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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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[Continued on next page]

(54) Title: METHOD TO DETECT SHORTED SOLENOID COILS

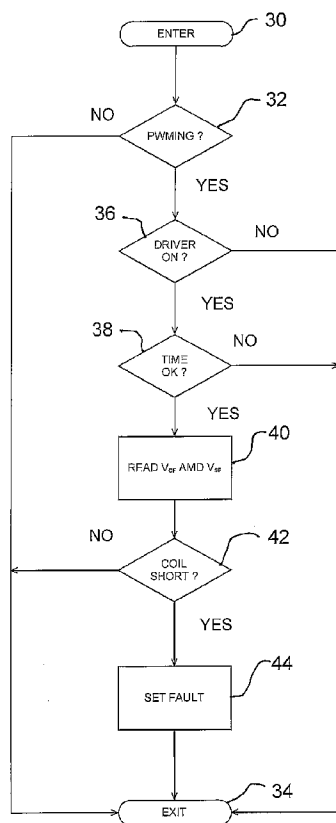


FIG. 3

(57) Abstract: A method for testing the continuity of a coil that is subjected to a high frequency pulse modulated current that includes sensing a coil voltage, determining a ratio of the sensed coil voltage to the supply voltage and comparing the ratio to a threshold to determine whether the solenoid coil is functional.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/081907**A. CLASSIFICATION OF SUBJECT MATTER****B60R 16/02(2006.01)i, B60T 8/88(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 : B60R16/02

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

Korean Utility Models and applications for Utility Models since 1975

Japanese Utility Models and applications for Utility Models since 1975

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

eKIPASS(KIPO internal) & keywords : "solenoid*" and "short*" and "detect*"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	KR 10-1997-0040603 A (DAEWOO ELECTRIC MACHINERY LTD) 24 July 1997 See the abstract; fig. 1; claims 1-4.	1-3, 5, 6 4, 7
Y	US 4,838,037 A (WOOD) 13 June 1989 See the abstract; figs. 1-2; column 2, line 10 - column 3, line 19.	4, 7
A	KR 10-2006-0031227 A (MANDO CORP.) 12 April 2006 See the abstract; fig. 2; claims 1-3.	1-11
A	JP 11-218256 A (NIPPON DENKI HOME ELECTRONICS) 10 August 1999 See the abstract; figs. 1-2; paragraphs [0011]-[0017].	1-11

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-1997-0040603 A	24.07.1997	NONE	
US 4,838,037 A	13.06.1989	CA 1336294 C	11.07.1995
KR 10-2006-0031227 A	12.04.2006	NONE	
JP 11-218256 A	10.08.1999	NONE	