

Title (en)
Electromagnetic valve with pneumatic spring and toggle drive mechanism

Title (de)
Elektromagnetventil mit Pneumatikfeder und Kniehebelmechanismus

Title (fr)
Soupape à commande électromagnétique, à ressort pneumatique et articulation par genouillère

Publication
EP 1132581 A1 20010912 (FR)

Application
EP 01400607 A 20010308

Priority
FR 0003111 A 20000310

Abstract (en)
The valve stem (25) passes through the cylinder head (12) along the axis of the pneumatic spring's cylinder (40). It is aligned, but discontinuous, with the operating plunger (24) of the adjoining electromagnetic actuator (10). The actuator's armature (22) operates in the air-space of a laminated ferromagnetic core (36), carrying an exciting coil (38). On the adjacent ends of plunger and stem are fixed plate pistons (30,34) that slide inside the spring cylinder, forming two pneumatic return springs that keep the valve, at rest, in mid-position between fully open and fully closed. The actuator coil carries current pulses, at a frequency near the natural frequency, alternately raising and depressing the moving parts under the control of a position sensor. The stiffness of the return springs depends on the air pressure in the cylinder. Each is connected to an electrically operated valve (42) controlled by a calculator (44) forming part of the engine management unit. The valve can connect the spring cylinders to a simple discharge (50) or to a reservoir (460) maintained at a constant pressure by a pump (51). 3 variants are described.

Abstract (fr)
Le dispositif de commande de soupape à actionneur de déplacement linéaire de la soupape suivant un axe comprend une palette (22) en matériau ferromagnétique fixée à une tige de poussée de soupape déplaçable dans un boîtier de l'actionneur par des moyens électromagnétiques, ayant au moins une bobine (38) montée sur un circuit ferromagnétique, entre deux positions stables définies par l'appui de la palette contre le circuit ferromagnétique. Un au moins des ressorts de rappel est un ressort pneumatique muni de moyens permettant d'y régler la pression moyenne ou maximale. <IMAGE>

IPC 1-7
F01L 9/04

IPC 8 full level
F01L 1/46 (2006.01); **F01L 9/20** (2021.01)

CPC (source: EP)
F01L 1/465 (2013.01); **F01L 9/20** (2021.01)

Citation (applicant)
• FR 9812489 A 19981006
• FR 9811670 A 19980918

Citation (search report)
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• [Y] US 5029516 A 19910709 - ERICKSON FREDERICK L [US], et al
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