Certificate No:
TAA000031K

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Governor Control System

with type designation(s)
ECU Level 14/ 14VI, ECU Level 15, ECU Level 16

Issued to
John Deere Power Systems
Waterloo, IA, USA

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Type	Temperature	Humidity	Vibration	EMC	Enclosure
ECU Level 14/ 14VI	D	B	B	A	B
ECU Level 15	D	B	B	A	B
ECU Level 16	D	B	B	A	B

Issued at **Hamburg** on **2021-08-12**

This Certificate is valid until **2025-09-01**.

for **DNV**

DNV local station: **Houston Offshore Services**

Approval Engineer: **Jens Dietrich**

Joannis Papanuskas
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

The ECU Level Controllers are electronic engine controllers used to control the speed of John Deere Engine Models. The units monitor and control pressures and temperatures within the engine Cooling, lubrication and fuel Systems.
Applications:

ECU Level 14, ECU Level 14VI
Electronic Control Unit for speed control
JD Part no. RE520953 (Level 14), RE531808 (Level 14VI)
-Common Rail Injector Control (HPCR)
-CAN interface to external systems (Alarming)
-Power supply: 12/24VDC

ECU Level 15
Electronic Control Unit for speed control
JD Part no. RE520954
-Injection control of camshaft driven electronic unit injectors (EUI)
-CAN interface to external systems (Alarming)
-Power supply: 12/24VDC

ECU Level 16
Electronic Control Unit for speed control
JD Part no. RE526588
-Common Rail Injector Control (HPCR)
-CAN interface to external systems (Alarming)
-Power supply: 12/24VDC

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.

The following documentation of the actual application is to be submitted for approval in each case:
- Reference to this Type Approval Certificate
- System block diagram (showing overall system layout and ECM interfaces)
- List of control & monitored points (including alarms, shutdowns, setpoints)
- Power supply arrangement (may be part of the System block diagram)
- Software version

Product certificate
As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 will not be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

Clause for application software control
All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV for evaluation and approval. Major changes in the software are to be approved before being installed in the computer.

Application/Limitation

-The systems are suitable for generator application or multi-engine propulsion application.
-The systems are to be used for DNV / DNV GL type approved John Deere diesel engines
-An independent safety system is to be for the required shut-downs (not covered by this certificate).
-Alarms, indications and shut-downs are to be provided by the application system based on Pt.4 Ch.3 Sec.1.
-To cover EMC requirements a grounded line filter EPCOS B84112G0000G136 (w/ 20 µF capacitor) is to be used.

EMC in the range 2 GHz to 6 GHz according to DNVGL-CG-0339, December 2019 has not been documented. EMC up to 6 GHz must additionally be documented for installation on ships contracted for construction on or after 2022-01-01.

Tests carried out

-Applicable tests according to DNV GL CG-0339, Nov. 2016
-Functional performance tests.

Marking of product

Maker, type designation, JD Part number, serial number.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE