

Title (en)  
DUAL SWITCH ELECTROMAGNETIC VALVE-BASED LEVEL 3 OR LEVEL 4 VARIABLE DISPLACEMENT OIL PUMP

Title (de)  
ÖLPUMPE MIT VARIABLER VERDRÄNGUNG AUF STUFE 3 ODER STUFE 4 BASIEREND AUF EINEM ELEKTROMAGNETISCHEN VENTIL MIT DOPPELSCHALTER

Title (fr)  
POMPE À HUILE À CYLINDRÉE VARIABLE DE NIVEAU 3 OU DE NIVEAU 4 À BASE DE SOUPAPE ÉLECTROMAGNÉTIQUE À COMMUTATEUR DOUBLE

Publication  
**EP 3524816 A4 20200603 (EN)**

Application  
**EP 18865337 A 20180801**

Priority  
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• CN 2018097838 W 20180801

Abstract (en)  
[origin: EP3524816A1] A three-stage or four-stage variable displacement engine oil pump based on two switch solenoid valves uses a structure of two variable feedback cavities. One variable feedback cavity is directly connected to a pump outlet, and the other variable feedback cavity is controlled by a pressure control valve. The control valve includes two independent control cavities that are both in communication with a main oil gallery and are each controlled by a switch solenoid valve. The two switch solenoid valves are in four different combined states: off and off, on and off, off and on, and on and on, so that the pressure control valve has four different pressure control modes, and an engine oil pump correspondingly forms four different pressure control modes, which can meet pressure requirements of various different working conditions of an engine, to realize a pressure control target that is very close to actual requirements of the engine; power saving of the pump is very close to that of a continuously variable displacement engine oil pump controlled by an electro-hydraulic proportional valve, and the control modes in the present invention are logically simple and reliable, fast in response, and stable in pressure control, and have a small pressure fluctuation.

IPC 8 full level  
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CPC (source: EP)  
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Citation (search report)  
• [X] WO 2012149929 A2 20121108 - IXETIC BAD HOMBURG GMBH [DE], et al  
• [X] WO 2015097637 A1 20150702 - VHIT SPA [IT]  
• [X] WO 2008037070 A1 20080403 - MAGNA POWERTRAIN USA INC [CA], et al  
• [X] EP 2738388 A1 20140604 - YAMADA MFG CO LTD [JP]  
• [X] US 9670926 B2 20170606 - OHNISHI HIDEAKI [JP], et al  
• See references of WO 2019080570A1

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