



Vehicle  
Certification  
Agency

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## THE UNITED KINGDOM TYPE APPROVAL AUTHORITY

Date: 28 June 2017

Dear Sir / Madam.

1. The vehicle component / type described on the attached approval(s) has been tested and meets the requirements of the ECE Regulation/EEC Directive displayed on the approval certificate(s). I enclose a set of approval documents, comprising, as appropriate, the approval certificate(s), test report and your documentation duly authenticated.

2. Maintaining Conformity of Production (COP) is a means of evidencing the ability to produce a series of products that exactly match the specification, performance and marking requirements outlined in the type approval documentation. Whether you are a manufacturer, or the agent applying for approvals on behalf of a manufacturer, and whatever your product is, suitable COP arrangements must be made. **Please follow these links to documents that explain COP in more detail:**

<http://www.dft.gov.uk/vca/conformity-of-production/conformity-of-production.asp>

3. If you think there are any errors in the enclosed package, please contact Ian Woodruff, [ian.woodruff@vca.gov.uk](mailto:ian.woodruff@vca.gov.uk) immediately.

Please be aware that from the date of issue we have a three week holding period, any manufacture/applicant document changes within this period may incur an additional time charge to review and re-issue. Any corrections required after this time will need to be corrected via an extension, index revision or correction 1 certificate, as appropriate.

### ROAD TRAFFIC ACT 1988 - SECTION 80

3. The Secretary of State for Transport authorises, under section 80 of the Road Traffic Act 1988, the stated manufacturer or accredited agent to apply to the motor vehicle type / part specified, the appropriate mark designated in the Motor Vehicles (Designation of Approval Marks) Regulations 1979, as amended. The conditions attached to this authorisation are set out overleaf.

4. If this approval / extension / index revision results in a change being required to a vehicle information document issued under either a National or European Whole Vehicle approval you should notify the issuing authority to arrange for the approval(s) to be updated.

5. VCA is continually scrutinising the quality of the service it provides to customers, in order to discover more ways in which the standard can be improved. If you have a specific complaint concerning the way this job has been dealt with, please view the VCA complaints procedure for guidance: <http://www.dft.gov.uk/vca/vca-complaints-procedure.asp>

Yours faithfully,

Title Name

VCA

## **1. CONDITIONS**

1.1 This Approval may be withdrawn at any time and while held is subject to the following conditions.

## **2. CONDITIONS OF MOTOR VEHICLE PARTS**

2.1 The holder of this approval shall put the approval mark described in the Motor Vehicles (Designation of Approval Marks) Regulations 1979 as amended only on Motor Vehicle Parts that:

- a. Have been manufactured, assembled or completed in factories under his control and
- b. Conform in all material respects with the samples, which were tested before this approval was issued.

2.2 The holder of this approval shall mark his products in the manner set out in the relevant Regulation / Directive as given in the Motor Vehicles (Designation of Approval Marks) Regulations 1979 as amended together with:

- a. The approval number allocated by the Secretary of State for Transport.
- b. His name or trademark
- c. Any other markings specified in the appropriate international Regulation

2.3 The holder of this approval shall be prepared at any time to satisfy Department for Transport officials or agents of the Department, that the quality of the part being produced and marked or intended to be by him with the approval marking conforms in all material respects with that of the samples tested as the International Regulation requires.

2.4 The holder of this approval undertakes to admit duly authorised officials or agents of the Department at all reasonable times to any premises in which parts marked or intended to be marked are being manufactured, assembled or stored and to permit any such official or agent to inspect parts and all records relating to them and their production processes.

2.5 This approval may be suspended or withdrawn by the Secretary of State for Transport at any time without any particular length of notice being given and in the event of that being done the holder will absolve the Secretary of State from any claim for damages or compensation.

## **3. CONDITIONS FOR MOTOR VEHICLES**

3.1 The holder of this approval shall put the approval mark described in the Motor Vehicles (Designation of Approval Marks) Regulation 1979 as amended only on Motor Vehicles fitted with Motor Vehicle parts which Motor Vehicles as fitted with such parts conform with the type of Motor Vehicle approved by as on behalf of the Secretary of State for Transport and only on Motor Vehicles that:

- a. Have been manufactured, assembled or completed in factories under his control and
- b. Conform in all material respects with the type of Motor Vehicle, which was tested before an approval certificate was issued.

3.2 The holder of this approval shall mark motor vehicles of the type approved. In the matter set out in the relevant Regulation / Directive using the authorised approval mark as given in the Motor Vehicles (Designation of Approval Marks) Regulation 1979 as amended together with the approval number allocated by the Secretary of State for Transport.

3.3 The holder of this approval shall mark Motor Vehicles of the type approved in the manner set out in the relevant Regulation annexed to the United Nations agreement of 1958 as amended using the authorised approval mark which comprises a capital letter E followed by the number 11 within a circle together with the approval number allocated by the Secretary of State for Transport.

3.4 The holder of this approval shall be prepared at any time to satisfy Department for Transport officials or agents of the Department that Motor Vehicles of the type approved which have been produced and marked or that are intended to be marked by him conform in all material respects with the type of vehicle approved.

3.5 The holder of this approval undertakes to admit duly authorised officials or agents of the Department at all reasonable times to any premises in which the Motor Vehicles of the type approved which have been or are intended to be marked are manufactured, assembled or stored and to permit any such official or agent to inspect the Motor Vehicles and all records relating to them and their production processes.

3.6 This approval may be suspended or withdrawn by the Secretary of State for Transport at any time without any particular length of notice given and in the event of that being done the holder will absolve the Secretary of State from any claim for damages or compensation.



THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

COMMUNICATION CONCERNING THE EXTENSION <sup>(4)</sup>/~~REFUSAL <sup>(4)</sup>/WITHDRAWAL OF TYPE-  
APPROVAL <sup>(4)</sup>~~ 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 2002/88/EC

EC type-approval No: e11\*97/68SA\*2002/88\*0255\*10

Reason(s) for extension: To cover

- 1) Addition of family engine (MX175)
- 2) Format change to location and method of affixing of type coding

**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)<sup>(1)</sup>:

Parent: MZ175 (EF2800i)

Family: See manufacturer's documentation

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

Location:	7CF (EF2400iS)	Body cover
	All others	Fan case

Method of affixing: Laminated sticker

0.4. Specification of machinery to be propelled by the engine<sup>(2)</sup>: 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:

7CF (EF2400iS): Body cover, 7CNV???????, laminated sticker  
 7CA (EF2300): Fan case, 7CNC???????, laminated sticker  
 7VU: Fan case, 7CNW???????, laminated sticker  
 All others: Fan case, 7CN?-???????, laminated sticker

0.7 Location and method of affixing of the EC approval mark:

7VU (EF2800i), 7CA (EF2300): Air shroud, laminated sticker or fan case, laminated sticker  
 7CF (EF2400iS): Air cleaner, laminated sticker  
 All others: Fan case, laminated sticker

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

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

## 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: See manufacturer's documentation

1.1.2. Maximum allowable back pressure: See manufacturer's documentation

2. Technical service responsible for carrying out the tests<sup>(3)</sup>: Vehicle Certification Agency

3. Date of test report: As before (26 January 2011)


4. Number of test report: As before (JSL230798(0255))

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)<sup>(1)</sup>.

Type-approval is ~~EXTENDED/REFUSED/WITHDRAWN~~

Place: BRISTOL

Date: 28 JUNE 2017

Signature: 

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(4) (if applicable)

- (1) Delete as appropriate.
- (2) As defined in Annex I, section 1 of this Directive (e.g.: 'A')
- (3) Fill in n.a. where the tests are carried out by the approval authority itself.
- (4) Specified in Annex I section 4.2.

**APPENDIX 1: Not applicable**

## Test Results For Compression Ignition Engines

1. INFORMATION CONCERNING THE CONDUCT OF THE NRSC TEST <sup>(1)</sup>:

## 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 PAE (kW) absorbed at various engine speeds <sup>(2)</sup> , taking into account Appendix 3 of this Annex	
Equipment	Intermediate (if applicable)	Rated
Total:		

## 1.4. Engine performance

## 1.4.1. Engine speeds:

Idle: rpm

Intermediate: rpm

Rated: rpm

1.4.2. Engine power <sup>(3)</sup>

Condition	Power setting (kW) at various engine speeds	
	Intermediate (if applicable)	Rated
Maximum power measured on test (PM) (kW) (a)		
Total power absorbed by engine driven equipment as per section 1.3.2 of this Appendix, or section 3.1 of Annex III (PAE) (kW) (b)		
Net engine power as specified in section 2.4 of Annex I (kW) (c)		
$c = a + b$		

## 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)		
25 (if applicable)		
50		
75		
100		

### 1.5.2. Emission results on the NRSC test:

CO: g/kWh

HC: g/kWh

NOx: g/kWh

Particulates: g/kWh

### 1.5.3. Sampling system used for the NRSC test:

#### 1.5.3.1. Gaseous emissions: <sup>(4)</sup>

#### 1.5.3.2. Particulates: <sup>(4)</sup>

##### 1.5.3.2.1. Method: <sup>(5)</sup> single/multiple filter

- (1) For the 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 section 2.4 of Annex I.
- (4) Indicate figure numbers defined in Annex VI section 1.
- (5) Delete as appropriate

**APPENDIX 2****Test Results For Spark Ignition Engines**

1. INFORMATION CONCERNING THE CONDUCT OF THE TEST(S) <sup>(1)</sup>:
  - 1.1. Octane number
    - 1.1.1. Octane number: 86.1
    - 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: 757 kg/m<sup>3</sup>
  - 1.2. LUBRICANT
    - 1.2.1. Make(s): Showa Shell
    - 1.2.2. Type(s): X100 multi 10W-30
  - 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 <sub>AE</sub> (kW) absorbed at various engine speeds <sup>(2)</sup> , 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<sup>-1</sup>

Intermediate: Not applicable

Rated: 3600 min<sup>-1</sup>



1.4.2. Engine power <sup>(3)</sup>

Condition	Power setting (kW) at various engine speeds	
	Intermediate (if applicable)	Rated
Maximum power measured on test ( $P_M$ ) (kW) (a)	-	3.69
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)	-	-
Net engine power as specified in section 2.4 of Annex I (kW) (c)	-	3.69
$c = a + b$		

## 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)	-	0.3
25 (if applicable)	-	0.9
50	-	1.8
75	-	2.8
100	-	3.7

### 1.5.2. Emission results on the test cycle:

Rich

CO: 454 g/kWh

HC: 1 g/kWh

NO<sub>x</sub>: 12.8 g/kWh

Lean

CO: 450 g/kWh

HC: 1 g/kWh

NO<sub>x</sub>: 12.3 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  Crankcase emission control system Control devices for dual induction inlet manifold system Air flow meter Air inlet duct work Air filter Inlet silencer Speed-limiting device	Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment  Yes, standard production equipment Yes <sup>(a)</sup> Yes <sup>(a)</sup> Yes <sup>(a)</sup> Yes <sup>(a)</sup>
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 Exhaust manifold Connecting pipes Silencer Tail pipe Exhaust brake Pressure charging device	Yes, standard production equipment Yes, standard production equipment Yes <sup>(b)</sup> Yes <sup>(b)</sup> Yes <sup>(b)</sup> No <sup>(c)</sup> Yes, standard production equipment
4	Fuel supply pump	Yes, standard production equipment <sup>(d)</sup>
5	Carburation equipment Carburettor Electronic control system, air flow meter, etc. Equipment for gas engines Pressure reducer Evaporator Mixer	Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment
6	Fuel injection equipment (petrol and diesel) Prefilter  Filter  Pump High-pressure pipe Injector Air inlet valve Electronic control system, air flow meter, etc. Governor/control system Automatic full-load stop for the control rack depending on atmospheric conditions	Yes, standard production or test bed equipment Yes, standard production or test bed equipment  Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment <sup>(e)</sup> Yes, standard production equipment Yes, standard production equipment Yes, standard production equipment
7	Liquid-cooling equipment Radiator Fan Fan cowl Water pump Thermostat	No No No Yes, standard production equipment <sup>(f)</sup> Yes, standard production equipment <sup>(g)</sup>
8	Air cooling Cowl	No <sup>(h)</sup>

JST394484

	Fan or Blower Temperature-regulating device	No <sup>(h)</sup> 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 <sup>(i)</sup> 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 <sup>(j) (k)</sup> No <sup>(h)</sup> Yes, standard production equipment
11	Auxiliary test-bed fan	Yes, if necessary
12	Anti-pollution device	Yes, standard production equipment <sup>(l)</sup>
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.



Vehicle  
Certification  
Agency

THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

APPROVAL NUMBER: e11\*97/68SA\*2002/88\*0255\*10

**INFORMATION PACKAGE CONTENTS**

**INDEX REVISION NUMBER: 11 (Eleven)**

Total number of sheets: 50 (Fifty)

Reasons for Revision:      See approval certificate

Revision Date  
&  
Office Stamp

JST394484

An executive agency of the Department for Transport  
April 2017 Revision 5  
Page 1 of 1



## INFORMATION DOCUMENT

relating to type-approval and referring to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery

*(Directive 97/68/EC as last amended by Directive 2002/88/EC)*

Current Type-Approval No. : e11\*97/68SA\*2002/88\*0255\*09

Engine type : MZ175 ( 7VU : 2800i )

### CONTENTS LIST

Information document

Appendix1

Appendix2

Appendix3.1

Appendix3.2

Appendix3.3

Appendix3.4

Appendix3.5

Appendix3.6

Appendix3.7

Appendix3.8

Appendix3.9

Appendix3.10

Chart 2.1

Attach Sheet A-1

Attach Sheet A-2

Attach Sheet B

### REASON FOR THIS DOCUMENT

- Addition of family engine



## INFORMATION DOCUMENT

relating to type-approval and referring to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery

(Directive 97/68/EC as last amended by Directive 2002/88/EC)

Parent engine/engine type <sup>(1)</sup>: MZ175 (7VU : EF2800i)

### 0. General

0.1. Make (name of undertaking) : YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.

0.2. Type and commercial description of the parent- and (if applicable) of the family engine(s) <sup>(1)</sup> :

Parent: MZ175 (7VU: EF2800i) Family: See Appendix 2

0.3. Manufacturer's type coding as marked on the engine(s) <sup>(1)</sup> :

See paragraph 0.2.

0.4. Specification of machinery to be propelled by the engine <sup>(2)</sup> :

A(iii) Generator , Multi-purpose Engine, Water Pump

0.5. Name and address of manufacturer :

200-1 Sakagawa Kakegawa City Shizuoka Pref. Japan YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.

Name and address of manufacturer's authorized representative (if any) : NA

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

7CF (EF2400iS) Body Cover (Laminated Sticker) Coding: 7CNV??????

7CA (EF2300) Fan case (Laminated Sticker) Coding: 7CNC??????

7VU Fan case (Laminated Sticker) Coding: 7CNW??????

All other engines Fan case (Laminated Sticker) Coding: 7CN?-?????? ? : Serial number

0.7. Location and method of affixing of the EC approval mark :

7VU (EF2800i) , 7CA (EF2300) Air shroud (Laminated Sticker) or Fan case (Laminated Sticker)

7CF (EF2400iS) Air Cleaner (Laminated Sticker)

All other engines Fan case (Laminated Sticker)

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

28 Tianhong Road, Taizhou City, Jiangsu Province, China 225300

Yamaha Motor Powered Products(Jiangsu) Co.,Ltd.

### Attachments

1.1. Essential characteristics of the parent engine(s) (see Appendix 1)

1.2. Essential characteristics of the engine family (see Appendix 2)

1.3. Essential characteristics of engine types within the family (see Appendix 3)

2. Characteristics of engine-related parts of the mobile machinery ( if applicable )

3. Photographs of the parent engine

4. List further attachments if any

(1) Delete as appropriate

(2) As defined in Annex 1, section 1 (e.g. 'A')

# Appendix 1

## ESSENTIAL CHARACTERISTICS OF THE (PARENT) ENGINE <sup>(1)</sup>

### 1. DESCRIPTION OF ENGINE

- 1.1. Manufacturer : \_\_\_\_\_ YAMAHA MOTOR POWERED PRODUCTS CO.,LTD. \_\_\_\_\_
- 1.2. Manufacturer's engine code : \_\_\_\_\_ MZ175 ( 7VU : EF2800i ) \_\_\_\_\_
- 1.3. Cycle : four stroke
- 1.4. Bore : \_\_\_\_\_ 66.0 \_\_\_\_\_ mm
- 1.5. Stroke : \_\_\_\_\_ 50.0 \_\_\_\_\_ mm
- 1.6. Number and layout of cylinders : \_\_\_\_\_ 1 cylinder \_\_\_\_\_ 68° incline \_\_\_\_\_
- 1.7. Engine capacity : \_\_\_\_\_ 171 \_\_\_\_\_ cm<sup>3</sup>
- 1.8. Rated speed : \_\_\_\_\_ 3600rpm \_\_\_\_\_
- 1.9. Maximum torque speed : \_\_\_\_\_ 2400rpm \_\_\_\_\_
- 1.10. Volumetric compression ratio <sup>(3)</sup> : \_\_\_\_\_ 8.5 \_\_\_\_\_
- 1.11. Combustion system description : \_\_\_\_\_ 4 stroke \_\_\_\_\_
- 1.12. Drawing(s) of combustion chamber and piston crown : \_\_\_\_\_ See Attached Sheet A-1 and A-2 \_\_\_\_\_
- 1.13. Minimum cross sectional area of inlet and outlet ports : \_\_\_\_\_ See Attached Sheet B \_\_\_\_\_
- 1.14. Cooling system
- 1.14.1 *Liquid*
- 1.14.1 Nature of liquid : \_\_\_\_\_ NA \_\_\_\_\_
- 1.14.1 Circulating pump(s) : \_\_\_\_\_ NA \_\_\_\_\_
- 1.14.1 Characteristics or make(s) and type(s) ( if applicable ) : \_\_\_\_\_ NA \_\_\_\_\_
- 1.14.1 Drive ratio(s) ( if applicable ) : \_\_\_\_\_ NA \_\_\_\_\_
- 1.14.2 *Air*
- 1.14.2 Blower :
- 1.14.2 Characteristics or make(s) and type(s) ( if applicable ) : \_\_\_\_\_ Centrifugal Fan \_\_\_\_\_
- 1.14.2 Drive ratio(s) ( if applicable ) : \_\_\_\_\_ 1:1 (direct) \_\_\_\_\_
- 1.15. Temperature permitted by the manufacturer
- 1.15.1 Liquid cooling : maximum temperature at outlet : \_\_\_\_\_ NA \_\_\_\_\_ K
- 1.15.2 Air cooling : reference point : \_\_\_\_\_ Spark plug \_\_\_\_\_
- Maximum temperature at reference point : \_\_\_\_\_ 503 \_\_\_\_\_ K
- 1.15.3 Maximum charge air outlet temperature of the inlet intercooler ( if applicable ) \_\_\_\_\_ NA \_\_\_\_\_ K
- 1.15.4 Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) \_\_\_\_\_
- of the exhaust manifold(s) : \_\_\_\_\_ Exhaust Gas Temperature \_\_\_\_\_ 1053 \_\_\_\_\_ K
- 1.15.5 Lubricant temperature : minimum \_\_\_\_\_ NA \_\_\_\_\_ K
- maximum \_\_\_\_\_ 393 \_\_\_\_\_ K
- 1.16. Pressure charger : No
- 1.16.1 Make : \_\_\_\_\_ NA \_\_\_\_\_
- 1.16.2 Type : \_\_\_\_\_ NA \_\_\_\_\_
- 1.16.3 Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) \_\_\_\_\_ NA \_\_\_\_\_
- 1.16.4 Intercooler : n.a.





- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -1.74 kPa
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 8.5 kPa
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1 Make(s) : ----- NA
- 3.2.1.2 Type(s) : ----- NA
- 3.2.1.3 Delivery :  
Mention the method used : ----- NA
- 3.2.1.4 Injection advance ----- NA
- 3.2.1.5 Injection advance curve<sup>(2)</sup> : ----- NA
- 3.2.1.6 Timing<sup>(2)</sup> : ----- NA
- 3.2.2. *Injection piping*
- 3.2.2.1 Length : ----- NA mm
- 3.2.2.2 Internal diameter : ----- NA mm
- 3.2.3. *Injector(s)*
- 3.2.3.1 Make(s) : ----- NA
- 3.2.3.2 Type(s) : ----- NA
- 3.2.3.3 Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA kPa
- 3.2.4. *Governor*
- 3.2.4.1 Make(s) : ----- NA
- 3.2.4.2 Type(s) : ----- NA
- 3.2.4.3 Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA rpm
- 3.2.4.4 Maximum no-load speed<sup>(1)</sup> : ----- NA rpm
- 3.2.4.5 Idling speed<sup>(1)</sup> : ----- NA rpm
- 3.3. Cold start system
- 3.3.1 Make(s) : ----- NA
- 3.3.2 Type(s) : ----- NA
- 3.3.3 Description : ----- NA
4. FUEL FEED FOR PETROL ENGINES
- 4.1. Carburettor :
- 4.1.1. Make(s) : ----- MIKUNI CORPORATION
- 4.1.2. Type(s) : ----- 7CN4?



- 4.2. Port fuel injection : single-point or multi-point : NA
- 4.2.1. Make(s) : NA
- 4.2.2. Type(s) : NA
- 4.3. Direct injection : NA
- 4.3.1. Make(s) : NA
- 4.3.2. Type(s) : NA
- 4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : 1400g/h A/F 11.78

## 5. VALVE TIMING

- 5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

- 5.2. Reference and/or setting ranges<sup>(2)</sup> :

Ramp Height 0.45mm

- 5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : NA
- 5.3.1. Type: continuous or on/off : NA
- 5.3.2. Cam phase shift angle : NA

## 6. PORTING CONFIGURATION

- 6.1. Position, size and number : See Attached Sheet B

## 7. IGNITION SYSTEM

- 7.1. Ignition coil

- 7.1.1. Make(s) : Yuxin Electronic CO.,Ltd.
- 7.1.2. Type(s) : T.C.I.
- 7.1.3. Number : 7CN-0?

- 7.2. Spark plug(s) :

- 7.2.1. Make(s) : NGK
- 7.2.2. Type(s) : BPR-4ES

- 7.3. Magneto :

- 7.3.1. Make(s) : Yuxin Electronic CO.,Ltd.
- 7.3.2. Type(s) : Fly Wheel Magneto

- 7.4. Ignition timing :

- 7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°
- 7.4.2. Advance curve, if applicable : NA

Appendix 2

ESSENTIAL CHARACTERISTICS OF THE ENGINE FAMILY

1. COMMON PARAMETERS<sup>(1)</sup> :

1.1. Combustion cycle : 4 Stroke

1.2. Cooling medium : Air

1.3. Method of air aspiration : Natural Aspiration

1.4. Combustion chamber type/design : See Attached Sheet A-1

1.5. Valve and porting – configuration, size and number : See Attached Sheet B

1.6. Fuel system : Gravity (No Pump)

1.7. Engine management systems : NA

Proof of identity pursuant to drawing number(s) : NA

- charge cooling system : NA

- exhaust gas recirculation<sup>(2)</sup> : NA

- water injection/emulsion<sup>(2)</sup> : NA

- air injection<sup>(2)</sup> : NA

1.8. Exhaust after-treatment system<sup>(2)</sup> : NA

proof of identical ( or lowest for the parent engine ) ratio : system capacity/fuel delivery per stroke,

pursuant to diagram number(s) :

2.ENGINE FAMILY LISTING

2.1. Name of engine family : MZ175

2.2. Specification of engines within this family : See Chart 2.1

(1) To be completed in conjunction with the specifications given in sections 6 and 7 of Annex 1.

(2) If not applicable mark n.a.



## Appendix 3.1

### ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

#### 1. DESCRIPTION OF ENGINE

- 1.1. Manufacturer : YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.
- 1.2. Manufacturer's engine code : MZ175 ( 7CA : EF2300 )
- 1.3. Cycle : four stroke/two stroke<sup>(2)</sup>
- 1.4. Bore : 66 mm
- 1.5. Stroke : 50 mm
- 1.6. Number and layout of cylinders : 1 cylinder 68° incline
- 1.7. Engine capacity : 171 cm<sup>3</sup>
- 1.8. Rated speed : 3,000 r.p.m.
- 1.9. Maximum torque speed : 2,500 r.p.m.
- 1.10. Volumetric compression ratio <sup>(3)</sup> : 8.5
- 1.11. Combustion system description : 4 stroke
- 1.12. Drawing(s) of combustion chamber and piston crown : See Attached Sheet A-1,A-2
- 1.13. Minimum cross sectional area of inlet and outlet ports : See Attached Sheet B
- 1.14. Cooling system
- 1.14.1 *Liquid*
- 1.14.1 Nature of liquid : NA
- 1.14.1 Circulating pump(s) : NA
- 1.14.1 Characteristics or make(s) and type(s) ( if applicable ) : NA
- 1.14.1 Drive ratio(s) ( if applicable ) : NA
- 1.14.2 *Air*
- 1.14.2 Blower :
- 1.14.2 Characteristics or make(s) and type(s) ( if applicable ) : Centrifugal Fan
- 1.14.2 Drive ratio(s) ( if applicable ) : 1:1 (Direct)
- 1.15. Temperature permitted by the manufacturer
- 1.15.1 Liquid cooling : maximum temperature at outlet : NA K
- 1.15.2 Air cooling : reference point : Spark Plug
- Maximum temperature at reference point : 503 K
- 1.15.3 Maximum charge air outlet temperature of the inlet intercooler ( if applicable ) : NA K
- 1.15.4 Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s)  
of the exhaust manifold(s) : Exhaust Gas Temperature 1053 K
- 1.15.5 Lubricant temperature : minimum NA K  
maximum 393 K
- 1.16. Pressure charger : No
- 1.16.1 Make : NA
- 1.16.2 Type : NA
- 1.16.3 Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) : NA
- 1.16.4 Intercooler : N.A.



- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -1.29 ----- kPa
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 6.04 ----- kPa
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA -----
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1 Make(s) : ----- NA -----
- 3.2.1.2 Type(s) : ----- NA -----
- 3.2.1.3 Delivery :  
Mention the method used : ----- NA -----
- 3.2.1.4 Injection advance ----- NA -----
- 3.2.1.4 Injection advance curve<sup>(2)</sup> : ----- NA -----
- 3.2.1.4 Timing<sup>(2)</sup> : ----- NA -----
- 3.2.2. *Injection piping*
- 3.2.2.1 Length : ----- NA ----- mm
- 3.2.2.2 Internal diameter : ----- NA ----- mm
- 3.2.3. *Injector(s)*
- 3.2.3.1 Make(s) : ----- NA -----
- 3.2.3.2 Type(s) : ----- NA -----
- 3.2.3.3 Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2.4 *Governor*
- 3.2.4.1 Make(s) : ----- NA -----
- 3.2.4.2 Type(s) : ----- NA -----
- 3.2.4.3 Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.4 Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.5 Idling speed<sup>(1)</sup> : ----- NA ----- rpm
- 3.3. Cold start system
- 3.3.1 Make(s) : ----- NA -----
- 3.3.2 Type(s) : ----- NA -----
- 3.3.3 Description :
4. FUEL FEED FOR PETROL ENGINES
- 4.1. Carburettor :
- 4.1.1. Make(s) : ----- MIKUNI CORPORATION -----
- 4.1.2. Type(s) : ----- 7CN1? -----



- 4.2. Port fuel injection : single-point or multi-point : NA
- 4.2.1. Make(s) : NA
- 4.2.2. Type(s) : NA
- 4.3. Direct injection : NA
- 4.3.1. Make(s) : NA
- 4.3.2. Type(s) : NA
- 4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : 1040g/h A/F 13.35

## 5. VALVE TIMING

- 5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

- 5.2. Reference and/or setting ranges<sup>(2)</sup> : Ramp Height 0.45mm
- 5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : NA
- 5.3.1. Type: continuous or on/off : NA
- 5.3.2. Cam phase shift angle : NA

## 6. PORTING CONFIGURATION

- 6.1. Position, size and number : See Attached Sheet B

## 7. IGNITION SYSTEM

- 7.1. Ignition coil
- 7.1.1. Make(s) : Yuxin Electronic CO.,Ltd.
- 7.1.2. Type(s) : T.C.I.
- 7.1.3. Number : 7CN-0?
- 7.2. Spark plug(s) :
- 7.2.1. Make(s) : NGK
- 7.2.2. Type(s) : BPR-4ES
- 7.3. Magneto :
- 7.3.1. Make(s) : Yuxin Electronic CO.,Ltd.
- 7.3.2. Type(s) : Fly Wheel Magneto
- 7.4. Ignition timing :
- 7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°
- 7.4.2. Advance curve, if applicable : NA

## ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

1.1.	Manufacturer :	YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.		
1.2.	Manufacturer's engine code :	MZ175 ( 7CN:YP30G )		
1.3.	Cycle : four stroke/two stroke <sup>(2)</sup>			
1.4.	Bore :	66		mm
1.5.	Stroke :	50		mm
1.6.	Number and layout of cylinders :	1 cylinder	68°	incline
1.7.	Engine capacity :	171		cm <sup>3</sup>
1.8.	Rated speed :	3,600		r.p.m.
1.9.	Maximum torque speed :	2,500		r.p.m.
1.10.	Volumetric compression ratio <sup>(3)</sup> :	8.5		
1.11.	Combustion system description :	4 stroke		
1.12.	Drawing(s) of combustion chamber and piston crown :	See Attached Sheet A-1,A-2		
1.13.	Minimum cross sectional area of inlet and outlet ports :	See Attached Sheet B		
1.14.	Cooling system			
1.14.1.	<i>Liquid</i>			
1.14.1.1.	Nature of liquid :	NA		
1.14.1.2.	Circulating pump(s) :	NA		
1.14.1.3.	Characteristics or make(s) and type(s) ( if applicable ) :	NA		
1.14.1.4.	Drive ratio(s) ( if applicable ) :	NA		
1.14.2.	<i>Air</i>			
1.14.2.	Blower :			
1.14.2.1.	Characteristics or make(s) and type(s) ( if applicable ) :	Centrifugal Fan		
1.14.2.2.	Drive ratio(s) ( if applicable ) :	1:1 (Direct)		
1.15.	Temperature permitted by the manufacturer			
1.15.1.	Liquid cooling : maximum temperature at outlet :	NA		K
1.15.2.	Air cooling : reference point :	Spark Plug		
	Maximum temperature at reference point :	503		K
1.15.3.	Maximum charge air outlet temperature of the inlet intercooler ( if applicable )	NA		K
1.15.4.	Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s) :	Exhaust Gas Temperature	1053	K
1.15.5.	Lubricant temperature :	minimum	NA	K
		maximum	393	K
1.16.	Pressure charger : No			
1.16.1.	Make :	NA		
1.16.2.	Type :	NA		
1.16.3.	Description of the system ( e.g. max charge pressure, waste-gate, if applicable	NA		
1.16.4.	Intercooler :	N.A.		



- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
 ----- -1.71 ----- kPa
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
 ----- 9.04 ----- kPa
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
 - Description and/or diagram(s) : ----- NA -----
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
 Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1. Make(s) : ----- NA -----
- 3.2.1.2. Type(s) : ----- NA -----
- 3.2.1.3. Delivery :  
 Mention the method used : ----- NA -----
- 3.2.1.4. Injection advance ----- NA -----
- 3.2.1.4. Injection advance curve<sup>(2)</sup> : ----- NA -----
- 3.2.1.4. Timing<sup>(2)</sup> : ----- NA -----
- 3.2.2. *Injection piping*
- 3.2.2.1. Length : ----- NA ----- mm
- 3.2.2.2. Internal diameter : ----- NA ----- mm
- 3.2.3. *Injector(s)*
- 3.2.3.1. Make(s) : ----- NA -----
- 3.2.3.2. Type(s) : ----- NA -----
- 3.2.3.3. Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2.4. *Governor*
- 3.2.4.1. Make(s) : ----- NA -----
- 3.2.4.2. Type(s) : ----- NA -----
- 3.2.4.3. Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.4. Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.5. Idling speed<sup>(1)</sup> : ----- NA ----- rpm
- 3.3. Cold start system
- 3.3.1. Make(s) : ----- NA -----
- 3.3.2. Type(s) : ----- NA -----
- 3.3.3. Description :
4. FUEL FEED FOR PETROL ENGINES
- 4.1. Carburettor :
- 4.1.1. Make(s) : ----- MIKUNI CORPORATION -----
- 4.1.2. Type(s) : ----- 7CN1? -----





- 4.2. Port fuel injection : single-point or multi-point : NA
- 4.2.1. Make(s) : NA
- 4.2.2. Type(s) : NA
- 4.3. Direct injection : NA
- 4.3.1. Make(s) : NA
- 4.3.2. Type(s) : NA
- 4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : 1370g/h A/F 11.77

## 5. VALVE TIMING

- 5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :		Max. Lift	Event Angle	Opening Angel	Closeing Angle
	INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
	EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

- 5.2. Reference and/or setting ranges<sup>(2)</sup> : Ramp Height 0.45mm
- 5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : NA
- 5.3.1. Type: continuous or on/off : NA
- 5.3.2. Cam phase shift angle : NA

## 6. PORTING CONFIGURATION

- 6.1. Position, size and number : See Attached Sheet B

## 7. IGNITION SYSTEM

- 7.1. Ignition coil
- 7.1.1. Make(s) : Yuxin Electronic CO.,Ltd.
- 7.1.2. Type(s) : T.C.I.
- 7.1.3. Number : 7CN-0?
- 7.2. Spark plug(s) :
- 7.2.1. Make(s) : NGK
- 7.2.2. Type(s) : BPR-4ES
- 7.3. Magneto :
- 7.3.1. Make(s) : Yuxin Electronic CO.,Ltd.
- 7.3.2. Type(s) : Fly Wheel Magneto
- 7.4. Ignition timing :
- 7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°
- 7.4.2. Advance curve, if applicable : NA

### Appendix 3.3

#### ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

##### 1. DESCRIPTION OF ENGINE

- 1.1. Manufacturer : \_\_\_\_\_ YAMAHA MOTOR POWERED PRODUCTS CO.,LTD. \_\_\_\_\_
- 1.2. Manufacturer's engine code : \_\_\_\_\_ MZ175 ( 7CF : EF2400iS) \_\_\_\_\_
- 1.3. Cycle : four stroke/two stroke <sup>(2)</sup>
- 1.4. Bore : \_\_\_\_\_ 66 \_\_\_\_\_ mm
- 1.5. Stroke : \_\_\_\_\_ 50 \_\_\_\_\_ mm
- 1.6. Number and layout of cylinders : \_\_\_\_\_ 1 cylinder \_\_\_\_\_ 68° incline \_\_\_\_\_
- 1.7. Engine capacity : \_\_\_\_\_ 171 \_\_\_\_\_ cm<sup>3</sup>
- 1.8. Rated speed : \_\_\_\_\_ 3,200 r.p.m. \_\_\_\_\_
- 1.9. Maximum torque speed : \_\_\_\_\_ 2,500 r.p.m. \_\_\_\_\_
- 1.10. Volumetric compression ratio <sup>(3)</sup> : \_\_\_\_\_ 8.5 \_\_\_\_\_
- 1.11. Combustion system description : \_\_\_\_\_ 4 stroke \_\_\_\_\_
- 1.12. Drawing(s) of combustion chamber and piston crown : \_\_\_\_\_ See Attached Sheet A-1,A-2 \_\_\_\_\_
- 1.13. Minimum cross sectional area of inlet and outlet ports : \_\_\_\_\_ See Attached Sheet B \_\_\_\_\_
- 1.14. Cooling system
- 1.14.1. *Liquid*
- 1.14.1.1. Nature of liquid : \_\_\_\_\_ NA \_\_\_\_\_
- 1.14.1.2. Circulating pump(s) : \_\_\_\_\_ NA \_\_\_\_\_
- 1.14.1.3. Characteristics or make(s) and type(s) ( if applicable ) : \_\_\_\_\_ NA \_\_\_\_\_
- 1.14.1.4. Drive ratio(s) ( if applicable ) : \_\_\_\_\_ NA \_\_\_\_\_
- 1.14.2. *Air*
- 1.14.2.1. Blower :
- 1.14.2.2. Characteristics or make(s) and type(s) ( if applicable ) : \_\_\_\_\_ Centrifugal Fan \_\_\_\_\_
- 1.14.2.3. Drive ratio(s) ( if applicable ) : \_\_\_\_\_ 1:1 (Direct) \_\_\_\_\_
- 1.15. Temperature permitted by the manufacturer
- 1.15.1. Liquid cooling : maximum temperature at outlet : \_\_\_\_\_ NA \_\_\_\_\_ K
- 1.15.2. Air cooling : reference point : \_\_\_\_\_ Spark Plug \_\_\_\_\_
- Maximum temperature at reference point : \_\_\_\_\_ 503 \_\_\_\_\_ K
- 1.15.3. Maximum charge air outlet temperature of the inlet intercooler ( if applicable ) \_\_\_\_\_ NA \_\_\_\_\_ K
- 1.15.4. Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s)  
of the exhaust manifold(s) : \_\_\_\_\_ Exhaust Gas Temperature \_\_\_\_\_ 1053 \_\_\_\_\_ K
- 1.15.5. Lubricant temperature : minimum \_\_\_\_\_ NA \_\_\_\_\_ K  
maximum \_\_\_\_\_ 393 \_\_\_\_\_ K
- 1.16. Pressure charger : No
- 1.16.1. Make : \_\_\_\_\_ NA \_\_\_\_\_

- 
- 1.16.2. Type : ----- NA -----
- 1.16.3. Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) NA -----
- 1.16.4. Intercooler : N.A.
- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -1.29 ----- kPa
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 6.04 ----- kPa
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA -----
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1. Make(s) : ----- NA -----
- 3.2.1.2. Type(s) : ----- NA -----
- 3.2.1.3. Delivery :  
Mention the method used : ----- NA -----
- 3.2.1.4. Injection advance ----- NA -----
- 3.2.1.4.1. Injection advance curve<sup>(2)</sup> : ----- NA -----
- 3.2.1.4.2. Timing<sup>(2)</sup> : ----- NA -----
- 3.2.2. *Injection piping*
- 3.2.2.1. Length : ----- NA ----- mm
- 3.2.2.2. Internal diameter : ----- NA ----- mm
- 3.2.3. *Injector(s)*
- 3.2.3.1. Make(s) : ----- NA -----
- 3.2.3.2. Type(s) : ----- NA -----
- 3.2.3.3. Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2.4. *Governor*
- 3.2.4.1. Make(s) : ----- NA -----
- 3.2.4.2. Type(s) : ----- NA -----
- 3.2.4.3. Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.4. Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.5. Idling speed<sup>(1)</sup> : ----- NA ----- rpm
- 3.3. Cold start system
- 3.3.1. Make(s) : ----- NA -----
- 3.3.2. Type(s) : ----- NA -----

3.3.3 Description : .....

4. FUEL FEED FOR PETROL ENGINES

4.1. Carburettor :

4.1.1. Make(s) : ..... MIKUNI CORPORATION .....

4.1.2. Type(s) : ..... 7CF0? .....

4.2. Port fuel injection : single-point or multi-point : ..... NA .....

4.2.1. Make(s) : ..... NA .....

4.2.2. Type(s) : ..... NA .....

4.3. Direct injection : ..... NA .....

4.3.1. Make(s) : ..... NA .....

4.3.2. Type(s) : ..... NA .....

4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : ..... 1130g/h A/F 13.07 .....

5. VALVE TIMING

5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

5.2. Reference and/or setting ranges<sup>(2)</sup> :

..... Ramp Height 0.45mm .....

5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : ..... NA .....

5.3.1. Type: continuous or on/off : ..... NA .....

5.3.2. Cam phase shift angle : ..... NA .....

6. PORTING CONFIGURATION

6.1. Position, size and number : ..... See Attached Sheet B .....

7. IGNITION SYSTEM

7.1. Ignition coil

7.1.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....

7.1.2. Type(s) : ..... T.C.I. ....

7.1.3. Number : ..... 7CF-0? .....

7.2. Spark plug(s) :

7.2.1. Make(s) : ..... NGK .....

7.2.2. Type(s) : ..... BPR-4ES .....

7.3. Magneto :

7.3.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....

7.3.2. Type(s) : Fly Wheel Magneto

7.4. Ignition timing :

7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°

7.4.2. Advance curve, if applicable : NA

## ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

1.1.	Manufacturer :	YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.		
1.2.	Manufacturer's engine code :	MZ175 (7VU)		
1.3.	Cycle :	four stroke/two stroke <sup>(2)</sup>		
1.4.	Bore :	66	mm	
1.5.	Stroke :	50	mm	
1.6.	Number and layout of cylinders :	1 cylinder	68° incline	
1.7.	Engine capacity :	171	cm <sup>3</sup>	
1.8.	Rated speed :	3550 r.p.m.		
1.9.	Maximum torque speed :	2500 r.p.m.		
1.10.	Volumetric compression ratio <sup>(3)</sup> :	8.5		
1.11.	Combustion system description :	4 stroke		
1.12.	Drawing(s) of combustion chamber and piston crown :	See Attached Sheet A-1,A-2		
1.13.	Minimum cross sectional area of inlet and outlet ports :	See Attached Sheet B		
1.14.	Cooling system			
1.14.1.	<i>Liquid</i>			
1.14.1.1.	Nature of liquid :	NA		
1.14.1.2.	Circulating pump(s) :	NA		
1.14.1.3.	Characteristics or make(s) and type(s) ( if applicable ) :	NA		
1.14.1.4.	Drive ratio(s) ( if applicable ) :	NA		
1.14.2.	<i>Air</i>			
1.14.2.1.	Blower :			
1.14.2.2.	Characteristics or make(s) and type(s) ( if applicable ) :	Centrifugal Fan		
1.14.2.3.	Drive ratio(s) ( if applicable ) :	1:1 (Direct)		
1.15.	Temperature permitted by the manufacturer			
1.15.1.	Liquid cooling : maximum temperature at outlet :	NA	K	
1.15.2.	Air cooling : reference point :	Spark Plug		
	Maximum temperature at reference point :	503	K	
1.15.3.	Maximum charge air outlet temperature of the inlet intercooler ( if applicable )	NA	K	
1.15.4.	Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s) :	Exhaust Gas Temperature	1053	K
1.15.5.	Lubricant temperature : minimum	NA	K	
	maximum	393	K	
1.16.	Pressure charger : No			
1.16.1.	Make :	NA		

- 
- 1.16.2. Type : ----- NA -----
- 1.16.3. Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) : NA -----
- 1.16.4. Intercooler : N.A.
- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -1.54 kPa -----
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 7.15 kPa -----
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA -----
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1. Make(s) : ----- NA -----
- 3.2.1.2. Type(s) : ----- NA -----
- 3.2.1.3. Delivery :  
Mention the method used : ----- NA -----
- 3.2.1.4. Injection advance ----- NA -----
- 3.2.1.4.1. Injection advance curve<sup>(2)</sup> : ----- NA -----
- 3.2.1.4.2. Timing<sup>(2)</sup> : ----- NA -----
- 3.2.2. *Injection piping*
- 3.2.2.1. Length : ----- NA ----- mm
- 3.2.2.2. Internal diameter : ----- NA ----- mm
- 3.2.3. *Injector(s)*
- 3.2.3.1. Make(s) : ----- NA -----
- 3.2.3.2. Type(s) : ----- NA -----
- 3.2.3.3. Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2.4. *Governor*
- 3.2.4.1. Make(s) : ----- NA -----
- 3.2.4.2. Type(s) : ----- NA -----
- 3.2.4.3. Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.4. Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.5. Idling speed<sup>(1)</sup> : ----- NA ----- rpm
- 3.3. Cold start system
- 3.3.1. Make(s) : ----- NA -----
- 3.3.2. Type(s) : ----- NA -----

3.3.3 Description : .....

4. FUEL FEED FOR PETROL ENGINES

4.1. Carburettor :

4.1.1. Make(s) : ..... MIKUNI CORPORATION .....

4.1.2. Type(s) : ..... 7VU1? .....

4.2. Port fuel injection : single-point or multi-point : ..... NA .....

4.2.1. Make(s) : ..... NA .....

4.2.2. Type(s) : ..... NA .....

4.3. Direct injection : ..... NA .....

4.3.1. Make(s) : ..... NA .....

4.3.2. Type(s) : ..... NA .....

4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : ..... 1260g/h A/F 12.46 .....

5. VALVE TIMING

5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

5.2. Reference and/or setting ranges<sup>(2)</sup> :

..... Ramp Height 0.45mm .....

5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : ..... NA .....

5.3.1. Type: continuous or on/off : ..... NA .....

5.3.2. Cam phase shift angle : ..... NA .....

6. PORTING CONFIGURATION

6.1. Position, size and number : ..... See Attached Sheet B .....

7. IGNITION SYSTEM

7.1. Ignition coil

7.1.1. Make(s) : ..... KOKUSAN DENKI CO.,LTD. ....

7.1.2. Type(s) : ..... AC – C.D.I. ....

7.1.3. Number : ..... 7VU-0? .....

7.2. Spark plug(s) :

7.2.1. Make(s) : ..... NGK .....

7.2.2. Type(s) : ..... BPR-4ES .....

7.3. Magneto :

7.3.1. Make(s) : ..... Yamaha Motor PoweredProducts Co.,Ltd. ....





7.3.2. Type(s) : ----- Generator Rotor -----

7.4. Ignition timing :

7.4.1. Static advance with respect to top dead centre [crank angle degrees] : ----- BTDC 23° -----

7.4.2. Advance curve, if applicable : ----- NA -----

### ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

1.1.	Manufacturer :	YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.		
1.2.	Manufacturer's engine code :	MZ175 (S.SEMIDRY)		
1.3.	Cycle :	four stroke/two stroke <sup>(2)</sup>		
1.4.	Bore :	66	mm	
1.5.	Stroke :	50	mm	
1.6.	Number and layout of cylinders :	1 cylinder	68° incline	
1.7.	Engine capacity :	171	cm <sup>3</sup>	
1.8.	Rated speed :	3600r.p.m.		
1.9.	Maximum torque speed :	2400r.p.m.		
1.10.	Volumetric compression ratio <sup>(3)</sup> :	8.5		
1.11.	Combustion system description :	4 stroke		
1.12.	Drawing(s) of combustion chamber and piston crown :	See Attached Sheet A-1,A-2		
1.13.	Minimum cross sectional area of inlet and outlet ports :	See Attached Sheet B		
1.14.	Cooling system			
1.14.1.	<i>Liquid</i>			
1.14.1.1.	Nature of liquid :	NA		
1.14.1.2.	Circulating pump(s) :	NA		
1.14.1.3.	Characteristics or make(s) and type(s) ( if applicable ) :	NA		
1.14.1.4.	Drive ratio(s) ( if applicable ) :	NA		
1.14.2.	<i>Air</i>			
1.14.2.1.	Blower :			
1.14.2.2.	Characteristics or make(s) and type(s) ( if applicable ) :	Centrifugal Fan		
1.14.2.3.	Drive ratio(s) ( if applicable ) :	1:1 (Direct)		
1.15.	Temperature permitted by the manufacturer			
1.15.1.	Liquid cooling : maximum temperature at outlet :	NA	K	
1.15.2.	Air cooling : reference point :	Spark Plug		
	Maximum temperature at reference point :	503	K	
1.15.3.	Maximum charge air outlet temperature of the inlet intercooler ( if applicable )	NA	K	
1.15.4.	Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s) :	Exhaust Gas Temperature	1053	K
1.15.5.	Lubricant temperature : minimum	NA	K	
	maximum	393	K	
1.16.	Pressure charger : No			
1.16.1.	Make :	NA		

- 
- 1.16.2. Type : ----- NA -----
- 1.16.3. Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) : NA -----
- 1.16.4. Intercooler : N.A.
- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -1.77 ----- kPa
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 8.5 ----- kPa
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA -----
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1. Make(s) : ----- NA -----
- 3.2.1.2. Type(s) : ----- NA -----
- 3.2.1.3. Delivery :  
Mention the method used : ----- NA -----
- 3.2.1.4. Injection advance ----- NA -----
- 3.2.1.4.1. Injection advance curve<sup>(2)</sup> : ----- NA -----
- 3.2.1.4.2. Timing<sup>(2)</sup> : ----- NA -----
- 3.2.2. *Injection piping*
- 3.2.2.1. Length : ----- NA ----- mm
- 3.2.2.2. Internal diameter : ----- NA ----- mm
- 3.2.3. *Injector(s)*
- 3.2.3.1. Make(s) : ----- NA -----
- 3.2.3.2. Type(s) : ----- NA -----
- 3.2.3.3. Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2.4. *Governor*
- 3.2.4.1. Make(s) : ----- NA -----
- 3.2.4.2. Type(s) : ----- NA -----
- 3.2.4.3. Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.4. Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.5. Idling speed<sup>(1)</sup> : ----- NA ----- rpm
- 3.3. Cold start system
- 3.3.1. Make(s) : ----- NA -----
- 3.3.2. Type(s) : ----- NA -----

3.3.3 Description : .....

4. FUEL FEED FOR PETROL ENGINES

4.1. Carburettor :

4.1.1. Make(s) : ..... MIKUNI CORPORATION .....

4.1.2. Type(s) : ..... 7CN1? .....

4.2. Port fuel injection : single-point or multi-point : ..... NA .....

4.2.1. Make(s) : ..... NA .....

4.2.2. Type(s) : ..... NA .....

4.3. Direct injection : ..... NA .....

4.3.1. Make(s) : ..... NA .....

4.3.2. Type(s) : ..... NA .....

4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : ..... 1280g/h A/F 12.41 .....

5. VALVE TIMING

5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

5.2. Reference and/or setting ranges<sup>(2)</sup> :

..... Ramp Height 0.45mm .....

5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : ..... NA .....

5.3.1. Type: continuous or on/off : ..... NA .....

5.3.2. Cam phase shift angle : ..... NA .....

6. PORTING CONFIGURATION

6.1. Position, size and number : ..... See Attached Sheet B .....

7. IGNITION SYSTEM

7.1. Ignition coil

7.1.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....

7.1.2. Type(s) : ..... T.C.I. ....

7.1.3. Number : ..... 7CN-0? .....

7.2. Spark plug(s) :

7.2.1. Make(s) : ..... NGK .....

7.2.2. Type(s) : ..... BPR-4ES .....

7.3. Magneto :

7.3.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....



7.3.2. Type(s) : Fly Wheel Magneto

7.4. Ignition timing :

7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°

7.4.2. Advance curve, if applicable : NA

## Appendix 3.6

### ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

#### 1. DESCRIPTION OF ENGINE

- 1.1. Manufacturer : YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.
- 1.2. Manufacturer's engine code : MZ175 (TYPE:A)
- 1.3. Cycle : four stroke/two stroke<sup>(2)</sup>
- 1.4. Bore : 66 mm
- 1.5. Stroke : 50 mm
- 1.6. Number and layout of cylinders : 1 cylinder 68° incline
- 1.7. Engine capacity : 171 cm<sup>3</sup>
- 1.8. Rated speed : 3000r.p.m.
- 1.9. Maximum torque speed : 2000r.p.m.
- 1.10. Volumetric compression ratio <sup>(3)</sup> : 8.5
- 1.11. Combustion system description : 4 stroke
- 1.12. Drawing(s) of combustion chamber and piston crown : See Attached Sheet A-1,A-2
- 1.13. Minimum cross sectional area of inlet and outlet ports : See Attached Sheet B
- 1.14. Cooling system
- 1.14.1. *Liquid*
- 1.14.1.1. Nature of liquid : NA
- 1.14.1.2. Circulating pump(s) : NA
- 1.14.1.3. Characteristics or make(s) and type(s) ( if applicable ) : NA
- 1.14.1.4. Drive ratio(s) ( if applicable ) : NA
- 1.14.2. *Air*
- 1.14.2.1. Blower :
- 1.14.2.2. Characteristics or make(s) and type(s) ( if applicable ) : Centrifugal Fan
- 1.14.2.3. Drive ratio(s) ( if applicable ) : 1:1 (Direct)
- 1.15. Temperature permitted by the manufacturer
- 1.15.1. Liquid cooling : maximum temperature at outlet : NA K
- 1.15.2. Air cooling : reference point : Spark Plug
- Maximum temperature at reference point : 503 K
- 1.15.3. Maximum charge air outlet temperature of the inlet intercooler ( if applicable ) : NA K
- 1.15.4. Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s) : Exhaust Gas Temperature 1053 K
- 1.15.5. Lubricant temperature : minimum NA K
- maximum 393 K
- 1.16. Pressure charger : No
- 1.16.1. Make : NA

- 
- 1.16.2. Type : ----- NA -----
- 1.16.3. Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) : NA -----
- 1.16.4. Intercooler : N.A.
- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -1.47 ----- kPa
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 9.2 ----- kPa
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA -----
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1. Make(s) : ----- NA -----
- 3.2.1.2. Type(s) : ----- NA -----
- 3.2.1.3. Delivery :  
Mention the method used : ----- NA -----
- 3.2.1.4. Injection advance ----- NA -----
- 3.2.1.4.1. Injection advance curve<sup>(2)</sup> : ----- NA -----
- 3.2.1.4.2. Timing<sup>(2)</sup> : ----- NA -----
- 3.2.2. *Injection piping*
- 3.2.2.1. Length : ----- NA ----- mm
- 3.2.2.2. Internal diameter : ----- NA ----- mm
- 3.2.3. *Injector(s)*
- 3.2.3.1. Make(s) : ----- NA -----
- 3.2.3.2. Type(s) : ----- NA -----
- 3.2.3.3. Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2.4. *Governor*
- 3.2.4.1. Make(s) : ----- NA -----
- 3.2.4.2. Type(s) : ----- NA -----
- 3.2.4.3. Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.4. Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.5. Idling speed<sup>(1)</sup> : ----- NA ----- rpm
- 3.3. Cold start system
- 3.3.1. Make(s) : ----- NA -----
- 3.3.2. Type(s) : ----- NA -----

3.3.3 Description : .....

4. FUEL FEED FOR PETROL ENGINES

4.1. Carburettor :

4.1.1. Make(s) : ..... MIKUNI CORPORATION .....

4.1.2. Type(s) : ..... 7CNA? .....

4.2. Port fuel injection : single-point or multi-point : ..... NA .....

4.2.1. Make(s) : ..... NA .....

4.2.2. Type(s) : ..... NA .....

4.3. Direct injection : ..... NA .....

4.3.1. Make(s) : ..... NA .....

4.3.2. Type(s) : ..... NA .....

4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : ..... 1100g/h A/F 12.43 .....

5. VALVE TIMING

5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

5.2. Reference and/or setting ranges<sup>(2)</sup> :

..... Ramp Height 0.45mm .....

5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : ..... NA .....

5.3.1. Type: continuous or on/off : ..... NA .....

5.3.2. Cam phase shift angle : ..... NA .....

6. PORTING CONFIGURATION

6.1. Position, size and number : ..... See Attached Sheet B .....

7. IGNITION SYSTEM

7.1. Ignition coil

7.1.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....

7.1.2. Type(s) : ..... T.C.I. ....

7.1.3. Number : ..... 7CN-0? .....

7.2. Spark plug(s) :

7.2.1. Make(s) : ..... NGK .....

7.2.2. Type(s) : ..... BPR-4ES .....

7.3. Magneto :

7.3.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....





7.3.2. Type(s) : Fly Wheel Magneto

7.4. Ignition timing :

7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°

7.4.2. Advance curve, if applicable : NA

## ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

1.1.	Manufacturer :	YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.		
1.2.	Manufacturer's engine code :	MZ175 (7CH : EF3000iSE)		
1.3.	Cycle :	four stroke/two stroke <sup>(2)</sup>		
1.4.	Bore :	66	mm	
1.5.	Stroke :	50	mm	
1.6.	Number and layout of cylinders :	1 cylinder	68° incline	
1.7.	Engine capacity :	171	cm <sup>3</sup>	
1.8.	Rated speed :	3800r.p.m.		
1.9.	Maximum torque speed :	2500r.p.m.		
1.10.	Volumetric compression ratio <sup>(3)</sup> :	8.5		
1.11.	Combustion system description :	4 stroke		
1.12.	Drawing(s) of combustion chamber and piston crown :	See Attached Sheet A-1,A-2		
1.13.	Minimum cross sectional area of inlet and outlet ports :	See Attached Sheet B		
1.14.	Cooling system			
1.14.1.	<i>Liquid</i>			
1.14.1.1.	Nature of liquid :	NA		
1.14.1.2.	Circulating pump(s) :	NA		
1.14.1.3.	Characteristics or make(s) and type(s) ( if applicable ) :	NA		
1.14.1.4.	Drive ratio(s) ( if applicable ) :	NA		
1.14.2.	<i>Air</i>			
1.14.2.1.	Blower :			
1.14.2.2.	Characteristics or make(s) and type(s) ( if applicable ) :	Centrifugal Fan		
1.14.2.3.	Drive ratio(s) ( if applicable ) :	1:1 (Direct)		
1.15.	Temperature permitted by the manufacturer			
1.15.1.	Liquid cooling : maximum temperature at outlet :	NA	K	
1.15.2.	Air cooling : reference point :	Spark Plug		
	Maximum temperature at reference point :	503	K	
1.15.3.	Maximum charge air outlet temperature of the inlet intercooler ( if applicable )	NA	K	
1.15.4.	Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s) :	Exhaust Gas Temperature	1053	K
1.15.5.	Lubricant temperature :	minimum	NA	K
		maximum	393	K
1.16.	Pressure charger :	No		
1.16.1.	Make :	NA		

-----

1.16.2. Type : ----- NA -----

1.16.3. Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) : NA -----

1.16.4. Intercooler : N.A.

1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -1.72 ----- kPa

1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 7.6 ----- kPa

2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA -----

3. FUEL FEED FOR DIESEL ENGINES

3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa

3.2. Injection system

3.2.1. *Pump*

3.2.1.1. Make(s) : ----- NA -----

3.2.1.2. Type(s) : ----- NA -----

3.2.1.3. Delivery :  
Mention the method used : ----- NA -----

3.2.1.4. Injection advance ----- NA -----

3.2.1.4.1. Injection advance curve<sup>(2)</sup> : ----- NA -----

3.2.1.4.2. Timing<sup>(2)</sup> : ----- NA -----

3.2.2. *Injection piping*

3.2.2.1. Length : ----- NA ----- mm

3.2.2.2. Internal diameter : ----- NA ----- mm

3.2.3. *Injector(s)*

3.2.3.1. Make(s) : ----- NA -----

3.2.3.2. Type(s) : ----- NA -----

3.2.3.3. Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa

3.2.4. *Governor*

3.2.4.1. Make(s) : ----- NA -----

3.2.4.2. Type(s) : ----- NA -----

3.2.4.3. Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm

3.2.4.4. Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm

3.2.4.5. Idling speed<sup>(1)</sup> : ----- NA ----- rpm

3.3. Cold start system

3.3.1. Make(s) : ----- NA -----

3.3.2. Type(s) : ----- NA -----

3.3.3 Description : .....

4. FUEL FEED FOR PETROL ENGINES

4.1. Carburettor :

4.1.1. Make(s) : ..... MIKUNI CORPORATION .....

4.1.2. Type(s) : ..... 7CP0? .....

4.2. Port fuel injection : single-point or multi-point : ..... NA .....

4.2.1. Make(s) : ..... NA .....

4.2.2. Type(s) : ..... NA .....

4.3. Direct injection : ..... NA .....

4.3.1. Make(s) : ..... NA .....

4.3.2. Type(s) : ..... NA .....

4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : ..... 1,360g/h A/F: 12.45 .....

5. VALVE TIMING

5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

5.2. Reference and/or setting ranges<sup>(2)</sup> :

..... Ramp Height 0.45mm .....

5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : ..... NA .....

5.3.1. Type: continuous or on/off : ..... NA .....

5.3.2. Cam phase shift angle : ..... NA .....

6. PORTING CONFIGURATION

6.1. Position, size and number : ..... See Attached Sheet B .....

7. IGNITION SYSTEM

7.1. Ignition coil

7.1.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....

7.1.2. Type(s) : ..... T.C.I. ....

7.1.3. Number : ..... 7CF-00 .....

7.2. Spark plug(s) :

7.2.1. Make(s) : ..... NGK .....

7.2.2. Type(s) : ..... BPR-4ES .....

7.3. Magneto :

7.3.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....



7.3.2. Type(s) : Fly Wheel Magneto

7.4. Ignition timing :

7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°

7.4.2. Advance curve, if applicable : NA

## ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

1.1.	Manufacturer :	YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.		
1.2.	Manufacturer's engine code :	MZ175 (7CPV)		
1.3.	Cycle :	four stroke/two stroke <sup>(2)</sup>		
1.4.	Bore :	66	mm	
1.5.	Stroke :	50	mm	
1.6.	Number and layout of cylinders :	1 cylinder	68° incline	
1.7.	Engine capacity :	171	cm <sup>3</sup>	
1.8.	Rated speed :	3600r.p.m.		
1.9.	Maximum torque speed :	2400r.p.m.		
1.10.	Volumetric compression ratio <sup>(3)</sup> :	8.5		
1.11.	Combustion system description :	4 stroke		
1.12.	Drawing(s) of combustion chamber and piston crown :	See Attached Sheet A-1,A-2		
1.13.	Minimum cross sectional area of inlet and outlet ports :	See Attached Sheet B		
1.14.	Cooling system			
1.14.1.	<i>Liquid</i>			
1.14.1.1.	Nature of liquid :	NA		
1.14.1.2.	Circulating pump(s) :	NA		
1.14.1.3.	Characteristics or make(s) and type(s) ( if applicable ) :	NA		
1.14.1.4.	Drive ratio(s) ( if applicable ) :	NA		
1.14.2.	<i>Air</i>			
1.14.2.1.	Blower :			
1.14.2.2.	Characteristics or make(s) and type(s) ( if applicable ) :	Centrifugal Fan		
1.14.2.3.	Drive ratio(s) ( if applicable ) :	1:1 (Direct)		
1.15.	Temperature permitted by the manufacturer			
1.15.1.	Liquid cooling : maximum temperature at outlet :	NA	K	
1.15.2.	Air cooling : reference point :	Spark Plug		
	Maximum temperature at reference point :	503	K	
1.15.3.	Maximum charge air outlet temperature of the inlet intercooler ( if applicable )	NA	K	
1.15.4.	Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s) :	Exhaust Gas Temperature	1053	K
1.15.5.	Lubricant temperature : minimum	NA	K	
	maximum	393	K	
1.16.	Pressure charger : No			
1.16.1.	Make :	NA		

- 1.16.2. Type : ----- NA -----
- 1.16.3. Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) : NA -----
- 1.16.4. Intercooler : N.A.
- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -3.74 ----- kPa
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 4.94 ----- kPa
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA -----
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1. Make(s) : ----- NA -----
- 3.2.1.2. Type(s) : ----- NA -----
- 3.2.1.3. Delivery :  
Mention the method used : ----- NA -----
- 3.2.1.4. Injection advance ----- NA -----
- 3.2.1.4.1. Injection advance curve<sup>(2)</sup> : ----- NA -----
- 3.2.1.4.2. Timing<sup>(2)</sup> : ----- NA -----
- 3.2.2. *Injection piping*
- 3.2.2.1. Length : ----- NA ----- mm
- 3.2.2.2. Internal diameter : ----- NA ----- mm
- 3.2.3. *Injector(s)*
- 3.2.3.1. Make(s) : ----- NA -----
- 3.2.3.2. Type(s) : ----- NA -----
- 3.2.3.3. Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2.4. *Governor*
- 3.2.4.1. Make(s) : ----- NA -----
- 3.2.4.2. Type(s) : ----- NA -----
- 3.2.4.3. Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.4. Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.5. Idling speed<sup>(1)</sup> : ----- NA ----- rpm
- 3.3. Cold start system
- 3.3.1. Make(s) : ----- NA -----
- 3.3.2. Type(s) : ----- NA -----

3.3.3 Description : .....

4. FUEL FEED FOR PETROL ENGINES

4.1. Carburettor :

4.1.1. Make(s) : ..... MIKUNI CORPORATION .....

4.1.2. Type(s) : ..... 7CP1? .....

4.2. Port fuel injection : single-point or multi-point : ..... NA .....

4.2.1. Make(s) : ..... NA .....

4.2.2. Type(s) : ..... NA .....

4.3. Direct injection : ..... NA .....

4.3.1. Make(s) : ..... NA .....

4.3.2. Type(s) : ..... NA .....

4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : ..... 1,158g/h A/F: 12.03 .....

5. VALVE TIMING

5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

5.2. Reference and/or setting ranges<sup>(2)</sup> :

..... Ramp Height 0.45mm .....

5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : ..... NA .....

5.3.1. Type: continuous or on/off : ..... NA .....

5.3.2. Cam phase shift angle : ..... NA .....

6. PORTING CONFIGURATION

6.1. Position, size and number : ..... See Attached Sheet B .....

7. IGNITION SYSTEM

7.1. Ignition coil

7.1.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....

7.1.2. Type(s) : ..... T.C.I. ....

7.1.3. Number : ..... 7CF-00 .....

7.2. Spark plug(s) :

7.2.1. Make(s) : ..... NGK .....

7.2.2. Type(s) : ..... BPR-4ES .....

7.3. Magneto :

7.3.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....





7.3.2. Type(s) : Fly Wheel Magneto

7.4. Ignition timing :

7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°

7.4.2. Advance curve, if applicable : NA

### Appendix 3.9

#### ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

##### 1. DESCRIPTION OF ENGINE

- 1.1. Manufacturer : YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.
- 1.2. Manufacturer's engine code : MZ175 (7CNV)
- 1.3. Cycle : four stroke/two stroke<sup>(2)</sup>
- 1.4. Bore : 66 mm
- 1.5. Stroke : 50 mm
- 1.6. Number and layout of cylinders : 1 cylinder 68° incline
- 1.7. Engine capacity : 171 cm<sup>3</sup>
- 1.8. Rated speed : 3600r.p.m.
- 1.9. Maximum torque speed : 2400r.p.m.
- 1.10. Volumetric compression ratio <sup>(3)</sup> : 8.5
- 1.11. Combustion system description : 4 stroke
- 1.12. Drawing(s) of combustion chamber and piston crown : See Attached Sheet A-1,A-2
- 1.13. Minimum cross sectional area of inlet and outlet ports : See Attached Sheet B
- 1.14. Cooling system
- 1.14.1. *Liquid*
- 1.14.1.1. Nature of liquid : NA
- 1.14.1.2. Circulating pump(s) : NA
- 1.14.1.3. Characteristics or make(s) and type(s) ( if applicable ) : NA
- 1.14.1.4. Drive ratio(s) ( if applicable ) : NA
- 1.14.2. *Air*
- 1.14.2.1. Blower :
- 1.14.2.2. Characteristics or make(s) and type(s) ( if applicable ) : Centrifugal Fan
- 1.14.2.3. Drive ratio(s) ( if applicable ) : 1:1 (Direct)
- 1.15. Temperature permitted by the manufacturer
- 1.15.1. Liquid cooling : maximum temperature at outlet : NA K
- 1.15.2. Air cooling : reference point : Spark Plug
- Maximum temperature at reference point : 503 K
- 1.15.3. Maximum charge air outlet temperature of the inlet intercooler ( if applicable ) : NA K
- 1.15.4. Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s)  
of the exhaust manifold(s) : Exhaust Gas Temperature 1053 K
- 1.15.5. Lubricant temperature : minimum NA K  
maximum 393 K
- 1.16. Pressure charger : No
- 1.16.1. Make : NA



- 
- 1.16.2. Type : ----- NA -----
- 1.16.3. Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) : NA -----
- 1.16.4. Intercooler : N.A.
- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -3.74 ----- kPa
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 4.94 ----- kPa
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA -----
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1. Make(s) : ----- NA -----
- 3.2.1.2. Type(s) : ----- NA -----
- 3.2.1.3. Delivery :  
Mention the method used : ----- NA -----
- 3.2.1.4. Injection advance ----- NA -----
- 3.2.1.4.1. Injection advance curve<sup>(2)</sup> : ----- NA -----
- 3.2.1.4.2. Timing<sup>(2)</sup> : ----- NA -----
- 3.2.2. *Injection piping*
- 3.2.2.1. Length : ----- NA ----- mm
- 3.2.2.2. Internal diameter : ----- NA ----- mm
- 3.2.3. *Injector(s)*
- 3.2.3.1. Make(s) : ----- NA -----
- 3.2.3.2. Type(s) : ----- NA -----
- 3.2.3.3. Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2.4. *Governor*
- 3.2.4.1. Make(s) : ----- NA -----
- 3.2.4.2. Type(s) : ----- NA -----
- 3.2.4.3. Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.4. Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.5. Idling speed<sup>(1)</sup> : ----- NA ----- rpm
- 3.3. Cold start system
- 3.3.1. Make(s) : ----- NA -----
- 3.3.2. Type(s) : ----- NA -----

3.3.3 Description : .....

4. FUEL FEED FOR PETROL ENGINES

4.1. Carburettor :

4.1.1. Make(s) : ..... MIKUNI CORPORATION .....

4.1.2. Type(s) : ..... 7CF1? .....

4.2. Port fuel injection : single-point or multi-point : ..... NA .....

4.2.1. Make(s) : ..... NA .....

4.2.2. Type(s) : ..... NA .....

4.3. Direct injection : ..... NA .....

4.3.1. Make(s) : ..... NA .....

4.3.2. Type(s) : ..... NA .....

4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : ..... 1,206g/h A/F: 11.84 .....

5. VALVE TIMING

5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

5.2. Reference and/or setting ranges<sup>(2)</sup> :

..... Ramp Height 0.45mm .....

5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : ..... NA .....

5.3.1. Type: continuous or on/off : ..... NA .....

5.3.2. Cam phase shift angle : ..... NA .....

6. PORTING CONFIGURATION

6.1. Position, size and number : ..... See Attached Sheet B .....

7. IGNITION SYSTEM

7.1. Ignition coil

7.1.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....

7.1.2. Type(s) : ..... T.C.I. ....

7.1.3. Number : ..... 7CF-00 .....

7.2. Spark plug(s) :

7.2.1. Make(s) : ..... NGK .....

7.2.2. Type(s) : ..... BPR-4ES .....

7.3. Magneto :

7.3.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....

7.3.2. Type(s) : Fly Wheel Magneto

7.4. Ignition timing :

7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°

7.4.2. Advance curve, if applicable : NA

## ESSENTIAL CHARACTERISTICS OF ENGINE TYPE WITHIN THE FAMILY <sup>(1)</sup>

1.1.	Manufacturer :	YAMAHA MOTOR POWERED PRODUCTS CO.,LTD.		
1.2.	Manufacturer's engine code :	MX175		
1.3.	Cycle : four stroke/two stroke <sup>(2)</sup>			
1.4.	Bore :	66	mm	
1.5.	Stroke :	50	mm	
1.6.	Number and layout of cylinders :	1 cylinder	68° incline	
1.7.	Engine capacity :	171	cm <sup>3</sup>	
1.8.	Rated speed :	3600r.p.m.		
1.9.	Maximum torque speed :	2400r.p.m.		
1.10.	Volumetric compression ratio <sup>(3)</sup> :	8.5		
1.11.	Combustion system description :	4 stroke		
1.12.	Drawing(s) of combustion chamber and piston crown :	See Attached Sheet A-1,A-2		
1.13.	Minimum cross sectional area of inlet and outlet ports :	See Attached Sheet B		
1.14.	Cooling system			
1.14.1.	<i>Liquid</i>			
1.14.1.1.	Nature of liquid :	NA		
1.14.1.2.	Circulating pump(s) :	NA		
1.14.1.3.	Characteristics or make(s) and type(s) ( if applicable ) :	NA		
1.14.1.4.	Drive ratio(s) ( if applicable ) :	NA		
1.14.2.	<i>Air</i>			
1.14.2.1.	Blower :			
1.14.2.2.	Characteristics or make(s) and type(s) ( if applicable ) :	Centrifugal Fan		
1.14.2.3.	Drive ratio(s) ( if applicable ) :	1:1 (Direct)		
1.15.	Temperature permitted by the manufacturer			
1.15.1.	Liquid cooling : maximum temperature at outlet :	NA	K	
1.15.2.	Air cooling : reference point :	Spark Plug		
	Maximum temperature at reference point :	503	K	
1.15.3.	Maximum charge air outlet temperature of the inlet intercooler ( if applicable )	NA	K	
1.15.4.	Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold(s) :	Exhaust Gas Temperature	1053	K
1.15.5.	Lubricant temperature : minimum	NA	K	
	maximum	393	K	
1.16.	Pressure charger : No			
1.16.1.	Make :	NA		

- 1.16.2. Type : ----- NA -----
- 1.16.3. Description of the system ( e.g. max charge pressure, waste-gate, if applicable ) : NA -----
- 1.16.4. Intercooler : N.A.
- 1.17. Intake system : Maximum allowable intake depression at rated engine speed and at 100% load :  
----- -2.75 ----- kPa
- 1.18. Exhaust system : Maximum allowable exhaust back pressure at rated engine speed and at 100% load :  
----- 6.46 ----- kPa
2. ADDITIONAL ANTI-POLLUTION DEVICES ( if any, and of not covered by another heading )  
- Description and/or diagram(s) : ----- NA -----
3. FUEL FEED FOR DIESEL ENGINES
- 3.1. Feed pump  
Pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2. Injection system
- 3.2.1. *Pump*
- 3.2.1.1. Make(s) : ----- NA -----
- 3.2.1.2. Type(s) : ----- NA -----
- 3.2.1.3. Delivery :  
Mention the method used : ----- NA -----
- 3.2.1.4. Injection advance ----- NA -----
- 3.2.1.4.1. Injection advance curve<sup>(2)</sup> : ----- NA -----
- 3.2.1.4.2. Timing<sup>(2)</sup> : ----- NA -----
- 3.2.2. *Injection piping*
- 3.2.2.1. Length : ----- NA ----- mm
- 3.2.2.2. Internal diameter : ----- NA ----- mm
- 3.2.3. *Injector(s)*
- 3.2.3.1. Make(s) : ----- NA -----
- 3.2.3.2. Type(s) : ----- NA -----
- 3.2.3.3. Opening pressure<sup>(2)</sup> or characteristic diagram : ----- NA ----- kPa
- 3.2.4. *Governor*
- 3.2.4.1. Make(s) : ----- NA -----
- 3.2.4.2. Type(s) : ----- NA -----
- 3.2.4.3. Speed at which cut-off starts under full load<sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.4. Maximum no-load speed <sup>(1)</sup> : ----- NA ----- rpm
- 3.2.4.5. Idling speed<sup>(1)</sup> : ----- NA ----- rpm
- 3.3. Cold start system
- 3.3.1. Make(s) : ----- NA -----
- 3.3.2. Type(s) : ----- NA -----

3.3.3 Description : .....

4. FUEL FEED FOR PETROL ENGINES

4.1. Carburettor :

4.1.1. Make(s) : ..... RUIXING CARBURETOR MANUFACTURING CO.,LTD.ZHEJIANG .....

4.1.2. Type(s) : ..... 7C80? .....

4.2. Port fuel injection : single-point or multi-point : ..... NA .....

4.2.1. Make(s) : ..... NA .....

4.2.2. Type(s) : ..... NA .....

4.3. Direct injection : ..... NA .....

4.3.1. Make(s) : ..... NA .....

4.3.2. Type(s) : ..... NA .....

4.4. Fuel flow [g/h] and air/fuel ratio at rated speed and wide open throttle : ..... 1,204g/h A/F: 12.13 .....

5. VALVE TIMING

5.1. Maximum lift and angles of opening and closing in relation to dead centers or equivalent

data :

	Max. Lift	Event Angle	Opening Angel	Closeing Angle
INTAKE	5.8 mm	ATDC 107°	BTDC 13°	ATDC 227°
EXHAUST	5.5 mm	ATDC 110°	BTDC 234°	ATDC 14°

5.2. Reference and/or setting ranges<sup>(2)</sup> :

..... Ramp Height 0.45mm .....

5.3. Variable valve timing system (if applicable and where intake and/or exhaust) : ..... NA .....

5.3.1. Type: continuous or on/off : ..... NA .....

5.3.2. Cam phase shift angle : ..... NA .....

6. PORTING CONFIGURATION

6.1. Position, size and number : ..... See Attached Sheet B .....

7. IGNITION SYSTEM

7.1. Ignition coil

7.1.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....

7.1.2. Type(s) : ..... T.C.I. ....

7.1.3. Number : ..... 7DB-00 .....

7.2. Spark plug(s) :

7.2.1. Make(s) : ..... NGK .....

7.2.2. Type(s) : ..... BPR-4ES .....

7.3. Magneto :

7.3.1. Make(s) : ..... Yuxin Electronic CO.,Ltd. ....



7.3.2. Type(s) : Fly Wheel Magneto

7.4. Ignition timing :

7.4.1. Static advance with respect to top dead centre [crank angle degrees] : BTDC 23°

7.4.2. Advance curve, if applicable : NA

Chart 2.1 Specification of engines within this family

									Parent engine <sup>(1)</sup>
Engine type	MZ175 (EF2300)	MZ175 (YP30G)	MZ175 (EF2400iS)	MZ175 (7VU)	MZ175 (S.SEMIDRY)	MZ175 (TYPE A)	MZ175 ( 7CH : EF3000iSE )	MZ175 (7CPV)	MZ175 (EF2800i)
No of cylinders	1	1	1	1	1	1	1	1	1
Rated speed (rpm)	3,000	3,600	3200	3550	3600	3000	3800	3600	3,600
Fuel delivery per stroke (mm <sup>3</sup> ) for diesel engines, fuel flow (g/h) for petrol engines	1040g/h	1370g/h	1130g/h	1260g/h	1280g/h	1100g/h	1360g/h	1158g/h	1400g/h
Rated net power (kW)	2.7	3.3	2.5	3.3	3.8	2.8	3.5	3.2	3.8
Maximum torque speed (rpm)	2,500	2,500	2500	2500	2400	2000	2500	2400	2,400
Fuel delivery per stroke (mm <sup>3</sup> ) for diesel engines, fuel flow (g/h) for petrol engines	840g/h	840g/h	877g/h	920g/h	870g/h	700g/h	930	887	950g/h
Maximum torque (Nm)	10.8	10.8	10.8	10.8	10.7	10.3	10.8	11.3	10.7
Low idle speed (rpm)	–	2,000	2600	2800	2000	2000	2800	2000	2,000
Cylinder displacement (in % of parent engine)	100	100	100	100	100	100	100	100	100

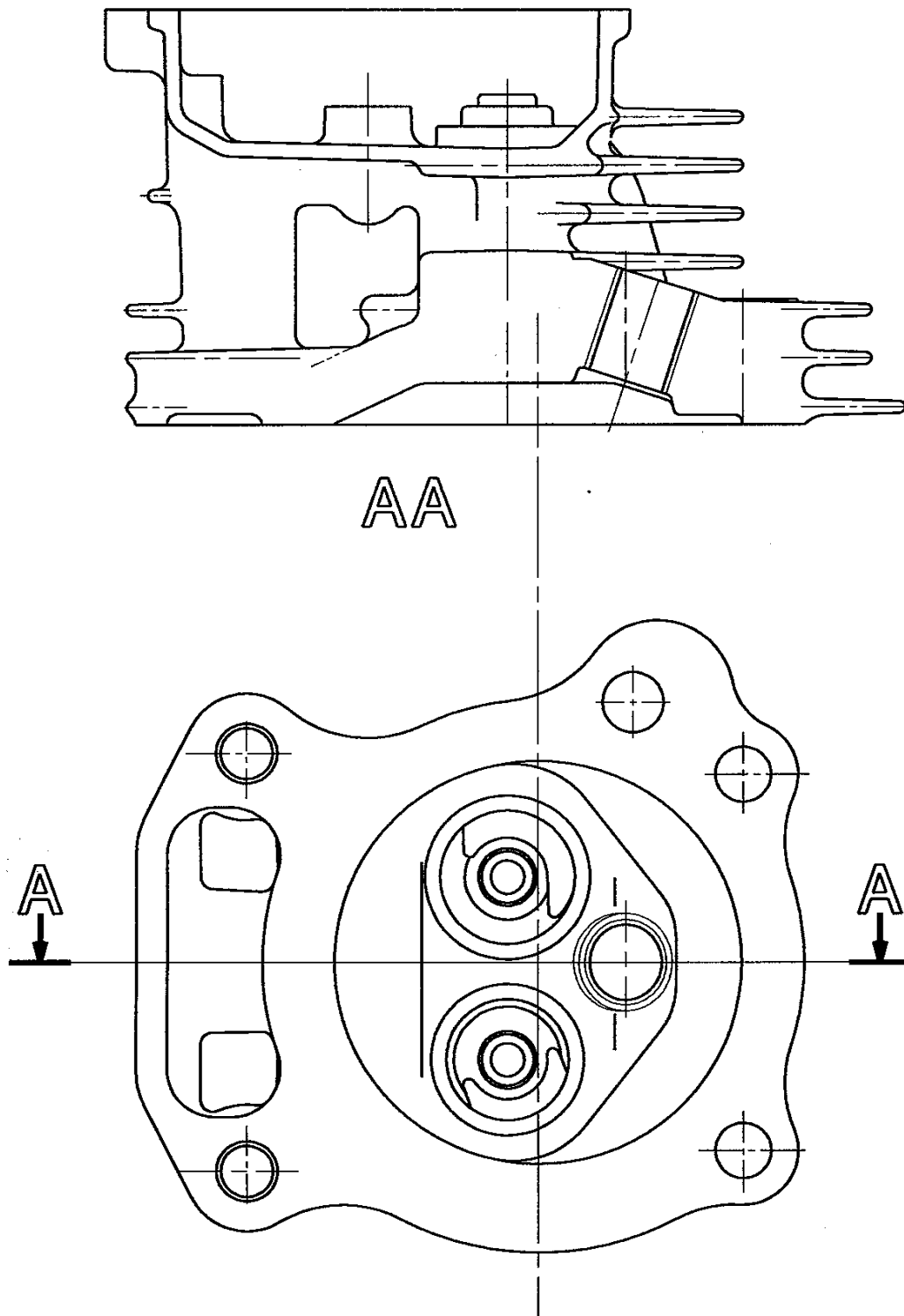
<sup>(1)</sup> For full details see Appendix 1.

Chart 2.1 Specification of engines within this family

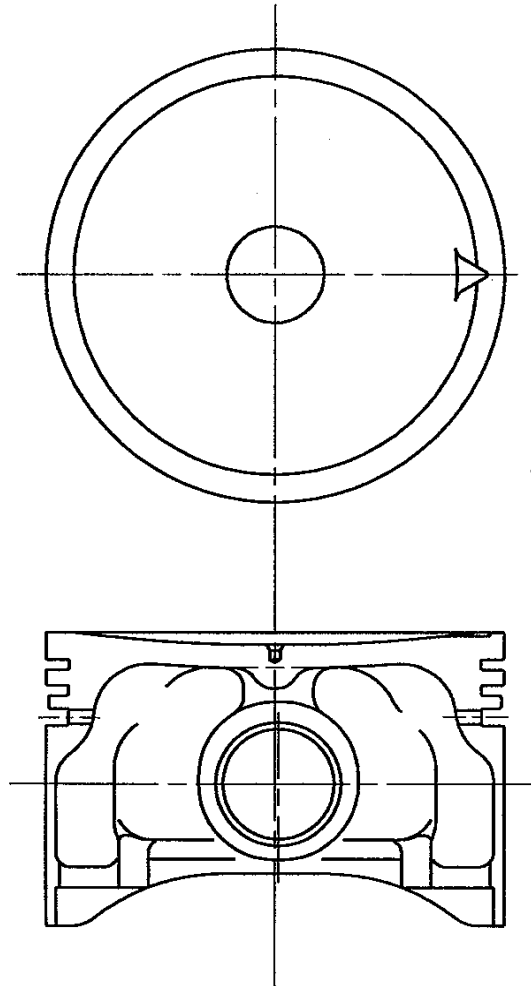
									Parent engine <sup>(1)</sup>
Engine type	MZ175 (7CNV)	MX175							MZ175 (EF2800i)
No of cylinders	1	1							1
Rated speed (rpm)	3,600	3,600							3,600
Fuel delivery per stroke (mm <sup>3</sup> ) for diesel engines, fuel flow (g/h) for petrol engines	1206g/h	1204g/h							1400g/h
Rated net power (kW)	3.2	3							3.8
Maximum torque speed (rpm)	2,400	2,400							2,400
Fuel delivery per stroke (mm <sup>3</sup> ) for diesel engines, fuel flow (g/h) for petrol engines	880g/h	932g/h							950g/h
Maximum torque (Nm)	10.8	11.0							10.7
Low idle speed (rpm)	–	–							2,000
Cylinder displacement (in % of parent engine)	100	100							100

<sup>(1)</sup> For full details see Appendix 1.

**A-1 :** Drawing of combustion chamber (scale 1:1 )

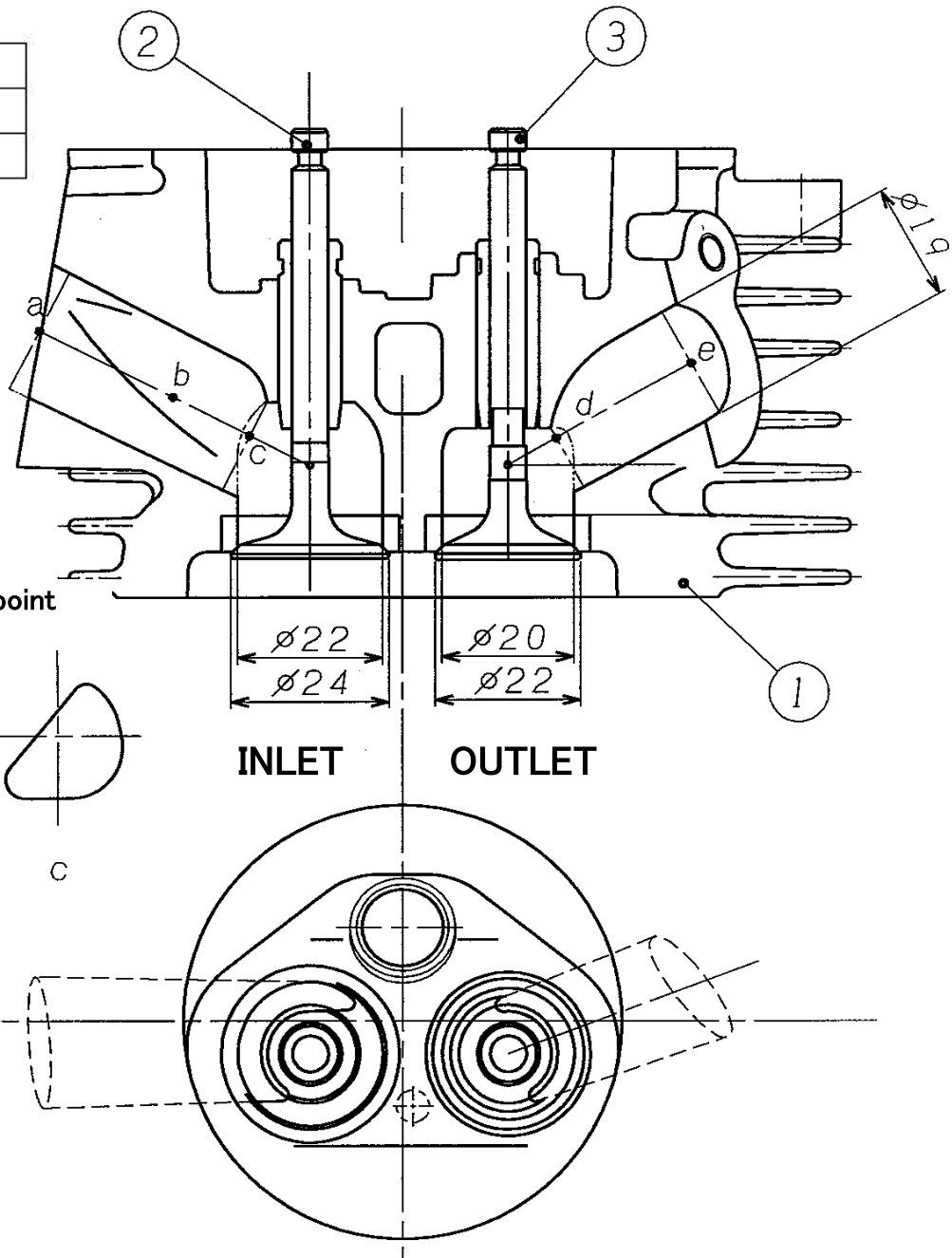


**A-2** : Drawing of piston crown (scale 1:1 )



**B :** Drawing of inlet and outlet ports (scale 1:1 , unit : mm)

①	HEAD, CYLINDER
②	VALVE, INTAKE
③	VALVE, EXHAUST



Cross section of each point

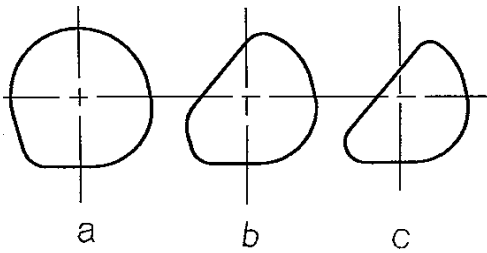


Table 1 Cross sectional area of each points

point	area	remarks
a	336 mm <sup>2</sup>	
b	240 mm <sup>2</sup>	
c	205 mm <sup>2</sup>	Inlet Min.
d	198 mm <sup>2</sup>	Outlet Min.
e	284 mm <sup>2</sup>	

## Photograph of Engine

