

SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.



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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

DEPARTMENT OF AUTOMOBILE ENGINEERING

23AUT202 – AUTOMOTIVE ENGINES AND EMISSION CONTROL

II YEAR / III SEMESTER

Topic – **Common Rail Direct Injection**



Common Rail Direct Injection

- Common Rail Direct Injection (CRDI) is an advanced technology used in diesel engines to enhance performance, fuel efficiency, and emissions control.
- At the heart of the CRDI system is the common rail, a high-pressure fuel rail that maintains a constant pressure and supplies fuel to each injector.
- The system includes key components such as high-pressure fuel injectors, a high-pressure fuel pump, a fuel pressure sensor, an electronic control unit (ECU), and a fuel filter.
- In common rail systems, the fuel is supplied to the engine under pressure with electronically controlled precision.



Working Principle

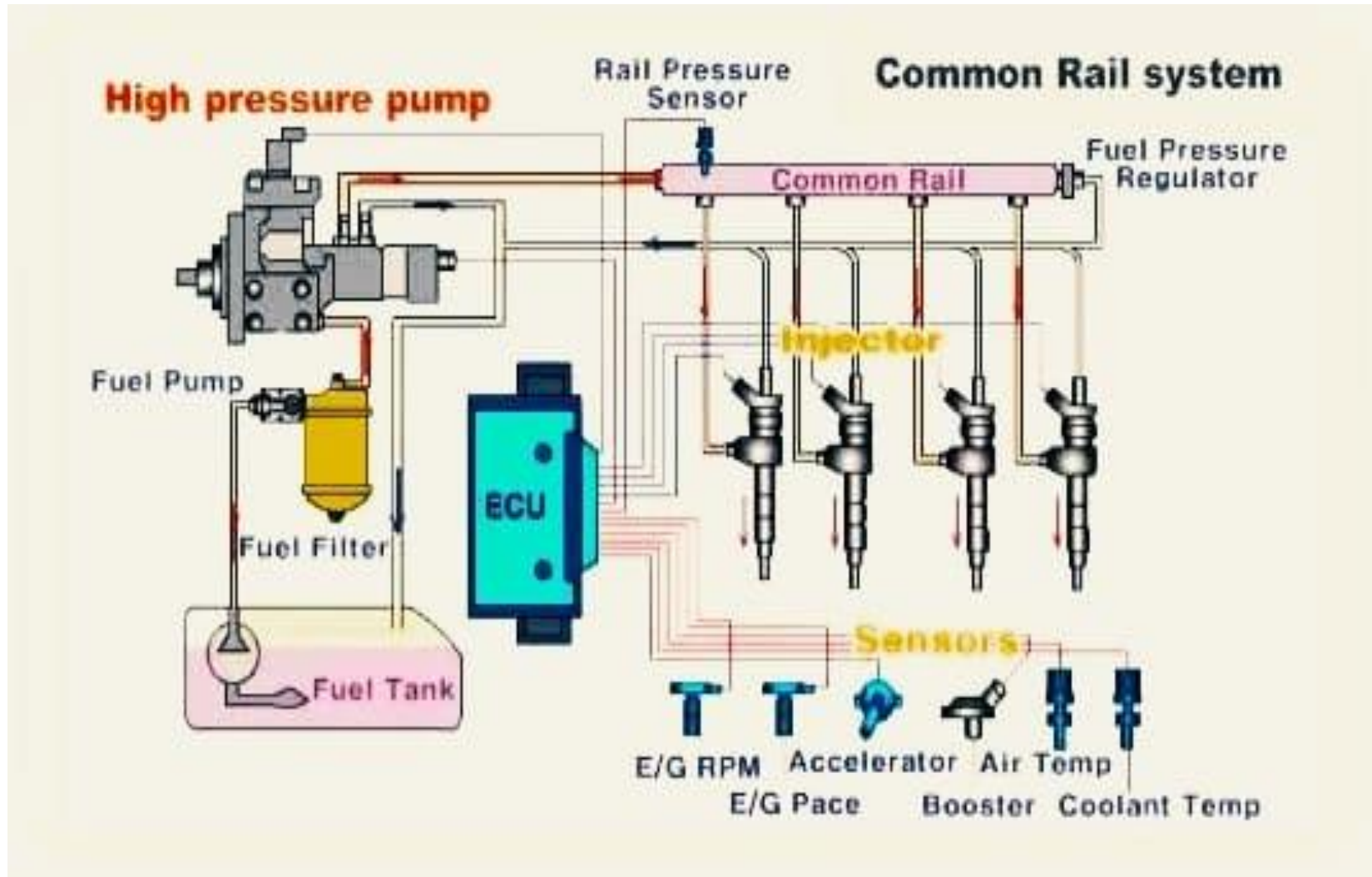


- Fuel from the tank is first drawn by a low-pressure pump and passed through a fuel filter to ensure it is free from contaminants. The filtered fuel then enters the high-pressure pump, which significantly increases the fuel pressure and supplies it to the common rail.
- The common rail maintains this high pressure, which can be adjusted according to the engine's requirements.
- The ECU, which acts as the system's brain, receives inputs from various sensors to calculate the optimal injection timing and duration.
- It sends precise signals to the fuel injectors, which then spray a fine mist of fuel directly into the combustion chamber at high pressure.
- This ensures efficient mixing with air, leading to complete and efficient combustion.



Advantages

- The precise control over fuel injection improves fuel atomization and combustion, leading to better fuel efficiency and higher power output.
- The system also contributes to reduced emissions by ensuring more complete combustion, helping engines meet stringent emission standards.
- Advanced injection control reduces engine noise and vibration, resulting in a quieter and smoother engine operation.





Thank You !