

ABSTRACT

The automotive industry is currently facing a major transition from internal combustion power source to electric. While this transition drives manufacturer on innovation, it also drives hobbyists and technicians on finding a feasible way to implement electrification in their work.

Electric vehicle conversion has been done since before the introduction of mobile phones but the practice recently increased in popularity for its affordability and practicality. When compared to buying an electric vehicle directly from manufacturer at the mercy of their design and engineering, building an electric vehicle by converting a vehicle with internal combustion engine is considerably cheaper and could lead to a much more customizable vehicle.

Among vehicles popular within the practice is vintage 2 stroke Vespas. This is primarily thanks to the iconic design and relative affordability of several models despite older models are climbing up in price. However, a design feature of the Vespa that make electric conversion more involved is the use of single-sided swing arm with engine mounted directly on top of it. This means the mounting option of the new electric motor is limited and a new design for the swing arm is needed to mount the electric motor.

Even then, many fabricators and modification shops have done the conversion and sold their fabricated component along with the electric motor and equipment to riders who want to have their own electric scooter. These riders seem to be satisfied with their purchase and the market for self-converted electric scooter has started to grow which inspired this project to be done.

Keyword: swingarm, static load, frame stress, vintage vespa, 2 stroke vespa, electric motor, electric conversion, electric vehicle