

Title (en)
A fuel injection valve

Title (de)
Kraftstoffeinspritzventil

Title (fr)
Soupape d'injection de combustible

Publication
EP 1164283 A2 20011219 (EN)

Application
EP 01114379 A 20010613

Priority
JP 2000184584 A 20000615

Abstract (en)
A fuel injection valve (10) is provided with a valve needle (105) which is urged by the pressure of fuel in a control chamber (109) to a closed position where the valve needle (105) closes the fuel injection hole (103). A supply passage (209) with a throttled portion connects a high pressure fuel passage (123) to the control chamber (109). The control chamber (109) is connected to a leak chamber (130) by two return passages (201,203). The leak chamber (130) has a leak passage (117) for spilling fuel in the leak chamber (130) to the outside of the fuel injection valve (10). A control valve (300) is provided in the leak chamber (130). The control valve (300) is capable of taking any of a closed position where the leak passage (117) is closed, a medium lift position where the leak passage (117) and two return passages (201,203) are opened, and a full lift position where the leak passage (117) and only one return passage (201) are opened. In the closing position of the control valve (300), the pressure in the control chamber (109) is high and the valve needle (105) is kept at the closing position. In the medium lift position and the full lift position, fuel in the control chamber (109) is spilled through the leak passage (117) via return passages (201,203) and the leak chamber (130). This causes the valve needle (105) to move to the position where the fuel injection hole (103) is opened. However, at the full lift position, since only one return passage (201) is opened, the rate of the pressure drop in the control chamber (109) is smaller and the speed of the lift of the valve needle (105) is lower. Therefore, the fuel injection characteristics can be changed by switching the position of the control valve (300) between the medium lift position and the full lift position during fuel injection. <IMAGE>

IPC 1-7
F02M 47/02; **F02M 59/46**

IPC 8 full level
F02M 47/00 (2006.01); **F02M 45/08** (2006.01); **F02M 45/12** (2006.01); **F02M 47/02** (2006.01); **F02M 51/00** (2006.01); **F02M 59/46** (2006.01); **F02M 61/20** (2006.01); **F02M 63/00** (2006.01)

CPC (source: EP)
F02M 45/12 (2013.01); **F02M 47/027** (2013.01); **F02M 63/0026** (2013.01)

Citation (applicant)
JP H0571438 A 19930323 - NIPPON DENSO CO

Cited by
EP1041272A3; DE10131619A1; FR2869651A1; CN116181537A; FR2894631A1; DE10254749A1; US7284712B2; WO2007071473A1; WO2007098986A1; WO2008058799A1; WO2004016936A1; WO03004856A1; WO2004051071A1; WO2004048769A1; US7347385B2; US10677184B2; WO03004860A3; WO2015189082A1

Designated contracting state (EPC)
DE ES FR GB IT SE

DOCDB simple family (publication)
EP 1164283 A2 20011219; **EP 1164283 A3 20031105**; **EP 1164283 B1 20061213**; DE 60125098 D1 20070125; DE 60125098 T2 20070628; ES 2277601 T3 20070716; JP 2001355533 A 20011226; JP 3551898 B2 20040811

DOCDB simple family (application)
EP 01114379 A 20010613; DE 60125098 T 20010613; ES 01114379 T 20010613; JP 2000184584 A 20000615