

# Review on the Impact of Auxiliary Engine Loads on the Fuel Economy of Light Duty Vehicles

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Due to the overwhelming motorization, the fuel consumption has increased exponentially. Therefore, the fuel economy has inevitably become a major attraction in today's automotive research. There exist several fundamental factors affecting the fuel economy of a vehicle viz. engine factors, drive train factors, vehicle factors, driving pattern, test cycles etc. Besides the said factors, the auxiliary engine loads are one of the essential factors affecting a vehicle's performance pertaining to fuel economy. An auxiliary load can be defined as the energy utilized to operate auxiliary equipment which draw power from the respective engine. Auxiliary loads can be listed viz. alternator, air-conditioning system, power-assisted steering and braking, water pump, cooling fan etc. In reference to the previous studies conducted on behaviour of the auxiliary loads, the impact of the auxiliary loads on the fuel economy of a vehicle will be reviewed in this study. With respect to the research conclusions, it can clearly be stated that the air-conditioning system and the alternator appeal for higher power demand, resulting in higher fuel consumption. Moreover, it can be noted that almost all the auxiliaries depict a closely proportional relationship with the engine speed whereas the auxiliaries appeal for higher power demand at higher engine speeds. During the study, the air-conditioning system, water pump and the alternator operation and characteristics pertaining to automotive operating fuel economy are reviewed and discussed.

**Keywords:** *fuel economy, auxiliary loads, air-conditioning, alternator, water pump*