Title (en)

A fuel injection system for an internal combustion engine

Title (de)

Kraftstoffeinspritzsystem für eine Brennkraftmaschine

Title (fr)

Système d'injection de combustible pour moteur à combustion interne

Publication

EP 0860601 A2 19980826 (EN)

Application

EP 98102970 A 19980220

Priority

- JP 3799697 A 19970221
- JP 20060197 A 19970725

Abstract (en)

In the fuel injection system, fuel is supplied to a common rail from a high pressure fuel pump, and injected into the cylinders of an engine, from the common rail, via fuel injection valves. An electronic control unit (ECU) of the engine controls the pressure in the common rail at a value determined by the operating conditions of the engine. The ECU further detects the pressure and the temperature of the fuel in the common rail, and determines the bulk modulus of elasticity of the fuel based on the pressure and the temperature of the fuel. The ECU calculates an estimated value of the pressure change in the common rail during the fuel injection period using the determined bulk modulus. If the difference between the estimated value of the pressure change and the pressure change actually measured during the fuel injection period is large, the ECU determines that the fuel injection system has failed. Since the estimated value of the pressure change is calculated based on the bulk modulus of elasticity which is determined in accordance with the actual pressure and temperature of the fuel, the accurate estimated value is obtained even if the pressure and the temperature of the fuel in the common rail change over a very wide range. <IMAGE>

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F02D 41/38; F02D 41/24

IPC 8 full level

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CPC (source: EP)

F02D 41/221 (2013.01); **F02D 41/3827** (2013.01); F02D 2041/224 (2013.01); F02D 2200/0604 (2013.01); F02D 2200/0606 (2013.01)

Cited by

CN102644515A; DE112004002987B4; CN110121589A; CN108180082A; US2012020384A1; CN103075286A; EP1030047A3; EP1255037A4; EP1975398A3; CN100378314C; CN102812226A; DE102010013602B4; CN111237072A; EP0860600A3; EP0974826A3; EP2835518A1; CN100455785C; FR2803875A1; EP1571319A3; DE112008001486B4; US8196564B2; US7937988B2; US9051893B2; US10801428B2; US9002666B2; US11181089B2; US9567937B2; US7556023B2; WO2008147319A1; WO2011120848A1; WO2015069171A1; WO2008095815A1; WO2006053852A1; WO2009121652A1; US9903849B2; US10801462B2; WO2006040617A1; WO2010000561A3; WO2014121980A1

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