



(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
11.02.2004 Bulletin 2004/07

(51) Int Cl.7: F02D 41/02, F02D 41/14,
F02D 41/30

(43) Date of publication A2:
28.11.2001 Bulletin 2001/48

(21) Application number: 01112559.8

(22) Date of filing: 23.05.2001

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

- Takagi, Noboru, c/o Toyota Jidosha K.K.
Toyota-shi, Aichi-ken, 471-8571 (JP)
- Hokuto, Hiroyuki, c/o Toyota Jidosha K.K.
Toyota-shi, Aichi-ken, 471-8571 (JP)
- Mizuno, Hiroyuki, c/o Toyota Jidosha K.K.
Toyota-shi, Aichi-ken, 471-8571 (JP)
- Kitamura, Tooru, c/o Toyota Jidosha K.K.
Toyota-shi, Aichi-ken, 471-8571 (JP)

(30) Priority: 26.05.2000 JP 2000156556
02.11.2000 JP 2000335964

(71) Applicant: TOYOTA JIDOSHA KABUSHIKI
KAISHA
Toyota-shi, Aichi 471-8571 (JP)

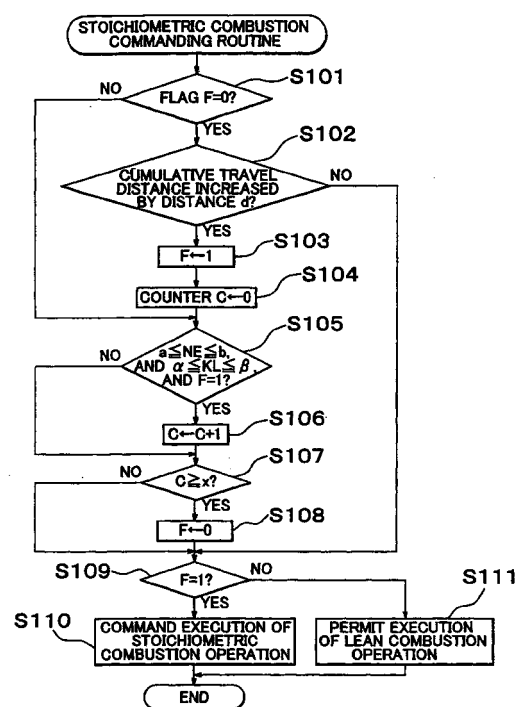
(74) Representative:
Leson, Thomas Johannes Alois, Dipl.-Ing.
Tiedtke-Bühling-Kinne & Partner GbR,
TBK-Patent,
Bavariaring 4
80336 München (DE)

(72) Inventors:
• Idogawa, Masanao, c/o Toyota Jidosha K.K.
Toyota-shi, Aichi-ken, 471-8571 (JP)

(54) Internal combustion engine control apparatus and method for controlling the same

(57) A forced stoichiometric combustion is executed every time a cumulative travel distance of a vehicle increases by a distance, thereby creating an opportunity to determine an air-fuel ratio value in a region in which a rich spike control is performed. Therefore, the determination of an air-fuel ratio value can be precisely calculated so that the air-fuel ratio value corresponds to a value that reflects a deviation of the actual air-fuel ratio and a proper value. Accordingly, it becomes possible to control, with high precision, correlation between the air-fuel ratio and a proper value based on the determined air-fuel ratio value during a fuel-rich combustion that is caused by the rich spike control.

FIG. 3





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 11 2559

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 778 666 A (CULLEN MICHAEL JOHN ET AL) 14 July 1998 (1998-07-14)	1-4,6,8	F02D41/02
A	* the whole document *	5,7	F02D41/14
	---		F02D41/30
E	EP 1 083 323 A (TOYOTA MOTOR CO LTD) 14 March 2001 (2001-03-14)	1,4,7,8	
	* figures 1,9,10,14,20 *		

A	EP 0 908 613 A (DENSO CORP) 14 April 1999 (1999-04-14)	5	
	* paragraph [0038] - paragraph [0052] *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F02D
Place of search		Date of completion of the search	Examiner
MUNICH		19 December 2003	Aign, T
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p> <p>& : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.82 (P04C01)

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

EP 01 11 2559

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.

19-12-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5778666	A	14-07-1998	US 5704339 A	06-01-1998
			DE 69724693 D1	16-10-2003
			EP 0803646 A2	29-10-1997
			JP 9329047 A	22-12-1997

EP 1083323	A	14-03-2001	JP 2001082135 A	27-03-2001
			EP 1083323 A2	14-03-2001

EP 0908613	A	14-04-1999	JP 11117791 A	27-04-1999
			JP 11270330 A	05-10-1999
			EP 0908613 A2	14-04-1999
			US 6148612 A	21-11-2000
			US 6263668 B1	24-07-2001
