

Title (en)  
Hydraulic control apparatus

Title (de)  
Hydraulisches Steuergerät

Title (fr)  
Appareil de commande hydraulique

Publication  
**EP 1598561 B1 20071226 (EN)**

Application  
**EP 05010782 A 20050518**

Priority  
JP 2004148967 A 20040519

Abstract (en)  
[origin: EP1598561A2] A driving loss of a pump is avoided to reduce a load of an engine driving the pump. At least a first circuit group and a second circuit group, each including switching valves 11 to 19 to switch supply of operating oil to actuators, an auxiliary switching valve 16 disposed in the first circuit group to switch supply of the operating oil to an auxiliary actuator, and at least two pumps supplying the operating oil to each of the first circuit group and the second circuit group are provided. A convergence flow passage 40 to converge the operating oil from the second circuit group to the first circuit group, a drain flow passage 43 branched from the convergence flow passage 40 to release the operating oil to a side of a reservoir, and a control valve 42 interposed in the branched portion are provided, wherein the control valve 42 is operated to be switched in accordance with a difference in pressures between the first circuit group and the second circuit group, and introduces the operating oil of the first circuit group to the drain flow passage 43 when supply pressure of the first circuit group is higher than supply pressure of the second circuit group. <IMAGE>

IPC 8 full level  
**E02F 9/22** (2006.01); **F15B 11/16** (2006.01); **F15B 11/17** (2006.01)

CPC (source: EP)  
**E02F 9/2239** (2013.01); **E02F 9/2282** (2013.01); **E02F 9/2292** (2013.01); **F15B 11/167** (2013.01); **F15B 11/17** (2013.01); **F15B 2211/20576** (2013.01); **F15B 2211/30595** (2013.01); **F15B 2211/3116** (2013.01); **F15B 2211/3127** (2013.01); **F15B 2211/329** (2013.01); **F15B 2211/353** (2013.01); **F15B 2211/7142** (2013.01); **F15B 2211/781** (2013.01)

Cited by  
EP1975324A1; EP3037676A4; EP3683452A4; CN107532408A; US9279236B2; US8910474B2; US8966891B2; US8943819B2; US9290911B2; WO2007120997A1; WO2016166178A1; US7841175B2; US7481052B2; US9481975B2; US8978374B2; US9719532B2; US8893490B2; US9051714B2; US8966892B2; US9080310B2; US8944103B2; US8984873B2; US9151018B2; US8863509B2; US8973358B2; US8978373B2; US8919114B2; US9057389B2; US9068578B2

Designated contracting state (EPC)  
DE GB IT

DOCDB simple family (publication)  
**EP 1598561 A2 20051123**; **EP 1598561 A3 20051214**; **EP 1598561 B1 20071226**; CN 100516555 C 20090722; CN 1699761 A 20051123; DE 602005003980 D1 20080207; DE 602005003980 T2 20080430; JP 2005331011 A 20051202; JP 4139352 B2 20080827

DOCDB simple family (application)  
**EP 05010782 A 20050518**; CN 200510072761 A 20050519; DE 602005003980 T 20050518; JP 2004148967 A 20040519