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ME200

Extra Credit Assignment: The Advantage of Mazda Skyactiv

Conventionally, a gasoline engine provides a smoother engine cycle, better internal heating, cleaner exhaust gas, and lower weight. However, this engine also has downsides such as lower power, torque, response, and fuel efficiency. Whereas, today’s diesel engines cover the downsides of the gasoline engine exerting a significantly higher power output than the gasoline cycle. However, in exchange they have more higher weight due to the radical cycle and its auxiliary sound and heat insulations. The new Skyactiv by Mazda is significant in that this technology cheery-picks the advantages of both gasoline engine and diesel engine with its newly featured SPCCI (SPark Controlled Compression Ignition) system.

Before the inception of the Skyactiv technology, it was deemed difficult for a gasoline engine to go above a compression ratio of 14 due to knocking and to allow the dilution of the air-fuel ratio below 14:1 owning to that it will lead to an incomplete combustion. As a solution, the SPCCI system uses a spark plug to create a supplemental combustion to compress the air-gasoline mixture much higher to enable compression ignition. A vehicle loaded with the Skyactiv can perform equally as a 2.0L gasoline engine sportscar (e.g. Mazda Roadster) and emit the same amount of CO­2 as a 1.5L diesel engine compact car (e.g. Mazda Demio). Thus, the Skyactiv technology realizes an ecofriendly, high performance engine. Excitingly, this technology has been updated from its debut in 2010, and this year in 2019 the new Skyactiv-X will be loaded on to newly released models.