

1) Family number: 66164073 (US2018372200A)

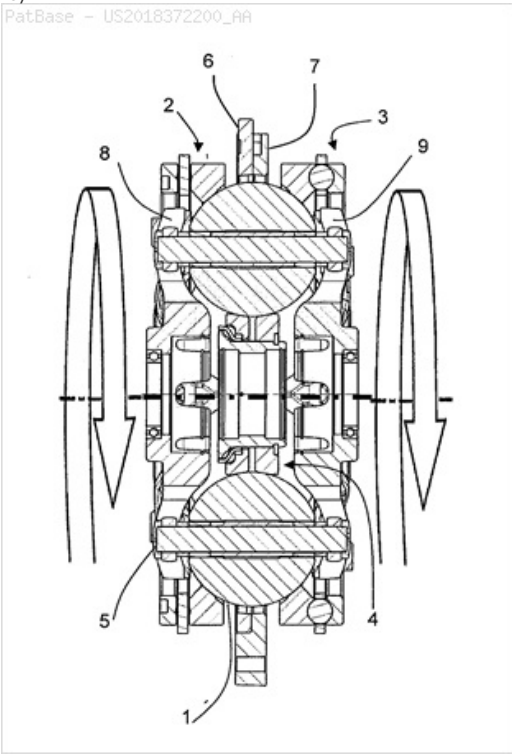
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**Title:** CONTROL STRATEGIES FOR HYBRID ELECTRIC POWERTRAIN CONFIGURATIONS WITH A BALL VARIATOR USED AS A POWERSPLIT E-CVT

**Abstract:** A computer-implemented system for a vehicle having an engine, a battery system, a first motor/generator, and a second motor/generator, each motor/generator operably coupled to a ball-planetary variator (CVP), the computer-implemented system comprising: a digital processing device comprising an operating system configured to perform executable instructions and a memory device; a computer program including instructions executable by the digital processing device, the computer program comprising a software module configured to manage a plurality of vehicle driving conditions; a hybrid supervisory controller; and a plurality of sensors configured to monitor vehicle parameters including at least one of CVP input speed, engine torque, accelerator pedal position, CVP speed ratio, and battery charge, wherein the software module includes a plurality of software sub-modules configured to optimize the CVP speed ratio based at least in part on one of the vehicle parameters monitored by the plurality of sensors. The hybrid supervisory controller can choose the torque split and path of highest efficiency from engine to wheel, optionally operate at the best potential overall efficiency point in any mode and also provide torque variability, thereby leading to the best combination of powertrain performance and fuel efficiency.

**Classifications:**

**International (IPC 8-9):** B60K6/36 B60K6/442 B60K6/445 B60K6/52 B60W10/08 B60W20/10 B60W20/11 B60W30/182 F16H15/28 F16H37/08 (Advanced/Invention)  
**CPC:** Y02T10/6234 Y02T10/6239 Y02T10/6265 B60W20/11 B60W10/08 F16H37/086 B60K6/36 B60K6/442 B60K6/445 B60K6/52 B60W20/10 B60W30/182 B60W2050/0005 B60W2050/0006 B60W2050/0088 F16H15/28 F16H2037/0866



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2018372200 AA    | 20181227         | US20160062400      | 20161215         |
| WO17106410 A1      | 20170622         | WO2016US66766      | 20161215         |

**Priority:**

US20150267704P 20151215      US20160062400 20161215      WO2016US66766 20161215

**Probable Assignee:** DANA LTD

**Assignee(s):** (std): DANA LTD

**Inventor(s):** (std): KUMAR KRISHNA ; WESOLOWSKI STEVEN J

**Agent(s):** EVANS STEPHEN P ET AL

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

2) Family number: 42617133 (US2008300827A)

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**Title:** SYSTEM AND METHOD TO DETERMINE ELECTRIC MOTOR EFFICIENCY NONINTRUSIVELY

**Abstract:** A system and method for nonintrusively determining electric motor efficiency includes a processor programmed to, while the motor is in operation, determine a plurality of stator input currents, electrical input data, a rotor speed, a value of stator resistance, and an efficiency of the motor based on the determined rotor speed, the value of stator resistance, the plurality of stator input currents, and the electrical input data. The determination of the rotor speed is based on one of the input power and the plurality of stator input currents. The determination of the value of the stator resistance is based on at least one of a horsepower rating and a combination of the plurality of stator input currents and the electrical input data. The electrical input data includes at least one of an input power and a plurality of stator input voltages.

**Classifications:**

**International (IPC 8-9):** G01R19/22 G01R31/34 G06F15/00 H02K11/00 H02P21/14 H02P23/14 (Advanced/Invention);

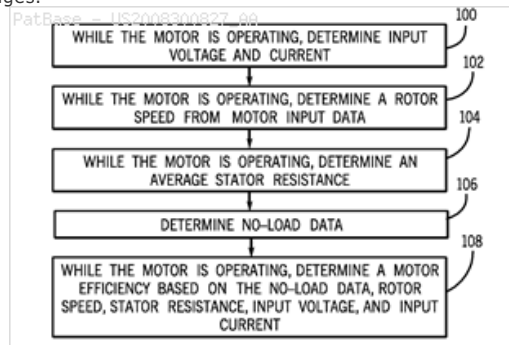
G01R31/34 H02K11/00 H02P21/14 H02P23/14 (Core/Invention);  
G01R (Subclass/Invention)

**International (IPC 1-7):** G01R31/34 H02P21/14 H02P23/14

**CPC:** G01R31/343 H02P23/14

**European:** G01R31/34B H02P23/14

**US:** 1/1 318/490 318/490P 324/120 324/765.01 340/648 340/661 702/145 702/145S 702/182 702/182P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2008302740 AA    | 20090326         | AU20080302740      | 20080603         |
| AU2008302740 BB    | 20140116         | AU20080302740      | 20080603         |
| BRPI0811391 A2     | 20141104         | BR2008PI11391      | 20080603         |
| CA2689512 AA       | 20090326         | CA20082689512      | 20080603         |
| CA2689512 C        | 20161018         | CA20082689512      | 20080603         |
| CN101688897 A      | 20100331         | CN200880018878     | 20080603         |
| CN101688897 B      | 20140430         | CN200880018878     | 20080603         |
| DE602008039165 D1  | 20150903         | DE200860039165T    | 20080603         |
| EP2162980 A2       | 20100317         | EP20080832461      | 20080603         |
| EP2162980 B1       | 20150722         | EP20080832461      | 20080603         |
| IN04166KN2009 A    | 20100326         | IN2009KN04166      | 20091201         |
| IN279806 B         | 20170203         | IN2009KN04166      | 20091201         |
| MX2009013285 A1    | 20100218         | MX20090013285      | 20080603         |
| US2008300827 AA    | 20081204         | US20080132151      | 20080603         |
| US2009051308 AA    | 20090226         | US20080132194      | 20080603         |
| US2011213589 AA    | 20110901         | US20110088846      | 20110418         |
| US7956637 BB       | 20110607         | US20080132194      | 20080603         |
| US8010318 BB       | 20110830         | US20080132151      | 20080603         |
| US9170303 BB       | 20151027         | US20110088846      | 20110418         |
| WO09038832 A2      | 20090326         | WO2008US65628      | 20080603         |
| WO09038832 A3      | 20090514         | WO2008US65628      | 20080603         |
| ZA200908879 A      | 20100929         | ZA20090008879      | 20091211         |

**Priority:**

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|---------------|----------|----------------|----------|----------------|----------|
| US20070932741 | 20070604 | US20070932741P | 20070604 | US20070959459P | 20070713 |
| EP20080832461 | 20080603 | US20080132151  | 20080603 | US20080132194  | 20080603 |
| WO2008US65628 | 20080603 | US20110088846  | 20110418 |                |          |

**Probable Assignee:** EATON CORP

**Assignee(s):** (std): EATON CORP ; HABETLER THOMAS ; HARLEY RONALD G ; HABETLER THOMAS G ; LU BIN ; HARLEY RONALD

**Assignee(s):** EATON CORP CLEVELAND ; EATON INTELLIGENT POWER LTD ; ENERGY UNITED STATES DEPARTMENT OF

**Inventor(s):** (std): HARLEY RONALD G ; HABETLER THOMAS G ; LU BIN ; HARLEY RONALD ; HABETLER THOMAS ; BIN LU ; THOMAS HABETLER ; RONALD HARLEY

**Agent(s):** PETER MAXWELL AND ASSOCIATES; MAXWELLS PATENT AND TRADE MARK ATTORNEYS PTY LTD; BERESKIN AND PARR LLP SENCRL SRL; WAGNER AND GEYER PARTNERSCHAFT MBB PATENT U RECHTSANWAELTE; WAGNER KARL H; ZIOLKOWSKI PATENT SOLUTIONS GROUP SC EATON; ZIOLKOWSKI PATENT SOLUTIONS GROUP SC; ZIOLKOWSKI TIMOTHY ET AL

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**3) Family number: 57699327 (US2016076465A)**

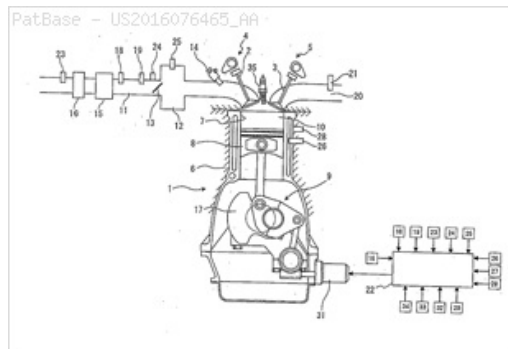
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**Title:** INTERNAL COMBUSTION ENGINE CONTROL DEVICE AND CONTROL METHOD

**Abstract:** A target compression ratio  $e(t+T_{act})$  after a prescribed time  $T_{act}$  has expired from a current point of time is calculated from an intake air volume drawn into a cylinder after expiration of the prescribed time  $T_{act}$  from the current point of time. A control command to an electric motor that drives a variable compression ratio mechanism is calculated so as to bring an actual compression ratio  $er(t+T_{act})$  after the prescribed time  $T_{act}$  into accordance with the target compression ratio  $e(t+T_{act})$  after the prescribed time  $T_{act}$ . This enables the actual compression ratio to follow the target compression ratio accurately.

**Classifications:**

**International (IPC 8-9):** F02D15/02 F02D41/10 F02D41/14  
F02D45/00 (Advanced/Invention);  
F02D41/14 (Advanced/Non-invention)  
**CPC:** F02D15/02 F02D2041/1412 F02D2200/0402 F02D2200/0408  
Y02T10/12  
**US:** 123/48AA  
**JP F-Term:** 3G092 3G092/AA01 3G092/AA12 3G092/AA18 3G092/BA01  
3G092/DB02 3G092/DB03 3G092/EA17 3G092/FA03 3G092/FA15  
3G092/GA11 3G092/HA05 3G092/HA06 3G092/HA14 3G092/HA15  
3G092/HB01 3G092/HB02 3G092/HC05 3G092/HC09 3G092/HE03 3G384  
3G384/AA01 3G384/BA04 3G384/BA13 3G384/BA18 3G384/BA22  
3G384/CA11 3G384/DA05 3G384/DA55 3G384/ED11 3G384/FA01  
3G384/FA06 3G384/FA14 3G384/FA16 3G384/FA33 3G384/FA52  
3G384/FA58  
**JP F-Index:** F02D15/02/C F02D45/00/314/A



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BR112015025244 A2  | 20170718         | BR20151125244      | 20140326         |
| CN105121816 A      | 20151202         | CN201480022438     | 20140326         |
| CN105121816 B      | 20170630         | CN201480022438     | 20140326         |
| DE602014042429 D1  | 20190328         | DE201460042429T    | 20140326         |
| EP2990629 A1       | 20160302         | EP20140788427      | 20140326         |
| EP2990629 A4       | 20160511         | EP20140788427      | 20140326         |
| EP2990629 B1       | 20190306         | EP20140788427      | 20140326         |
| IN03801KN2015 A    | 20160304         | IN2015KN03801      | 20151118         |
| JP2014174969 A1    | 20170223         | JP20150513631T     | 20140326         |
| JP6015853 B1       | 20161026         | JP20150513631T     | 20140326         |
| MX2015014714 A1    | 20160307         | MX20150014714      | 20140326         |
| MX345528 B         | 20170203         | MX20150014714      | 20140326         |
| RU2618146 C1       | 20170502         | RU20150149660      | 20140326         |
| US2016076465 AA    | 20160317         | US20140785797      | 20140326         |
| US9784190 BB       | 20171010         | US20140785797      | 20140326         |
| WO14174969 A1      | 20141030         | WO2014JP58406      | 20140326         |

#### Priority:

JP20130090059 20130423 EP20140788427 20140326 WO2014JP58406 20140326

**Probable Assignee:** NISSAN MOTOR CO LTD

**Assignee(s):** (std): NISSAN MOTOR

**Assignee(s):** NISSAN MOTOR CO ; NISSAN MOTOR CO LTD ; NISSAN MOTOR CO LTD YOKOHAMA SHI ; NISSAN MOTOR KO

**Inventor(s):** (std): KAMADA SHINOBU ; OHTSU SHO ; IKARI TAISUKE ; OKHTSU SE ; IKARI TAJSUKE ; KAMADA SINOBU ; SHO OHTSU ; SHINOBU KAMADA ; TAISUKE IKARI

**Agent(s):** HOFER AND PARTNER PATENTANWALTE MBB; KOBAYASHI HIROMICHI; TOMIOKA KIYOSHI; FOLEY AND LARDNER LLP; KOBAYASHI HIROMICHI ET AL

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

#### 4) Family number: 31781371 (US2005071095A)

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**Title:** MOTOR PARAMETER ESTIMATION METHOD AND APPARATUS

**Abstract:** A system and method for establishing estimated values of electrical parameters of a motor. The electrical parameters may be established from motor databases, measured input electrical data, measured output data, and various estimations to account for unknown motor parameters. Compensations also may be provided for stator resistance, cable resistance, and other motor parameters. Based on the foregoing data, the system and method also may be used to estimate motor operating parameters, such as torque, efficiency, output power, output speed, and other performance criteria of the motor. The system and method also may establish energy and monetary comparison data between the motor and at least one alternative motor.

#### Classifications:

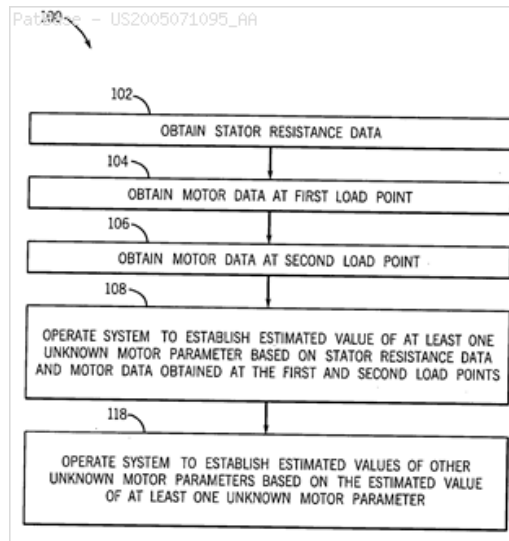
**International (IPC 8-9):** G01R21/00 G01R21/06 G06F19/00  
H02P23/14 (Advanced/Invention);  
G01R21/00 G06F19/00 H02P23/14 (Core/Invention)

**International (IPC 1-7):** G06F19/00

**CPC:** G01R31/343 H02P23/14

**European:** H02P23/14 S01R31/34B

**US:** 702/6 702/60



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2005071095 AA    | 20050331         | US20030675104      | 20030930         |
| US2007118307 AA    | 20070524         | US20060644634      | 20061222         |
| US2007118308 AA    | 20070524         | US20060644654      | 20061222         |
| US7184902 BB       | 20070227         | US20030675104      | 20030930         |

#### Priority:

US20030675104 20030930 US20060644634 20061222 US20060644654 20061222

**Probable Assignee:** RELIANCE ELECTRIC TECHNOLOGIES LLC

**Assignee(s):** (std): EL IBIARY YEHIA ; RELIANCE ELECTRIC TECH

**Assignee(s):** RELIANCE ELECTRIC TECHNOLOGIES LLC ; BNP PARIBAS

**Inventor(s):** (std): EL IBIARY YEHIA

**Agent(s):** ALEXANDER M GERASIMOW ALLEN BRADLEY CO LLC; ROCKWELL AUTOMATION INC; ALEXANDER M; PATRICK S

#### 5) Family number: 51817430 (JP2012153287A)

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**Title:** HYBRID VEHICLE CONTROL DEVICE

**Abstract:** PROBLEM TO BE SOLVED: To provide a hybrid vehicle control device that enables the vehicle always run in a best condition of efficiency of energy without deteriorating the drivability. SOLUTION: The hybrid vehicle control device includes an internal combustion engine and an electric motor as drive power sources, and can control the idling rotation speed of the internal combustion engine in the EV driving. The device is provided with: an idling rotation speed holding means (step S7) that holds the idling speed by the holding speed that is raised toward the target rotation speed of the internal combustion engine; a combustion efficiency estimation means (step S9) that estimates the combustion efficiency of the internal combustion engine; and a fuel supply determination means (steps S8, S9 and S10) that determines whether the internal combustion engine is made idling or combustion driving based on the estimated combustion efficiency estimated when the internal combustion engine is carried out combustion driving with the holding rotation speed when the internal combustion engine is held by the holding rotation speed.

#### Classifications:

**International (IPC 8-9):** B60K6/445 B60W10/06 B60W20/00

F02D29/02 (Advanced/Invention)

**CPC:** Y02T10/6239

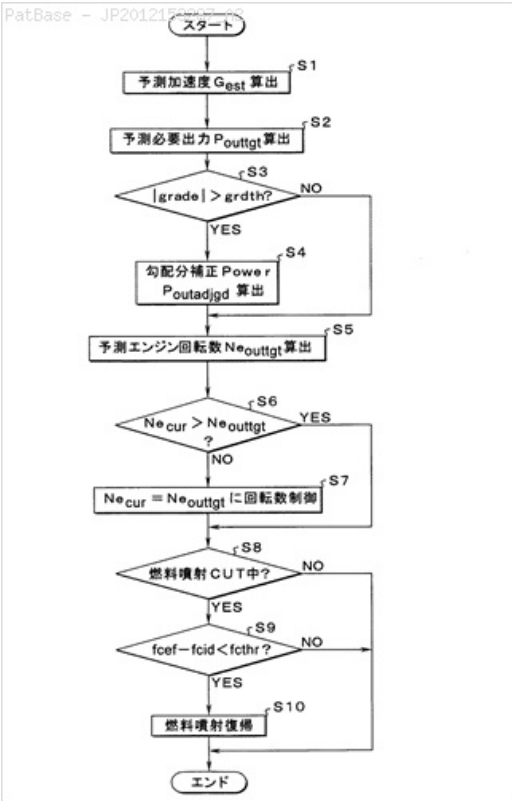
**European:** Y02T10/62F6D

**JP F-Term:** 3D202 3D202/AA03 3D202/BB02 3D202/BB12 3D202/CC15 3D202/CC35 3D202/DD00 3D202/DD18 3G093 3G093/AA07 3G093/EA03

**JP F-Index:** B60K6/20/310 B60K6/445/ZHV B60W10/00/900

B60W10/06/900 B60W20/12 F02D29/02/D

**JP Facet:** ZHV



Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP2012153287 A2    | 20120816         | JP20110015077      | 20110127         |

Priority:

JP20110015077 20110127

Probable Assignee: TOYOTA MOTOR CORP

Assignee(s): (std): TOYOTA MOTOR CORP

Assignee(s): TOYOTA JIDOSHA KABUSHIKI KAISHA ; TOYOTA JIDOSHA KK

Inventor(s): (std): KATSUMATA MUNEHIRO ; MATSUNAGA HITOSHI

6) Family number: 31779472 (US2005067991A)

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Title: SYSTEM AND METHOD FOR IDENTIFYING OPERATIONAL PARAMETERS OF A MOTOR

**Abstract:** A system and method for establishing estimated values of electrical parameters of a motor. The electrical parameters may be established from stator resistance data and motor data obtained at a single load on the motor. The electrical parameters also may be established without stator resistance data by using motor data at three load conditions of the motor. The electrical parameters also may be established from baseline motor data and motor data obtained at a desired operating load of the motor. Based on the estimated values, the system and method also may be used to estimate motor operating parameters, such as torque, efficiency, output power, output speed, and other performance criteria of the motor.

Classifications:

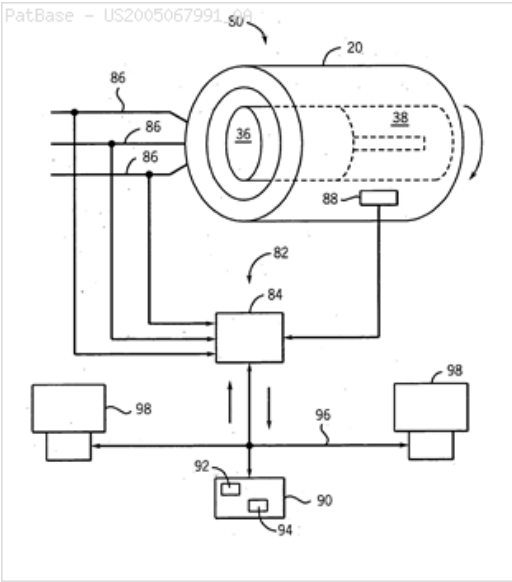
**International (IPC 8-9):** G05B13/00 H02P23/14 H02P29/00 H02P5/00 (Advanced/Invention); G05B13/00 H02P23/14 H02P29/00 H02P5/00 (Core/Invention)

**International (IPC 1-7):** H02P5/00

**CPC:** H02P29/664 H02P23/14 G01R31/343

**European:** H02P23/14 H02P29/00T6W S01R31/34B

**US:** 318/49 318/490 318/560 318/561 318/569



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2005067991 AA    | 20050331         | US20030675723      | 20030930         |
| US7135830 BB       | 20061114         | US20030675723      | 20030930         |

**Priority:**

US20030675723 20030930

**Probable Assignee:** BALDOR ELECTRIC CO

**Assignee(s):** (std): RELIANCE ELECTRIC TECH

**Assignee(s):** RELIANCE ELECTRIC TECHNOLOGIES LLC ; BALDOR ELECTRIC CO ; BNP PARIBAS ; EL IBIARY YEHIA

**Inventor(s):** (std): EL IBIARY YEHIA

**Agent(s):** ALEXANDER M GERASIMOW ALLEN BRADLEY CO LLC ; ALEXANDER M; PATRICK S

**7) Family number: 28260601 (US2002133286A)** © PatBase

**Title:** METHOD AND SYSTEM FOR ENGINE AIR-CHARGE ESTIMATION

**Abstract:** The air flow into an engine is estimated via a speed-density calculation wherein the volumetric efficiency is estimated on-line. There are three interconnected observers in the estimation scheme. The first observer estimates the flow through the throttle based on the signal from a mass air flow sensor (MAF). The second observer estimates the intake manifold pressure using the ideal gas law and the signal from a intake manifold absolute pressure sensor (MAP). The third observer estimates the volumetric efficiency and provides an estimate of the air flow into the engine.

**Classifications:**

**International (IPC 8-9):** F02D41/14 F02D41/18 (Advanced/Invention); F02D41/14 F02D41/18 (Core/Invention)

**International (IPC 1-7):** F02D41/14 F02D41/18 G06F19/00 G06G7/70

**CPC:** F02D41/1401 F02D41/18 F02D2041/001 F02D2041/1416 F02D2200/0402 F02D2200/0406 F02D2200/0411

**European:** F02D41/14B F02D41/18 R02D200/0402 R02D200/0406 R02D200/0411 R02D41/00D6 R02D41/14B20A1

**US:** 123/480 123/480S 123/491 701/104 701/104P 701/113 701/113P 73/114.32 73/114.33 73/114.330S 73/114.34 73/114.340S 73/114.36 73/114.37 73/114.370S 73/114.38 73/114.380S 73/118.2

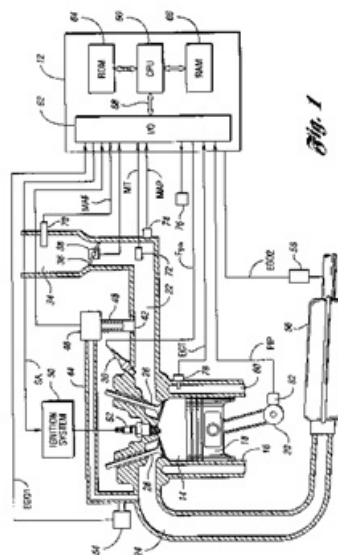


Fig. 1

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| EP1227233 A1       | 20020731         | EP20010000765      | 20011218         |
| US2002133286 AA    | 20020919         | US20010769800      | 20010125         |
| US2002198649 AA    | 20021226         | US20020161918      | 20020604         |
| US6636796 BB       | 20031021         | US20010769800      | 20010125         |
| US6671613 BB       | 20031230         | US20020161918      | 20020604         |

**Priority:**

US20010769800 20010125 US20020161918 20020604

**Probable Assignee:** AB VOLVO**Assignee(s):** (std): FORD GLOBAL TECHNOLOGIES LLC ; FORD GLOBAL TECH INC ; FORD GLOBAL TECH LLC ; STOTSKY ALEXANDER ANATOLJEVICH**Assignee(s):** VOLVO CAR CORP ; FORD GLOBAL TECHNOLOGIES INC ; FORD MOTOR CO ; KOLMANOVSKY ILYA V ; KOLMANOVSKY LLYA V ; AB VOLVO**Inventor(s):** (std): KOLMANOVSKY ILYA V ; STOTSKY ALEXANDER ANATOLJEVICH ; KOLMANOVSKY LLYA V ; KOLMANOVSKY ILYA**Designated states:** DE GB SE**8) Family number: 12841642 (US6415273B)**

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**Title:** METHOD OF FEED-FORWARD CONTROL USING CONTROL LOGIC WITH ANTICIPATORY LEARNING CONTROL

**Abstract:** A machine control system for controlling an unstable or transition running condition of a machine which is operable by a causative signal and the performance of which is indicatable by an indicative signal. The control system includes: (a) a model-based control unit for outputting an estimated value of a causative signal when receiving an indicative signal, which model-based control unit undergoes learning based on teacher data; (b) a feedback control unit for providing first teacher data to the model-based control unit upon receiving feedback information from the machine; and (c) an anticipatory control unit for providing second teacher data to the model-based control unit. The anticipatory control unit includes: (i) a deviation detection program programmed to determine whether the running condition of the machine deviates from a predetermined stable running condition; and (ii) a compensation formulation program programmed to formulate anticipatory compensations to compensate for deviation of the machine from the predetermined stable running condition based on feedback information received from the machine, output from which program is provided to the model-based control unit as second teacher data.

**Classifications:**

**International (IPC 8-9):** F02D41/14 F02D41/24 G05B11/32 G05B13/02 G05B13/04 G06F15/18 G06N3/00 (Advanced/Invention); F02D41/00 F02D41/14 G05B11/32 G05B13/02 G05B13/04 G06F15/18 G06N3/00 (Core/Invention)

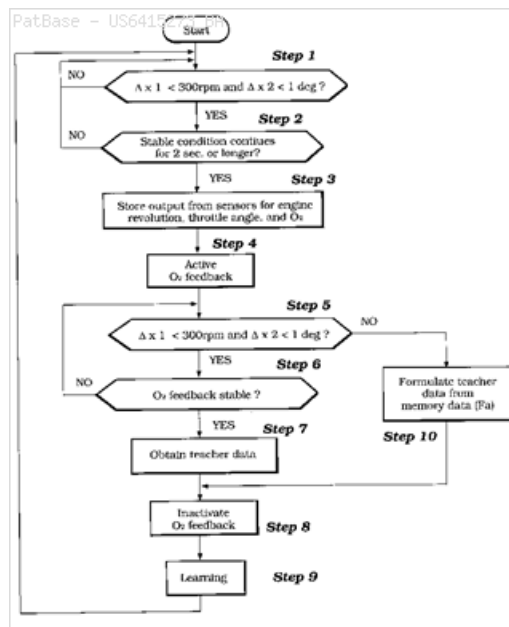
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**CPC:** Y10S706/903 G05B13/0285 F02D41/1404 F02D41/1405 F02D41/1456 F02D41/2454 F02D41/2477 F02D41/248 F02D2041/1418 F02D2041/1433 F02D2200/0402 F02D2200/0411 F02D2200/0614

**European:** F02D41/14B8 F02D41/24D4L10B F02D41/24D4L12 F02D43/02 G05B13/02C4 R02D200/0402 R02D200/0411 R02D200/0614 R02D41/14B20B R02D41/14B30 R02D41/14B6 R02D41/14B8 R02D41/14D3H4 R02D41/24D4L12B

**US:** 706/16 706/23 706/46 706/903

**JP F-Term:** 5B078 5H004 5H004/GA02 5H004/GA14 5H004/GB12 5H004/HA13 5H004/HB01 5H004/HB02 5H004/HB03 5H004/HB04 5H004/HB07 5H004/HB08 5H004/JA12 5H004/KA61 5H004/KB22 5H004/KB33 5H004/KC24 5H004/KC28 5H004/KD23 5H004/KD33 5H004/KD43 5H004/LA03  
**JP F-Index:** G05B11/32/F G05B13/02/L G05B13/04 G06F15/18/550/E G06N20/00 G06N3/00/550/E G06N3/04/136 G06N99/00/150



#### Family:

| Publication number | Publication date | Application number | Application date |
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| DE59909980 D1      | 20040826         | DE19995009980      | 19990212         |
| EP0936351 A2       | 19990818         | EP19990102910      | 19990212         |
| EP0936351 A3       | 20010404         | EP19990102910      | 19990212         |
| EP0936351 B1       | 20040721         | EP19990102910      | 19990212         |
| JP11231907 A2      | 19990827         | JP19980029895      | 19980212         |
| US6415273 BA       | 20020702         | US19990249194      | 19990212         |

#### Priority:

JP19980029895 19980212

**Probable Assignee:** YAMAHA HATSUDOKI KK

**Assignee(s):** (std): YAMAHA MOTOR CO LTD

**Assignee(s):** YAMAHA HATSUDOKI K K ; YAMAHA HATSUDOKI K K IWATA ; YAMAHA HATSUDOKI KABUSHIKI KAISHA ; YAMAHA HATSUDOKI KK

**Inventor(s):** (std): YOKO FUJIME ; FUJIME YOKO

**Designated states:** AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

#### 9) Family number: 42613783 (US2010169030A)

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**Title:** MACHINE CONDITION ASSESSMENT THROUGH POWER DISTRIBUTION NETWORKS

**Abstract:** A device, which is preferably embedded in a power distribution enclosure, enables analysis of conditions of electromechanical machines and, alternatively, also their driven or driver devices. The analysis uses operating voltages and currents supplied to or from the electromechanical machines. Since these voltages and currents are available at the enclosure, wiring or any other communication means to any sensors on the electromechanical machines or on the driver or driven devices are not necessary. The embedded device may optionally transmit its results to a computing or monitoring device remote from the enclosure, preferably wirelessly. The embedded device may receive all its power from an existing, conventional potential transformer in the enclosure, so that the embedded device may be retrofitted to the enclosure without the addition of any wiring external to the enclosure.

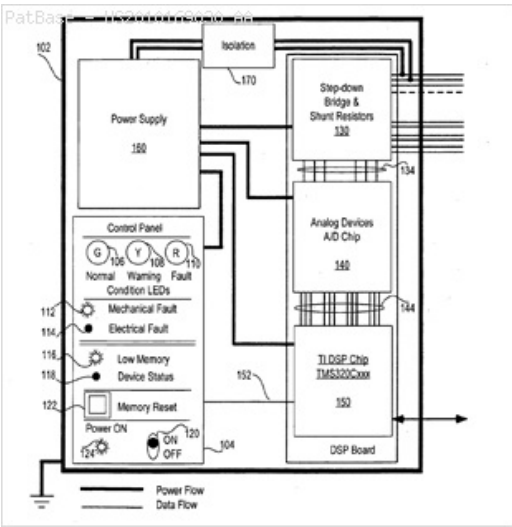
#### Classifications:

**International (IPC 8-9):** G01R31/14 G01R31/34 (Advanced/Invention); G01R31/12 G01R31/34 (Core/Invention)

**CPC:** G01H1/00 G01R31/343 H02P29/0241

**European:** G01H1/00 G01R31/34B H02P29/02D

**US:** 702/58 702/58P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2010169030 AA    | 20100701         | US20080601262      | 20080524         |
| WO08148075 A1      | 20081204         | WO2008US64810      | 20080524         |

**Priority:**

US20070931616P 20070524      US20080601262 20080524      WO2008US64810 20080524

**Probable Assignee:** TEXAS A AND M UNIV SYSTEM AN AGENCY OF STATE OF TEXAS

**Assignee(s):** (std): PARLOS ALEXANDER GEORGE

**Assignee(s):** TEXAS A AND M UNIV SYSTEM AN AGENCY OF STATE OF TE ; TEXAS A AND M UNIV SYSTEM AN AGENCY OF STATE OF TEXAS

**Inventor(s):** (std): PARLOS ALEXANDER GEORGE

**Agent(s):** ANTHONY ENGLAND; ENGLAND ANTHONY VERNON SHAW

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**10) Family number: 49883841** (US2011265840A)

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**Title:** SOLAR PANEL EFFICIENCY ESTIMATOR

**Abstract:** A photovoltaic efficiency estimator, comprising a photovoltaic cell covered by a sunlight-penetrable surface; an illuminator for artificially illuminating said surface; and a controller connected to said photovoltaic cell and to said illuminator, said controller being configured to measure an amount of voltage produced in said photovoltaic cell as a result of the artificial illumination by said illuminator, so as to estimate a decrease in the efficiency of said photovoltaic cell caused by dirt on said surface.

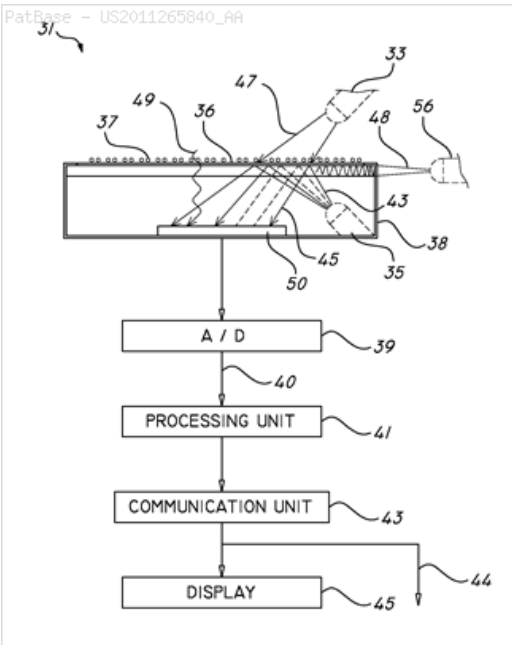
**Classifications:**

**International (IPC 8-9):** G01J1/42 H01L31/042 (Advanced/Invention)

**CPC:** G01J1/18 G01J1/4204 G01J2001/4266 H02S50/10 Y02E10/40 F24S40/00 F24S2201/00

**European:** G01J1/18 G01J1/42A S01J1/42S Y02E10/50

**US:** 136/244 356/218 356/218S



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2011265840 AA    | 20111103         | US20100770743      | 20100430         |

**Priority:**

US20100770743 20100430

**Probable Assignee:**

SELA MOSHE

**Assignee(s):** (std):

SELA MOSHE

**Inventor(s):** (std):

SELA MOSHE

**11) Family number: 56393899** (WO14069281A1)

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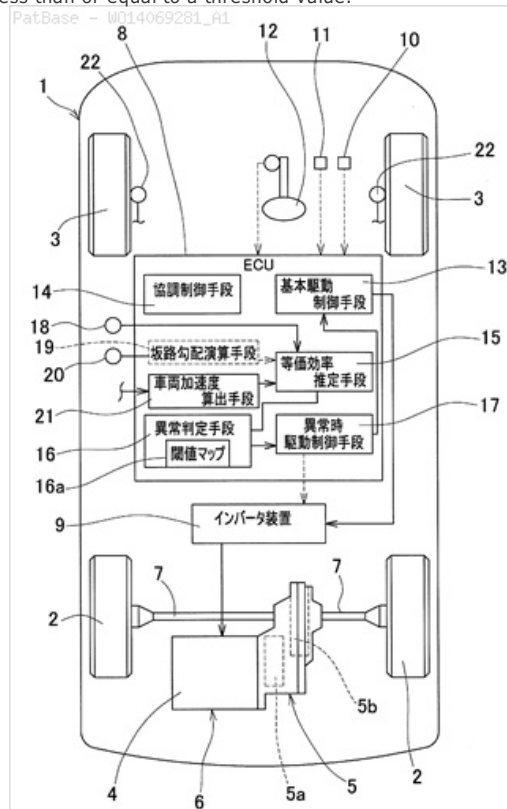
**Title:** ELECTRIC VEHICLE CONTROL DEVICE AND ELECTRIC VEHICLE

**Abstract:** This control device controls an electric vehicle driven by a drive motor unit (6) configured from an electric motor (4) and a mechanical unit (5), and is provided with: an equivalent efficiency estimation means (15) which estimates an equivalent efficiency, which is the product of the transmission efficiency of the mechanical unit of the drive motor unit (6) and the ratio of the output torque to the drive motor command torque; and an abnormality determination means (17) which determines that the drive motor unit (6) is abnormal if the estimated equivalent efficiency value is less than or equal to a threshold value.

**Classifications:****International (IPC 8-9):** B60L3/00 B60L3/06 H02P29/00

H02P29/028 (Advanced/Invention);

H02P27/06 (Advanced/Non-invention)

**CPC:** B60L2240/14 B60L2240/423 B60L2240/461 B60L2240/465  
B60L2240/642 B60L2250/10 B60L2260/44 Y02T10/642 Y02T10/7005  
Y02T10/7291 Y02T90/16 B60L3/0061 B60L50/51**JP F-Term:** 5H115 5H125 5H125/AA01 5H125/AB01 5H125/AC12  
5H125/BA00 5H125/CA11 5H125/EE06 5H125/EE51 5H125/EE53  
5H125/EE57 5H125/EE62 5H125/FF02 5H501 5H501/AA20 5H501/BB08  
5H501/CC04 5H501/DD04 5H501/EE08 5H501/HB07 5H501/JJ03  
5H501/JJ17 5H501/LL01 5H501/LL32 5H501/LL49 5H501/LL53  
5H501/MM09**JP F-Index:** B60L3/00/H B60L3/06/C H02P29/028

- 9 Inverter
- 13 Basic drive control means
- 14 Cooperative control means
- 15 Equivalent efficiency estimation means
- 16 Abnormality determination means
- 16a Threshold value map
- 17 Abnormal conditions drive control means
- 19 Slope grade calculation means
- 21 Vehicle acceleration calculation means

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP2014093849 A2    | 20140519         | JP20120242514      | 20121102         |
| JP6050089 B2       | 20161221         | JP20120242514      | 20121102         |
| WO14069281 A1      | 20140508         | WO2013JP78547      | 20131022         |

**Priority:**

**Probable Assignee:** NTN CORP  
**Assignee(s):** (std): NTN TOYO BEARING CO LTD  
**Assignee(s):** NTN CORP  
**Inventor(s):** (std): MAKINO TOMOAKI  
**Agent(s):** NODA MASASHI; SUGIMOTO SHUJI; SUGIMOTO SHUJI ET AL  
**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

12) Family number: 67496924 (WO17196921A1)

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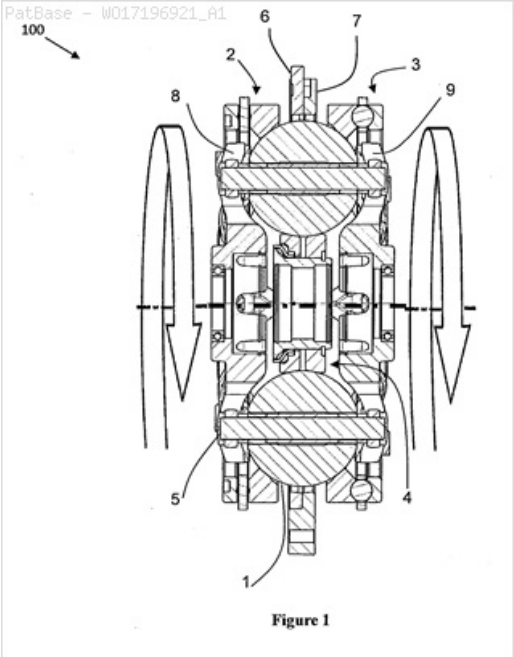
**Title:** CONTROL STRATEGIES FOR HYBRID ELECTRIC POWERTRAIN CONFIGURATIONS WITH A BALL VARIATOR

**Abstract:** Regular torque split planetary gear trains for automotive hybrid powertrains are limited by the fixed ratio of the planetary gear train. A powertrain incorporating a continuously variable transmission using a torque split with variable ratios enables the powertrain to use the ideal operating lines (IOL) of the engine, electric motor-generator along with the high voltage battery charge/discharge paths, depending upon the mode of operation (charge sustain or charge deplete modes) of the hybrid powertrain. A powertrain further equipped with a hybrid supervisory controller that chooses the torque split and path of highest efficiency from engine to wheel, optionally operate at the best potential overall efficiency point in any mode and also provide torque variability, thereby leading to the best combination of powertrain performance and fuel efficiency. Embodiments of powertrain configurations that optionally improve the efficiency of hybrid vehicles are discussed herein.

**Classifications:**

**International (IPC 8-9):** B60K6/543 B60W10/06 B60W10/08 B60W10/103 B60W10/108 B60W20/11 F16H15/50 F16H15/52 F16H37/08 (Advanced/Invention)

**CPC:** B60K6/543 B60W10/06 B60W10/08 B60W10/103 B60W10/108 B60W20/11 B60W2510/0604 B60W2510/0657 B60W2510/102 B60W2510/244 F16H2037/0886 Y02T10/6286 B60K6/365 B60K6/387 B60K6/445 F16H15/28 F16H15/52 F16H37/086 Y02T10/6239



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| WO17196921 A1      | 20171116         | WO2017US31875      | 20170510         |

**Priority:**

US20160334029P 20160510

**Probable Assignee:** DANA LTD

**Assignee(s):** (std): DANA LTD

**Inventor(s):** (std): KUMAR KRISHNA

**Agent(s):** EVANS STEPHEN P ET AL

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

13) Family number: 30226956 (US2004019439A)

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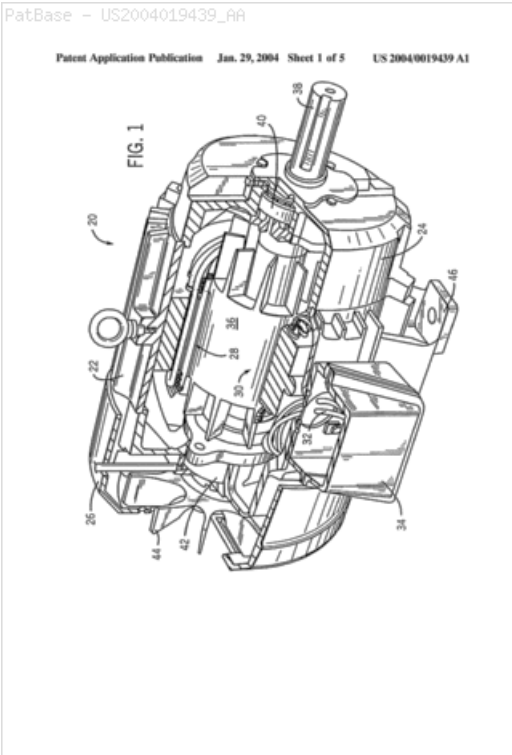
**Title:** INDUCTION MOTOR MODULE AND MOTOR INCORPORATING SAME

**Abstract:** A system and method for establishing estimated values of a plurality of electrical parameters of a motor. The plurality of electrical parameters may be established from stator resistance data and electrical input data obtained with no load on the

motor. The plurality of electrical parameters may also be established from stator resistance data, electrical input data, and motor speed data obtained at at least two load conditions of the motor. The plurality of electrical parameters may comprise rotor resistance. The system and method may also be used to estimate a plurality of operating parameters of the motor based on the estimated values of a plurality of electrical parameters of the motor. The plurality of operating parameters of a motor may comprise rotor temperature, motor torque, and motor efficiency.

**Classifications:**

**International (IPC 8-9):** G01R31/34 H02P23/14  
H02P29/00 (Advanced/Invention);  
G01R31/34 H02P23/14 H02P29/00 (Core/Invention)  
**International (IPC 1-7):** G01B3/00 G01B5/00 G01R15/00 G06F19/00  
**CPC:** H02P29/66 H02P23/14 G01R31/34  
**European:** G01R31/34 H02P23/14 H02P29/00T6  
**US:** 702/33 702/38 702/57



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2004019439 AA    | 20040129         | US20020201073      | 20020723         |
| US6862538 BB       | 20050301         | US20020201073      | 20020723         |

**Priority:**

US20020201073 20020723

**Probable Assignee:** BALDOR ELECTRIC CO

**Assignee(s):** (std): EL IBIARY YEHIA ; RELIANCE ELECTRIC TECH ; RELIANCE ELECTRIC TECHNOLOGIES

**Assignee(s):** RELIANCE ELECTRIC TECHNOLOGIES LLC ; BALDOR ELECTRIC CO ; BNP PARIBAS

**Inventor(s):** (std): EL IBIARY YEHIA

**Agent(s):** RALPH A; ALEXANDER M

**14) Family number: 23511979** (US2003000202A)

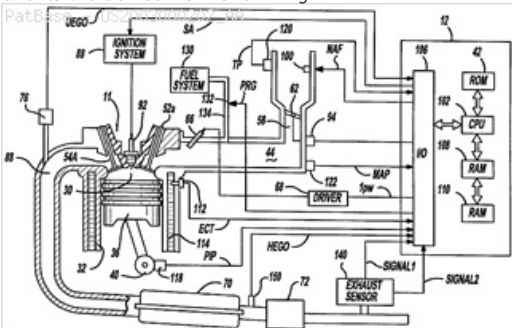
© PatBase

**Title:** EXHAUST GAS AFTERTREATMENT DEVICE EFFICIENCY ESTIMATION

**Abstract:** A method for monitoring efficiency of an exhaust gas aftertreatment device is presented. The efficiency is inferred from the amount of fuel required to perform purge of the device after it has been saturated with exhaust gas components such as NOx and oxygen to a predetermined level. The level of saturation is determined from the amount of tailpipe emissions as indicated by the tailpipe exhaust gas sensor. This method improves precision in determining device efficiency and therefore eliminates unnecessary sulfur purges and improves fuel economy. Also, better emission control is achieved since the tailpipe exhaust gas sensor allows closed loop monitoring of NOx emissions and prevents the device from overfilling.

**Classifications:**

**International (IPC 8-9):** F01N11/00 F02D41/02  
F02D41/14 (Advanced/Invention);  
F01N3/08 F02D37/02 F02P7/07 (Advanced/Non-invention);  
F01N11/00 F02D41/02 F02D41/14 (Core/Invention);  
F01N3/08 F02D37/00 F02P7/00 (Core/Non-invention)  
**International (IPC 1-7):** B01D53/94 F01N11/00 F01N3/00 F01N3/18  
F01N3/20 F01N7/00  
**CPC:** Y02T10/22 F01N3/0842 F01N11/00 F01N11/007 F01N2550/03  
F01N2570/16 F02D37/02 F02D41/0275 F02D41/1441 F02D41/1452  
F02D41/1456 F02D41/1459 F02D41/146 F02D41/1462 F02D41/1476  
F02D41/187 F02D2200/0806 F02P7/07 Y02T10/47  
**European:** F01N11/00 F01N11/00C F01N3/08B6D F02D41/02C4D1  
F02D41/14D1D F02D41/14D3L2E R01N550/03 R01N570/16  
R02D200/0806 R02D37/02 R02D41/14D3F R02D41/14D3H4  
R02D41/14D3J R02D41/14D3L R02D41/14D5D2 R02D41/18D R02P7/07  
**US:** 60/274 60/274S 60/277 60/277P 60/285 60/285S 60/295 60/297 602/770



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE10222591 A1      | 20030109         | DE20021022591      | 20020522         |
| DE10222591 B4      | 20060713         | DE20021022591      | 20020522         |
| GB200212458 A0     | 20020710         | GB20020012458      | 20020530         |
| GB2381475 A1       | 20030507         | GB20020012458      | 20020530         |
| GB2381475 B2       | 20041124         | GB20020012458      | 20020530         |
| US2003000202 AA    | 20030102         | US20010884338      | 20010619         |
| US6594985 BB       | 20030722         | US20010884338      | 20010619         |

**Priority:**

US20010884338 20010619

**Probable Assignee:** FORD GLOBAL TECHNOLOGIES LLC

**Assignee(s):** (std): FORD GLOBAL TECHNOLOGIES LLC ; SURNILLA GOPICHANDRA ; FORD GLOBAL TECH INC ; FORD GLOBAL TECH LLC

**Assignee(s):** FORD GLOBAL TECHNOLOGIES INC ; INGRAM GRANT ALAN ; FORD GLOBAL TECHNOLOGIES LLC N D GES D STAATESDELAWARE ; FORD GLOBAL TECHNOLOGIES LLC NDGESD STAATESDELAWARE ; FORD MOTOR CO ; FORD GLOBAL TECHNOLOGIES LLC N D GES D STAATESDEL

**Inventor(s):** (std): INGRAM GRANT ALAN ; SURNILLA GOPICHANDRA

**Inventor(s):** GRANT ALAN INGRAM ; GOPICHANDRA SURNILLA

**15) Family number: 41788981** (DE102006052810A1)

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**Title:** ELECTROMECHANICAL ACTUATOR'S FORCE DEVELOPMENT ESTIMATING METHOD FOR HAND BRAKE OF MOTOR VEHICLE, INVOLVES CONSIDERING CONSUMED CURRENT OR ROTATIONAL SPEED OF MOTOR I.E. DIRECT CURRENT MOTOR, DURING ESTIMATION OF SUPPLY VOLTAGE VALUE

**Abstract:** The method involves considering consumed current and/or rotational speed of an electric motor (3) i.e. direct current motor (2), during the estimation of a value of the supply voltage connected to an electromechanical actuator (1) of a hand brake of a motor vehicle. Multiple operating phases such as starting phase of the electric motor, pre-force deployment phase, and force deployment phase, are considered during the development of a force deployment and during the estimation of the value of the supply voltage. An independent claim is also included for a device for implementing a method for estimating a force development of an actuator of a hand brake of a motor vehicle.

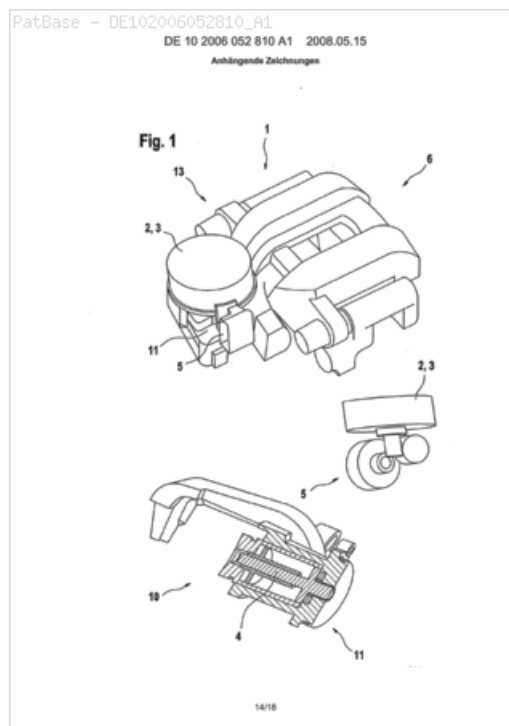
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**International (IPC 8-9):** B60T17/22 F16D65/28 G01L5/22 G01L5/28 (Advanced/Invention);

B60T17/18 F16D65/14 G01L5/22 G01L5/28 (Core/Invention)

**CPC:** B60T13/741 B60T17/22 H02P7/00

**European:** B60T13/74A B60T17/22 H02P7/00



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE102006052810 A1  | 20080515         | DE200610052810     | 20061109         |

**Priority:**

DE200610052810 20061109

**Probable Assignee:** BOSCH GMBH ROBERT

**Assignee(s):** (std): BOSCH GMBH ROBERT

**Assignee(s):** ROBERT BOSCH GMBH

**Inventor(s):** (std): BAEHRLE MILLER FRANK ; CARUSO CORRADO ; BLESSING PETER