

Title (en)  
ELECTROMAGNET

Publication  
**EP 0204181 B1 19890927 (DE)**

Application  
**EP 86106472 A 19860513**

Priority  
DE 3520142 A 19850605

Abstract (en)  
[origin: US4660011A] An electromagnet which serves particularly to control a fuel injection valve for fuel injection systems in internal combustion engines. The electromagnet includes an inner core of soft-magnetic material, which is surrounded by a magnetic coil. An outer core at least partly surrounds the magnetic coil and has an outer pole located in the same plane as an inner pole of the inner core. On one side of the magnetic coil, between the inner core and the outer core, there is a first annularly embodied and radially magnetized permanent magnet, and on the other side of the magnetic coil there is a second annularly embodied and radially magnetized permanent magnet. Facing the poles, there is an armature, which at one end is joined to a valve needle that has a valve body cooperating with a valve seat, and on its other end forms a first working air gap with the outer pole and a second working air gap with the inner pole. The permanent magnets are poled such that their magnetic fields at the working air gaps extend counter to the electromagnetic field induced by the magnetic coil.

IPC 1-7  
**F02M 51/06**; **H01F 7/04**; **H01F 7/20**

IPC 8 full level  
**H01F 7/08** (2006.01); **F02M 51/06** (2006.01); **F16K 31/06** (2006.01); **H01F 7/04** (2006.01); **H01F 7/20** (2006.01); **H01F 7/123** (2006.01)

CPC (source: EP US)  
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Cited by  
EP3034853A1; EP3141736A1; DE3834446A1; EP2589786A1; CN103975157A; WO2013064523A1; WO2017041978A1

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