



THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

COMMUNICATION CONCERNING THE EU TYPE-APPROVAL /~~EXTENSION OF EU TYPE-APPROVAL / REFUSAL OF EU TYPE-APPROVAL / WITHDRAWAL OF EU TYPE-APPROVAL~~ OF AN ENGINE TYPE/ENGINE FAMILY WITH REGARD TO GASEOUS AND PARTICULATE POLLUTANT EMISSION PURSUANT TO REGULATION (EU) 2016/1628, AS LAST AMENDED BY (COMMISSION DELEGATED) REGULATION 2016/1628 (OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL)

EU type-approval No: e11*2016/1628*2016/1628AC1/D*0332*00

Reason(s) for extension: Not applicable

SECTION I

- 1.1. Make (trade name(s) of manufacturer): JCB Power Systems Limited
- 1.2. Commercial name(s) (if applicable): Not applicable
- 1.3. Company name and address of manufacturer:
JCB Power Systems Limited
1000 Park Avenue
Dove Valley Park
Foston
Derby
DE65 5BX
United Kingdom
- 1.4. Name and address of manufacturer's authorised representative (if any):
Managing Director
JCB Vibromax GmbH
Graf-Zeppelin-Straße 16
51147 Cologne
Germany

- 1.5. Name(s) and address(es) of assembly/manufacture plant(s):
JCB Power Systems Limited
1000 Park Avenue
Dove Valley Park
Foston
Derby
DE65 5BX
United Kingdom
- 1.6. Engine type designation/engine family designation/FT: JCB 448 TGWA
- 1.7. Category and sub-category of the engine type/engine family: IWA-c-1
- 1.8. Emissions durability period category: Not applicable
- 1.9. Emissions stage: V
- 1.10. Engine for snow throwers No

SECTION II

1. Technical service responsible for carrying out the test(s): Vehicle Certification Agency
2. Date(s) of the test report(s): 21 December 2018
3. Number(s) of the test report(s): ESU444791 and ESU444791-IV

SECTION III

The undersigned hereby certifies the accuracy of the manufacturer's description in the attached information document of the engine type/engine family described above, for which one or more representative samples, selected by the approval authority, have been submitted as prototypes and that the attached test results apply to the engine type/engine family.

1. The engine type/engine family meets/does not meet the requirements laid down in Regulation (EU) 2016/1628.

ESU444791

2. The approval is granted
3. The approval is granted in accordance with Article 35 of Regulation (EU) 2016/1628 and the validity of the approval is thus limited to dd/mm/yyyy: Not applicable
4. Restrictions to validity: None
5. Exemptions applied: None

Place: BRISTOL

Date: 21 DECEMBER 2018

Name and signature (or visual representation of an 'advanced electronic signature' according to Regulation (EU) No 910/2014, including data for verification):



D LAWLOR
Chief Technical and Statutory Operations Officer

Attachments:

Information package

Test report(s)

Where applicable, the name(s) and specimen(s) of the signature(s) of the person(s) authorised to sign statement of conformity and a statement of their position in the company
Where applicable, a completed specimen of a statement of conformity

NB:

If this model is used for EU type-approval of an engine as an exemption for new technologies or new concepts, pursuant to Article 35(4) of Regulation (EU) 2016/1628, the heading of the certificate shall read 'PROVISIONAL EU TYPE-APPROVAL CERTIFICATE VALID ONLY ON THE TERRITORY OF ...

ADDENDUM

EU type-approval number: e11*2016/1628*2016/1628AC1/D*0332*00

PART A — CHARACTERISTICS OF THE ENGINE TYPE/ENGINE FAMILY

- 2. Common design parameters of the engine type/engine family
 - 2.1. Combustion Cycle: Four stroke cycle
 - 2.2. Ignition Type: Compression ignition
 - 2.3.1. Position of the cylinders in the block: In-line
 - 2.6. Main Cooling medium: Water
 - 2.7. Method of air aspiration: Pressure charged
 - 2.8.1. Fuel Type(s): Diesel (non-road gas-oil)
 - 2.8.1.1. Sub Fuel type (Natural gas/Biomethane only): Not applicable
 - 2.8.2. Fuelling arrangement: Liquid-fuel only
 - 2.8.3. List of additional fuels compatible with use by the engine declared by the manufacturer in accordance with point 1 of Annex I to Delegated Regulation (EU) 2017/654 (provide reference to recognised standard or specification): Not applicable
 - 2.8.4. Lubricant added to fuel: No
 - 2.8.5. Fuel supply type: In-line pump or distributor pump
- 2.9. Engine management systems: Mechanical

- 2.10. Miscellaneous devices: Yes
 - 2.10.1. Exhaust gas recirculation (EGR): Yes
 - 2.10.2. Water injection: No
 - 2.10.3. Air injection: No
 - 2.10.4. Others (specify): No
- 2.11. Exhaust after-treatment system: No
 - 2.11.1. Oxidation catalyst: No
 - 2.11.2. DeNOx system with selective reduction of NOx (addition of reducing agent): No
 - 2.11.3. Other DeNOx systems: No
 - 2.11.4. Three-way catalyst combining oxidation and NOx reduction: No
 - 2.11.5. Particulate after-treatment system with passive regeneration: No
 - 2.11.6. Particulate after-treatment system with active regeneration: No
 - 2.11.7. Other particulate after-treatment systems: No
 - 2.11.8. Other after-treatment devices (specify): None
 - 2.11.9. Other devices or features that have a strong influence on emissions (specify): No

3. Essential characteristics of the engine type(s)

Item Number	Item Description	Parent Engine / Engine type	Engine types within the family (if applicable)	
3.1.1.	Engine Type Designation:	JCB 448 TGWA-72	JCB 448 TGWA-68	JCB 448 TGWA-60
3.1.2.	Engine type designation shown on engine mark: Yes/No	Yes	Yes	Yes
3.1.3.	Location of the manufacturer's statutory marking:	The statutory marking(s) is printed on the engine identification label, which is bonded to the rocker cover.		
3.2.1.	Declared rated speed (rpm):	1500	1800	1500
3.2.1.2.	Declared rated net Power (kW):	72	68	60
3.2.2.	Maximum power speed (rpm):	Not applicable		
3.2.2.2.	Maximum net power (kW):	Not applicable		
3.2.3.	Declared maximum torque speed (rpm):	1500	1800	1500
3.2.3.2.	Declared maximum torque (Nm):	458, 504 (standby)	361, 397 (standby)	382, 420 (standby)
3.6.3.	Number of Cylinders:	4		
3.6.4.	Engine total swept volume (cm ³):	4765		
3.8.5.	Device for recycling crankcase gases: Yes/ No	No		
3.11.3.12.	Consumable reagent: Yes/No	No		
3.11.3.12.1.	Type and concentration of reagent needed for catalytic action:	Not applicable		
3.11.3.13.	NOx sensor(s): Yes/No	No		
3.11.3.14.	Oxygen sensor: Yes/No	No		
3.11.4.7.	Fuel borne catalyst (FBC): Yes/No	No		

Particular conditions to be respected in the installation of the engine on non-road mobile machinery:

Item Number	Item Description	Parent Engine / Engine type	Engine types within the family (if applicable)
3.8.1.1.	Maximum allowable intake depression at 100 % engine speed and at 100 % load (kPa) with clean air cleaner:	5	
3.8.3.2.	Maximum charge air cooler outlet temperature at 100 % speed and 100 % load (deg. C):	Not applicable	
3.8.3.3.	Maximum allowable pressure drop across charge cooler at 100 % engine speed and at 100 % load (kPa) (if applicable):	Not applicable	
3.9.3.	Maximum permissible exhaust gas back- pressure at 100 % engine speed and at 100 % load (kPa):	9	
3.9.3.1.	Location of measurement:	Adjacent to the outer flange of the turbocharger	
3.11.1.2.	Maximum temperature drop from exhaust system or turbine outlet to first exhaust after-treatment system (deg. C) if stated:	Not applicable	
3.11.1.2.1.	Test conditions for measurement:	Not applicable	

PART B — TEST RESULTS

- 3.8. Manufacturer intends to use ECU torque signal for in-service monitoring: No
- 3.8.1. Dynamometer torque greater than or equal to $0,93 \times$ ECU torque: No
- 3.8.2. ECU torque correction factor in case that dynamometer torque less than $0,93 \times$ ECU torque: Not applicable
- 11.1. Cycle emissions results

Emissions	CO (g/ kWh)	HC (g/ kWh)	NOx (g/ kWh)	HC+NOx (g/kWh)	PM (g/ kWh)	PN #/kWh	Test Cycle
NRSC final result with DF.	0.707	NA	NA	4.360	0.230	NA	D2
NRTC Final test result with DF	NA	NA	NA	NA	NA	NA	NA

- 11.2. CO₂ result: 757.47 g/kWh