

FABRICATION OF CVT OPERATED BIKE

Professor. Dinesh Yelure¹, Kushal N. Ukey², Amol S. Chaudhary³, Gajanan D. Ingole⁴, Aman V. Ingole⁵

¹ Assisatce professor J D College of engineering Nagpur Maharashtra (India)

² Student J D College of engineering Nagpur Maharashtra (India)

³ Student J D College of engineering Nagpur Maharashtra (India)

⁴ Student J D College of engineering Nagpur Maharashtra (India)

⁵ Student J D College of engineering Nagpur Maharashtra (India)

Abstract- Nowadays, automakers have invested in new technologies in order to improve the efficiency of their products. Giant automakers have taken an important step toward achieving this objective by designing continuously variable transmission systems (CVT) to continuously adapt the power of the engine with the external load according to the optimum efficiency curve of engine and reducing fuel consumption; beside, making smooth start up and removing the shock caused by changing the gear ratio and making more pleasurable driving. In this research work the fabrication of CVT operated bike.

Keywords- CVT operated bike , continuous change in gear ratio, fabrication concept.

I. INTRODUCTION:

Reviewing the development of Continuously Variable Transmission (CVT) technology, reveals that after the conceptualization of the first CVT by Leonardo da Vinci in 1490. A continuously variable transmission (CVT) transfers power through a range of speed/torque ratios from engine input to output, continuously without Interruption. A continuously variable transmission is an automatic transmission that can change seamlessly through a continuous range of effective gear ratios. This contrasts with other mechanical transmissions that offer a fixed number of gear ratios. The flexibility of a CVT allows the input shaft to maintain a constant angular velocity. So in this research the fabrication of CVT operated bike can do it. In this the variator pulley are mounted on crank shaft and clutch pulley on transmission shaft on which smaller sprocket are mounted. The CVT components are:

CVT INFORMATION:

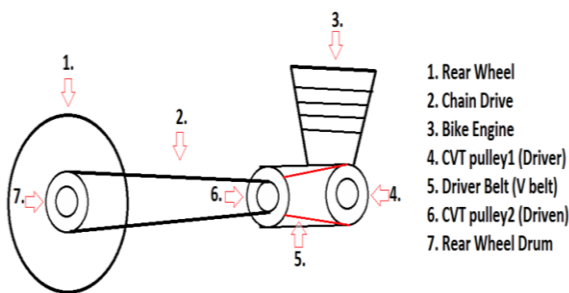
A continuously variable transmission, or CVT, is a type of automatic transmission that provides more useable power, better fuel economy and a smoother driving experience than a traditional automatic transmission. Conventional automatic transmissions use a set of gears that provides a

given number of ratios (or speeds). The transmission shifts gears to provide the most appropriate ratio for a given situation: Lowest gears for starting out, middle gears for acceleration and passing, and higher gears for fuel-efficient cruising.

The CVT replaces the gears with two variable-diameter pulleys, each shaped like a pair of opposing cones, with a metal belt or chain running between them. One pulley is connected to the engine (input shaft) and the other to the drive wheels (output shaft). The halves of each pulley are movable; as the pulley halves come closer together the belt is forced to ride higher on the pulley, effectively making the pulley's diameter larger. Changing the diameter of the pulleys varies the transmission's ratio (the number of times the output shaft spins for each revolution of the engine), in the same way, that a 10-speed bike routes the chain over larger or smaller gears to change the ratio. Making the input pulley smaller and the output pulley larger gives a low ratio (a large number of engine revolutions producing a small number of output revolutions) for better low-speed acceleration. As the car accelerates, the pulleys vary their diameter to lower the engine speed as car speed rises. This is the same thing a conventional transmission does, but instead of changing the ratio in stages by shifting gears, the CVT continuously varies the ratio.



II. 2D AND 3D VIEW OF FABRICATION:

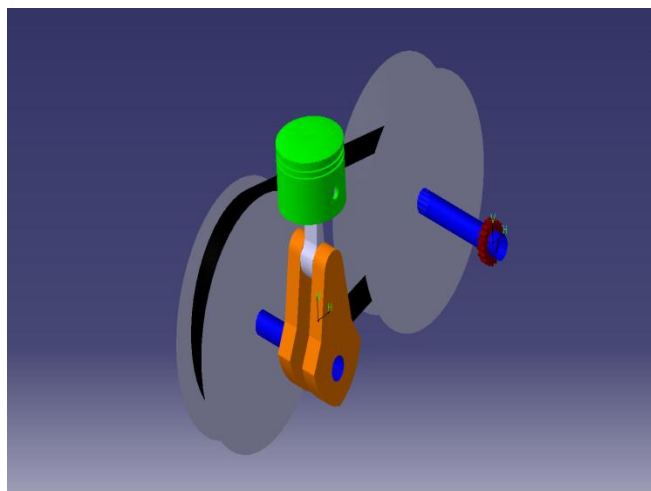


- To design gearless bike by mean of CVT transmission.
- CVT varies the transmission ratio continuously.
- Shifts automatically with an infinite number of ratio.
- Seamless power delivery.
- Constantly changes its gear ratio to optimize engine efficiency.
- Allows the engine to revolve almost immediately to deliver maximum torque.

In the CVT operated bike fabrication, the variator pulley (CVT pulley1) are mounted on crank shaft. In this variator pulley the defined number of rollers are situated. When the crank shaft is rotated, then because of crank shaft rotation rollers placed inside the variator pulley move outward direction because of centrifugal force. After this they rotated the belt. Because of rotation of belt the clutch pulley (CVT pulley2) also rotated this clutch pulley are mounted on the transmission shaft. On this transmission shaft the smaller sprocket of chain drive in a bike was also mounted. Rotation of clutch pulley is rotated the transmission shaft and this transmission shaft rotates the smaller sprocket and with the help of chain drive smaller sprocket rotates the final larger sprocket situated on the rear wheel.

V. LITERATURE REVIEW ON CVT:

Colin Alexander Bell have studied and created thesis on CVT. He said, Manual transmissions, which are historically more popular in Europe, require that the correct gear ratio is manually chosen by the driver, increasing the amount of effort the driver has to exert, but also increasing perceived control. The earliest manual transmission design could be considered the “sliding mesh gearbox”, in which gears are engaged by the sliding of the gears on a splined shaft using a selector fork. This has the disadvantage of causing the gears to ‘grind’ (gear-clash), which occurs when the associated shafts are rotating with different speeds. Modern manual transmissions overcome this through the use of “constant mesh gearboxes”, in which the gear pairs are always interlocked. Each gear pair is selected though a dog-mesh (a type of clutch, Childs, 2004), whilst a synchroniser can also be employed to ensure the shafts are rotating at similar speeds when the clutch engages. By ensuring the gears are always engaged, these types of gear boxes have the significant advantage of reducing gear-wear, which can happen when gear-clash occurs.



Automatic transmissions conversely require no input from the driver to select an appropriate gear using advanced algorithms to change gear automatically based upon throttle position, engine load and vehicle speed. More complex in design, automatic transmissions typically utilise epicyclic (planetary) gear systems to provide various ratios using electro/hydraulic actuators. A torque converter is also typically employed to permit a degree of ‘slip’ allowing the vehicle to move away from rest and to dampen engine excitation. The torque converter itself is a large source of inefficiency within the drive train, and is one of the reasons both fuel efficiency and performance are inferior on vehicles fitted with automatic transmissions.

In above 3D view shows the

III. AIM:

Aim is decreases engine fatigue, saving the engine fuel, easy to handle (neglect gear shifting).

IV. OBJECTIVES:

Despite the extra effort required, nearly 80% of vehicles sold in Europe come equipped with a manual transmission (Bharat Book Bureau, 2006). It is thought that the reason for this is that motorists with an interest in

performance prefer to select the correct gear themselves (control), whilst those who are more concerned with fuel economy believe that automatic transmissions deliver inferior economy (Bharat Book Bureau, 2006). The latter reason is generally true, with properly operated manual transmission vehicles offering an improvement of about 5% to 15% over automatic transmissions depending on driving conditions and style of driving (Kluger and Long, 1999). Outside of Europe this trend is not repeated, especially in Northern America, where drivers almost universally prefer automatic transmissions. Because of this, it can be reasonably expected that CVT technology is more likely to be adopted in North America before Europe.

CONCLUSION:

We have studied previous literature on CVT transmission. We use CVT transmission in bike by certain changing in transmission system.

VI. REFERENCES:

1. Browning EP. Design of agricultural tractor transmission elements. In: ASAE distinguished lecture No. 4. MI (USA): St. Joseph; 1978.
2. Fredriksen N. TRAXION – the 2nd generation of power split transmissions from CLAAS (long version). Transmission presentation. CLAAS Industrietechnik GmbH; 2001.
3. Garcý'a G. Diseño del prototipo de una transmissi3n CVT con rami.caci3n de potencia meca'nica-meca'nica. MBA thesis. Universidad Polite'cnica de Madrid; 2005.
4. Go'mez M. A continuously variable power-split transmission in a hybrid electric sport utility vehicle. PhD thesis. West Virginia University; 2003.
5. Ir. B. Pennings, (2010) "New CVT Push Belt Design"
6. C.de Silva, M. Schultz, (2002) "kinematic analysis and design of CVT"
7. Thesis made on CVT by Colin Alexander Bell.