

Effects of Needle Lift and Pilot Injection rate on the Performance of DME DI Engines using Common rail Fuel Injection Systems

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Abstract : Diversification of energy sources, decreasing environmental emission and global emission gases are the one of the most important task. The fact that JP-8 is derived from natural gas, coal, biomass and ruined plastics is the bright prospect. JP-8 is called as multi source-multi-purpose, according to the diverse application such as generation, public use, vehicles, military use, and aviation use. In this injection characteristic, a preliminary injection characterization of injection rate and injection quantity behavior was investigated from a high-pressure common rail injection system used in heavy-duty engine. According to the spill injection and injection pressure, the trade-off trend for injection rate and injection quantity was observed. As expected, with pilot injection affects spray quantity and injection evolution of subsequent without pilot injection in JP-8 aviation fuel and diesel fuel. It was found that the total injection quantity was decreased by adding 20% pilot injection duration. Because pilot injection quantity causes solenoid response, loss and needle lift stroke friction loss.

Key words : DME(dimethyl ether), common rail, direct injection engine, pilot injection, main injection, needle lift