

Title (en)

METHOD FOR THE MODEL-BASED OPEN-LOOP AND CLOSED-LOOP CONTROL OF AN INTERNAL COMBUSTION ENGINE

Title (de)

VERFAHREN ZUR MODELLBASIERTEN STEUERUNG UND REGELUNG EINER BRENNKRAFTMASCHINE

Title (fr)

PROCÉDÉ DE COMMANDE REPOSANT SUR UN MODÈLE EN BOUCLE OUVERTE ET EN BOUCLE FERMÉE D'UN MOTEUR À COMBUSTION INTERNE

Publication

**EP 4093962 A1 20221130 (DE)**

Application

**EP 21701282 A 20210119**

Priority

- DE 102020000327 A 20200121
- EP 2021051077 W 20210119

Abstract (en)

[origin: WO2021148410A1] The invention relates to a method for model-based open-loop and closed-loop control of an internal combustion engine (1), in which: the injection system setpoint values for controlling the injection system actuators are determined via a combustion model (4) according to a setpoint torque; during operation of the internal combustion engine (1), the combustion model (4) is adapted according to a model value, the model value being calculated from a first Gaussian process model for representing a base grid and a second Gaussian process model for representing adaptation data points; a minimised measure of quality is determined by an optimiser (3) by changing the injection system setpoint values within a prediction horizon, and, in the event that a minimised measure of quality is found, the injection system setpoint values are set as critical for adjusting the operating point of the internal combustion engine (1). The invention is characterised in that the model value is monitored in respect of a predefined monotonicity.

IPC 8 full level

**F02D 41/24** (2006.01); **F02D 35/02** (2006.01); **F02D 41/14** (2006.01); **F02D 41/26** (2006.01)

CPC (source: EP US)

**F02D 35/02** (2013.01 - EP); **F02D 41/1406** (2013.01 - EP US); **F02D 41/2429** (2013.01 - EP); **F02D 41/248** (2013.01 - EP); **F02D 41/26** (2013.01 - EP); **F02D 41/30** (2013.01 - US); **F02D 2041/1412** (2013.01 - EP); **F02D 2041/1418** (2013.01 - US); **F02D 2041/1429** (2013.01 - US); **F02D 2041/1433** (2013.01 - EP US); **F02D 2041/286** (2013.01 - EP); **F02D 2200/0402** (2013.01 - EP)

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

Designated validation state (EPC)

KH MA MD TN

DOCDB simple family (publication)

**DE 102020000327 A1 20210722**; **DE 102020000327 B4 20240627**; CN 114945741 A 20220826; EP 4093962 A1 20221130; US 11846245 B2 20231219; US 2022356852 A1 20221110; WO 2021148410 A1 20210729

DOCDB simple family (application)

**DE 102020000327 A 20200121**; CN 202180010112 A 20210119; EP 2021051077 W 20210119; EP 21701282 A 20210119; US 202217870280 A 20220721