EV Drive Train Design

Objective:

- The goal was to design a retrofitment kit for a Light commercial vehicle To convert the IC Engine drivetrain into an electric motor-driven drivetrain maintaining the same performance.

Approach:

- Tata ACE was selected as a vehicle for retrofitment since it is widely used in the LCV Domain.
- Calculated required torque to carry fully loaded cargo with 14.5 Degree Gradeability.
- To meet torque and top speed requirements decided to keep a variable gear box & coupling it with a DC motor for prototype.
- Motor was selected which can give the required torque at the wheel using the existing gearbox.

Solution:

- Deigned motor assembly to a couple of motors & gearboxes.
- Gear box & motor shaft coupled using a flexible coupling to protect the motor during testing of the prototype.
- Separated gearbox from engine reverse-engineered gearbox bolt & locating point to achieve connectivity of motor & gearbox shaft.
- The mount plate was designed such that the existing mount bracket can be used to mount a new drivetrain assembly with a small attachment in-between.
- The drivetrain was kept the same as the existing post gearbox.

My Role:

- Conceptualization
- CAD & Production drawing GD&T
- Design for Manufacturing & Assembly
- Manufacturing & Assembly
- Testing