

Title (en)
Injection nozzle

Title (de)
Einspritzdüse

Title (fr)
Buse à injection

Publication
EP 1967730 A1 20080910 (EN)

Application
EP 08157000 A 20040715

Priority
• EP 04254231 A 20040715
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• EP 08157000 A 20040715

Abstract (en)
An injection nozzle for an internal combustion engine, the nozzle comprising: a valve member (30) which is engageable with a seating surface (32), defining a seat cone angle (\hat{N}_s), so as to control fuel delivery through a nozzle outlet (36), the valve member (30) including a cylindrical upper region (44), a seat region (46), arranged immediately downstream of the upper region (44), defining a first cone angle (\hat{N}_1), wherein the upper region (44) and the seat region (46) define, at their intersection, a seating line (40) for engagement with the seating surface (32), a second region (48), arranged immediately downstream of the seat region (46), defining a second cone angle (\hat{N}_2), and an end conical region (50), arranged immediately downstream of the second region (48), wherein a first differential angle between the first cone angle (\hat{N}_1) and the seat cone angle (\hat{N}_s) is smaller than a second differential angle between the second cone angle (\hat{N}_2) and the seat cone angle (\hat{N}_s), said first differential angle being selected to ensure the seating line (40) migrates in a downstream direction along the seat region (46) as the valve member (30) becomes worn, in use, and the second differential angle being selected to prevent said migration of the seating line (40) beyond a pre-determined amount.

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CPC (source: EP)
F02M 61/1873 (2013.01); **F02M 61/1806** (2013.01)

Citation (applicant)
• EP 1180596 A1 20020220 - DELPHI TECH INC [US]
• US 5890660 A 19990406 - STEVENS JOHN WILLIAM [GB]

Citation (search report)
• [X] US 5033679 A 19910723 - GOLEV VLADISLAV I [SU], et al
• [A] US 3980237 A 19760914 - PARRISH JR WALTER A
• [DA] EP 1180596 A1 20020220 - DELPHI TECH INC [US]
• [A] US 5890660 A 19990406 - STEVENS JOHN WILLIAM [GB]
• [X] US 6546914 B1 20030415 - FATH ANDREAS [DE], et al
• [Y] DE 19942370 A1 20010322 - BOSCH GMBH ROBERT [DE]
• [Y] US 2002179743 A1 20021205 - HAEBERER RAINER [DE], et al
• [A] US 4153205 A 19790508 - PARRISH JR WALTER A
• [A] EP 0283154 A1 19880921 - LUCAS IND PLC [GB]
• [A] GB 2186632 A 19870819 - BOSCH GMBH ROBERT
• [X] WO 0236961 A1 20020510 - SIEMENS AG [DE], et al
• [XA] PATENT ABSTRACTS OF JAPAN vol. 2000, no. 25 12 April 2001 (2001-04-12)
• [A] PATENT ABSTRACTS OF JAPAN vol. 2000, no. 21 3 August 2001 (2001-08-03)

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