design adapted to the requirements of such a location.

Speed sensors for non-magnetic target wheels or applications that produce swarf

Some vehicle organizations are confronted with an extraordinary issue: the coursing air that keeps the engines cool conveys swarf rubbed from the haggles. This gathers on the heads of attractive sensors. There are likewise progressively engines in which sensors need to sweep aluminum target wheels, for example on the grounds that the impellers are made of an aluminum combination and the producer does not wish to need to shrivel on a different ferromagnetic apparatus edge.

For these applications there are speed sensors accessible that don't require an objective magnet. Various transmitting and accepting curls are utilized to produce a substituting electric field with a recurrence of the request of 1 MHz and the balance of the coupling amongst senders and recipients is then assessed. This sensor is establishment and flag good to the attractive sensors; for most basic target wheel modules the units can essentially be supplanted with no different measures being fundamental.

Speed sensors with interpolation

Clients regularly need a higher number of heartbeats per unrest than can be accomplished in the space accessible and with the littlest module $m = 1$. To accomplish this objective, sensors are accessible which offer interjection. These offer yield of 2-64X the first number of apparatus teeth or attractive shafts on the objective wheel. Precision is subject to the nature of sensor information: Hall sensors are lower fetched, however bring down exactness; magneto resistive sensors are higher cost, yet higher exactness. Exchanging controllers are utilized as substitutes for direct controllers when higher productivity, littler size or lighter weights are required. They are, be that as it may, more convoluted; their exchanging streams can bring about electrical commotion issues if not deliberately stifled, and straightforward plans may have a poor power calculate.

DESCRIPTION OF SHOCK ABSORBING (S7) TOOL STEEL

Availability

1. Spheroid zing.
2. Available size range: $5 \leq \Phi \leq 600\text{mm}$.

Applicable Documents

3. Macro etching test: According to ASTM A561 and A604.
4. Inclusions: According to ASTM E45 Method A.

Heat Treatment

Annealing—Heating slowly and uniformly to 815~845, furnace cooling to at a rate 8~15/hr. Hardness max. HB 229
Stress Relieving — warming to 650, furnace cooling. Hardening— Preheating: Warming to approx. 650~700, holding 20 minutes per 25 mm. Austenitizing: Heating to approx. 925~960, holding 20 minutes per mm. Quenchant: By oil Tempering—150~200, holding 30 minutes per 25 mm. Air-cooling. Hardness min. HRC 56

Equivalent Grade

Tab 6.1. Equivalent Grade of Shock absorbing steel

GMTC	AISI	ASTM
S7	S7	A681(S-7)

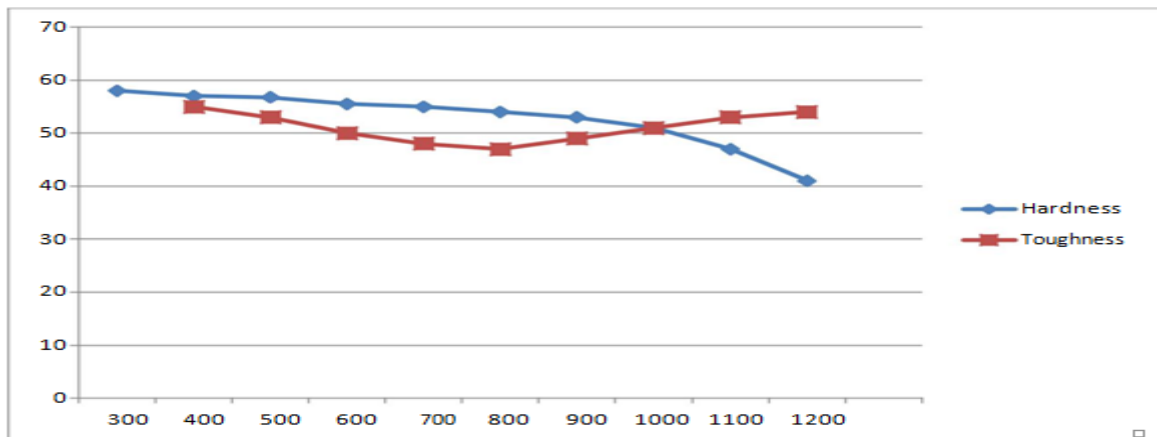
Chemical Composition

Fig 6.2. Chemical composition of Shock absorbing steel

GRADE	C	Si	Mn	P	S	Cr	Mo	V	Ni+CU
S7	0.45	0.20	0.20	MAX	MAX	3.00	1.30	MAX	MAX
	0.55	1.00	0.90	0.030	0.030	6.50	1.80	0.35	0.75

Characteristics

1. High Impact Resistance
2. Excellent Toughness at high Strength levels
3. Good Wear Resistance
4. High Hardenability & Softening Resistance



X-axis: Tempering temperature Y-axis: Toughness
The important components of our project are,

- Photo electric sensor
- Control Unit with Power supply
- Solenoid Valve
- Flow control Valve
- Air Tank (Compressor)
- T joint
- Safety Valve

The speed sensor when senses the critical speed of the vehicle that is preset by us, would activate the photoelectric sensor. The Photoelectric sensor senses that if any obstacle is there in a path, the ray would be reflected. This reflected Photo electric rays are received by the receiver circuit is called “PHOTO ELECTRIC RECEIVER”. The PHOTO ELECTRIC receiver circuit receives the reflected Photo electric rays and giving the control signal to the control circuit. The control circuit is used to activate the solenoid valve. The operating principle of solenoid valve is already explained in the above chapter.

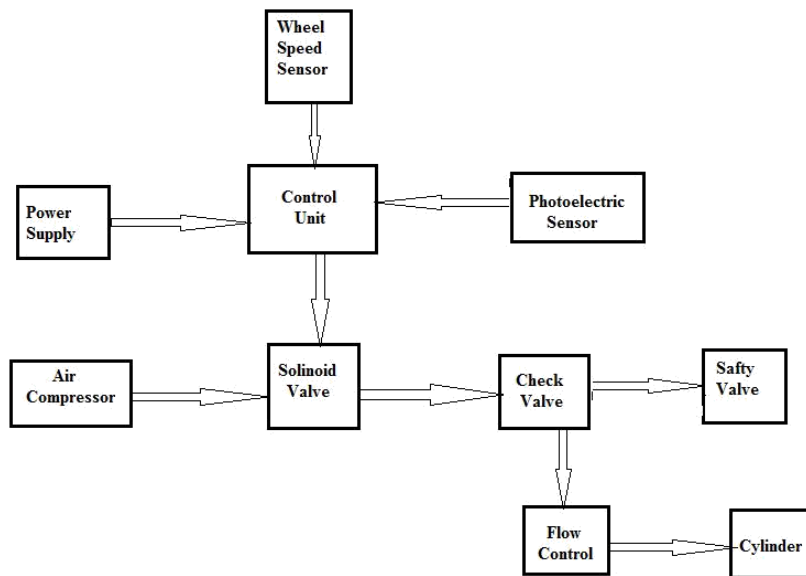


Fig.4.1. Block Diagram

If the solenoid valve is activated, the compressed air passes to the Single Acting Pneumatic Cylinder. The compressed air activates the pneumatic cylinder and moves the piston rod. Here the piston rod is welded to the Shock resisting (S7) Tool steel. Then the bumper is attached to the Steel. Then the air pressure would make the cylinder to move to a certain fixed level. Here the compressed air drawn from the compressor. The compressed air flows through the Polyurethane tube to the cylinder. The compressor used here is a centrifugal compressor and it does not have any motor fixed to it. Because the drive for the compressor is taken from the rear axle of the car using a belt drive.

Let us now consider that our vehicle hits an obstacle after the cylinder expands then the fiber bumper gets hits first then the shock absorbing tool steel would reduce certain amount of the impact. The piston in the pneumatic cylinder would compress due to the impact force. It would compress to a certain level and when the pressure inside the cylinder reaches the critical level thus compressed air due to friction would be made to escape through the safety valve (pressure relief valve). After the complete compression and the

obstacle's impact force would be resisted to a certain amount and then it reaches the vehicle's chassis. Thus the impact would be reduced to a certain considerable amount.

CONCLUSION

This project work has given us a fantastic open door and experience, to utilize our constrained learning. We picked up a great deal of reasonable learning with respect to, arranging, buying, gathering and machining while doing this venture work. We feel that the venture work is a decent answer for extension the doors amongst foundation and businesses. We are glad that we have finished the work with the constrained time effectively. The SHOCK ABSORBING PNEUMATIC BUMPER FOR FOUR WHEELER is working with attractive conditions. We can comprehend the troubles in keeping up the resilience's and quality. We have done to our ability and skill making maximum use of available facilities. The Further analysis and improvisations to this project would be carried out in the future.

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