A review on retrofit fuel injection technology for small carburetted motorcycle engines towards lower fuel consumption and cleaner exhaust emission

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Abstract

Most motorcycles in developing countries use carburettors as the fuel delivery system especially for models with cubic capacity of less than 350 cc. However, small gasoline carburetted engines suffer from low operating efficiency, high fuel consumption and produce high level of hazardous emissions. A retrofit fuel injection system (FIS) is a system that is developed to totally replace the conventional carburettor system to improve its fuel economy and exhaust emissions, providing a low-cost alternative in an effort to reduce fuel costs and air pollution. This paper provides a comprehensive review on the retrofit fuel injection technology developed for small gasoline spark ignition (SI) motorcycle engines from 50 cc to 350 cc. Three main retrofit FIS schemes – the throttle body injection (TBI), port fuel injection (PFI) and direct injection (DI) – are compared, in terms of configurations, complexity, costs and performances.

Keywords

Carburettor; Fuel injection; Fuel consumption; Retrofit technology; Small engine motorcycles

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