Vehicle Certification Agency

THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

COMMUNICATION CONCERNING THE ~~TYPE-APPROVAL~~ [4]/ EXTENSION [1]/ ~~REFUSAL~~ [4]/ ~~WITHDRAWAL OF TYPE-APPROVAL~~ [4] OF AN ENGINE TYPE OR FAMILY OF ENGINE TYPES WITH REGARD TO THE EMISSION OF POLLUTANTS PURSUANT TO DIRECTIVE 97/68/EC, AS LAST AMENDED BY DIRECTIVE 2012/46/EU

EC type-approval No: e11*97/68SA*2012/46*3312*01

Reason(s) for extension: To cover
1) Addition of family engine
2) Change to specification of machinery to be propelled by engine
3) Change to location, coding and affixing of engine identification number
4) Change to assembly plant address

SECTION I

0. General

0.1. Make (name of undertaking): Yamaha Motor Powered Products Co., Ltd.

0.2. Manufacturer's designation of the parent-/and (if applicable) of the family engine(s) type(s) [1]:

Parent: MZ200 (7DH)
Family: MX200

0.3. Manufacturer's type coding as marked on the engine(s): As 0.2

Location:	MZ200 (7DH), MZ200-50	Fan case
	MX200	Crank case
Method of affixing:	MZ200 (7DH), MZ200-50	Laminated sticker
	MX200	Laser carved seal

0.4. Specification of machinery to be propelled by the engine [2]: A(iii)

0.5. Name and address of manufacturer:

Yamaha Motor Powered Products Co., Ltd
200-1 Sakagawa, Kakegawa city
Shizuoka Prefecture, Japan

Name and address of manufacturer's authorized representative (if any): Not applicable

0.6. Location, coding and method of affixing of the engine identification number:

MZ200 (7DH), MZ200-50: Fan case, 7DH?-???????, laminated sticker
MX200: Crank case, 7DB?-???????, laser carved seal

0.7. Location and method of affixing of the EC approval mark: Laminated sticker on fan case

0.8. Address(es) of assembly plant(s):

Yamaha Motor Powered Products(Jiangsu) Co., Ltd
28 Tianhong Road, Taizhou City, Jiangsu Province
China 225300

(1) Delete as appropriate.

(2) As defined in Annex I, section 1 of this Directive (e.g.: 'A')

SECTION II

1. Restriction of use (if any):

1.1. Particular conditions to be respected in the installation of the engine(s) on the machinery

1.1.1. Maximum allowable intake depression: -3.03 kPa

1.1.2. Maximum allowable back pressure: 8.09 kPa

2. Technical service responsible for carrying out the tests[3]: Vehicle Certification Agency

3. Date of test report: As before (16 December 2015)

4. Number of test report: As before (JSR336582(MZ200))

5. The undersigned hereby certifies the accuracy of the manufacturer's description in the attached information document of the engine(s) described above and that the attached test results are applicable to the type. The sample(s) has (have) been selected by the approval authority and submitted by the manufacturer as the (parent) engine type(s) [1].

Type-approval is GRANTED/~~REFUSED/WITHDRAWN~~ [1]

Place: BRISTOL

Date: 26 JUNE 2017

Signature: D Lawlor

D LAWLOR
Chief Technical and Statutory Operations Officer

Attachments: Information package.

Test results (see Appendix 1)

Correlation study relevant to sampling systems used which are different from the reference systems [2] (if applicable)

(1) Delete as appropriate.

(2) Specified in Annex I section 4.2.

(3) Fill in n.a. where the tests are carried out by the approval authority itself.

APPENDIX 1 – Not applicable

Test report for compression ignition engines test results[1]

Information concerning the test engine

Engine Type:

Engine identification number:

1. Information concerning the conduct of the test:

1.1. Reference fuel used for test

1.1.1. Cetane number:

1.1.2. Sulphur content:

1.1.3. Density

1.2. Lubricant

1.2.1. Make(s):

1.2.2. Type(s):

(state percentage of oil in mixture if lubricant and fuel are mixed)

1.3. Engine driven equipment (if applicable)

1.3.1. Enumeration and identifying details:

1.3.2. Power absorbed at indicated engine speeds (as specified by the manufacturer):

	Power P_{AE} (kW) absorbed at various engine speeds [1] [2], taking into account Appendix 3 of this Annex		
Equipment	Intermediate speed (if applicable)	Maximum power speed (if different from rated)	Rated speed [3]
Total:			

(1) Delete as appropriate.
(2) Shall not be greater than 10 per cent of the power measured during the test.
(3) Insert values at engine speed corresponding to 100 % normalised speed if NRSC test uses this speed.

1.4. Engine performance

1.4.1. Engine speeds:

Idle: . .....min^{-1}

Intermediate: .....min^{-1}

Maximum Power.....min^{-1}

Rated [2]: .....min^{-1}

1.4.2. Engine power [1]

Condition	Power setting (kW) at various engine speeds		
	Intermediate speed (if applicable)	Maximum power speed (if different from rated)	Rated speed [1]
Maximum power measured at specified test speed (P_M) (kW) (a)			
Total power absorbed by engine driven equipment as per section 1.3.2 of this Appendix, taking into account Appendix 3 (dW) (b)			
Net engine power as specified in section 2.4 of Annex I (kW) (c)			
c = a + b			

(1) Replace with values at engine speed corresponding to 100 % normalised speed if NRSC test uses this speed.

2. Information concerning the conduct of the NRSC test:

2.1. Dynamometer setting (kW)

Per cent load	Dynamometer setting (kW) at various engine speeds				
	Intermediate speed (if applicable)	63 % (if applicable)	80 % (if applicable)	91 % (if applicable)	Rated speed [1]
10 (if applicable)					
25 (if applicable)					
50					
75 (if applicable)					

100					

(1) Replace with values at engine speed corresponding to 100 % normalised speed if NRSC test uses this speed.

2.2. Emission results of the engine/parent engine [4]

Deterioration Factor (DF): calculated/fixed [4]

Specify the DF values and the emission results in the following table [3]:

NRSC test						
DF Mult/add[4]	CO	HC	NO_X	HC + NO_X	PM	
Emissions	CO (g/k/Wh)	HC (g/k/Wh)	NO_x (g/k/Wh)	HC + NO_X (g/k/Wh)	PM (g/k/Wh)	CO_2 (g/k/Wh)
Test result						
Final test result with DF						

Additional control area test points (if applicable)

Emissions at test point	Engine speed	Load (%)	CO (g/k/Wh)	HC (g/k/Wh)	NO_x (g/k/Wh)	PM (g/k/Wh)
Test result 1						
Test result 2						
Test result 3						

2.3. Sampling system used for the NRSC test:

2.3.1. Gaseous emissions [5]:

2.3.2. PM [5]:

2.3.3.1 Method [4]: single/multiple filter

3. Information concerning the conduct of the NRTC test (if applicable):

3.1. Emission results of the engine/parent engine [4]
Deterioration Factor (DF): calculated/fixed [4]

Specify the DF values and the emission results in the following table [4]:

Regeneration related data may be reported for Stage IV engines.

NRTC test						
DF Mult/add [4]	CO	HC	NO_x	HC + NO_x	PM	
Emissions	CO (g/k/Wh)	HC (g/k/Wh)	NO_x (g/k/Wh)	HC + NO_x (g/k/Wh)	PM (g/k/Wh)	
Cold start						
Emissions	CO (g/k/Wh)	HC (g/k/Wh)	NO_x (g/k/Wh)	HC + NO_x (g/k/Wh)	PM (g/k/Wh)	CO_2 (g/k/Wh)
Hot start w/o regeneration						
Hot start with regeneration [4]						
kr,u (mult/add) [4] kr,u (mult/add) [4]						
Weighed test result						
Final test result with DF						

Cycle work for hot start w/o regeneration kWh

3.2. Sampling system used of the NRTC test:

Gaseous emissions [5]:

PM [5]:

Method [4]: Single/multiple filter

(1) For the case of several parent engines, the following is be indicated for each of them.

(2) Insert engine speed corresponding to 100 % normalised speed if NRSC test uses this speed.

(3) Uncorrected power measured in accordance with Section 2.4 of Annex I.

(4) Delete as appropriate.

(5) Indicate figure number of system used as defined in Annex VI Section 1 or Section 9 of Annex 4B of ECE R96 03 series of amendments, as applicable.

APPENDIX 2

test results for spark ignition engines

1. INFORMATION CONCERNING THE CONDUCT OF THE TEST(S)[1]:

1.1. Octane number

1.1.1. Octane number: 96.0

1.1.2. State percentage of oil in mixture when lubricant and petrol are mixed as in the case of two stroke engines: Not applicable

1.1.3. Density of petrol for four-stroke engines and petrol/oil mixture for two-stroke engines: 749.4 kg/m^3

1.2. LUBRICANT

1.2.1. Make(s): Yamaha

1.2.2. Type(s): FFO

1.3. ENGINE DRIVEN EQUIPMENT (IF APPLICABLE): Not applicable

1.3.1. Enumeration and identifying details

1.3.2. Power absorbed at indicated engine speed (as specified by the manufacturer)

Equipment	Power P_{AE} (kW) absorbed at various engine speeds [2], taking into account Appendix 3 of this Annex	
	Intermediate (if applicable)	Rated
Total		

1.4. Engine performance

1.4.1. Engine speeds:

Idle: 2000 min^{-1}

Intermediate: 3060 min^{-1}

Rated: 3600 min^{-1}

1.4.2. Engine power [3]

Condition	Power setting (kW) at various engine speeds	
	Intermediate (if applicable)	Rated
Maximum power measured on test (P_M) (kW) (a)	3.87	-
Total power absorbed by engine driven equipment as per section 1.3.2 of this Appendix, or section 2.8 of Annex III (P_{AE})(kW) (b)	0.00	-
Net engine power as specified in section 2.4 of Annex I (kW) (c)	3.87	-
c = a + b		

1.5. Emission levels

1.5.1. Dynamometer setting (kW)

Percent Load	Dynamometer setting (kW) at various engine speeds	
	Intermediate (if applicable)	Rated
10 (if applicable)	0.39	-
25 (if applicable)	0.97	-
50	1.94	-
75	2.90	-
100	3.87	-

1.5.2. Emission results on the test cycle:

CO: 238.1 g/kWh

HC: 8.3 g/kWh

NO_x: 3.4 g/kWh

(1) In case of several parent engines, to be indicated for each of them.

(2) Must not be greater than 10 % of the power measured during the test.

(3) Uncorrected power measured in accordance with the provisions of section 2.4 of Annex I.

APPENDIX 3

equipment and auxiliaries to be installed for the test to determine engine power

Number	Equipment and auxiliaries	Fitted for emission test
1	Inlet system	
	Inlet manifold	Yes, standard production equipment
	Crankcase emission control system	Yes, standard production equipment
	Control devices for dual induction inlet manifold system	Yes, standard production equipment
	Air flow meter	Yes, standard production equipment
	Air inlet duct work	Yes [a]
	Air filter	Yes [a]
	Inlet silencer	Yes [a]
	Speed-limiting device	Yes [a]
2	Induction-heating device of inlet manifold	Yes, standard production equipment. If possible to be set in the most favourable condition
3	Exhaust system	
	Exhaust purifier	Yes, standard production equipment
	Exhaust manifold	Yes, standard production equipment
	Connecting pipes	Yes [b]
	Silencer	Yes [b]
	Tail pipe	Yes [b]
	Exhaust brake	No [c]
	Pressure charging device	Yes, standard production equipment
4	Fuel supply pump	Yes, standard production equipment [d]
5	Carburation equipment	
	Carburettor	Yes, standard production equipment
	Electronic control system, air flow meter, etc.	Yes, standard production equipment
	Equipment for gas engines Pressure reducer	Yes, standard production equipment
	Evaporator	Yes, standard production equipment
	Mixer	Yes, standard production equipment
6	Fuel injection equipment (petrol and diesel)	
	Prefilter	Yes, standard production or test bed equipment
	Filter	Yes, standard production or test bed equipment
	Pump	Yes, standard production equipment
	High-pressure pipe	Yes, standard production equipment
	Injector	Yes, standard production equipment
	Air inlet valve	Yes, standard production equipment [e]
	Electronic control system, air flow meter, etc.	Yes, standard production equipment
	Governor/control system	Yes, standard production equipment
	Automatic full-load stop for the control rack depending on atmospheric conditions	Yes, standard production equipment
7	Liquid-cooling equipment	
	Radiator	No
	Fan	No
	Fan cowl	No
	Water pump	Yes, standard production equipment [f]
	Thermostat	Yes, standard production equipment [g]
8	Air cooling	

	Cowl Fan or Blower Temperature-regulating device	No [h] No [h] No
9	Electrical equipment Generator Spark distribution system Coil or coils Wiring Spark plugs Electronic control system including knock sensor/spark retard system	 Yes, standard production equipment [i] Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment
10	Pressure charging equipment Compressor driven either directly by the engine and/or by the exhaust gases Charge air cooler Coolant pump or fan (engine-driven) Coolant flow control device	 Yes, standard production equipment Yes, standard production or test bed equipment [j] [k] No [h] Yes, standard production equipment
11	Auxiliary test-bed fan	Yes, if necessary
12	Anti-pollution device	Yes, standard production equipment [l]
13	Starting equipment	Test bed equipment
14	Lubricating oil pump	Yes, standard production equipment

(a) The complete inlet system shall be fitted as provided for the intended application: where there is a risk of an appreciable effect on the engine power; in the case of naturally aspirated spark ignition engines; when the manufacturer requests that this should be done. In other cases, an equivalent system may be used and a check should be made to ascertain that the intake pressure does not differ by more than 100 Pa from the upper limit specified by the manufacturer for a clean air filter.

(b) The complete exhaust system shall be fitted as provided for the intended application: where there is a risk of an appreciable effect on the engine power; in the case of naturally aspirated spark ignition engines; when the manufacturer requests that this should be done. In other cases, an equivalent system may be installed provided the pressure measured does not differ by more than 1000 Pa from the upper limit specified by the manufacturer.

(c) If an exhaust brake is incorporated in the engine, the throttle valve shall be fixed in the fully open position.

(d) The fuel feed pressure may be adjusted, if necessary, to reproduce the pressure existing in the particular engine application (particularly when a "fuel return" system is used)

(e) The air intake valve is the control valve for the pneumatic governor of the injection pump. The governor or the fuel injection equipment may contain other devices which may affect the amount of injected fuel.

(f) The cooling-liquid circulation shall be operated by the engine water pump only. Cooling of the liquid may be produced by an external circuit, such that the pressure loss of this circuit and the pressure at the pump inlet remain substantially the same as those of the engine cooling system.

(g) The thermostat may be fixed in the fully open position.

(h) When the cooling fan or blower is fitted for the test, the power absorbed shall be added to the results, except for cooling fans of air cooled engines directly fitted on the crankshaft. The fan or blower power shall be determined at the speeds used for the test either by calculation from standard characteristics or by practical tests

(i) Minimum power of the generator: the electrical power of the generator shall be limited to that necessary for operation of accessories which are indispensable for engine operation. If the connection of a battery is necessary, a fully charged battery in good condition shall be used.

(j) Charge air-cooled engines shall be tested with charge air cooling, whether liquid- or air-cooled, but if the manufacturer prefers, a test bench system may replace the air cooler. In either case, the measurement of power at each speed shall be made with the maximum pressure drop and the minimum temperature drop of the engine air across the charge air cooler on the test bench system as specified by the manufacturer.

(k) These may include, for example, exhaust-gas recirculation (EGR)-system, catalytic converter, thermal reactor, secondary air-supply system and fuel evaporation protecting system.

(l) The power for electrical or other starting systems shall be provided from the test bed.