DESIGN DEVELOPMENT OF ALTERNATIVE FIXED PITCH CVT FOR SINGULAR STEPLESS CONTROL

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Abstract - The research is dedicated to modifying existing drawings to design new, reliable, cost-effective and complete system costs by using two other components, converting floating sprocket bars with fixed steel beams, changing input and output limits of both cone and custom design system (special design) belt with a regular timing belt. The sprocket bars are made to rotate in shape and are joined to the cone, this reduces the problem of vibration and convection. The easy rotation shape of the sprocket bars makes engaging and removing the conveyor belt easier, and also the free vibration thus provides a good, almost impractical engagement for any slip. The simple design of sprocket beams makes the manufacturing process easier and cheaper.

Key Words: CVT, Singular, Stepless, Alternative, Pitch, Belt drive.

1. INTRODUCTION

Continuous variable transmission (CVT) has been around for more than 100years, but only recently gained entry into automotive applications. The superb power of a superb motorcycle is the basis of the high speed speeds between the engine and the speed of the car. However, some existing designs can be energy efficient and at the same time provide a change of course. But with the introduction of advanced equipment, such as high-density bands, advance dhydraulics and more recently, high speed sensor sandmicro processors, the stage wasset for CVT'sriseinthe car field. Many small tractors for home and garden use have simple rubber CVTs. For example, John Deere Gator lines for small auxiliary motors use a belt with a pulley pulley system. They can deliver a lot of power and can reach speeds of 10-15 mph (16- 24 km / h), all without the need for a curved or adjustable gear. Nearly all vehicles with snowmobiles, old and new, and motorcycles using CVTs, are usually a flexible rubber / pulley variety belt.

Then standing of the meaning and function of a simple transication is apre-required for CVT. Transmission is related to the release of the engine light and the drive wheels. Such engines need to operate at a very high rotational speed, which is wrong to start, stop, and slow. Transmission reduces the engine speed to the slower wheel speed, ketsetorque in the process. The transication will generally be connected engine crankshaft. Transmission is transmitted via Driveshaft to one of the or more differentials, tointurn, drive the wheels

minute (but the speed varies, but the speed varies, and the differences vary. the car rotates, and the car shifts in vehicle collisions with rotation between 0 rpm and 1800 rpm. which converts the engine output to provide a high torch at low speeds, but also operates at a high speed car accident operating within its limits, is required. is being tried. The structural features of the transmission, especially the transmitter, often contribute significantly to the design of the power train and the vehicle as a whole. This is important when it comes to engineering with very low noise and vibration. The complexity of the power train assembly itself.

Rate reporting and torque power have been major issues, but these days, Toyota Corolla averaged 6.26 (0.396-2.48) on its new model (CVT iS) [4] and the new JATCO CVT on Nissan (2.0 L-class, Vehicles) -FWD) has an average of 7.0. [2] This improvement in accessibility was achieved by the smaller diameter of the steel belt and added the equivalent auxiliary transaction .The other challenge the emergence of CVT technology improves oil consumption. This issue is already being followed by a focus on driving technology which is followed by increasing the torque ratio and torque power and optimizing the control mechanisms. In addition to these factors, researchers' focus on the development of mechanical efficiency, too. Ideally, minimizing mechanical differences (internal belt tension between the band and the block and external collisions between the block and pulleys) is one of the best developmental topics achieved by adjusting the metal band and improving oilpump performance.

1.1 Anderson continuous variable transmission

Anderson CVT - It's a technology developed by Lawrence L. Anderson, under US patents. Non-standard chain involved with 'rocket' bar bars a specially selected chain or belt mechanism with a floating Sprocket cable, and free to rotate along the length of the lugs, changes the gear ratio in each position. The power input of the system will bedradcivecone (RH-cone) to adrivencone (LH-cone) with help of drivebelt. The appearance of a pulley or cone has grooves on its peripheral edge. The grooves are similar to the channels, with the Sprocket bars found in them. The channels are larger than the sprocket bars

because they allow the movement of the sprocket bars. Bars with one or more compressed or any our elastic material compression, sprocket attachments make the Anderson CVT lean forward, unreliable. Another advantage of the Anderson CVT is that it is simple in its design, as it contains far less material than other transmissions. The technology is also adaptable to the flexibility of the pulley type CVT range, by installing float sprocket bars on the inner surface of the pulley sheets [1].

The above design uses standard spring bars that carry rubber veins, made of nit nit rubber rubber. These sprocket bars are kept floating on the radial rays next to the above-mentioned cone generators. These sprocket bars at their ends have a spring that keeps them floating there as the high profile holds with a special roller chain that acts as a conveyor. Has a natural vibration. Chain required for transfer is a special roller instrument, which needs to be specially made because of the high cost. The luggage cover is made full of the right stuff because, the weight goes up. So the production cost of the above device is also high. The research was dedicated to converting existing drawings to design new, reliable, less expensive and lower overall cost of the system by using other materials for both cones, assuming the optimizer loofing sprocket bars by alloy steel bars, variable both the cone and the drive system are specially designed (non-standard) regular timing belt. The sprocket bars are made to rotate in shape and are joined to the cone, this reduces the problem of vibration and convection. The easy rotation shape of the sprocket bars makes engaging and removing the conveyor belt easier, and also the free vibration thus provides a good, almost impractical engagement for any slip. The simple design of sprocket bars makes the manufacturing process easier and at a lower price, as shown in fig, below. The material used for the cone input system and the LH Cone Ring is a non-grade EN24 instrument. Material selection was performed by reference to the PSG construction data book. The EN24 is famous for using a solid alloy steel due to its good durability. Used in parts such as gears, bars, screws, blocks, etc.EN24 a high steel tensilealloysteel

1.2 Design of CVT

Motor is as inglephaseac motor, capacitor run three lead motor with the following specification:

Power=50 watt

Speed =0 to 9000 rpm (variable)

Open BeltDrive:

The open belt drive is used to transmit power from the input source that is the motor to the input cone shaft. Motor pulley is 20mm diameter where as the input coneshaftpulleyis110mmdiameter. There duction ratio is 5.5 between the motor and input cone shaft. The power transmitted by an FZ-section belt between the motor pulley and input cone shaft pulley. Motor pulley diameter=20mm

Input shaft pulley diameter =100 mm Reduction ratio =5mm

Co. of friction =0.23

Max. allowable tension belt= 200N Center distance =150

Input ConeShaft:

The input cone shaft is basically as sub assembly of the base shaft, two sprocket bar holder rings on either side of the sprocket bars. The sprocket bars are sound round bars 4mm diameter held in radial holes in the holder rings. Holder rings are keyed to the base shaft and the sprocket bars are located radial pitch along the generatorsofthecones.Thebaseshaftisheldinheavydutyballbearingsateither ends, and carries the input pulley at oneend

Ult. Tensile strength=900N/mm^{2}Yield strenghth = 700N/mm^2

Output ConeShaft:

The output cone shaft is basically a sub assembly of the base shaft, two sprocket bar holder rings on either side and the sprocket bars. The sprocket bars are solid round bars 6mm diameter held in radial holes in the holder rings. Holder rings are keyed to the base shaft and the sprocket bars are located on radial pitch along the generators of the cones. The base shaft is held in heavy duty ball bearing at either end, and carries dynobrake pulley at one end. Ult. Tensile strength=900Nmm^{2}Yield strength=700N/mm^2

Input/Output BearingHousing:

The input and output bearing housing hold the ball bearings for respective base shafts and they are bolted to the base frame.

Transmission Belt:

The transmission element of the A+CVT is PIX 'X' treme Classical Synchronous belt with the followingfeatures.

Trapezoidal toothprofile

Highefficiencyduetopositiveengagementbetweenbeltteethandsprocket bars

No re-tensioningrequired

Free frommaintenance

No high tensionrequired

Speed AdjusterMechanism:

Theadjustermechanismisintheformofscrewandnutarrangement,whereinthe screw held in ball bearing at either end carries a nut which holds the belt guide mechanism in the form of free rotating rollers . The screw carries the hand wheel at one end for speedchange.

Base Frame:

Base frame is the structural element that supports the entire assembly of driveand the motor.

Materials Used For SprocketBar

Material used in system for Sprocket Bars is alloy steel with grade EN9..

2. RESULTS

Input spindle speed = 720 rpm

Table -1: Theorotical results

Sr no.	Input shaft dia.(mm)	Output shaft dia.(mm)	Diameter ratio	Output speed(rpm)
1	100	125	1.25	900
2	102	123	1.205	867.6
3	105	121	1.152	829.44
4	107	119	1.112	800.64
5	111	116	1.045	752.4
6	113	113	1	720
7	116	111	0.956	688.32
8	119	107	0.899	647.28
9	121	105	0.867	624.24
10	123	102	0.829	596.88
11	125	100	0.8	576

Sr no.	Input shaft dia.(mm)	Output shaft dia.(mm)	Diameter ratio	Output speed(rpm)
1	100	125	1.25	900
2	103.36	121.71	1.177	847.44
3	105.01	120.04	1.142	822.24
4	108.35	116.5	1.07	775.44
5	111.69	113.36	1.01	730.8
6	113.36	111.69	0.98	709.2
7	115.03	110.02	0.956	688.2
8	120.04	105.01	0.875	630
9	121.74	101.64	0.824	593.28
10	125	100	0.800	576

Table-2: proposed results

3.0 APPLICATION

Ride on Lawn Mowers like small tractors are gas powered and contribute to the air pollution problem. The C.V.T. approach can prevent ride-ons to pollute the air to the extend they currentlydo.

Motorized Wheelchairs. Battery run, speed controlled by a rheostat. Going up a ramp slowly, causes a drop in power (when it's most needed). C.V.T. is a form of transmission, lower speed means MOREPOWER.

Bicycles. Ever try to shift gears while pedaling uphill? Good news; the KINESIS C.V.T. will automaticaly select the appropriate for the situation "gear" ratio. No hasle, no trouble. Endof story.

Power tools and household appliances, that vary from benchtop drills to wash machines and blenders need to depart from the centuries old belt and pulley configuration for smoother operation and morereliability.

Industrial Equipment and production machinery often use either gears or cumbersom belt and pulley configurations. C.V.T. can do away with all that and additionaly give them infinite ratios.

3. CONCLUSIONS

"A Continuously Variable Transmission or CVT blendsthe ease of an automatic transmission with the efficiency of a manual transmission." This statement made by the Honda Motors completely summarizes the concept of CVT.

CVT is definitely a technology of the future with its higher fuel efficiency, infinite gear ratios, lower manufacturing costs, steady cruising speeds & better acceleration capabilities.

Technology has found such wide applications only recently. Thus most of us have to get used to the dynamics of a CVT-equipped vehicle for its better appreciation.

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