

Title (en)

Fuel injector for combustion engines with a multi-stage control valve

Title (de)

Kraftstoffinjektor für Verbrennungskraftmaschinen mit mehrstufigem Steuerventil

Title (fr)

Injecteur de carburant pour un moteur a combustion interne avec une soupape à plusieurs étages

Publication

**EP 1593839 B1 20070502 (DE)**

Application

**EP 05101342 A 20050222**

Priority

DE 102004022270 A 20040506

Abstract (en)

[origin: EP1593839A1] A fuel injector (3) has an injection valve element (IVE) (18). A multistage operating valve (MSOV) (30) has a control valve (32) designed as a servo valve operated by an activating valve (31). The MSOV controls a pressure intensifier (5) and the IVE. Different drain-off throttles (55,56) are closed and released to operate different opening speeds in a servo piston (35).

IPC 8 full level

**F02M 57/02** (2006.01); **F02M 45/12** (2006.01)

CPC (source: EP US)

**F02M 45/12** (2013.01 - EP US); **F02M 47/027** (2013.01 - EP US); **F02M 57/025** (2013.01 - EP US); **F02M 59/105** (2013.01 - EP US); **F02M 59/464** (2013.01 - EP US); **F02M 63/0029** (2013.01 - EP US); **F02M 2200/304** (2013.01 - EP US)

Cited by

US7412969B2; WO2007106510A3; WO2011029829A1

Designated contracting state (EPC)

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**EP 1593839 A1 20051109**; **EP 1593839 B1 20070502**; DE 102004022270 A1 20051201; DE 502005000640 D1 20070614; ES 2285638 T3 20071116; US 2005263133 A1 20051201; US 7201149 B2 20070410

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