

Title (en)  
PIEZO COMMON RAIL INJECTOR WITH HYDRAULIC CLEARANCE COMPENSATION INTEGRATED INTO THE SERVO VALVE

Title (de)  
PIEZO-COMMON RAIL INJEKTOR MIT INS SERVOVENTIL INTEGRIERTEM HYDRAULISCHEM SPIEL AUSGLEICH

Title (fr)  
INJECTEUR PIEZO À RAMPE COMMUNE À COMPENSATION DE JEU HYDRAULIQUE INTÉGRÉ DANS LA SERVOSOUPAPE

Publication  
**EP 3207243 B1 20180926 (DE)**

Application  
**EP 15778973 A 20151013**

Priority  
• DE 102014220883 A 20141015  
• EP 2015073710 W 20151013

Abstract (en)  
[origin: WO2016059069A1] The invention relates to an injection valve with servo valve control for injecting fuel into the combustion chamber of an internal combustion engine, having an injector element (100) with an injection nozzle, which has a nozzle module (110) with a nozzle element (120) and a nozzle needle (130). The nozzle module (110) is arranged in the lower injector element (100) face facing the combustion chamber, and the nozzle needle (130) corresponds to a nozzle spring (140) which is arranged so as to exert a closing force onto the nozzle needle (130). The injection valve additionally has a high-pressure line (210) which has a connection to the high-pressure fuel system at one location and is connected to a control chamber (250) via an inlet throttle (230) at another location, said control chamber (250) being connected to the valve chamber (300) via an outlet throttle (270). A valve element (310) is arranged in the valve chamber (300), and the valve element (310) interacts with a valve spring (330) such that the valve spring (330) pushes the valve element (310) away from the throttle plate (290) such that a gap (340) remains between the valve element (310) and the throttle plate (290). The valve element (310) is additionally connected to a valve pin (350) which is connected to an actuator (400) that is biased by a shaft spring (450) such that the valve pin (350) is fitted into the valve element (310) with very little clearance such that a sealing gap (360) is formed between the valve pin (350) and the valve element (310), and the valve element (310) has bores (370) which connect the valve chamber (300) to the sealing gap (360). Additionally, the lower end of the valve pin (350) is not completely connected to the valve element (310) such that a coupling volume (380) is formed between the valve pin (350) and the valve element (310), said coupling volume being connected to the valve chamber (300) via the sealing gap (360) and the bores (370). The sealing gap (360) is dimensioned small enough that a fluidic connection is produced between the coupling volume (380) and the valve chamber (300) and practically no fluids can be exchanged between the coupling volume (380) and the valve chamber (300) during the short time of the valve actuation such that the coupling volume (380) practically does not change during this time.

IPC 8 full level  
**F02M 63/00** (2006.01); **F02M 47/02** (2006.01); **F02M 61/16** (2006.01)

CPC (source: CN EP US)  
**F02M 47/027** (2013.01 - CN EP US); **F02M 61/167** (2013.01 - CN EP US); **F02M 63/0026** (2013.01 - CN EP US);  
**F02M 2200/703** (2013.01 - CN EP US); **F02M 2200/705** (2013.01 - CN EP US)

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**DE 102014220883 A1 20160421**; **DE 102014220883 B4 20160922**; CN 106795851 A 20170531; CN 106795851 B 20190618;  
EP 3207243 A1 20170823; EP 3207243 B1 20180926; US 10233885 B2 20190319; US 2017260950 A1 20170914;  
WO 2016059069 A1 20160421

DOCDB simple family (application)  
**DE 102014220883 A 20141015**; CN 201580055875 A 20151013; EP 15778973 A 20151013; EP 2015073710 W 20151013;  
US 201515516518 A 20151013