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 OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC,

[Continued on next page]

(54) Title: CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

FIG. 1

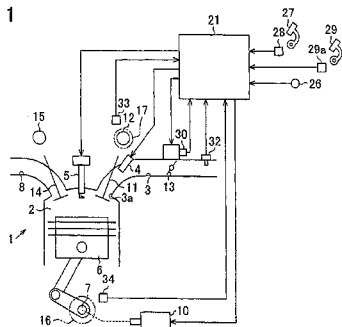


FIG. 8

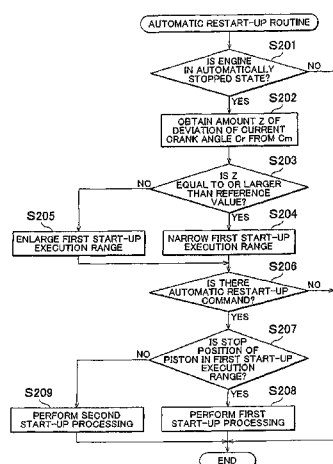


FIG. 4A

ENGINE
ROTATIONAL
SPEED

FIG. 4B

OUTPUT OF CRANK
POSITION SENSOR

FIG. 4C

REFERENCE VALUE

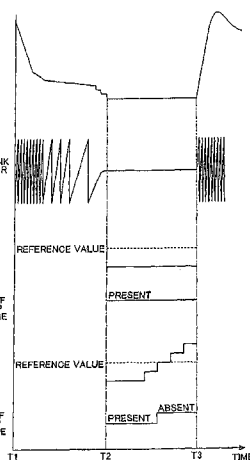
FIG. 4D

AMOUNT Z OF
DEVIATION

FIG. 4E

REFERENCE VALUE

FIG. 4F

ENLARGEMENT OF
FIRST START-UP
EXECUTION RANGE

(57) Abstract: When a stop position of a piston resulting from the automatic stop is in a range that is on an advance side of a threshold in terms of crank angle, fuel injection is performed at beginning of the automatic restart-up in the cylinder that is in the intake stroke and an ignition is performed in a subsequent initial compression stroke in the same cylinder. When the stop position of the piston resulting is in a range that is on a retard side of the threshold in terms of crank angle, initial fuel injection is performed in the cylinder that next enters an intake stroke among the cylinders of the internal combustion engine after the beginning of automatic restart-up and initial ignition is performed in a subsequent compression stroke in the same cylinder. The threshold is determined in accordance with an amount of deviation of a crank angle.



SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2011 099357 A (DENSO CORP) 19 May 2011 (2011-05-19) cited in the application the whole document	1-5
A	----- US 2010/042311 A1 (NAKAI YASUHIRO [JP]) 18 February 2010 (2010-02-18) abstract figures paragraphs [0001] - [0008]	1
A	----- US 2009/076714 A1 (YAMAMURA YOSHIYA [JP] ET AL) 19 March 2009 (2009-03-19) abstract paragraphs [0002] - [0006] -----	1



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See patent family annex.

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Information on patent family members

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