

## Design and Development of a Controller for Fuel Economy Improvement Based on Engine RPM and Temperature



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**Abstract:**

In current global situation on availability of Diesel is an issue, so saving of this fuel should be controlled by increasing the FE of an Automotive engines. There were various types of controllers for fuel injection control available in the CRDe system, but for the mechanical engines such controllers are not present.

To address the above concern, developing the controller which will work on RPM of engine and temperature of engine oil. The controller will help in improvement of FE by 4-5%, By doing literature survey and studying the BSFC curve the control logic were defined. After that the simulation model prepared in MATLAB Simulink for cross verification of the control logic. Then the controller prototype made to perform the required function and validated the proto on bench as well as on vehicle for logic. For driver indication the FE mode LED indicator (Power / ECO) provided.

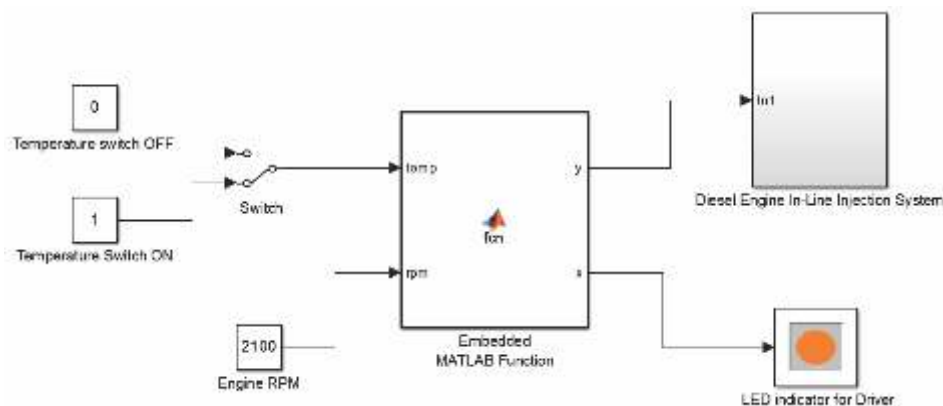
Simulation results are shown that the logic based on RPM and Temp gives the correct PWM output. The controller is based on Engine RPM and Temperature which advances the fuel injection time of the given engine. Hence this fuel injection timing advances better the SFC improvement. The fuel consumption is improved by 4.92% by fine tuning of the timing. This controller is also help in improving the cold startability issue, but at the cost of some NOx increase.



**Controller**



**Engine**



**Simulink model**