**Model Based Torque Control and Estimation for Common Rail Diesel Engine 2010**

A rapid control prototyping primarily based on torque control algorithm the usage of V-cycle mode for common rail diesel engine used to be developed, and a torque prediction model used to be existing which along with a feed-forward suggest value engine mannequin and a feedback correction of error caused through the feed ahead model. Finally, experiments were carried out on check bench to confirm the control feasibility and reliability of the techniques and optimize the emissions, Experimental consequences showed that the predicted manage effects have been finished and the engine reached the EURO-III exhaust emission standard.

**A research on the fuel quantity control for common rail diesel engine in the hybrid electric vehicles working on the low-load area 2009**

In order to improve the gas consumption of hybrid electric vehicles, this paper focuses on the method that calibration of electronic manipulate systems for hybrid electric vehicles based on optimizing the low-load MAP in the ECU. Through examining and altering the engine manage strategy, this paper finds out this method to search the first-class fuel-efficient area. On the other hand, to resolve the trouble of changing the nation of diesel engine when the automobiles work on the low-load country is another reason of this method. And this paper takes more attention on the performance of the hybrid electric powered vehicles through enhancing the engine manipulate strategy and calibrating the MAP of this part. Using this system in hybrid experimental bench for hybrid system, numerous experiments had been carried out: built-in control of the financial system area, the engine rapidly start/stop control, BSG motor and engine torque manipulate technology research. The effects exhibit that after parameter optimization the frequent rail diesel engine well-knownshows the aspects of speedy response, right smoothness and small speed overshoot. And in vehicles test, electricity provide in a field, everyday traffic, limp domestic control have been tested.

# Hardware-in-the-Loop Testing of Electronically-Controlled Common-Rail Systems for Marine Diesel Engine 2010

Tougher law on exhaust emissions reduction, more power and mobility and less fuel consumption, has led to better call for the electronic engine control units for marine diesel engines. Electronically-controlled common-rail structures for marine diesel engine is introduced in the paper. Testing approach based totally on Hardware-in-the-loop(HIL) simulation is depicted in details. The precise HIL platform is established upon the NI products, while the mean cost engine model(MVEM) of marine diesel engine and its accessorial components are developed in MATLAB/Simulink environment. Software of LabVIEW and Simulink are combined together with the Simulation Interface Toolkit. Implementation results show the feasibility of the unconventional solution, which will honestly play greater essential role in future marine engine controller development.

# Experiment study on control methods of common rail pressure by entering flow 2009

The manipulate strategies of frequent rail stress through regulating charge of coming into glide are studied. The manage circuit and solenoid valve are trial-manufactured. The stress of frequent rail managed by means of trial-manufactured solenoid valve are tested in test-bed. The results show that The opening time of Trial-manufactured solenoid valve is 1.1 ms, and its closing time is 0.9 ms. it can fulfill the requires of frequent rail system.

# Design and experimental validation of a model-based rail pressure controller for common rail diesel engines 2015

The excessive stress common rail (HPCR) gasoline injection systems are broadly used in modern diesel engines. The control of the rail pressure will become challenging in transient method over the entire range of operating conditions. To efficaciously address this issue, a model-based rail strain controller (RPC) in the HPCR fuel injection device for diesel engines is proposed based totally on the dynamic feedforward manipulate algorithm, the static feed ahead manage algorithm and the commentary comments control algorithm. The dynamic feed forward control algorithm for the rail strain is designed based totally on the mathematical model. The static feed ahead control algorithm for the rail pressure is designed based on the look-up tables (curves and maps). The remark remarks manipulate algorithm for the rail strain is designed based totally on the linear lively disturbance rejection control (LADRC). The RPC is simulated and implemented in the ASCET software surroundings of ETAS GmbH and has been built-in to an in-house developed electronic manage unit (ECU) of HPCR diesel engines. Experimental validation of RPC has been carried out on a turbocharged V-8 HPCR diesel engine check bench. Experimental outcomes are furnished to verify the effectiveness of the proposed controller. From the experimental results, it is located that the RPC indicates a precise degree of tracking overall performance in a large vary of the engine running conditions.

# Researches of common-rail diesel engine emission control based on cylinder pressure feedback 2008

For improving power output, gas economy, and emissions of diesel engines, stress feedback science is introduced to electronic control excessive strain frequent rail system. In this paper, the geometry characteristic index in the stress difference curve is introduced after examining stress distinction curve; the relations of the pressure attribute indexes with injection parameter, output torque and NOx emission are researched by using simulation and testing method; the impact of simulation and checking out suggests that the characteristic index can replicate the enter and output variable of diesel engine. By selecting radial basis feature (RBF) neural net, feedback variable module using the pressure characteristic index is structured; conversion to feedback variable from pressure characteristic index is performed. The check of electronic controlled injection using cylinder pressure remarks is carried out on the diesel engine equipped with high stress common rail system, trying out records suggests that introducing strain comments to digital controlled system can function closed-loop manipulate for NOx ; the engine emission control of common-rail diesel engine based on cylinder strain comments is feasible and effectively.

# Study on the Influence Factors of Common Rail System's Injection Mass 2010

The injection mass of common rail device is decided through rail pressure and injector energizing time. Under exclusive rail pressure, single injection experiments have been performed; beneath the identical rail stress two injections (preinjection and predominant injection) checks with various intervals have been carried out. According to the analysis of the results, find that at the start-up and end stages the injection rate becomes quicker with increasing rail stress and the injection characteristics for common-rail machine tends to rectangular jet. When the rail stress is low, the needle valve has sluggish response, and the fantastic go with the flow location of the injector radically influences the jet law. When the rail stress is improved, the valve's response pace will be extended remarkably and the injection rate is in most cases affected via the rail pressure. During a couple of injections the needle valve lift has affected on the mass of the primary injection extra than the rail strain fluctuations precipitated by means of pre-injection.

# Examinatal Study on Common Rail Diesel Engine for Multi-injection Strategies 2010

Based on diesel engine geared up with common rail, the multi-injection strategies common rail diesel engine test bed is set up with NI take a look at system. In this test bed, the influences of optimized multi-injection strategies to diesel engine performances are studied. The check outcomes exhibit that by the usage of multi-injection strategies, the diesel engine exhaust temperature can minimize 50°C, and noises can minimize 15dB, and emission improve obviously.

**Development of an Electromechanical Model for Piezo Actuated Common Rail Injectors 2010**

The project for the high speed direct injection (HSDI) diesel engines these days is to minimize dangerous emissions of diesel engines, such as particulate count (PM) and Nitrogen oxides (NOx), and enhance the fuel effectivity and power. To meet this challenge, extra accurate control of injection parameters such as the injection timing, injection rate, and injection volume is required. Compared with solenoid actuated injectors, the piezo actuated injectors can reduce the transition time for the start and end of the gasoline injection event, ensuing in extra accurate and quicker injections, and are step by step replacing the solenoid injectors. In this study, an electromechanical mannequin of a piezo injector is developed with MATLAB/Simulink. The piezo injector model consists of three subsystems: the piezoelectric stack actuator subsystem, the mechanical subsystem and the hydraulic subsystem. A lumped parameter electromechanical mannequin is used for describing the nonlinear conduct of the piezoelectric stack actuator. Different running prerequisites of the injection machine are modeled and tested. The mannequin has been used to furnish perception into the working prerequisites of the piezo injector and highlight the software to injection machine design.