

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 896 145 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
09.08.2000 Bulletin 2000/32

(51) Int. Cl.⁷: **F02D 41/38**

(43) Date of publication A2:
10.02.1999 Bulletin 1999/06

(21) Application number: **98114569.1**

(22) Date of filing: **03.08.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **04.08.1997 JP 20918397**

(71) Applicant:
TOYOTA JIDOSHA KABUSHIKI KAISHA
Aichi-ken 471-8571 (JP)

(72) Inventor: **Kotani, Akira**
Toyota-shi, Aichi-ken, 471-8571 (JP)

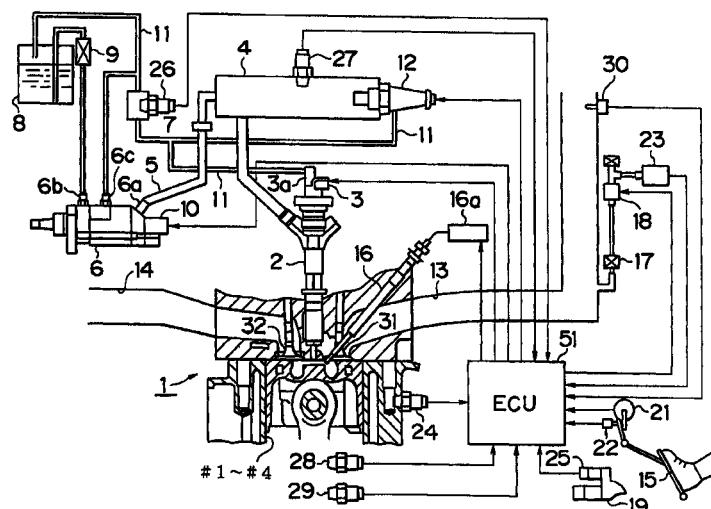
(74) Representative:
Pellmann, Hans-Bernd, Dipl.-Ing. et al
Patentanwaltsbüro
Tiedtke-Bühling-Kinne & Partner
Bavariaring 4-6
80336 München (DE)

(54) **Fuel injection control apparatus for accumulator type engine**

(57) A fuel injection control apparatus for an accumulator type engine (1) prevents occurrence of loud combustion noises due to excessively high fuel pressure in an accumulator pipe (4) at the time of start of the engine (1). Injectors (2) of a diesel engine (1) are connected to a common rail (4) provided commonly for all the cylinders (#1-#4). The common rail (4) is connected to a supply pump (6) by a supply pipe (5). A pressure control valve (10) for controlling the pressure of fuel ejected from the supply pump (6) is provided near an ejection portion (6a) of the supply pump (6). At the time

of start of the engine (1) before the cylinders are discriminated, an electronic control unit (ECU) (51) normally executes the starting-time control of the pressure control valve (10). Even before the cylinder discrimination, the ECU (51) calculates a target fuel pressure and detects actual fuel pressure in the main routine. If the actual fuel pressure exceeds the target fuel pressure, the ECU 51 switches off the pressure control valve (10) even before the cylinder discrimination. Therefore, an excessively high fuel pressure is prevented.

FIG.1



EP 0 896 145 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 11 4569

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cls)
X	DE 33 04 605 A (STEYR DAIMLER PUCH AG) 25 August 1983 (1983-08-25)	1-4, 10	F02D41/38
Y	* abstract * * claims 1-7 * * figures *	11	
A	EP 0 681 100 A (CUMMINS ENGINE CO INC) 8 November 1995 (1995-11-08)	1, 3, 4	
Y	* abstract * * claim 8 *	11	
A	GB 2 290 112 A (FUJI HEAVY IND LTD) 13 December 1995 (1995-12-13) * abstract *	5-8	
D, A	PATENT ABSTRACTS OF JAPAN vol. 018, no. 569 (M-1695), 31 October 1994 (1994-10-31) & JP 06 207548 A (NIPPONDENSO CO LTD), 26 July 1994 (1994-07-26) * abstract *	1	TECHNICAL FIELDS SEARCHED (Int.Cls)
			F02D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 June 2000	Examiner Trotereau, D
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 11 4569

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-06-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 3304605 A	25-08-1983	AT 380540 A	10-06-1986
		AT 388030 B	25-04-1989
		AT 52083 A	15-09-1988
		AT 53782 A	15-10-1985
EP 0681100 A	08-11-1995	BR 9501935 A	19-12-1995
		CN 1116686 A	14-02-1996
		JP 2865588 B	08-03-1999
		JP 8042382 A	13-02-1996
		US 5678521 A	21-10-1997
GB 2290112 A	13-12-1995	JP 6129322 A	10-05-1994
		DE 4334923 A	21-04-1994
		GB 2271810 A,B	27-04-1994
		US 5327872 A	12-07-1994
JP 06207548 A	26-07-1994	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82