ABSTRACT
The Continuously Variable Transmission (CVT) is increasingly used in automotive applications. It has an advantage over conventional automatic transmissions, with respect to the large transmission ratio coverage and absence of comfort issues related to shifting events. This enables the engine to operate at more economic operating points. For this reason, CVT equipped cars are more economical than cars equipped with planetary gear automatic transmissions. Despite these advantages, V-belt type CVT’s still have rather large potential in transmission efficiency. Also torque capacity needs expansion. As stated before, the main disadvantages of current CVTs are transmission efficiency and torque capacity without any slippage in the belt. CVT continues to emerge as a key technology for improving the fuel efficiency of automobiles with internal combustion (IC) engines. CVTs use infinitely adjustable drive ratios instead of discrete gears to attain optimal engine performance. Since the engine always runs at the most efficient number of revolutions per minute for a given vehicle speed, CVT-equipped vehicles attain better gas mileage and acceleration than cars with traditional transmissions. CVTs are not new to the automotive world, but their torque capabilities and reliability have been limited in the past. New developments in gear reduction and manufacturing have led to ever-more-robust CVTs, which in turn allows them to be used in more diverse automotive applications. CVTs are also being developed in conjunction with hybrid electric vehicles. As CVT development continues, costs will be reduced further and performance will continue to increase, which in turn makes further development and application of CVT technology desirable.

KEYWORDS Continuous Variable Transmission; Fabrication; internal combustion (IC) engines.

INTRODUCTION
After more than a century of research and development, the internal combustion (IC) engine is nearing both perfection and obsolescence: engineers continue to explore the outer limits of IC efficiency and performance, but advancements in fuel economy and emissions have effectively stalled. While many IC vehicles meet Low Emissions Vehicle standards, these will give way to new, stricter government regulations in the very near future. With limited room for improvement, automobile manufacturers have begun full-scale development of alternative power vehicles. Still, manufacturers are loath to scrap a century of development and billions or possibly even trillions of dollars in IC infrastructure, especially for technologies with no history of commercial success. Thus, the ideal interim solution is to further optimize the overall efficiency of IC vehicles. One potential solution to this fuel economy dilemma is the continuously variable transmission (CVT), an old idea that has only recently become a bastion of hope to automakers. CVTs could potentially allow IC vehicles to meet the first wave of new fuel regulations while development of hybrid electric and fuel cell vehicles continues. Rather than selecting one of four or five gears, a CVT constantly changes its gear ratio to optimize engine efficiency with a perfectly smooth torque-speed curve. This improves both gas mileage and acceleration compared to traditional transmissions. The fundamental theory behind CVTs has undeniable potential, but lax fuel regulations and booming sales in recent years have given manufacturers a sense of Complacency.

AIM:
• To develop a mechanical continuous variable transmission (CVT) system in four wheelers provides a good torque and transmission efficiency.
• The aim of this topic is to improve the efficiency and durability of the variator.

SCOPE
• Providing Smooth Acceleration.
• Facilitating Powerful Driving Performance
• Providing Better Transmission Efficiency and Torque Capacity
• Reducing Amount of Slippage which occurs in most of the belt
• To improve durability
• To improve drive ability

CVT THEORY
A typical automatic uses four or five such gears, while a manual normally employs five or six. The continuously variable transmission replaces discrete gear ratios with infinitely adjustable gearing through one of several basic CVT designs

Push Belt:
This most common type of CVT uses segmented steel blocks stacked on a steel ribbon, as shown in Figure (1). This belt transmits power between two conical pulleys, or sheaves, one fixed and one movable. With a belt drive:

In essence, a sensor reads the engine output and then electronically increases or decreases the distance between pulleys, and thus the tension of the drive
belt. The continuously changing distance between the pulleys—their ratio to one another—is analogous to shifting gears.

**Toroidal Traction-Drive:**
These transmissions use the high shear strength of viscous fluids to transmit torque between an input torus and an output torus. As the movable torus slides linearly, the angle of a roller changes relative to shaft position as seen in Figure (2). This results in a change in gear ratio

**Variable Diameter Elastomer Belt:**
This type of CVT, as represented in Figure (2), uses a flat, flexible belt mounted on movable supports. These supports can change radius and thus gear ratio. However, the supports separate at high gear ratios to form a discontinuous gear path, as seen in Figure (3). This can lead to the problems with creep and slip that have plagued CVTs for years

**WORKING PRINCIPLE**
The system consists of variator pulley, two stroke engine, Two speed gear box. When the engine starts to run the engine power is given to supplied to the two shaft where one shaft is connected to the variator pulley and other shaft is connected to the gear box. The variator expands and contracts based on the gear box arrangement. When the forward gear is engaged the variator starts to expand and contract based on the speed ratio. Output shaft is connected to a chain drive and chain drive is mounted on a sprocket. From the sprocket power is given to the back wheel, where one wheel is stationary. Gear shifter lever is provided to engage the forward gear and the reverse gear. When the forward gear is engaged the vehicle moves forward and the pulley also contracts and expands. When the reverse gear is engaged the vehicle moves backward to enable reverse position.

**RESULT**
Depending on the Adjustable Variable pulley diameter the speed reduction ratio varies it is shown in the table.

<table>
<thead>
<tr>
<th>Diameter of Driven Adjustable Pulley (D)</th>
<th>Diameter of Driving Pulley (d)</th>
<th>Speed reduction ratio (D/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>9</td>
<td>1.44</td>
</tr>
<tr>
<td>12</td>
<td>9</td>
<td>1.33</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>1.22</td>
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<td>10</td>
<td>9</td>
<td>1.11</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>1</td>
</tr>
</tbody>
</table>

**CONCLUSION**
Today, only a handful of cars worldwide make use of CVTs, but the applications and benefits of continuously variable transmissions can be increased based on today’s research and development. As automakers continue to develop CVTs, more and more vehicle lines will begin to use them. The usage of CVT in the automobile makes the transmission easier in operation as it has an advantage that it has fewer number of gear arrangement. The vehicle acceleration simulation displays that the CVT can provide a continuously variable ratio change and thus a smooth and continuous acceleration change. It is more comfortable for the driver and the passengers to ride a vehicle equipped with a CVT. The simulation of the vehicle acceleration performance presents that both the driveability and the fuel economy for the vehicle with a CVT are better than the one with a standard or a multi-ratio automatic transmission. A power split function is available for the CVT which expands the power capacity of the belt CVT. At low speeds, the belt only carries part of the input power. It is possible to shift the power flow in the system from the gear to the CVT unit in a continuous manner. Increased sales will prompt further development and implementation, and the cycle will be repeated infinum. Moreover, increasing development will foster competition among manufacturers—automakers from Japan, Europe, and the U.S. are already either using or developing CVTs—which will in turn lower manufacturing costs. Any technology with inherent benefits will eventually
reach fruition; the CVT has only just begun to blossom.

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