

Designing a Continuously Variable Transmission (CVT) with SOLIDWORKS

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Intro

A continuously variable transmission (CVT) is an automatic transmission that can change seamlessly through a continuous range of gear ratios. This contrasts with other transmissions that provide a limited number of gear ratios in fixed steps. The flexibility of a CVT with suitable control may allow the engine to operate at a constant RPM while the vehicle moves at varying speeds (a summary from Wikipedia to introduce CVT).

It's designed for a purpose of creating a full model of a new car under the supervision of Amir Taghavi Pour. The transmission part was what I had to designed and it was done by SOLIDWORK. Its components include two pulleys, a steel belt, a clutch pack, a planetary gearbox (consists of internal gear, a sun gear, three planet gears, and a carrier), final drives, and a differential gearbox, and a box.

i. Designing of Pulleys

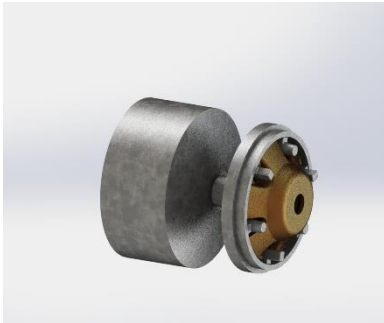


Fig.1 – The drive pulley



Fig.2 – The driven pulley



Fig.3 – The driven pulley



Fig.4 – The pulleys

ii. Designing of the Clutch Pack with a Planetary Gearbox

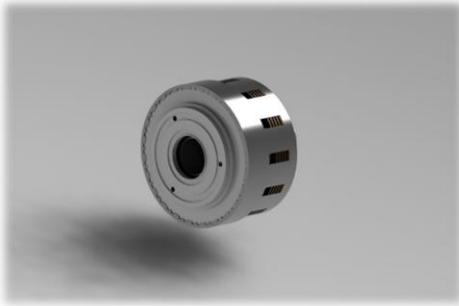


Fig.5 – The Clutches



Fig.6 – The K0 Clutch



Fig.7 – The K1 Clutch



Fig.8 – The Planetary Gearbox

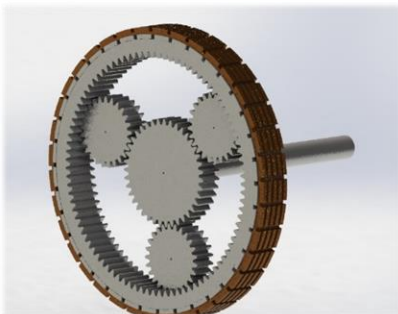


Fig.9 – The Planetary Gearbox with an associated Clutch



Fig.10 – The Clutch Pack

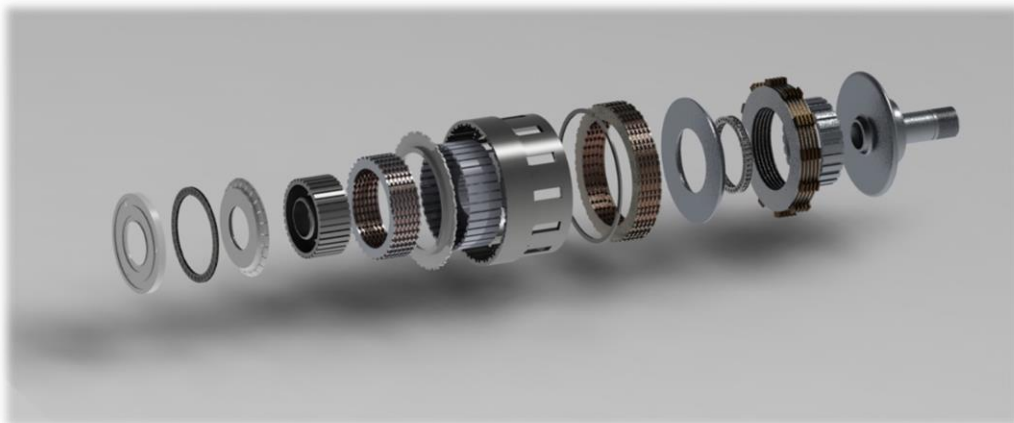


Fig.11 – The Exploded View

iii. Designing of the Differential Gearbox and Final Drives

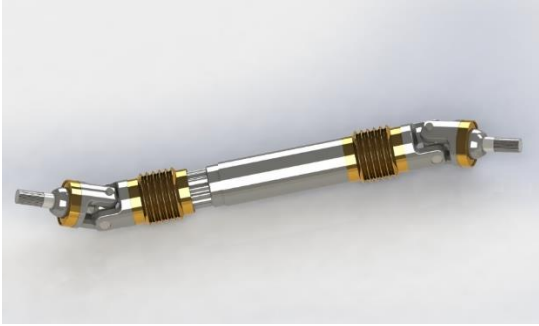


Fig.12 – The Final Drive



Fig.13 – The Differential Gearbox



Fig.14 – The Assembly of the Final Drive and The Differential Gearbox

iv. Assembling

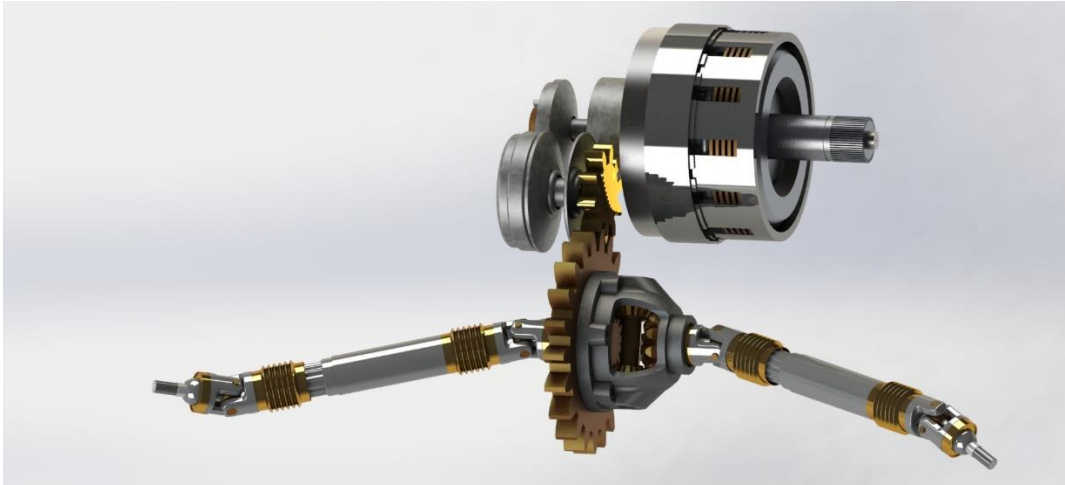


Fig.15 – The Assembled Result without the Box

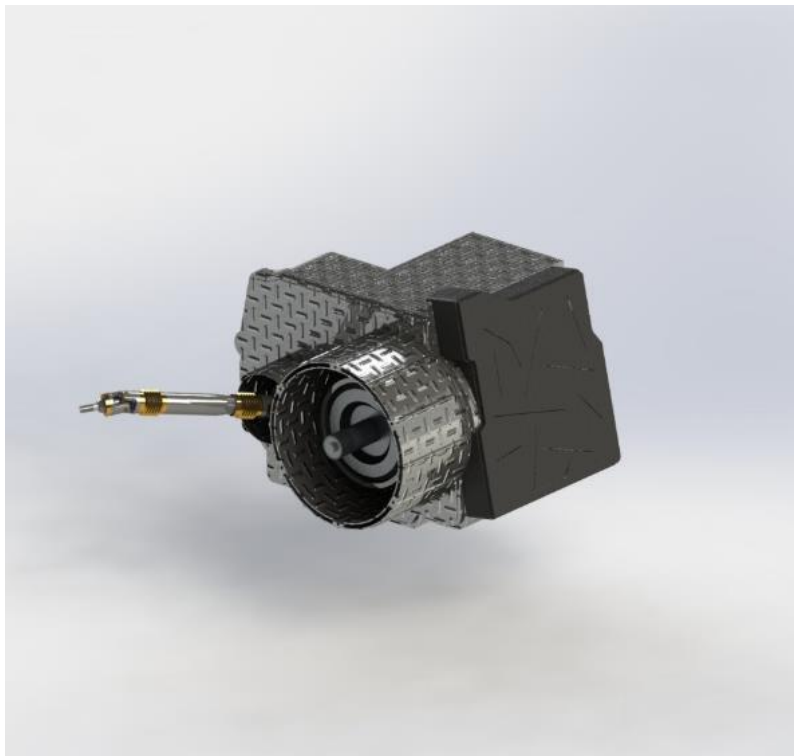


Fig.16 – The Assembled Result with the Box



Fig.17 – The Gearbox, Axle Shafts, Front Suspension.

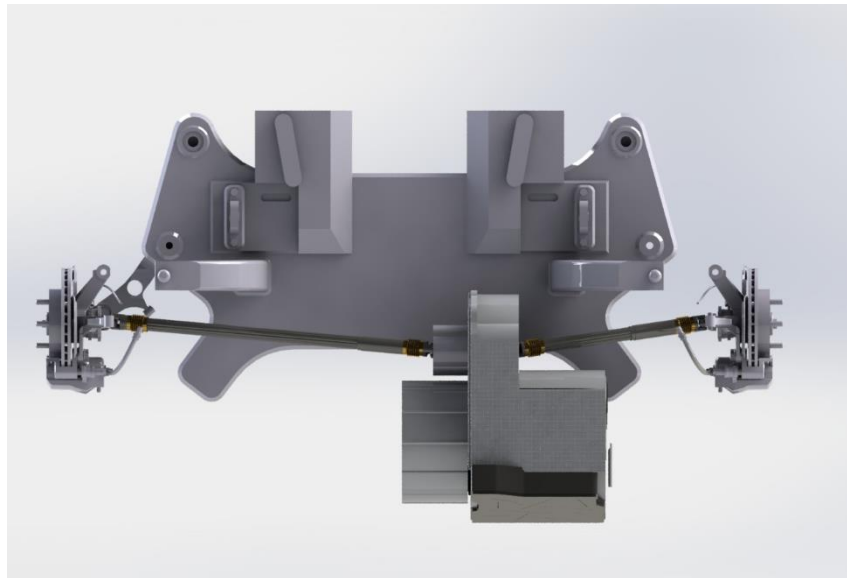


Fig.18 – The Gearbox, Axle Shafts, Front Suspension in top view