# Enhancing the Performance Characteristics of Electric Rickshaw through Torque Converter Mechanism

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**Abstract**

Electric rickshaw is now a great public transport and has a big network in India. But there are two problems; one is that they cannot run on a long way because their battery may be discharge in between the journey and charging of the battery on long way is not possible. If we add more batteries then their weight increases and space occupied by the batteries in electric rickshaw is also increased. And second problem is that their speed is very low. Their maximum speed is 25km/hr according to our research. Well second problem is not big issue. We think about this we connect a mechanical device which is very popular in automation and that device is torque converter. The work of torque converter is conversion of torque and torque converter working is based on the fluid coupling. In cars, torque converter use for increasing of torque but we use of torque converter for decreasing the torque due to which their corresponding shaft speed will increases. If we able to increase their speed with consumption of same amount of current/energy (from the battery), then our electric rickshaw will travel long distance in short. Weight of electric rickshaw will not increases too much, here we use small torque converters which have no heavy weight and big size, may be their weight and size of one torque converter for electric rickshaw is less than half of one torque converter of car. We focus on both problems and try to find solutions of both problems.

**Keywords:** Electric Rickshaw, Fluid Coupling, Impeller, Torque Converter, Torque, Turbine, Shaft.

## Introduction

In India, most of the population use public transport like auto rickshaw, buses, metro for travelling. Many of us do not have own vehicle or many of us do not afford their maintenances cost and their fuel cost. Fuel is very necessary item to run a vehicle. Generally, vehicles consumes non- renewable fossil fuels, and exhaust harmful gases. Vehicles are a noteworthy patron of green house gases, especially $CO_2$ emission from those global warming increases. But now many other fuels and new technology based vehicles have taken the participation in more advanced innovative time. Like CNG, LPG and CNG and LPG based engines respectively are in area of automation. But still automobiles are costly. To overcome high cost, new technologies stand up in market like electric vehicles. Battery is the source of energy of electric vehicles. Electric vehicles are operated by the motors, controllers and battery. If we talk about public transportation, electric rickshaws are becoming major public transportation system. Electric rickshaw is also known as a e- rickshaw. Electric rickshaw is now a great public transport and has a big network in India. Electric rickshaw has low or negligible maintenances cost. But there

are two problems; one is that they cannot run on a long way because their battery may be discharge in between the journey and charging of the battery on long way is not possible. If we add more batteries then their weight increases and space occupied by the batteries in electric rickshaw is also increased. And second problem is that their speed is very low. Their maximum speed is 25km/hr according to our research. Well second problem is not big issue.

We think about this we connect a mechanical device which is very popular in automation and that device is torque converter. The work of torque converter is conversion of torque. If we able to increase their speed with consumption of same amount of current/energy (from the battery), then our electric rickshaw will travel long distance in short. Weight of electric rickshaw will not increases too much, here we use small torque converters which have no heavy weight and big size, may be their weight and size of one torque converter for electric rickshaw is less than half of one torque converter of car. We focus on both problems and try to find solutions of both problems. It is necessary to know about working of torque converter before connection

**Literature Review**

*A.* In *Prof. F.Khan ,"Design and Development of Light Weight Multi-Utility Electric Scooter using Hub Motor Transmission"[1]*

Their task is gone for structuring and creating of a light weight multi-utility electric bike utilizing center point engine transmission. The proposed vehicle can do adaptable tasks in different fields, for example, material dealing with in little scale enterprises, for conveying farming items and furthermore can be utilized for short separation transportation reason without breaking a sweat. Watchwords: center point engine control transmission, regenerative framework, transportation, material dealing with and products bearer.

Their vehicles carrying capacity can be increased by using the motor of higher watts and using of battery of higher Ah. They tried to make it efficient by inclusion of regenerative system. Their vehicle is capable of carrying 300kg load.

*B. A.Geetha,"Design and Development of a Self Balancing Mono Wheel Electric Vehicle"[2]*

The 'Single Wheel Float board' is an individual electric vehicle running on a solitary wheel. The vehicle is fueled by a battery source. The engine (DC 24V, 250W, High Torque) is in skew with the pole of the wheel with the help of a chain drive, whose speed will be constrained by a specially crafted 'Speed control' circuit, skilled for flows about 50A. The control of the engine heading is the stance of the people driving it. Clever sensors like IMU, which houses accelerometer and spinner is utilized to screen the stance of the individual and in like manner the processor signals the speed controller circuit. Extra highlights for the Drift board incorporate the regenerative braking, inbuilt battery charging capacity, battery level pointer.

Researcher observed in their work that the single wheel hover board reacts well to the client tendency. The Figure demonstrates the completely assembled vehicle. The reaction of the PID calculation requires minimal all the more tuning driving at high speeds. At low speeds, the hover board gives adequate inclinatory reaction, which does the trick the client into a streamlined stance.

*C. R.B. Asuncion,"Development of an Electric Tri-Wheel Scooter"[3]*

The real goal of the investigation was to plan and build up an electric tri-wheel bike that would be utilized as a multi-reason transportation medium in the Bulacan State College Primary Grounds. The undertaking is produced to reduce the worry for individuals from varying backgrounds and conditions. The undertaking created is comprised of locally accessible materials. The venture can be utilized inside and outside, since it is intended to diminish the worry of a few people who walk a incredible length. It is particularly valuable in indoor use, inside the region of a school, college, shopping and so forth. It is proposed for one rider as it were. It has 2 critical parts, the center engine and the controller module. The center point engine is the one that drives the entire bike get together while the controller is the mind, instructing the center point, lights, sensors, and so forth. The bike is fueled utilizing a 48 V battery-powered battery and can keep running in forward and turn around headings. The bike can fit through an ordinary size entryway and is outfitted with a sensor that empowers it to work just when a rider is on the stage. The venture worked by desires, being a less expensive and environment friendly elective as contrasted and its monetarily accessible partners. It likewise gave a financially savvy way to deal with giving individualized transport frameworks in a wide assortment of uses.

*D. D. M. Sousa,"Electric bicycle using batteries and supercapacitors"[4]*

In this paper, a footing framework valuable for a self-governing Electric Vehicle of individual use is depicted. The created framework is established in a first methodology by two diverse power sources: one is comprised by batteries or by power devices and the other by super capacitors. This paper depicts a specialized arrangement joining and achieving the use of two vitality stockpiling frameworks in a similar footing framework. In the created framework, the super capacitors keep running as component that store vitality briefly and that

can be utilized to recover vitality. Beginning from the practical attributes of regular electrical vehicles and portrayal of a commonplace directing profile, the vitality utilization is gotten. So as to portray and structure the framework, this is depicted in detail, to be specific the super capacitors models, the battery, the power converters and the actualized technique of control. As indicated by the got outcomes, a control methodology that permits a compelling administration of the put away vitality in the framework with respect to the vehicle's ideal working and expanding its independence is too displayed and talked about.

In their results, the points of interest and inconveniences of the proposed arrangement are introduced. The proposed framework utilizes in its essential topology a lot of batteries and a bank of supercapacitors to supply the footing framework but on the other hand is intended to supplant the batteries by energy units. The origination of the proposed framework is likewise the initial step to examine the arrangements and frameworks that permit to charge electrical vehicles in remote spots or when the interminable power nets are not accessible. For this situation, energy units can be utilized to store vitality and to reestablish the vitality of these sorts of self-sufficient vehicles. From the exploratory and reproduction results got it is essential to bring up that the proposed framework has a suitable execution in difficult circumstances like high loads staying away from profound releases of the batteries. Besides, it is additionally conceivable to sufficient the calculation of to the profile of the course and boost the vitality recuperating. It is likewise imperative to allude that the running of the DC-DC converter either as buck or help converters does not present irritations in the framework elements, specifically the vehicle speed stays steady. This work reflects likewise the genuine point of view of joining of multi vitality stockpiling frameworks in an exceptional footing framework. The proposed arrangement uncovers favorable circumstances from the purpose of the perspective of the footing framework concerning over-burden circumstances and evading a superfluous over dimensioning of all frameworks.

*E. D. Hrovat and W. E. Tobler,"Bond Graph Modeling and Computer Simulation of Automotive Torque Converters"[5]*

A derivation of a set of four first order nonlinear differential equation [5] portraying torque converter elements is given, alongside the comparing bond chart portrayal. The bond diagram comprises of an inactivity field and balanced whirligigs which couple mechanical and water powered ports. A duplication of this structure replaces the first I-field by an IC-field, what not adjusted spinners by their fractional duals-the regulated transformers. Further bond chart controls lead to torque converter-identical mechanical structures. The paper closes with instances of static torque converter show approval and complete, powerful model use in the plan of move quality controllers for discrete proportion electronic transmissions. An induction of the nonlinear differential conditions depicting torque converter elements is given in this paper, trailed by the comparing bond diagram display. The model prompted the reduced portrayal of the torque converter conditions and obviously showed the hidden physical structure, which included nonlinear, adjusted gyroscopes and an inactivity field. Through the duplication of this structure the first I-field was supplanted by an IC-field, and all adjusted gyroscopes by their halfway duals-the tweaked transformers. It has been demonstrated that this model can be imitated by utilizing a structure comprising of an electronically controlled CVT and grip. This arrangement has some viable suggestions in perspective on the present accentuation on advancement of comparable equipment with the point of enhanced execution, mileage and driving solace. The paper incorporates instances of static torque converter show approval and complete, powerful model utilization in the plan of move quality controllers for discrete proportion electronic transmissions. In view of this experience, it is inferred that the above model offers a strong reason for future complete approval and exploratory work.

Despite the fact that torque converters have been dissected for over four decades, it is trusted that the present examination reveals some new parts of torque converter elements. Thus the end that bond diagrams are an incredibly note worthy and productive displaying methodology.

$$\tau_s = \iint_{CS} (r \times \vec{v}) \rho (\vec{v} \bullet dA) + \frac{\partial}{\partial t} \iiint_{CV} (r \times \vec{v}) \rho \, d\forall + I_{L_m} \omega_s$$

*F. Srdjan Lukic, "Energy Autonomous Solar/battery Auto Rickshaw"[6]*

Auto rickshaws are little, three-wheeled vehicles which are utilized broadly in numerous Asian nations for transport of individuals and products. The vehicles are little and thin taking into account simple mobility in blocked Asian cities. In India, auto rickshaws are usually utilized as taxicabs, as they are exceptionally modest to work. In spite of the clear focal points in the vehicle plan, auto rickshaws present a tremendous contamination issue in real Indian urban areas. This is because of the utilization of a wasteful motor, normally a 2 or 4 stroke, with no contamination control. This paper introduces a transportation framework dependent on auto rickshaws that work in an earth well disposed way. Existing vehicles are to be supplanted by an all-electric partner updated in a way which enhances the effectiveness of

the vehicle. Likewise, a reviving foundation is proposed which will take into account the batteries to be charged utilizing for the most part sustainable power sources, for example, sun based power. Up to this point, we have taken a gander at the current vehicle and nature in which it works, made a model of the vehicle in Consultant programming, created a model electric vehicle, and examined energizing foundation necessities and structures. Specifically, our proposed energizing framework comprises of a focal reviving station which supplies appropriation focuses with charged batteries. Since we mean to fuse sustainable power sources in the framework, we utilized HOMER programming to structure a doable foundation framework.

They have investigated the utilization of all-electric auto rickshaws for transportation in Asia. The all-electric vehicle was structured and tried, and a model of the vehicle was produced for use in framework level recreations. What's more, we displayed the activity of the whole transportation framework including an off- lattice energizing "mother" station. It was demonstrated that the mother station with 480kW PV, 358kW breeze turbine, what's more, 350kW propane generator can control 600 auto rickshaws while delivering 61% of its vitality utilizing inexhaustible assets. Later on, a matrix associated mother station will be examined.

*G. K. Iwasasa and H. Abe,"Simulation method and device for aiding the design of a fluid torque converter"[7]*

A strategy and device for recreating properties of a liquid torque converter, for example, torque proportion, limit factor and proficiency incorporates including the execution of the means of finding a majority of parameters including a liquid section point and a liquid section obstruction from a vane profile of a vane wheel of a liquid torque converter, and reenacting the properties of the liquid torque converter as indicated by the parameters and an info and yield torque relationship based on a precise force hypothesis. The liquid section edge is adjusted by a slip proportion between rotational paces of information and yield closures of the liquid torque converter for the motivation behind representing the impacts of the event of stream division. Great outcomes can be acquired by rectifying the surge point of a stator vane cluster by utilizing a revision esteem given as a numerical capacity of the slip proportion. In this way, the precision of reproduction can be considerably enhanced with a base increment in the computer time.

**Research And Theory**

*1. The Hydraulic Torque Converter[8]*

The hydraulic torque converter is a device which is used for transmitting increased torque at the driven shafts[8]. The torque transmitted at the driven shaft may be more or less than the torque available at the driving shafts[8]. The torque at the driven shafts may be increased about five times the torque available at the driving shafts with an efficiency of about 90%[8]. When the torque at the driven shaft is to be increases then the corresponding value of the speed at the same shaft should be decreases.

The speed of the driven shaft is decreases by decreasing the velocity and kinetic energy of fluid which is allowed to be flow from the impeller to the turbine through the reactor.

The working of hydraulic torque converter is based on fluid coupling which transfer the rotation with rotating power from a driving shaft of source, like an internal combustion engine (IC Engine), to a rotating driven shaft/ load. Generally, it is located between the engine and the transmission system. Clutch plate is connected to the one side of torque converter in automobile.

*2. Geometry/structure of torque converter*

- In Figure:-1, we can see that the entire unit resembles donut shaped housing, with a hollowed interior [9].
- In Figure:-2, we can see that the turbine (little/minor smaller in size as compare to impeller in cars) & impeller units resemble donut halves, and both are lined inside with fins [9].

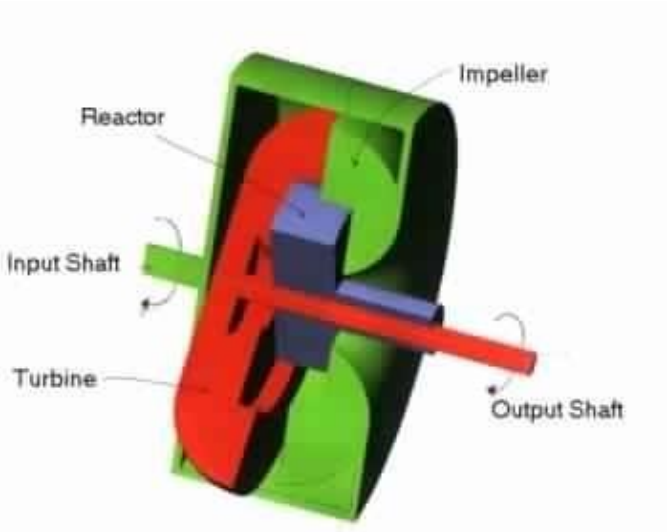


Figure: - 1[9]

Figure: - 2 [9]

- In Figure:-3, we can see that the reactor is "rigidly connected" to the casing by means of a one-way clutch.
- The reactor's fins are at 90° angle in the case of cars.

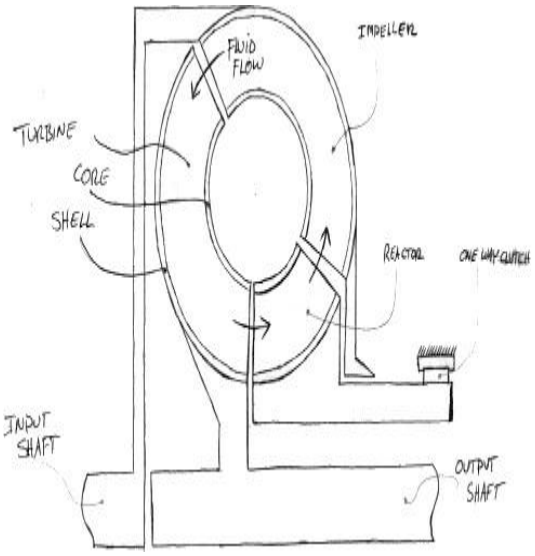


Figure: - 3[9]

*3. Explanation of how torque converter works/ is used in cars or in any other automobile*

- Power is applied to the input shaft, and turns the impeller then fluid moves at outer radius in impeller.
- Fluid attends the high kinetic energy and pressure energy and moves throughout the reactor.
- Moving fluid applies a force on the fins of turbine.

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- When the impeller speed is much greater than the turbine speed then the reactor is grounded to the outside housing. Because it has angled fins, so the reactor experiences a torque in the opposite direction as the impeller and turbine[9].
- Therefore this reaction torque causes the turbine to experience an increased torque (see figure:-5).

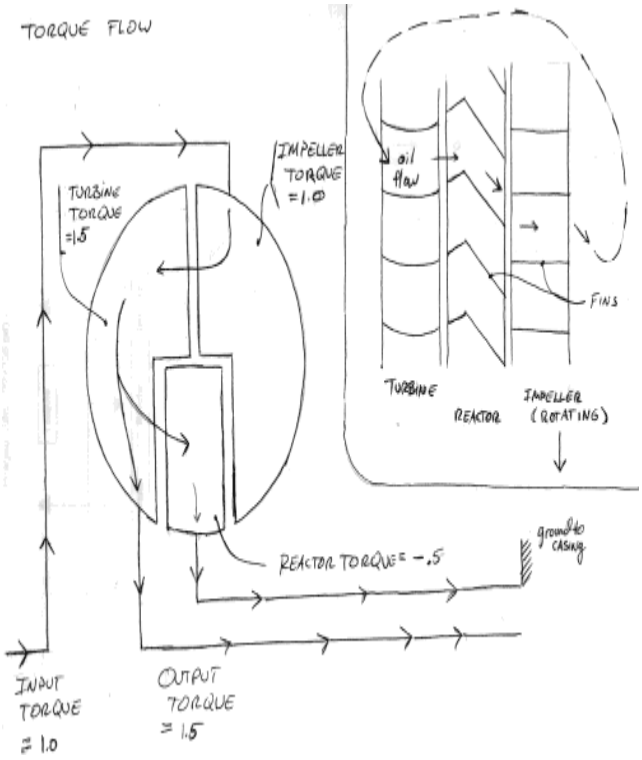


Figure:-4[9]

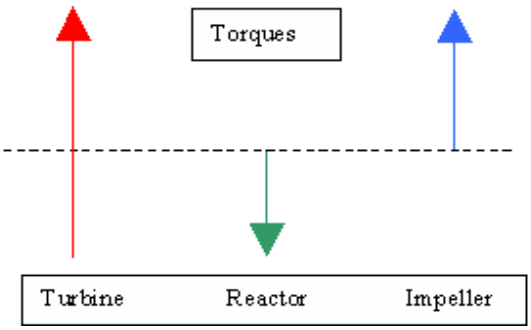


Figure:- 5; Torque Magnitudes (impeller speed >> turbine speed)[9]

- If the speed of turbine approaches the impeller's speed, the one way clutch gradually disengages. That torque is not longer applied to the turbine, so the torque of impeller and torque of turbine become equal in magnitude. [9]

*4. Applied Physics*

TABLE: - 1 Description and Units of the Variables [9]

| Variable | Description | Metric Units | English Units |
|---|---|---|---|
| **P(in)** | Power applied to input shaft | Watts | Horsepower |
| **P(out)** | Power applied to the output shaft | Watts | Horsepower |
| **P(loss)** | Power loss (friction, viscous dissipation & other factors) | Watts | Horsepower |
| **ω(in)** | Rotational speed of the input shaft | Rad/s | RPM |
| **ω(out)** | Rotational speed of the output shaft | Rad/s | RPM |
| **T(in)** | Input torque | Newton-meters | ft-lbs |
| **T(out)** | Output torque | Newton-meters | ft-lbs |
| **h (m)** | Mechanical Efficiency | --- | -- |

The torque converter takes power from the engine.

$$P(in) = T(in) \times \omega(in)$$

Some portion of the input power is vanished in the transmission fluid inside the chamber and calculations for the power loss are beyond the scope of this explanation. It is denoted as P(loss).

P(loss) = f (friction, viscous effects and other effects)

$$P(out) = T(out) \times \omega(out) = P(in) - P(loss) = T(in) \times \omega(in) - P(loss)$$

This is also being related to the efficiency.

$$P\ (out) = h\ (m) \times P\ (in)$$

$$\text{Efficiency,} \quad h\ (m) = \frac{P(out)}{P(in)}$$

It is a function of fluid viscosity, fin design in the turbine and impeller units, T(out), T(in) and other variables. Torque converters run at efficiencies anywhere from 0-95% depending on ω(in), ω(out), and T(in) and T(out)[9].

Take the conditions for explanation,

Condition 1:-

If a car is stopped at a traffic light but the engine still applies power to the input shaft, the brakes and transmission prevent the output shaft from rotating [9].

Since, P(out) = T(out) × ω(out), and ω(out) = P(out) = zero.

Therefore, the efficiency equals zero.

Condition 2:-

If a car is traveling at highway speeds but the turbine is rotating nearly as fast as the impeller [9].

Since, Power of turbine is less than Power of impeller. Therefore efficiency is rather high.

So from the above discussion we find that

$$Torque\ Ratio = \frac{T(out)}{T(in)}$$

$$Speed\ Ratio = \frac{w(out)}{w(in)}$$

$$Efficiency = \frac{P(out)}{P(in)}$$

5. The Fluid or Hydraulic coupling[8]

The fluid or hydraulic coupling is a device used for transmitting power from driving shafts to driven shaft with help of fluid (generally oil)[8]. There is no mechanical connection between the two shafts[8]. It consists of a radial pump impeller mounted on a driving shaft and radial flow reaction turbine mounted on the driven shaft [8]. Both the impeller and runner are identical in shape and they together from a casing which is completely enclosed and filled with fluid[8]. Torque is inversely proportional to speed of shaft.

$$\text{Efficiency of a fluid coupling} = \frac{Power\ Output}{Power\ Input}$$

$$\text{Power at any shaft} = \frac{2\pi NT}{60{,}000} \propto NT \propto Speed \times Torque$$

Power available to driving shaft is directly proportional to Speed of driving Shaft × Torque of driving shaft

$$Power\ transmitted\ to\ driven\ shaft \propto Speed\ of\ driven\ shaft \times Torque\ of\ driven\ shaft$$

Substituting these values of power in equation of Efficiency,

$$Efficiency\ of\ a\ fluid\ coupling = \frac{Speed\ of\ driven\ shaft \times Torque\ of\ driven\ shaft}{Speed\ of\ driving\ shaft \times Torque\ of\ driving\ shaft}$$

If,

*Torque at driving shaft = Torque transmitted to driven shaft*

Then,

$$Efficiency\ of\ a\ fluid\ coupling = \frac{Speed\ of\ driven\ staft}{Speed\ of\ driving\ staft}$$

Slip of fluid coupling (S) is equal to

$$\frac{Diffrence\ of\ the\ speeds\ of\ driving\ shaft\ and\ driven\ shaft}{Speed\ of\ the\ driving\ shaft}$$

Also can say that, S = 1- Efficiency of a fluid coupling

6. Electric Rickshaw Specification

**TABLE:-2**

| | |
|---|---|
| **Seating Capacity** | 4+1+(40 kg Luggae) |
| **Battery Rating** | 100 AH |
| **Battery Type** | Lead Acid |
| **Electricity Consumption/Charge** | 5-6 Units |
| **Charging Time** | 8-10 hours |
| **Range Per Charge** | 90 km & above |
| **Motor Max Power** | 1140W & 48 v (input) |
| **Motor Type** | BLDC |
| **Max Speed** | **25 KM/hr** |
| **Controller** | 24 Tube 50 Amp |
| **Charger** | 15 Amp. Copper |
| **System Voltage** | 12V (DC) |
| **Total vehicle weight** | 321 KG |
| **Front powerful shocker** | Helical Spring with dampener with hydraulic telescopic, shock absorber |
| **Rear suspension** | Leaf spring carriage spring |
| **Brakes** | Drum brakes, actuated internal with expanding shoe type |
| **Steering** | Hand bar type |

Source of table: - **http://shikaracorp.com/specifications/**

Our focus is on the speed of electric rickshaw, which is 25km/hr at present.

**Work Proposed**

*A. Mechanism Theory:-*

In Electric rickshaw or e-rickshaw at present, Motor rotates differential gears which mean differential gears gets torque directly from motor then differential gears rotate wheels that means torque directly transferred to the wheel from differential gears. But In our work we connected two torque converters in between the shaft

which is connected from the differential gears to wheel, one torque converter is connected in between left wheel and differential gear and second torque converter is connected in between right wheel and differential converter. Then torque is transferred to the torque converter then torque increases due to torque converter then torque transmit to the wheel. Working of torque converter is based on the fluid coupling which transfers rotating power from a driving shaft to a rotating driven shaft/load and the torque at the driven shafts may be decreased about five times the torque available at the driving shafts with an efficiency of about 90%[8].

As we discussed above, torque converter have three parts first is impeller, second is turbine and third is reactor. In our work turbine is connected towards the wheel and impeller is connected towards the differential gear casing but the reactor has different scenario. In our work, fins are at 90° angle in impeller unlike the fins of torque converter reactor in car (in cars, fins of torque converter reactor are at 90° angle). The kinetic energy and pressure energy of the fluid increases at outer radius of turbine at 90° angle of fins in reactor in the car then turbine attend high rpm and less torque, but in our case, the pressure energy and kinetic energy of the fluid increases at outer radius of the turbine at 90° angle of fins in impeller then turbine attend less torque and high rpm. As we discussed above, when the torque at the driven shaft is to be increases then the corresponding value of the speed at the same shaft should be decreases. The speed of the driven shaft is decreases by decreasing the velocity and kinetic energy of fluid which is allowed to be flow from the impeller to the turbine through the reactor. So torque is inversely proportional to speed of shaft, therefore if torque is increases then speed of shaft decreases.

*B. Calculation:-*

If we assume that torque converter gives exactly 90% efficiency,

Torque of the driving shaft is $T_1$,

Torque of the driven shaft is $T_2$,

And Torque of the driven shaft is five time the torque of driving shaft,

Such that, $T_2 = T_1/2$

Then from the above formula,

$$90\ \% = \frac{Speed\ of\ driven\ staft \times Torque\ of\ driven\ shaft}{Speed\ of\ driving\ staft \times Torque\ of\ driving\ shaft}$$

$$\frac{90}{100} = \frac{Speed\ of\ driven\ staft \times Torque\ of\ driven\ shaft}{Speed\ of\ driving\ staft \times Torque\ of\ driving\ shaft}$$

$$Torque \propto \frac{1}{speed\ of\ shaft}$$

If we take the maximum speed of electric rickshaw as a speed of a wheel and equal to the driving shaft which is comes from the differential gear is 25 km/hr, so angular speed of the driving shaft 25/2πr.

Then the angular speed of driving shaft will be V/2πr.

Here, assume V is the speed of a wheel and equal to the driving shaft which is comes from the torque converter. And also assume V will be the speed of the Electric Rickshaw.

$$\frac{90}{100} = \frac{\frac{V}{2\pi r} \times T_1}{\frac{25}{2\pi r} \times 2 \times T_1}$$

$$\Rightarrow \quad \mathbf{V = 45\ km/hr}$$

*C. Isometric view of rare wheel assembly*

In Figure:-6, Isometric view of rare wheel assembly is shown. Two torque converters are connected to between the shafts which are connect from differential gears to wheel. Torque converters are shown in blue colour.

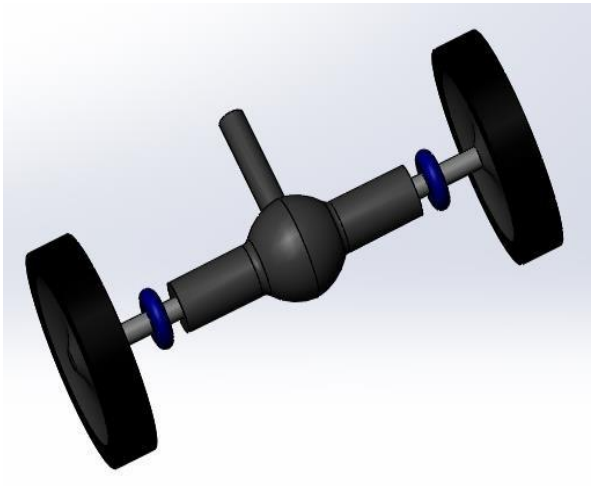

Figure: - 6

*D. Front view of rare wheel assembly*

In Figure:-7, Front view of rare wheel assembly is shown. Differential gears gets torque from the motor rotation then torque converter gets the torque from differential gears.

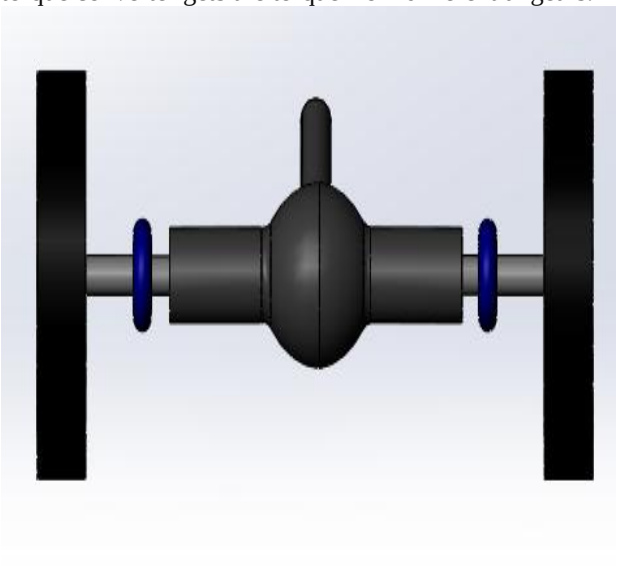

Figure:-7

*E. Torque converter*

Torque converter is in Figure:-8. The torque converter's behaviour is frequently modelled based on standardized component testing in the form of measured steady-state performance [10]. It is however known that transient dynamics can have a significant impact under certain conditions, such as vehicle take-off [10].

Here, we use small torque converters which have no heavy weight and big size may be weight and size of one torque converter for electric rickshaw is less than half of one torque converter of car. We also focused on balance weight and size of e-rickshaw. Weight and size of electric rickshaw will not increase too much; here we use small torque converters.

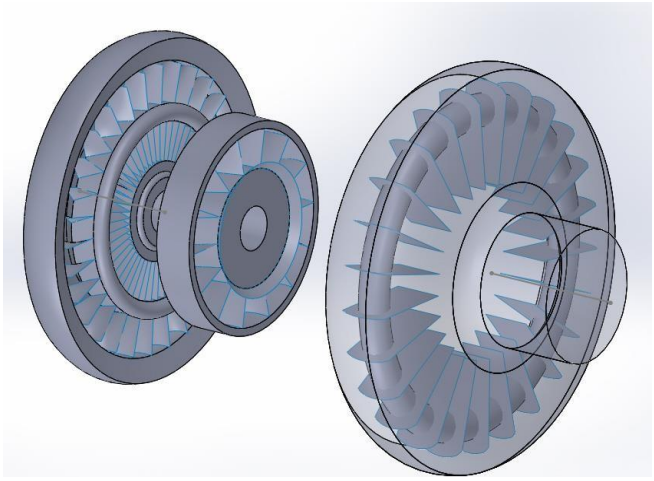

Figure: - 8

**Motivation**

Innovations affecting elective methods for transportation have been growing as of late because of expanding urbanization and mechanization. Light utility vehicles are winding up well known methods for free transportation for short separations. Cost and contamination with petrol and diesel are driving vehicles manufacturers to create vehicles energized by alternative energies.

Auto rickshaws are a standout amongst the most mainstream methods for transportation in India and different nations. Despite the fact that they have numerous advantages, including little size, lightweight, and minimal effort yet auto rickshaws are extremely uproarious, wasteful, remove a high level of toxins. Auto rickshaws are accessible in diesel, compressed natural gas (CNG), and liquefied petroleum gas (LPG) models. The working expenses of these are lower than rickshaws running on gas; nonetheless, the higher starting costs keep the admission of these rickshaws equivalent to its fuel partner. Auto rickshaws are commonly oil driven, however the administration is as of now supporting the generation and utilization of CNG (Compressed Natural Gas) driven rickshaws. This comes because of the administration attempting to diminish contamination and their remote oil reliance. Despite the fact that CNG rickshaws settle the contamination issue, India still needs to import the vast majority of the CNG that is utilized in the nation. Electric rickshaws (otherwise called e- rickshaw) have been ending up increasingly well known in a few urban areas since 2008 as an option in contrast to auto rickshaws and pulled rickshaw in view of their low fuel cost, and less human exertion contrasted with pulled rickshaws. They are by and large generally acknowledged as an option in contrast to Petrol/Diesel/CNG auto rickshaws.

The utilization of alternative vitality in transportation is being investigated as an answer for the issues experienced with the auto rickshaw like contamination. Be that as it may, they are distinctive on account of their little size and capacity to weave through traffic without being influenced by the traffic rules. The three-wheeled vehicles, as referenced prior, have an imperative job out in the open transport division. Electric three-wheelers or e-rickshaws in a very short time of period have emerged as a financial and environment friendly mode of public road transport in India.

**Future Scope**

Our research was concentrated with the torque converter in automation. Since the usage of a torque converter is limited to only motor vehicles present in the current market. It is highly possible to adopt such a mechanism for usage in different-different places and for different-different aim. Torque converter will be used for

different purpose. The research will tend to broaden the spectrum of torque converter possible in an electric rickshaw and in any vehicle.

**Conclusion**

In this paper, we connect the torque converter to between the shafts of wheels and shafts of differential gears. We basically focus on reducing the torque of turbine of torque converter (after the fitting of torque converter) due to this speed of shafts which is connected to the wheel and turbine is increases, hence speed of electric rickshaw will be increased.

When brakes are applied then controller stops the motor, at that moment if kinetic energy is conserved in fluid, then reactor of torque converter starts rotating due to circulating fluid.

If we replace the motor from the high power motor or if we connect the two motors of same power on the wheels respectively in an electric rickshaw then motor consume more energy of battery due to this battery will be discharge very quickly. By the fitting of torque converter speed will be increases on using of same power of motor, so battery is not discharged quickly.

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