

TYPE APPROVAL CERTIFICATE

Certificate No:
TAM000012M**This is to certify:****That the Diesel Engine**

with type designation(s)

4045DFM70, 4045TFM75, 4045TFM85, 4045AFM85, 6068TFM75, 6068TFM76

Issued to

**John Deere Power Systems
50701 Waterloo, United States**

is found to comply with

DNV GL rules for classification:**Ships Pt.4 Ch.3 Sec.1 Reciprocating internal combustion engines, and
High speed and ligh craft Pt.4 Ch.3 Rotating machinery - drivers****Application :**

propulsion, multi engine plant / auxiliary / emergency

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

This Certificate is valid until **5th May, 2024**.Issued at **Hamburg** on **6th May, 2019**DNV GL local station: **Houston**for **DNV GL**Approval Engineer: **Jan Sell**

**Burkhard Lilienthal
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.

Product description

four stroke, in-line engine, non-reversible, trunk-piston, direct injection, valve operation by cams, liquid fuel

4045DFM70	naturally aspirated, injection operation by cams
4045TFM75	with supercharging, injection operation electronically controlled (electronically controlled rotary injection pump)
4045TFM85	with supercharging, injection operation electronically controlled (high pressure common rail)
4045AFM85	with supercharging, with charge air cooling, injection operation electronically controlled (high pressure common rail)
6068TFM75, 6068TFM76	with supercharging, injection operation electronically controlled (electronically controlled rotary injection pump)
Cylinder bore [mm]	107
Piston stroke [mm]	127
No. of cylinders	4, 6

Additional place of production

Motores John Deere S.A. de C.V., Torreon, Mexico

Application/Limitation

The Type Approval is valid for the following ratings.

Rating definitions and max. load factor according to John Deere specification shall be observed (ratings except M1 are not "unrestricted continuous" ratings).

Engine model: **4045DFM70**

	Propulsion
Rating definition:	M2
Rated cont. output:	60 kW
Engine speed:	2500 RPM

	Auxiliary/Emergency	
Rated cont. output:	40 kW	46 kW
Engine speed:	1500 RPM	1800 RPM

Engine model: **4045TFM75**

	Propulsion		
Rating definition:	M3	M2	M1
Rated cont. output:	101 kW	90 kW	80 kW
Engine speed:	2600 RPM	2500 RPM	2400 RPM

	Auxiliary/Emergency	
Rated cont. output:	73 kW	55 kW
Engine speed:	1800 RPM	1500 RPM

Engine model: **4045AFM85**

	Propulsion			
Rating definition:	M4	M3	M2	M1
Rated cont. output:	168 kW	149 kW	134 kW	119 kW
Engine speed:	2600 RPM	2500 RPM	2400 RPM	2300 RPM

	Auxiliary/Emergency	
Rated cont. output:	110 kW	89 kW
Engine speed:	1800 RPM	1500 RPM

Engine model: **4045TFM85**

	Auxiliary/Emergency
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Rated cont. output:	74 kW	61 kW
Engine speed:	1800 RPM	1500 RPM

Engine model: **6068TFM75**

	Propulsion		
Rating definition:	M3	M2	M1
Rated cont. output:	150 kW	133 kW	118 kW
Engine speed:	2600 RPM	2500 RPM	2400 RPM

Engine model: **6068TFM76**

	Auxiliary/Emergency	
Rated cont. output:	89 kW	110 kW
Engine speed:	1500 RPM	1800 RPM

Type Approval documentation

Tests carried out

Type tests carried out 1999-10-07 and 2013-04-25

Marking of product

The product to be marked with manufacturer's name or trademark and type number identification.

Periodical assessment

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval certificate was issued.

In case where the Type Approved product is manufactured at other companies, the Periodical Assessment shall verify that the Type Approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore Periodical Assessment shall be carried out randomly at these companies.

Other Conditions

1. The engines shall be equipped with double walled high pressure fuel pipes with leakage alarm (DNV GL Rules Ships Pt.4 Ch.3 Sec.1 [2.8.7]).
2. Additional surface heat protection shall be fitted between cylinder head and exhaust manifold in order to meet the requirement to max. 220 °C surface temperature (DNV GL Rules Ships Pt.4 Ch.3 Sec.1 [2.6.1]). Ref. Nogva heat protection arrangement.
3. Engine safety, control and monitoring systems, including sensors and actuators, are not covered by this certificate. Documentation for engine safety, control (including speed governing), and monitoring systems shall be submitted for approval according to DNV GL Rules Ships Pt.4 Ch.9 Sec.1 Table 5 and/or as listed in relevant Type Approval certificates.
4. Correct oil sump shall be selected for the application (regarding inclinations, see DNV GL Rules Ships Pt.4 Ch.1 Sec.3 Table3).
5. Electric cables and installation of these are not covered by this Type Approval and shall be verified to comply with the requirements of DNV GL Rules Ships Pt.4 Ch.8.
6. Seawater cooling (if applicable) is not covered by this certificate. Seawater shall not be used in cooling systems on the engine as long as no explicit approval is existing, in particular regarding the use and fitting of flexible hoses.

END OF CERTIFICATE