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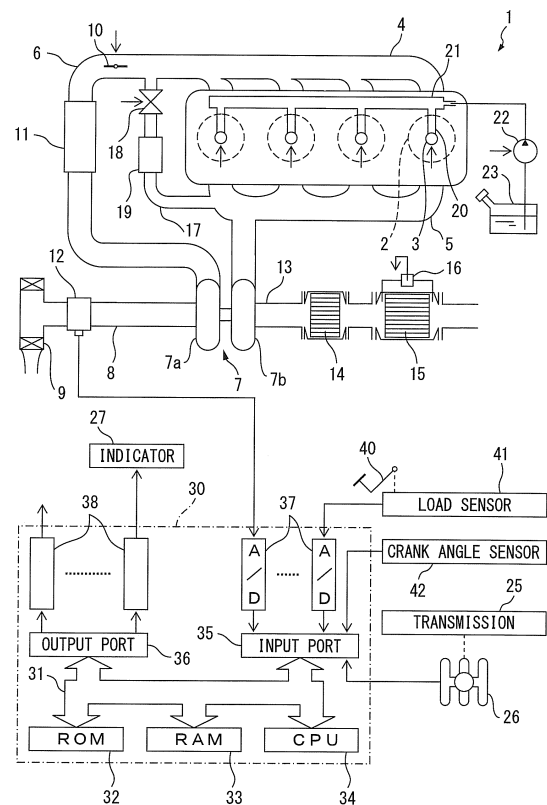
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(54) **EXHAUST PURIFICATION SYSTEM FOR INTERNAL COMBUSTION ENGINE**

(57) Opportunity for execution of rich control is secured whereby NO_x can be removed well. An NO_x storage catalyst (14) is arranged in an engine exhaust passage. When it is judged that rich control execution conditions stand, rich control is executed in order to release NO_x or SO_x from the NO_x storage catalyst. When it is judged that the rich control execution conditions do not stand, the gear position where the rich control execution conditions would stand when assuming the gear position of a transmission (25) were changed under a constant engine output is found as a target gear position. An indicator (27) is used to display an indication that the gear position should be changed to the target gear position to a vehicle operator. When the vehicle operator changes the gear position to the target gear position and it is thereby judged that the rich control execution conditions stand, rich control is executed.

FIG. 1





EUROPEAN SEARCH REPORT

Application Number
EP 14 19 1276

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 198 52 600 A1 (BOSCH GMBH ROBERT [DE]) 18 May 2000 (2000-05-18) * abstract * * column 2, line 21 - column 3, line 47 * * column 6, line 1 - column 7, line 30 * * figure 2 *	1-7	INV. F02D41/02
X	WO 01/53664 A2 (VOLKSWAGEN AG [DE]; POTT EKKEHARD [DE]; PFALZGRAF BERNHARD [DE]) 26 July 2001 (2001-07-26) * page 1, line 11 - line 24 * * page 2, line 11 - page 3, line 2 * * page 3, line 18 - line 20 * * claims 1,9,10 *	1-7	
X	EP 0 474 401 A2 (LUCAS IND PLC [GB]) 11 March 1992 (1992-03-11) * column 1, lines 1-8 * * column 1, line 34 - line 55 * * column 2, line 8 - line 21 * * column 2, line 50 - column 3, line 4 * * column 3, line 23 - line 33 * * column 4, line 18 - line 23 * * column 4, line 50 - column 5, line 10 * * figure 1 *	1-7	TECHNICAL FIELDS SEARCHED (IPC) F02D
X	WO 2005/019616 A1 (VOLVO LASTVAGNAR AB [SE]; BERGLUND SIXTEN [SE]; ERIKSSON ANDERS [SE];) 3 March 2005 (2005-03-03) * page 2, line 11 - page 3, line 1 * * page 3, line 27 - page 4, line 8 * * page 12, line 11 - page 13, line 2 * * page 14, line 25 - line 30 *	1-7	
A	WO 2007/145553 A1 (VOLVO LASTVAGNAR AB [SE]; JOHNSON NICLAS [SE]; STEEN MARCUS [SE]; LANG) 21 December 2007 (2007-12-21) * the whole document *	1-7	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 September 2015	Examiner Wettemann, Mark
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	



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Application Number
EP 14 19 1276

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 544 442 A2 (SIEMENS AG [DE]) 22 June 2005 (2005-06-22) * the whole document * -----	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 September 2015	Examiner Wettemann, Mark
<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 & : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)

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

EP 14 19 1276

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The members are as contained in the European Patent Office EDP file on
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09-09-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 19852600 A1	18-05-2000	DE 19852600 A1	18-05-2000
		EP 1047868 A1	02-11-2000
		ES 2168871 T3	16-06-2002
		JP 2002530565 A	17-09-2002
		US 6467255 B1	22-10-2002
		WO 0029736 A1	25-05-2000

WO 0153664 A2	26-07-2001	AT 309458 T	15-11-2005
		DE 10001992 A1	26-07-2001
		DE 50107983 D1	15-12-2005
		EP 1252427 A2	30-10-2002
		WO 0153664 A2	26-07-2001

EP 0474401 A2	11-03-1992	DE 69126263 D1	03-07-1997
		DE 69126263 T2	29-01-1998
		EP 0474401 A2	11-03-1992
		ES 2104671 T3	16-10-1997
		US 5201889 A	13-04-1993

WO 2005019616 A1	03-03-2005	SE 0302269 A	21-02-2005
		WO 2005019616 A1	03-03-2005

WO 2007145553 A1	21-12-2007	BR P10621826 A2	20-12-2011
		CN 101466925 A	24-06-2009
		EP 2041406 A1	01-04-2009
		JP 2009540213 A	19-11-2009
		WO 2007145553 A1	21-12-2007

EP 1544442 A2	22-06-2005	DE 10359674 A1	28-07-2005
		EP 1544442 A2	22-06-2005
		US 2005148430 A1	07-07-2005

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