

EU TYPE-APPROVAL CERTIFICATE

Communication concerning the:

- EU type-approval,
- ~~extension of EU type-approval,~~
- ~~refusal of EU type-approval,~~
- ~~withdrawal of EU type-approval,~~

of an ~~engine type~~/engine family ⁽¹⁾ with regard to gaseous and particulate pollutant emission pursuant to Regulation (EU) 2016/1628, ~~as last amended by (Commission Delegated)~~ ⁽¹⁾ Regulation (EU) 2022/992 ⁽¹⁾⁽²⁾ (of the European Parliament and of the Council) ⁽¹⁾

EU Type Approval No: e24*2016/1628*2022/992SR41/P*0662*00

Reason for ~~extension/refusal/withdrawal~~ ⁽¹⁾:

- N/A

SECTION I



1.1. Make (trade name(s) of manufacturer):

1.2. Commercial name(s) (if applicable):

N/A

1.3. Company name and address of manufacturer:

Taizhou Bison Machinery Co., Ltd.
Building 8, No. 1515, Feng Nan Dong
Road, Jiaojiang District, Taizhou City,
Zhejiang Province, China P.C 318000

1.4. Name and address of manufacturer's authorised representative (if any):

TAGMA D.O.O
SMARSKA CESTA 7C, 6000, KOPER,
SLOVENIA

1.5. Name(s) and address(es) of assembly/manufacture plant(s):

Taizhou Bison Machinery Co., Ltd.
Building 1, No. 1988, Haichang Road,
Sanjia, Taizhou Bay District, Taizhou
City, Zhejiang Province. China P.C
318000

1.6. ~~Engine type designation/engine family designation~~/FT ⁽¹⁾:

Engine family: **BS225**
 Parent engine: **BS172F**
 Commercial names: **BS172FE**
 Engine within family: **1) BS170F-1,**
2) BS170F, 3) BS168F-1
 Commercial names: **1) BS170FE-1,**
BS223, 2) BS170FE, BS210,
3) BS168FE-1, BS196



EU Type Approval No: e24*2016/1628*2022/992SR41/P*0662*00

1.7. Category and sub-category of the ~~engine~~
~~type~~/engine family ⁽¹⁾ ⁽⁴⁾:

Category: NRS

Sub-category: NRS-vr-1a

1.8. Emissions durability period category:

~~Not Applicable~~/Cat 1/Cat 2/Cat 3 ⁽¹⁾

1.9. Emissions stage:

V/ ~~SPE~~

1.10. Engine for snow throwers ⁽⁵⁾:

~~Yes~~/No ⁽¹⁾

EU Type Approval No: e24*2016/1628*2022/992SRA1/P*0662*00

SECTION II

1. Technical service responsible for carrying out the tests: **TÜV SÜD Auto Service GmbH,
Westendstraße 199,
D-80686 München,
Germany.**
2. Date(s) of test report(s): **26.11.2023**
3. Number(s) of test report(s): **23-02991-CX-SHA-00**

SECTION III

The undersigned hereby certifies the accuracy of the manufacturer's description in the attached information document of the ~~engine type~~/engine family ⁽¹⁾ described above, for which one or more representative samples, selected by the approval authority, have been submitted as prototypes and that the attached test results apply to the ~~engine type~~/engine family ⁽¹⁾.

1. The ~~engine type~~/engine family ⁽¹⁾ meets/~~does not meet~~ ⁽¹⁾ the requirements laid down in Regulation (EU) 2016/1628.
2. The approval is: **~~granted/extended/refused/withdrawn~~ ⁽¹⁾**
3. The approval is granted in accordance with Article 35 of Regulation (EU) 2016/1628 and the validity of the approval is thus limited to dd/mm/yyyy ⁽³⁾ **N/A**
4. Restrictions to validity ⁽³⁾ ⁽⁶⁾: **N/A**
5. Exemptions applied ⁽³⁾ ⁽⁶⁾: **N/A**

Place: **Dublin.**

Date: **24th January, 2024**

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




Attachments:

Information package

Test report(s)

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

NB:

If this model is used for EU type-approval of an engine as an exemption for new technologies or new concepts, pursuant to Article 35(4) of Regulation (EU) 2016/1628, the heading of the certificate shall read 'PROVISIONAL EU TYPE-APPROVAL CERTIFICATE VALID ONLY ON THE TERRITORY OF ... ⁽⁷⁾'.

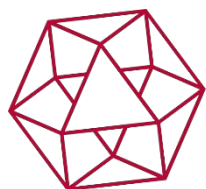
Addendum

PART A — CHARACTERISTICS OF THE ~~ENGINE TYPE~~/ENGINE FAMILY ⁽¹⁾

2. Common design parameters of the ~~engine type~~/engine family ⁽¹⁾
- 2.1. Combustion Cycle: *four stroke cycle/two stroke cycle/rotary
other: (describe) ⁽¹⁾*
- 2.2. Ignition Type: *Compression ignition/spark ignition ⁽¹⁾*
- 2.3.1. Position of the cylinders in the block: *V/in-line/radial/other(Single) ⁽¹⁾*
- 2.6 Main Cooling medium: *Air/Water/Oil ⁽¹⁾*
- 2.7. Method of air aspiration: *naturally aspirated/pressurecharged/
pressure charged with charge cooler ⁽¹⁾*
- 2.8.1. Fuel Type(s): *Diesel (non-road gas-oil)/Ethanol for
dedicated compression ignition engines
(ED95)/Petrol (E10)/Ethanol(E85)/
(Natural gas/Biomethane)/Liquid
Petroleum Gas (LPG) ⁽¹⁾*
- 2.8.1.1. Sub Fuel type (Natural gas/Biomethane only): *Universal fuel—high calorific fuel (H-
gas) and low calorific fuel (L-gas)/
Restricted fuel—high calorific fuel (H
gas)/Restricted fuel—low calorific fuel
(L-gas)/Fuel specific (LNG);*
- 2.8.2. Fuelling arrangement: *Liquid-fuel only/Gaseous-fuel only/Dual-
fuel type 1A/Dual-fuel type 1B/Dual-fuel
type 2A/Dual-fuel type 2B/Dual-fuel
type 3B ⁽¹⁾*
- 2.8.3. List of additional fuels compatible with use by the engine declared by the manufacturer in accordance with point 1 of Annex I to Delegated Regulation (EU) 2017/654 (provide reference to recognised standard or specification): *N/A*
- 2.8.4. Lubricant added to fuel: *Yes/No ⁽¹⁾*
- 2.8.5. Fuel supply type: *Pump (high pressure) line and injector/in
line pump or distributor pump/Unit
injector/Common rail/Carburettor/port
injector/direct injector/Mixing unit/
other(specify) ⁽¹⁾*
- 2.9. Engine management systems: *mechanical/electronic control strategy ⁽¹⁾*

EU Type Approval No: e24*2016/1628*2022/992SR41/P*0662*00

- | | | |
|---------|--|-----------------------------------|
| 2.10. | Miscellaneous devices: | |
| 2.10.1. | Exhaust gas recirculation (EGR): | Yes /No ⁽¹⁾ |
| 2.10.2. | Water injection: | Yes /No ⁽¹⁾ |
| 2.10.3. | Air injection: | Yes /No ⁽¹⁾ |
| 2.10.4. | Others (specify): | N/A |
| 2.11. | Exhaust after-treatment system: | Yes /No ⁽¹⁾ |
| 2.11.1. | Oxidation catalyst: | Yes /No ⁽¹⁾ |
| 2.11.2. | DeNOx system with selective reduction of NOx (addition of reducing agent): | Yes /No ⁽¹⁾ |
| 2.11.3. | Other DeNOx systems: | Yes /No ⁽¹⁾ |
| 2.11.4. | Three-way catalyst combining oxidation and NOx reduction: | Yes /No ⁽¹⁾ |
| 2.11.5. | Particulate after-treatment system with passive regeneration: | Yes /No ⁽¹⁾ |
| 2.11.6. | Particulate after-treatment system with active regeneration: | Yes /No ⁽¹⁾ |
| 2.11.7. | Other particulate after-treatment systems: | Yes /No ⁽¹⁾ |
| 2.11.8. | Other after-treatment devices (specify): | N/A |
| 2.11.9. | Other devices or features that have a strong influence on emissions (specify): | N/A |

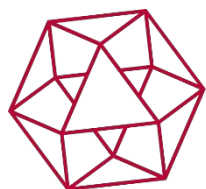


NSAI

EU Type Approval No: e24*2016/1628*2022/992SRA1/P*0662*00

3. Essential characteristics of the engine type(s)

Item Number	Item Description	Parent Engine / Engine type	Engine types within the family (if applicable)
3.1.1.	Engine Type Designation:	BS172F	*
3.1.2.	Engine type designation shown on engine mark: Yes/ No ⁽¹⁾	Yes	*
3.1.3.	Location of the manufacturer's statutory marking:	Refer to drawing No. 001	*
3.2.1.	Declared rated speed (rpm):	3600	*
3.2.1.2.	Declared rated net Power (kW):	5.3	*
3.2.2.	Maximum power speed (rpm):	3600	*
3.2.2.2.	Maximum net power (kW):	5.3	*
3.2.3.	Declared maximum torque speed (rpm):	2500	*
3.2.3.2.	Declared maximum torque (Nm):	14.5	*
3.6.3.	Number of Cylinders:	1	*
3.6.4.	Engine total swept volume (cm ³):	224	*
3.8.5.	Device for recycling crankcase gases: Yes / No ⁽¹⁾	No	*
3.11.3.12.	Consumable reagent: Yes /No ⁽¹⁾	No	*
3.11.3.12.1.	Type and concentration of reagent needed for catalytic action:	N/A	*
3.11.3.13.	NOx sensor(s): Yes /No ⁽¹⁾	No	*
3.11.3.14.	Oxygen sensor: Yes /No ⁽¹⁾	No	*
3.11.4.7.	Fuel borne catalyst (FBC): Yes /No ⁽¹⁾	No	*



NSAI

EU Type Approval No: e24*2016/1628*2022/992SRA1/P*0662*00

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

Item Number	Item Description	Parent Engine / Engine type	Engine types within the family (if applicable)
3.8.1.1.	Maximum allowable intake depression at 100 % engine speed and at 100 % load (kPa) with clean air cleaner:	-2.0	*
3.8.3.2.	Maximum charge air cooler outlet temperature at 100 % speed and 100 % load (deg. C):	<i>N/A</i>	*
3.8.3.3.	Maximum allowable pressure drop across charge cooler at 100 % engine speed and at 100 % load (kPa) (if applicable):	<i>N/A</i>	*
3.9.3.	Maximum permissible exhaust gas backpressure at 100 % engine speed and at 100 % load (kPa):	10	*
3.9.3.1	Location of measurement:	<i>Inlet of muffler</i>	*
3.11.1.2.	Maximum temperature drop from exhaust system or turbine outlet to first exhaust after-treatment system (deg. C) if stated:	<i>N/A</i>	*
3.11.1.2.1.	Test conditions for measurement:	<i>N/A</i>	*

*** See manufacturer's information document BS225-ext.00 (last dated 01.11.2023), Part C, Essential Characteristics of engines types for details.**

PART B — TEST RESULTS

3.8. Manufacturer intends to use ECU torque signal for in-service monitoring: ***Yes/No*** ⁽¹⁾

3.8.1. Dynamometer torque greater than or equal to $0,93 \times$ ECU torque: ***Yes/No*** ⁽¹⁾

3.8.2. ECU torque correction factor in case that dynamometer torque less than $0,93 \times$ ECU torque: ***N/A***

11.1. Cycle emissions results

Emissions	CO (g/kWh)	HC (g/kWh)	NOx (g/kWh)	HC+NOx (g/kWh)	PM (g/kWh)	PN #/kWh	Test Cycle ⁽⁸⁾
NRSC final result with DF.	237.4	-*	-*	7.2	N/A	N/A	G2
NRTC Final test result with DF	-	-	-	-	-	-	-

(*) Optionally, as an alternative, any combination of values satisfying the equation $(HC + NOx) \times CO^{0,784} \leq 8,57$ as well as the following conditions: $CO \leq 20,6$ g/kWh and $(HC + NOx) \leq 2,7$ g/kWh

11.2. CO₂ result: ***952.8 g/kWh***

EU Type Approval No: e24*2016/1628*2022/992SR41/P*0662*00

11.3. In service monitoring reference values ⁽⁹⁾

11.3.1. Reference work (kWh): *N/A*

11.3.2. Reference CO₂ mass (g): *N/A*

Explanatory notes to Annex IV:

(Footnote markers, footnotes and explanatory notes not to be stated on the EU type-approval certificate)

⁽¹⁾ Strike out the unused options, or only show the used option(s).

⁽²⁾ Indicate only the latest amendment in case of an amendment of one or more Articles of Regulation (EU) 2016/1628, according to the amendment applied for the EU type-approval.

⁽³⁾ Delete this entry when not applicable.

⁽⁴⁾ Indicate the applicable option for the category and sub-category in accordance with entry 1.7 of the information document set out in Part A of Appendix 3 to Annex I.

⁽⁵⁾ Indicate whether the approval is for a NRS (< 19 kW) engine family consisting exclusively of engine types for snow throwers.

⁽⁶⁾ Applicable only for EU type-approval of an engine type or an engine family as an exemption for new technologies or new concepts, pursuant to Article 35 of Regulation (EU) 2016/1628.

⁽⁷⁾ Indicate the Member State.

⁽⁸⁾ Indicate the test cycle in accordance with the fifth column of the Tables set out in Annex IV to Regulation (EU) 2016/1628.

⁽⁹⁾ Only applicable to engines of sub-categories NRE-v-5 and NRE-v-6 tested on NRTC.

Index to the Information Package

Date of issue:	<i>24th January, 2024</i>
Date of latest amendment:	<i>N/A</i>
Reason for extension/revision:	<i>N/A</i>
1. Additional conditions, and advisory notes on legal alternatives.	
2. Test report(s)	
- numbers(s):	<i>23-02991-CX-SHA-00</i>
- date of issue:	<i>26.11.2023</i>
- date of latest amendment:	<i>N/A</i>
3. Information document	
- number(s):	<i>BS225-ext.00</i>
- date of issue:	<i>01.11.2023</i>
- date of latest amendment:	<i>N/A</i>
Documentation:	<i>61 pages</i>



EU Type Approval No: e24*2016/1628*2022/992SRA1/P*0662*00

Appendix: **Additional conditions, and advisory notes on legal alternatives**

A: Additional conditions:

1. The attached technical report, with any of its attachments, forms part of this Type Approval certificate.
2. Each type from series production shall be to the measurements specified in the attached drawings, and shall be manufactured only from the materials specified in the Approval documents.
3. Changes in the type are permitted only with the explicit permission of NSAI. Breaches of this requirement will lead to a withdrawal of the Type Approval, and in addition may be subject to criminal prosecution.
4. At regular intervals, any tests or associated checks prescribed by the applicable legislation to verify continued conformity with the approved type shall be carried out. The manufacturer shall demonstrate compliance with this by submitting to NSAI evidence of adequate arrangements and documented control plans for each type approved.
5. Any set of samples or test pieces showing evidence of non-conformity shall give rise to further sampling and testing and all steps shall be taken to restore conformity of production.
6. This Type Approval will expire when it is surrendered by the holder, or withdrawn by NSAI, or when the approved type no longer conforms to legal requirements. The recall of the Type Approval can be issued by NSAI when the conditions required for the issuing or continuation of the Type Approval are no longer current, or when the Approval holder is in breach of the duties attached to the Type Approval, or when it is established that the approved type no longer meets the requirements of traffic safety.
7. Changes in the company name, address or manufacturing site, as well as in any of the sales or other agents specified in the issuing of the approval must immediately be notified to NSAI.
8. The duties imposed by the issuing of this certificate are not transferable. The legal protection of third parties is not affected by this certificate.
9. When the manufacture or sale of the system, component or separate technical unit has not been started within one year of the date of issue of this certificate, then NSAI is to be informed. This requirement also applies when the manufacture or sale has been halted for more than one year, or when it ought to have been halted for more than one year. The initial commencement of manufacture or sale, or the resumption of manufacture or sale, shall then be notified to NSAI within one month of commencement or resumption.

B: Legal Options:

Any objection to the requirements set out in this certificate shall be made within one month of the date of issue. The objection shall be made, in writing, to NSAI in Dublin.

Test Report

No.: 23-02991-CX-SHA-00

Test in accordance with the regulation of the European Parliament and the Council on requirements

relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery

Regulation (EU) 2016/1628	dated	14.09.2016
Regulation (EU) 2017/654	dated	19.12.2016
Regulation (EU) 2017/655	dated	19.12.2016
Regulation (EU) 2017/656	dated	19.12.2016

Including all amendments of Commission Delegated/Implementing up to

Regulation (EU) 2022/992	dated	08.06.2022
Regulation (EU) 2021/1398	dated	04.06.2021
Regulation (EU) 2022/2387	dated	30.08.2022
Regulation (EU) 2018/988	dated	27.04.2018

Approval status	
☒	Granting of a type approval
☐	Extension/correction to type approval no. : ---

I. General



- Make (trade name of manufacturer) : **BISON**
- ~~Engine type designation/engine family designation/FT~~ : Engine family: BS225
Parent engine: BS172F
Commercial names: BS172FE
Engine within family: 1)BS170F-1, 2)BS170F, 3)BS168F-1
Commercial names: 1)BS170FE-1, BS223, 2)BS170FE, BS210, 3)BS168FE-1, BS196
- Engine Category and subcategory : Category: NRS
Sub-category: NRS-vr-1a
- Name and address of manufacturer : Taizhou Bison Machinery Co., Ltd.
Building 8, No. 1515. Feng Nan Dong Road,
Jiaojiang District, Taizhou City, Zhejiang Province,
China P.C 318000
- Name and address of manufacturer's representative (if applicable) : TAGMA D.O.O
SMARSKA CESTA 7C, 6000, KOPER,
SLOVENIA
- Address(es) of assembly plant(s) : Taizhou Bison Machinery Co., Ltd.
Building 1, No. 1988, Haichang Road, Sanjia,
Taizhou Bay District, Taizhou City, Zhejiang
Province.China P.C 318000
- Location and method of affixing of the approval mark : Location: Refer to drawing No. 001 of Information folder
Method: By engraving and/or labelling

II. Test results

Refer to the Annex II

III. Enclosures

Annex I Reason of Extension

Annex II Test results

Information folder No. BS225-ext.00 dated 01.11.2023 (dd.mm.yyyy)

IV. Statement of conformity

The mentioned information folder and the type described therein are in accordance with the test basis mentioned above. Sampling plan or method result from the requirements of the test basis. The worst-case configuration was selected in accordance with process description "Requirements for Test Reports (AS-PB-T-02)". Valid decision rule in accordance with ILAC G8:2019, 4.2.1: in question of meeting the limits the measurement uncertainty was ignored.

The manufacturer is responsible for the information (III.) and the test specimens provided by him. The test results relate only to the test specimens as received and mentioned (II.). The test specimens are representative for the type described (III.).

The test report may be reproduced and published in full and by the client only. It can be reproduced partially with the written permission of the test laboratory only.

TÜV SÜD Auto Service GmbH is designated as Technical Service by:

Approval authority	Country	Registration number
Kraftfahrt-Bundesamt (KBA)	Germany	KBA-P 00100-10
Vehicle Certification Agency (VCA)	United Kingdom	VCA-TS-006
Approval Authority of the Netherlands (RDW)	The Netherlands	RDWT-082-xx
National Standards Authority of Ireland (NSAI)	Ireland	Technical Service Number: 49
Société Nationale de Certification et d'Homologation s.a. (SNCH)	Luxembourg	13/B(g)
Swedish Transport Agency (STA)	Sweden	TT 0024

München, 26.11.2023 (dd.mm.yyyy)



Jianjun Lu



Auto Service

Test report No.: 23-02991-CX-SHA-00
Manufacturer: Taizhou Bison Machinery Co., Ltd.
Type: BS225

Annex I Reason of Extension

Correction of : ---

Modification of : ---

Addition of : ---

Deletion of : ---

Annex II Test results

1. General information

- 1.1. Make (trade name(s) of manufacturer) : 
- 1.2. Commercial name(s) (if applicable) : N/A
- 1.3. Company name and address of manufacturer : Taizhou Bison Machinery Co., Ltd.
 Building 8, No. 1515. Feng Nan Dong Road, Jiaojiang District, Taizhou City, Zhejiang Province, China P.C 318000
- 1.4. Name of technical service : TÜV SÜD Auto Service GmbH
- 1.5. Address of technical service : Westendstraße 199
 D-80686 München
- 1.6. Location of test : Hangzhou ORD Certification Technology Service Co., Ltd. Laboratory of General Utility Internal - Combustion Engine & Tools
- 1.7. Date of test : 04.11.2023 - 17.11.2023
- 1.8. Test report number : 23-02991-CX-SHA-00
- 1.9. Information document reference number (if available) : BS225-ext.00
- 1.10. Test report type : Primary test/~~additional test/supplementary test~~
- 1.10.1. Description of the purpose of the test : New approval test

2. General engine information (test engine)

- 2.1. ~~Engine type designation/engine family designation/FT~~ : Engine family: BS225
 Parent engine: BS172F
 Commercial names: BS172FE
 Engine within family: 1)BS170F-1, 2) BS170F, 3)BS168F-1
 Commercial names: 1)BS170FE-1, BS223, 2)BS170FE, BS210, 3)BS168FE-1, BS196
- 2.2. Engine identification number : 23100001

Test report No.: 23-02991-CX-SHA-00
 Manufacturer: Taizhou Bison Machinery Co., Ltd.
 Type: BS225

- 2.3. Engine category and subcategory : Category: NRS
 Sub-category: NRS-vr-1a
- 2.4. Worst case rationale : Tests are carried out on the parent engine. Carburettor (Make: SP, Type: 16100) with the highest fuel flow at maximum torque speed is selected for the tests.
- 2.5. Test equipment
- Make, type and series no. of analyser : HORIBA / MEXA-7400D / S2000652117000010
 [Valid until: 09.08.2024]
- Make, type and series no. of dynamometer : Tianbo / QC100-7.5 / 111008-3
 [Valid until: 07.08.2024]
- 3. Documentation and information Check list (primary test only)**
- 3.1. Engine mapping documentation reference : G2 cycle, tested at rated speed, manufacturer's declared rated power, rated speed checked before carrying out emission test, and the check results meet the relevant requirements in paragraph 5, annex VI, 2017/654/EU.
- 3.2. Deterioration factor determination documentation reference : See Appendix 1
- 3.3. Infrequent regeneration factors determination documentation reference, where applicable : N/A
- 3.4. NO_x control diagnostic demonstration documentation reference, where applicable : N/A
- 3.5. Particulate control diagnostic demonstration documentation reference, where applicable : N/A
- 3.6. For engine types and engine families that use an Electronic Control Unit (ECU) as part of the emission control system anti-tampering declaration documentation reference : N/A

Test report No.: 23-02991-CX-SHA-00
 Manufacturer: Taizhou Bison Machinery Co., Ltd.
 Type: BS225

- 3.7. For engine types and engine families that use mechanical devices as part of the emission control system anti-tampering and adjustable parameters declaration and demonstration documentation reference : Tamper-proof carburetor
- 3.8. Manufacturer intends to use Electronic Control Unit (ECU) torque signal for in-service monitoring : ~~Yes~~/No
- 3.8.1. Dynamometer torque greater than or equal to $0.93 \times$ Electronic Control Unit (ECU) torque : ~~Yes~~/No
- 3.8.2. Electronic Control Unit (ECU) torque correction factor in case that dynamometer torque less than $0.93x$ Electronic Control Unit (ECU) torque : N/A

4. Reference fuel(s) used for test (complete relevant subparagraph(s))

4.1. Liquid fuel for spark-ignition engines

- 4.1.1. Make : CHONGQING BAILILEI ENERGY TECHNOLOGY CO., LTD.
- 4.1.2. Type : E10
- 4.1.3. Octane number RON : 97.4
- 4.1.4. Octane number MON : 86.9
- 4.1.5. Ethanol content (%) : 9.78
- 4.1.6. Density at 15 Deg.C (kg/m³) : 751.2

4.2. Liquid fuel for compression-ignition engines

- 4.2.1. Make : N/A
- 4.2.2. Type : N/A
- 4.2.3. Cetane number : N/A
- 4.2.4. Fame content (%) : N/A
- 4.2.5. Density at 15 Deg.C (kg/m³) : N/A

4.3. Gaseous fuel – LPG

- 4.3.1. Make : N/A

Test report No.: 23-02991-CX-SHA-00
 Manufacturer: Taizhou Bison Machinery Co., Ltd.
 Type: BS225

- 4.3.2. Type : N/A
- 4.3.3. Reference fuel type : ~~Fuel A/Fuel B~~
- 4.3.4. Octane number MON : N/A
- 4.4. *Gaseous fuel- Methane/biomethane*
- 4.4.1. Reference fuel type: $G_R/G_{23}/G_{25}/G_{20}$: N/A
- 4.4.2. Source of reference gas : ~~specific reference fuel/pipeline gas with admixture~~
- 4.4.3. For specific reference fuel
- 4.4.3.1. Make : N/A
- 4.4.3.2. Type : N/A
- 4.4.4. For pipeline gas with admixture
- 4.4.4.1. Admixture(s): : ~~Carbon dioxide/Ethane/Methane/Nitrogen/Propane~~
- 4.4.4.2. The value of SA for the resulting fuel blend: : N/A
- 4.4.4.3. The Methane Number (MN) of the resulting fuel blend : N/A
- 4.5. *Dual fuel engine (in addition to relevant sections above)*
- 4.5.1. Gas energy ratio on test cycle : N/A
- 5. Lubricant**
- 5.1. Make(s) : CHANGCHENG
- 5.2. Type(s) : SF
- 5.3. SAE viscosity : 15W/40
- 5.4. Lubricant and fuel are mixed : ~~yes/no~~
- 5.4.1. Percentage of oil in mixture : N/A
- 6. Engine Speed**
- 6.1. 100% speed (rpm) : 3600
- 6.1.1. 100% speed determined by : ~~Declared rated speed/Declared MTS/Measured MTS~~
- 6.1.2. Adjusted MTS if applicable (rpm) : N/A

Test report No.: 23-02991-CX-SHA-00
 Manufacturer: Taizhou Bison Machinery Co., Ltd.
 Type: BS225

- 6.2. Intermediate speed (rpm) : N/A
- 6.2.1. Intermediate speed determined by : ~~Declared intermediate speed/Measured intermediate speed/60% of 100% speed/75% of 100% speed /85% of 100% speed~~
- 6.3. Idle speed (rpm) : 1600

7. Engine Power

- 7.1. Engine driven equipment (if applicable)
- 7.1.1. ~~Power absorbed at indicated engine speeds by necessary auxiliaries for engine operation that cannot be fitted for the test (as specified by the manufacturer) to be shown in Table 1:~~

Table 1

Power absorbed by engine auxiliaries

Auxiliary type and identifying details	Power absorbed by auxiliaries (kW) at indicated engine speed (complete relevant columns)						
	Idle	63%	80%	91%	Inter-mediate	Max. power	100%
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
Total ($P_{t,i}$):	-	-	-	-	-	-	-

- 7.1.2. ~~Power absorbed at indicated engine speeds by auxiliaries linked with operation of the machine that cannot be removed for the test (as specified by the manufacturer) to be shown in Table 2:~~

Table 2

Power absorbed by non-road mobile machinery auxiliaries

Auxiliary type and identifying details	Power absorbed by auxiliary (kW) at indicated engine speed (complete relevant columns)						
	Idle	63%	80%	91%	Inter-mediate	Max. power	100%
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
Total ($P_{t,i}$):	-	-	-	-	-	-	-

Test report No.: 23-02991-CX-SHA-00
 Manufacturer: Taizhou Bison Machinery Co., Ltd.
 Type: BS225

7.2. Engine net power to be stated in Table 3

Table 3
Engine net power

Condition	Engine net Power (kW) at indicated engine speed (complete relevant columns)		
	Intermediate	Max. power	100%
Maximum power measured at specified test speed ($P_{m,i}$)	---	5.3	5.3
Total auxiliary power from table 1 ($P_{f,i}$)	---	0	0
Total auxiliary power from table 2 ($P_{r,i}$)	---	0	0
Net engine power $P_i = P_{m,i} - P_{f,i} + P_{r,i}$	---	5.3	5.3

8. Conditions at test

8.1. f_a within range 0.93 to 1.07 : Yes/~~No~~

8.1.1. If f_a is not within specified range state : N/A

altitude of test facility and dry
 atmospheric pressure

8.2. Applicable intake air temperature range : : Yes

20 to 30/~~0 to -5 (snow throwers only)~~/ -5 to

~~-15 (snowmobiles only)~~/20 to 35 (NRE

greater than 560 kW only)

9. Information concerning the conduct of the NRSC test:

9.1 Cycle (mark cycle used with X) to be stated in Table 4:

Table 4
NRSC test cycle

Cycle	C1	C2	D2	E2	E3	F	G1	G2	G3	H
Discrete mode	-	-	-	-	-	-	-	x	-	-
RMC	-	-	-	-	-	-	-	N/A	-	-

The length of each mode : 3 minutes

Sampling time for each mode : 2 minutes

9.2. Dynamometer setting (kW) to be stated in Table 5:

Table 5
Dynamometer setting

% Load at point or % of rated power (as applicable)	Dynamometer setting (kW) at indicated engine speed after adjustment for auxiliary power ⁽¹⁾ (complete relevant columns)					
	Idle	63%	80%	91%	Inter- mediate	100%
5%	-	-	-	-	-	-
10%	-	-	-	-	-	0.53
25%	-	-	-	-	-	1.325
50%	-	-	-	-	-	2.65
75%	-	-	-	-	-	3.975
100%	-	-	-	-	-	5.3
⁽¹⁾ The dynamometer setting shall be determined using the procedure set out in point 7.7.1.3 of Annex VI to Delegated Regulation (EU) 2017/654. The auxiliary power in that point shall be determined using the total values set out in Tables 1 and 2 of this Appendix.						

9.3. NRSC Emission results

9.3.1. Deterioration Factor (DF): calculated/assigned

9.3.2. Specify the DF values and the cycle weighted emission results in the following table

Note: In the event that a discrete mode NRSC is run where the K_{ru} or K_{rd} factors have been established for individual modes then a table showing each mode and the applied K_{ru} or K_{rd} should replace the shown table

Table 6
NRSC cycle DF values and weighted emissions results

DF	CO	HC	NO _x	HC+NO _x	PM	PN
mult/add	1.08	_*	_*	1.08	N/A	N/A
Emissions	CO (g/kWh)	HC (g/kWh)	NO _x (g/kWh)	HC+NO _x (g/kWh)	PM (g/kWh)	PN #/kWh
Test result with/without regeneration	220.39	4.41	2.20	6.61	N/A	N/A
k_{ru}/k_{rd} mult/add	N/A	N/A	N/A	N/A	N/A	N/A
test result with infrequent regeneration adjustment (IRAFs)	N/A	N/A	N/A	N/A	N/A	N/A
Final test result with DF	237.4	_*	_*	7.2	N/A	N/A

9.3.3. Cycle weighted CO₂ (g/kWh) : 952.8

9.3.4. Cycle weighted NH₃ (ppm) : N/A

Test report No.: 23-02991-CX-SHA-00
 Manufacturer: Taizhou Bison Machinery Co., Ltd.
 Type: BS225

9.4. ~~Additional control area test points (if applicable) to be stated in Table 7:~~

Table 7

~~Additional control area test points~~

Emissions at test point	Engine Speed	Load (%)	CO (g/kWh)	HC (g/kWh)	NO _x (g/kWh)	HC+NO _x (g/kWh)	PM (g/kWh)	PN n/kWh
Test result 1	-	-	-	-	-	-	-	-
Test result 2	-	-	-	-	-	-	-	-
Test result 3	-	-	-	-	-	-	-	-

9.5. Sampling systems used for the NRSC test

- 9.5.1. Gaseous emissions : Sampling system for diluted exhaust
- 9.5.2. PM : N/A
- 9.5.2.1. Method : single/multiple filter
- 9.5.3. Particle number : N/A

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

10.1. ~~Cycle (mark cycle with X) to be stated in Table 8:~~

Table 8

~~Transient test cycle~~

NRTC	-
LSI-NRTC	-

10.2. ~~NRTC deterioration factors:~~

- 10.2.1. ~~Deterioration Factor (DF) : calculated/fixed~~
- 10.2.2. ~~DF values and the emissions results to be stated in Table 9 or in Table 10~~

Test report No.: 23-02991-CX-SHA-00
 Manufacturer: Taizhou Bison Machinery Co., Ltd.
 Type: BS225

10.3. NRTC emission results

Table 9
DF values and the emission results for NRTC

DF	CO	HC	NO _x	HC+NO _x	PM	PN
mult/add	-	-	-	-	-	-
Emissions	CO (g/kWh)	HC (g/kWh)	NO _x (g/kWh)	HC+NO _x (g/kWh)	PM (g/kWh)	PN #/kWh
Cold start	-	-	-	-	-	-
Hot start test result with/without regeneration	-	-	-	-	-	-
Weighted test result	-	-	-	-	-	-
k_{Ful}/k_{Fid} mult/add	-	-	-	-	-	-
Weighted test result with IRAFs	-	-	-	-	-	-
Final test result with DF	-	-	-	-	-	-

- 10.3.1 Hot cycle CO₂ (g/kWh) ÷
- 10.3.2. Cycle weighted NH₃ (ppm) ÷
- 10.3.3. Cycle work for hot start test (kWh) ÷
- 10.3.4. Cycle CO₂ for hot start test (g) ÷

Test report No.: 23-02991-CX-SHA-00
 Manufacturer: Taizhou Bison Machinery Co., Ltd.
 Type: BS225

10.4. LSI-NRTC emission results

Table 10

DF values and the emissions results for LSI-NRTC

DF mult/add	CO	HC	NO _x	HC+NO _x	PM	PN
	-	-	-	-	-	-
Emissions	CO (g/kWh)	HC (g/kWh)	NO _x (g/kWh)	HC+NO _x (g/kWh)	PM (g/kWh)	PN #/kWh
test result with/without regeneration	-	-	-	-	-	-
k_{ru}/k_{rd} mult/add	-	-	-	-	-	-
Weighted test result with IRAFs	-	-	-	-	-	-
Final test result with DF	-	-	-	-	-	-

- 10.4.1. Cycle CO₂ (g/kWh) ÷
- 10.4.2. Cycle NH₃ (ppm) ÷
- 10.4.3. Cycle work (kWh) ÷
- 10.4.4. Cycle CO₂ (g) ÷
- 10.5. Sampling system used for the NRTC test ÷
- 10.5.1. Gaseous emissions ÷
- 10.5.2. PM ÷
- 10.5.3. Particle number ÷

11. Final emission result

11.1 Cycle emissions results to be stated in Table 11.

Table 11
Final emissions results

Emissions	CO (g/kWh)	HC (g/kWh)	NO _x (g/kWh)	HC+NO _x (g/kWh)	PM (g/kWh)	PN #/kWh	Test Cycle ⁽¹⁾
NRSC final result with DF ⁽²⁾ .	237.4	-*	-*	7.2	N/A	N/A	G2
NRTC Final test result with DF ⁽³⁾	-	-	-	-	-	-	-

11.2 CO₂ result (g/kWh) ⁽⁴⁾ : 952.8

11.3. In service monitoring reference values ⁽⁵⁾ : N/A

11.3.1. Reference work (kWh) ⁽⁶⁾ : N/A

11.3.2. Reference CO₂ mass (g) ⁽⁷⁾ : N/A

(Footnote markers, footnotes and explanatory notes not to be stated on the test report)

(¹) For NRSC indicate the cycle noted in point 9.1 (Table 4); for transient test indicate cycle noted in point 10.1 (Table 8).

(²) Copy the 'Final test result with DF' results from Table 6.

(³) Copy 'Final test result with DF' results from Table 9 or 10, as applicable.

(⁴) For an engine type or engine family that is tested on both the NRSC and a transient cycle, indicate the hot cycle CO₂ emissions values from the NRTC noted in point 10.3.4 or the CO₂ emissions values from the LSI-NRTC noted in point 10.4.4. For an engine only tested on an NRSC indicate the CO₂ emissions values given in that cycle noted in point 9.3.3.

(⁵) Only applicable to engines of sub-categories NRE-v-5 and NRE-v-6 tested on NRTC.

(⁶) Indicate the cycle work for hot start test value from the NRTC noted in point 10.3.3.

(⁷) Indicate the cycle CO₂ for hot start test value from the NRTC noted in point 10.3.4.

Appendix 1 Determination of deterioration factor

Engine type BS172F (engine No: 23100001)

	New stabilized engine	engine after 125 hours' aging cycle	DF
CO	220.39 g/kWh	237.35 g/kWh	1.08
HC	4.41 g/kWh	4.75 g/kWh	_*
NO _x	2.20 g/kWh	2.40 g/kWh	_*
HC + NO _x	6.61 g/kWh	7.15 g/kWh	1.08

* Separate DF for HC and NO_x are not required for engine categories and sub-categories NRSh and NRS, except for NRS-v-2b and NRS-v-3.

Aging cycle (started at 17.11.2023) [only as sample, the complete file is available]

Date	Time (h)	Required Time	Engine Speed (min ⁻¹)	Actual Engine Power (kW)	Actual Torque (N.m)	Fuel Flow (kg/h)	Temperature of Spark Plug Washer (°C)	Barometric Pressure (kPa)	Ambient Temperature (°C)	Air Relative Humidity (%)
2023/11/7	1	08:00-09:00	3608	5.42	14.35	1.722	210.0	102.2	20.4	52.0
2023/11/7	2	09:00-10:00	3601	5.41	14.35	1.720	211.5	102.6	20.4	52.1
2023/11/7	3	10:00-11:00	3601	5.41	14.35	1.723	210.1	102.2	20.3	53.1
2023/11/7	4	11:00-12:00	3608	5.42	14.34	1.725	210.5	102.4	20.9	52.1
2023/11/7	5	12:00-13:00	3606	5.42	14.35	1.728	210.6	102.4	20.3	52.1
2023/11/7	6	13:00-14:00	3606	5.42	14.35	1.722	210.8	102.6	20.6	51.8
2023/11/7	7	14:00-15:00	3606	5.42	14.34	1.724	211.1	102.4	20.5	52.3
2023/11/7	8	15:00-16:00	3601	5.41	14.35	1.726	211.4	102.5	21.0	53.1
2023/11/7	9	16:00-17:00	3608	5.42	14.36	1.721	210.7	102.1	20.5	53.1
2023/11/7	10	17:00-18:00	3607	5.42	14.35	1.727	211.8	102.5	20.8	52.5
2023/11/7	/	18:00-19:00	Oil change, checking air filter, fuel pipe, spark plug, fuel tank filter and fuel							
2023/11/7	11	19:00-20:00	3606	5.42	14.35	1.728	212.0	102.6	20.7	51.9
2023/11/7	12	20:00-21:00	3606	5.42	14.36	1.722	209.6	102.3	20.7	51.8
2023/11/7	13	21:00-22:00	3606	5.42	14.35	1.723	212.0	102.5	20.3	53.2
2023/11/7	14	22:00-23:00	3602	5.41	14.35	1.727	211.3	102.3	21.0	52.5
2023/11/7	15	23:00-00:00	3601	5.40	14.31	1.721	210.7	102.2	20.7	52.5
2023/11/8	16	00:00-01:00	3608	5.40	14.30	1.722	211.4	102.2	20.8	52.2
2023/11/8	17	01:00-02:00	3602	5.39	14.30	1.723	209.7	102.5	20.3	52.6
2023/11/8	18	02:00-03:00	3606	5.40	14.31	1.724	210.6	102.2	20.3	52.9
2023/11/8	19	03:00-04:00	3608	5.40	14.29	1.720	210.7	102.2	20.7	52.5
2023/11/8	20	04:00-05:00	3601	5.39	14.29	1.723	211.6	102.4	20.9	51.9
2023/11/8	21	05:00-06:00	3605	5.40	14.30	1.723	212.1	102.2	21.0	52.4
2023/11/8	22	06:00-07:00	3604	5.40	14.30	1.721	211.3	102.2	20.4	52.5
2023/11/8	23	07:00-08:00	3607	5.38	14.25	1.723	211.5	102.4	20.9	53.0

Test report No.: 23-02991-CX-SHA-00
 Manufacturer: Taizhou Bison Machinery Co., Ltd.
 Type: BS225

Auto Service

2023/11/9	51	13:00-14:00	3605	5.36	14.20	1.739	211.2	102.3	20.9	52.0
2023/11/9	52	14:00-15:00	3606	5.37	14.22	1.730	212.1	101.9	20.8	52.2
2023/11/9	53	15:00-16:00	3607	5.35	14.16	1.734	212.3	102.0	20.6	51.9
2023/11/9	54	16:00-17:00	3605	5.34	14.16	1.737	210.0	102.2	20.9	51.7
2023/11/9	55	17:00-18:00	3602	5.34	14.17	1.737	212.1	102.3	20.9	51.8
2023/11/9	56	18:00-19:00	3608	5.35	14.17	1.738	210.5	102.3	21.2	52.1
2023/11/9	57	19:00-20:00	3602	5.34	14.16	1.740	210.6	101.9	20.9	51.6
2023/11/9	58	20:00-21:00	3607	5.35	14.16	1.737	211.4	102.4	20.9	51.8
2023/11/9	59	21:00-22:00	3607	5.35	14.17	1.733	210.9	102.1	20.8	53.0
2023/11/9	60	22:00-23:00	3601	5.34	14.16	1.736	212.3	102.3	20.4	52.0
2023/11/9	61	23:00-00:00	3608	5.35	14.17	1.739	211.3	102.3	20.5	52.6
2023/11/10	62	00:00-01:00	3604	5.35	14.17	1.740	212.0	101.9	20.5	52.3
2023/11/10	63	01:00-02:00	3604	5.34	14.15	1.730	211.2	102.1	20.8	52.5
2023/11/10	64	02:00-03:00	3602	5.34	14.16	1.733	210.6	101.9	21.0	52.0
2023/11/10	65	03:00-04:00	3602	5.34	14.17	1.737	211.8	102.1	20.6	52.5
2023/11/10	66	04:00-05:00	3605	5.35	14.17	1.733	210.7	102.4	20.9	51.8
2023/11/10	67	05:00-06:00	3606	5.35	14.17	1.734	212.2	102.2	20.5	52.6
2023/11/10	68	06:00-07:00	3608	5.35	14.16	1.731	209.9	102.0	21.2	52.5
2023/11/10	69	07:00-08:00	3603	5.34	14.17	1.735	210.9	102.3	20.5	52.0
2023/11/10	70	08:00-09:00	3603	5.34	14.16	1.732	212.3	102.1	20.9	52.5
2023/11/10	71	09:00-10:00	3601	5.32	14.10	1.731	211.1	102.3	20.7	52.1
2023/11/10	72	10:00-11:00	3601	5.32	14.11	1.738	210.9	102.4	20.6	52.9

2023/11/12	101	08:00-09:00	3605	5.33	14.11	1.749	211.3	102.3	20.7	52.2
2023/11/12	102	09:00-10:00	3607	5.33	14.10	1.744	211.7	101.8	21.1	52.3
2023/11/12	103	10:00-11:00	3603	5.31	14.07	1.749	212.7	102.2	20.6	52.4
2023/11/12	104	11:00-12:00	3608	5.33	14.10	1.749	210.8	101.9	20.6	51.5
2023/11/12	105	12:00-13:00	3603	5.30	14.05	1.742	211.2	102.2	21.4	52.1
2023/11/12	106	13:00-14:00	3602	5.30	14.06	1.747	210.6	101.8	21.3	51.9
2023/11/12	107	14:00-15:00	3605	5.29	14.02	1.744	211.4	102.2	20.8	52.1
2023/11/12	108	15:00-16:00	3602	5.29	14.02	1.746	210.3	102.2	21.4	52.4
2023/11/12	109	16:00-17:00	3603	5.30	14.05	1.743	211.8	101.9	21.4	52.5
2023/11/12	110	17:00-18:00	3605	5.30	14.03	1.748	210.5	102.1	21.2	52.1
2023/11/12	111	18:00-19:00	3601	5.28	13.99	1.741	211.8	102.1	20.7	52.0
2023/11/12	112	19:00-20:00	3601	5.28	14.00	1.745	212.8	101.9	21.2	52.6
2023/11/12	113	20:00-21:00	3604	5.29	14.01	1.749	212.7	102.0	20.8	52.1
2023/11/12	114	21:00-22:00	3606	5.29	14.00	1.745	212.8	101.8	21.3	52.4
2023/11/12	115	22:00-23:00	3602	5.28	14.00	1.746	212.0	102.2	21.3	52.6
2023/11/12	116	23:00-00:00	3601	5.29	14.02	1.748	212.3	101.8	20.6	51.6
2023/11/13	117	00:00-01:00	3606	5.30	14.03	1.748	211.1	102.1	21.2	51.9
2023/11/13	118	01:00-02:00	3608	5.28	13.99	1.746	212.3	102.0	21.3	52.2
2023/11/13	119	02:00-03:00	3602	5.28	13.99	1.747	211.8	102.1	20.9	52.5
2023/11/13	120	03:00-04:00	3605	5.27	13.95	1.745	210.4	102.2	21.4	52.1

2023/11/13	121	04:00-05:00	3601	5.28	13.99	1.743	211.8	102.2	20.6	52.4
2023/11/13	122	05:00-06:00	3608	5.28	13.99	1.742	211.4	102.0	21.1	52.1
2023/11/13	123	06:00-07:00	3601	5.27	13.97	1.740	211.9	101.8	21.3	52.0
2023/11/13	124	07:00-08:00	3605	5.28	13.99	1.746	212.8	101.9	20.7	52.4
2023/11/13	125	08:00-09:00	3607	5.28	13.99	1.746	211.8	102.2	21.2	51.9
2023/11/13	/	/	Oil change, clean air filter and spark plug fouling, checking fuel pipe, fuel tank filter and fuel							

PARTIAL TYPE INFORMATION DOCUMENT

No.: BS225-ext.00



Taizhou Bison Machinery Co., Ltd.

ENGINE FAMILY : BS225

SUBJECT : NRMM EMISSION

LEGAL BASIS : 2016/1628/EU

Date : 2023-11-01[YYYY-MM-DD]

Approval : Du Jinzhong

AMENDMENT

Version	Approval No.	Modification / Correction	Date
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

CONTENT

1.	General information	3
2.	Common design parameters of engine family	4
3.	Essential characteristics of the engine type(s)	6
Attachment 1	Photographs of the engines	23
Attachment 2	Drawings of the engines	24
Attachment 3	Manufacturer's declaration on compliance with Regulation (EU) 2016/1628.....	37
Attachment 4	Manufacturer's statement on compliance with the exhaust emission limits when use fuels other than the reference fuels	38
Attachment 5	Overview of the emission control strategy for electronically controlled engines	38
Attachment 6	The functional operational characteristics of the NOx control measures and inducement system	38
Attachment 7	The functional operational characteristics of the particulate control measures.....	38
Attachment 8	Manufacturer's declaration, and supporting test reports or data, on deterioration factors	39
Attachment 9	Manufacturer's declaration, and supporting test reports or data, of the infrequent regeneration adjustment factors	40
Attachment 10	The physical connector required to receive the torque signal from the engine Electronic control Unit (ECU) during the in-service monitoring test	40
Attachment 11	Manufacturer's declaration and supporting data on tampering prevention for emission control systems.....	41
Attachment 12	List of scheduled for emission-related maintenance requirements	42
Attachment 13	Declaration of fuel delivery with carburettors	43

Part A**1. General information**

1.1.	Make (trade name(s) of manufacturer)	:	
1.2.	Commercial name(s) (if applicable)	:	N/A
1.3.	Company name and address of manufacturer	:	Taizhou Bison Machinery Co., Ltd. Building 8, No. 1515. Feng Nan Dong Road, Jiaojiang District, Taizhou City, Zhejiang Province, China P.C 318000
1.4.	Name and address of manufacturer's authorised representative (if any)	:	TAGMA D.O.O SMARSKA CESTA 7C, 6000, KOPER, SLOVENIA
1.5.	Name(s) and address(es) of assembly/manufacture plant(s)	:	Taizhou Bison Machinery Co., Ltd. Building 1, No. 1988, Haichang Road, Sanjia, Taizhou Bay District, Taizhou City, Zhejiang Province.China P.C 318000
1.6.	Engine type designation/engine family designation /FT	:	Engine family: BS225 Parent engine: BS172F Commercial names: BS172FE Engine within family: 1)BS170F-1, 2) BS170F, 3)BS168F-1 Commercial names: 1)BS170FE-1, BS223, 2)BS170FE, BS210, 3)BS168FE-1, BS196
1.7.	Category and sub-category of the engine type/engine family	:	Category: NRS Sub-category: NRS-vr-1a
1.8.	Emissions durability period category	:	125hCat 1 (Consumer products)
1.9.	Emissions stage	:	V/Special Purpose Engine (SPE)
1.10.	In case of NRS <19 kW only, engine family consisting exclusively of engine types for snow throwers	:	Yes /No
1.11.	Reference power is	:	rated net power /maximum net power
1.12.	Primary NRSC test cycle	:	C1/C2/D2/E2/E3/F/G1/G2/G3/H
1.12.1.	In case of variable speed IWP category only, Additional propulsion test cycle	:	Not applicable/ E2/E3
1.12.2.	In case of IWP category only, additional auxiliary NRSC test cycle	:	Not applicable/ D2/C1
1.13.	Transient test cycle	:	Not applicable/ NRTC/LSI-NRTC
1.14.	Restrictions on use (if applicable)	:	N/A

Part B

2. Common design parameters of engine family

2.1.	Combustion Cycle	:	four stroke cycle/ two stroke cycle/rotary/other (specify)
2.2.	Ignition Type	:	Compression ignition /spark ignition
2.3.	Configuration of the cylinders		
2.3.1.	Position of the cylinders in the block	:	Single/ V/in-line/opposed /radial/ other (specify)
2.3.2.	Bore centre to centre dimension (mm)	:	N/A
2.4.	Combustion chamber type/design		
2.4.1.	Open chamber/divided chamber/ other (specify)	:	Open chamber
2.4.2.	Valve and porting configuration	:	Refer to drawing No. 002
2.4.3.	Number of valves per cylinder	:	One in and one out
2.5.	Range of swept volume per cylinder (cm ³)	:	See item 3.6.4. in Part C
2.6.	Main Cooling medium	:	Air/ Water / Oil
2.7.	Method of air aspiration	:	naturally aspirated/ pressure charged / pressure charged with charge cooler
2.8.	Fuel		
2.8.1.	Fuel Type	:	Diesel (non-road gas-oil)/Ethanol for dedicated compression ignition engines (ED95)/Petrol (E10)/Ethanol (E85)/Natural gas/Biomethane/Liquid Petroleum Gas (LPG)
2.8.1.1.	Sub Fuel type (Natural gas/Biomethane only)	:	Universal fuel – high calorific fuel (H-gas) and low-calorific fuel (L-gas)/Restricted fuel – high calorific-fuel (H-gas)/Restricted fuel – low calorific fuel (L-gas)/Fuel specific (LNG)
2.8.2.	Fuelling arrangement	:	Liquid-fuel only/Gaseous-fuel only/Dual-fuel type 1A/Dual-fuel type 1B/Dual-fuel type 2A/Dual-fuel-type 2B/Dual-fuel type 3B
2.8.3.	list of additional fuels, fuel mixtures or emulsions suitable for use by the engine, as declared by the manufacturer in accordance with point 1.2.3 of Annex I to Delegated Regulation (EU) 2017/654 (provide reference to recognised standard or specification)	:	N/A
2.8.4.	Lubricant added to fuel	:	Yes/No
2.8.4.1.	Specification	:	N/A
2.8.4.2.	Ratio of fuel to oil	:	N/A
2.8.5.	Fuel supply type	:	Pump (high pressure) line and injector/in-line pump or distributor pump/Unit injector/Common-rail/Carburettor/port injector/direct injector/Mixing-unit/other (specify) :
2.9.	Engine management systems	:	mechanical/ electronic control strategy ⁽²⁾
2.10.	Miscellaneous devices		
2.10.1.	Exhaust gas recirculation: Yes/No	:	No

- (if yes, complete section 3.10.1. and provide a schematic diagram of the location and order of the devices)
- 2.10.2. Water injection: Yes/No : No
 (if yes, complete section 3.10.2. and provide a schematic diagram of the location and order of the devices)
- 2.10.3. Air injection: Yes/No : No
 (if yes, complete section 3.10.3. and provide a schematic diagram of the location and order of the devices)
- 2.10.4. Others: Yes/No : No
 (if yes, complete section 3.10.4 and provide a schematic diagram of the location and order of the devices)
- 2.11. Exhaust after-treatment system** (if yes : ~~Yes~~/No
 provide a schematic diagram of the location and order of the devices)
- 2.11.1. Oxidation catalyst : ~~Yes~~/No
 (if yes, complete section 3.11.2.)
- 2.11.2. DeNOx system with selective reduction of NOx (addition of reducing agent) : ~~Yes~~/No
 (if yes, complete section 3.11.3.)
- 2.11.3. Other DeNOx systems : ~~Yes~~/No
 (if yes, complete section 3.11.3.)
- 2.11.4. Three-way catalyst combining oxidation and NOx reduction : ~~Yes~~/No
 (if yes, complete section 3.11.3.)
- 2.11.5. Particulate after-treatment system with passive regeneration : ~~Yes~~/No
 (if yes, complete section 3.11.4.)
- 2.11.5.1. Wall-flow/non-wall-flow : N/A
- 2.11.6. Particulate trap with active regeneration : ~~Yes~~/No
 (if yes, complete section 3.11.4.)
- 2.11.6.1. Wall-flow/non-wall-flow : N/A
- 2.11.7. Other particulate after-treatment systems : ~~Yes~~/No
 (if yes, complete section 3.11.4.)
- 2.11.8. Other after-treatment devices (specify) : ~~Yes~~/No
 (if yes, complete section 3.11.5.)
- 2.11.9. Other devices or features that have a strong influence on emissions : ~~Yes~~/No
 (if yes, complete section 3.11.7.)

Part C**3. Essential characteristics of the engine type(s)**

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.1	Engine Identification							
3.1.1.	Engine type designation			X	BS172F	BS170F-1	BS170F	BS168F-1
3.1.2.	Engine type designation shown on engine marking:			X	Yes			
3.1.3.	Location of the statutory marking:			X	Refer to drawing No. 001			
3.1.4.	Method of attachment of the statutory marking:			X	By engraving and/or labelling			
3.1.5.	Drawings of the location of the engine identification number (complete example with dimensions):			X	Refer to drawing No. 001			
3.2.	Performance Parameters							
3.2.1.	Declared rated speed (rpm):	X			3600			
3.2.1.1.	Fuel delivery/stroke (mm³) for diesel engine , fuel flow (g/h) for other engines, at rated net power:			X	1750	1650	1600	1550
3.2.1.2.	Declared rated net power (kW):	X			5.3	4.5	4.2	3.8
3.2.2.	Maximum power speed(rpm):			X	Same as above 3.2.1.			
3.2.2.1.	Fuel delivery/stroke (mm³) for diesel engine , fuel flow (g/h) for other engines, at maximum net power			X	Same as above 3.2.1.1.			
3.2.2.2.	Maximum net power (kW):	X		X	Same as above 3.2.1.2.			
3.2.3.	Declared maximum torque speed (rpm):	X			2500			
3.2.3.1.	Fuel delivery/stroke (mm³) for diesel engine , fuel flow (g/h) for other engines, at maximum torque speed:			X	1420	1230	1150	1050
3.2.3.2.	Declared maximum torque (Nm):	X			14.5	13	12	11

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.2.4.	Declared 100% test speed:	X			3600			
3.2.5.	Declared Intermediate test speed:	X			N/A			
3.2.6.	Idle speed (rpm)	X			1600±300			
3.2.7.	Maximum no load speed (rpm):	X			3800			
3.2.8.	Declared minimum torque (Nm)	X			N/A			
3.3.	Run-in procedure							
3.3.1.	Run in time:	X			4 hour			
3.3.2.	Run-in cycle:	X			G2			
3.4.	Engine test							
3.4.1.	Specific fixture required: Yes/No	X			No			
3.4.1.1.	Description, including photographs and/or drawings, of the system for mounting the engine on the test bench including the power transmission shaft for connection to the dynamometer:	X			N/A			
3.4.2.	Exhaust mixing chamber permitted by manufacturer: Yes/No	X			No			
3.4.2.1.	exhaust mixing chamber description, photograph and/or drawing:	X			N/A			
3.4.3.	Manufacturers chosen NRSC: RMC/Discrete mode	X			Discrete mode			
3.4.4.	Additional NRSC: E2/D2/C1	X			N/A			
3.4.5.	Number of pre-conditioning cycles prior to transient test	X			N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.4.6.	Pre-conditioning for RMC NRSC: Steady-state operation/RMC	X			N/A			
3.4.6.1.	In case of RMC, number of pre-conditioning RMC prior to RMC NRSC test	X			N/A			
3.5.	Lubrication system							
3.5.1.	<i>Lubricant temperature</i>							
3.5.1.1.	Minimum (deg. °C):	X			-15	-5	-5	-5
3.5.1.2.	Maximum (deg. °C):	X			160	115	125	125
3.6.	Combustion Cylinder							
3.6.1.	Bore(mm):			X	72	70	70	68
3.6.2.	Stroke(mm):			X	55	58	55	54
3.6.3.	Number of cylinders:			X	1			
3.6.4.	Engine total swept volume (cm³):			X	224	223	210	196
3.6.5.	Swept volume per cylinder as % of parent engine:			X	100	99.6	93.8	87.5
3.6.6.	Volumetric compression ratio:			X	9: 1	8.6: 1	8.5: 1	8.5: 1
3.6.7.	Combustion system description:			X	Spark ignition			
3.6.8.	Drawings of combustion chamber and piston crown:			X	Refer to drawing no. 002 & 003			
3.6.9.	Minimum cross sectional area of inlet and outlet ports (mm²):			X	Inlet: 442 mm², Outlet: 381 mm²	Inlet: 423 mm², Outlet: 315 mm²	Inlet: 423 mm², Outlet: 315 mm²	Inlet: 441 mm², Outlet: 429 mm²
3.6.10.	<i>Valve timing</i>							
3.6.10.1.	Maximum lift and angles of opening and closing in relation to dead centre or equivalent data:			X	Refer to drawing No. 005			
3.6.10.2.	Reference and/or setting range:			X	TDC			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.6.10.3.	Variable valve timing system: Yes/No			X	No			
3.6.10.3.1.	Type: continuous/(on/off)			X	N/A			
3.6.10.3.2.	Cam phase shift angle:			X	N/A			
3.6.11.	Porting configuration							
3.6.11.1.	position, size and number:			X	Refer to drawing No. 002			
3.7.	Cooling system							
3.7.1.	<i>Liquid cooling</i>				N/A			
3.7.1.1.	Nature of liquid:			X	N/A			
3.7.1.2.	Circulating pumps: Yes/No			X	No			
3.7.1.2.1.	type(s):			X	N/A			
3.7.1.2.2.	Drive ratio(s):			X	N/A			
3.7.1.3.	Minimum coolant temperature at outlet (deg. °C):	X			N/A			
3.7.1.4.	Maximum coolant temperature at outlet (deg. °C):	X						
3.7.2.	<i>Air cooling</i>							
3.7.2.1.	fan: Yes/No			X	Yes			
3.7.2.1.0.	Make:			X	Chongqing Yinwang, Chongqing Yonggang, Chongqing Runtong, Taizhou Xingcheng	Chongqing Yinwang, Chongqing Yonggang, Taizhou Xingcheng	Chongqing Yinwang, Chongqing Yonggang, Taizhou Xingcheng	Chongqing Yinwang, Chongqing Yonggang, Taizhou Xingcheng
3.7.2.1.1.	type(s):			X	168F			
3.7.2.1.2.	Drive ratio(s):			X	1:1			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.7.2.2.	Maximum temperature at reference point (deg. °C):			X	270	230	230	230
3.7.2.2.1.	Reference point location			X	Spark plug washer			
3.8.	Aspiration							
3.8.1.	Maximum allowable intake depression at 100% engine speed and at 100% load (kPa)	X	X					
3.8.1.1.	With clean air cleaner:	X	X		-2.0			
3.8.1.2.	With dirty air cleaner:	X	X		-2.0			
3.8.1.3.	Location, of measurement:	X	X		Behind air filter			
3.8.2.	Pressure charger(s): Yes/No			X	No			
3.8.2.0.	Make:			X	N/A			
3.8.2.1.	Type(s):			X	N/A			
3.8.2.2.	Description and schematic diagram of the system (e.g. maximum charge pressure, waste gate, VGT, Twin turbo, etc.):			X	N/A			
3.8.3.	Charge air cooler: Yes/No	X	X		No			
3.8.3.1.	Type: air-air/air-water/other(specify)		X		N/A			
3.8.3.2.	Maximum charge air cooler outlet temperature at 100% speed and 100% load (deg. °C):	X	X		N/A			
3.8.3.3.	Maximum allowable pressure drop across charge cooler at 100% engine speed and at 100% load (kPa):	X	X		N/A			
3.8.4.	Intake throttle valve: Yes/No			X	Yes			
3.8.5.	Device for recycling crankcase gases: Yes/No			X	No			
3.8.5.1.	If yes, description and drawings:			X	N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.8.5.2.	If no, compliance with paragraph 6.10 of Annex VI to Delegated Regulation (EU) 2017/654: Yes/No	X			N/A			
3.8.6.	Inlet path							
3.8.6.1.	Description of inlet path, (with drawings, photographs and/or part numbers):			X	Refer to drawing No. 008			
3.8.7.	Air filter			X	Yes			
3.8.7.0.	Make:			X	Chongqing Quanyuexiang, Chongqing Jinlang, Chongqing Langrun, Chongqing Runtong, Taizhou Xingcheng	Taizhou Xingcheng	Taizhou Xingcheng	Taizhou Xingcheng
3.8.7.1.	Type:			X	17100-Z30,17100-Z44, 17100-Z01,17100-Z43, 17100-Z33,17100-Z95, 17100-Z29,17100-Z1D, 17100-Z14,17100-Z3N, 17100-Z1X,17100-Z0X, 17100-Z4W,17100-Z4A, 17100-Z6R,17400-Z14, 17400-Z2M,17400-Z6V, 168F	168F	168F	168F
3.8.8.	Intake air-silencer				No			
3.8.8.0.	Make:			X	N/A			
3.8.8.1.	Type:			X	N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.9.	Exhaust system							
3.9.1.	Description of the exhaust system (with drawings, photos and/or part numbers as required):			X	Refer to drawing No. 007			
3.9.2.	Maximum exhaust temperature (deg. °C):	X			650			
3.9.3.	Maximum permissible exhaust backpressure at 100% engine speed and at 100% load (kPa):	X	X		10	6	5.5	5
3.9.3.1.	Location of measurement:	X	X		Inlet of muffler			
3.9.4.	Exhaust backpressure at loading level specified by manufacturer for variable restriction after-treatment at start of test (kPa):	X			N/A			
3.9.4.1.	Location and speed/load conditions:	X			N/A			
3.9.5.	Exhaust throttle valve: Yes/No			X	No			
3.10.	Miscellaneous devices: Yes/No				No			
3.10.1.	<i>Exhaust gas recirculation (EGR)</i>				N/A			
3.10.1.1.	Characteristics: cooled/uncooled, high pressure/low pressure/other (specify):			X	N/A			
3.10.2.	<i>Water injection</i>				N/A			
3.10.2.1.	Operation principle:			X	N/A			
3.10.3.	Air injection				N/A			
3.10.3.1.	Operation principle:			X	N/A			
3.10.4.	Other(s)				N/A			
3.10.4.1.	Type(s):			X	N/A			
3.11.	Exhaust after-treatment system							

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.11.1.	<i>Location</i>		X		N/A			
3.11.1.1.	Place(s) and maximum/minimum distance(s) from engine to first after-treatment device:		X		N/A			
3.11.1.2.	Maximum temperature drop from exhaust or turbine outlet to first after-treatment device (deg. °C) if stated:	X	X		N/A			
3.11.1.2.1.	Test conditions for measurement:	X	X		N/A			
3.11.1.3.	Minimum temperature at inlet to first after-treatment device (deg. C), if stated:	X	X		N/A			
3.11.1.3.1.	Test conditions for measurement:	X	X		N/A			
3.11.2.	Oxidation catalyst				N/A			
3.11.2.1.	Number of catalytic converters and elements:			X	N/A			
3.11.2.2.	Dimensions and volume of the catalytic converter(s):			X	N/A			
3.11.2.3.	Total charge of precious metals:			X	N/A			
3.11.2.4.	Relative concentration of each compound:			X	N/A			
3.11.2.5.	Substrate (structure and material):			X	N/A			
3.11.2.6.	Cell density:			X	N/A			
3.11.2.7.	Type of casing for the catalytic converter(s):			X	N/A			
3.11.3.	<i>Catalytic exhaust gas after treatment system for NO_x or three way catalyst</i>				N/A			
3.11.3.0.	Make:			X	N/A			
3.11.3.1.	Type:			X	N/A			
3.11.3.2.	Number of catalytic converters and elements:			X	N/A			
3.11.3.3.	Type of catalytic action:			X	N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.11.3.4.	Dimensions and volume of the catalytic converter(s):			X	N/A			
3.11.3.5.	Total charge of precious metals:			X	N/A			
3.11.3.6.	Relative concentration of each compound:			X	N/A			
3.11.3.7.	Substrate (structure and material):			X	N/A			
3.11.3.8.	Cell density:			X	N/A			
3.11.3.9.	Type of casing for the catalytic converter(s):			X	N/A			
3.11.3.10.	Method of regeneration:	X		X	N/A			
3.11.3.10.1.	Infrequent regeneration: Yes/No:	X			No			
3.11.3.11.	Normal operating temperature range (deg. °C):	X	X		N/A			
3.11.3.12.	Consumable reagent: Yes/No			X	No			
3.11.3.12.1.	Type and concentration of reagent needed for catalytic action:			X	N/A			
3.11.3.12.2.	Lowest concentration of the active ingredient present in the reagent that does not activate warning system (CD _{min}) (%vol):			X	N/A			
3.11.3.12.3.	Normal operational temperature range of reagent:		X		N/A			
3.11.3.12.4.	International standard:		X	X	N/A			
3.11.3.13.	NO _x sensor(s): Yes/No			X	No			
3.11.3.13.0.	Make:			X	N/A			
3.11.3.13.1.	Type:			X	N/A			
3.11.3.13.2.	Location(s)			X	N/A			
3.11.3.14.	Oxygen sensor(s): Yes/No			X	No			
3.11.3.14.0.	Make:			X	N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.11.3.14.1.	Type:			X	N/A			
3.11.3.14.2.	Location(s):			X	N/A			
3.11.4.	<i>Particulate trap</i>				N/A			
3.11.4.1.	Type of filtration: through flow/partial flow/wall flow/other (specify)			X	N/A			
3.11.4.2'.	Make:			X	N/A			
3.11.4.2.	Type:			X	N/A			
3.11.4.3.	Dimensions and capacity of the particulate trap:			X	N/A			
3.11.4.4.	Location place(s) and maximum and minimum distance(s) from engine:		X		N/A			
3.11.4.5.	Method or system of regeneration, description and/or drawing:			X	N/A			
3.11.4.5.1.	Infrequent regeneration: Yes/No			X	No			
3.11.4.5.2.	Minimum exhaust gas temperature for initiating regeneration procedure (deg. °C):			X	N/A			
3.11.4.6.	Catalytic coating: Yes/No			X	No			
3.11.4.6.1.	Type of catalytic action:			X	N/A			
3.11.4.7.	Fuel borne catalyst (FBC): Yes/No			X	No			
3.11.4.8.	Normal operating temperature range (deg. °C):			X	N/A			
3.11.4.9.	Normal operating pressure range (kPa)			X	N/A			
3.11.4.10.	Storage capacity soot/ash [g]:			X	N/A			
3.11.4.11.	Oxygen sensor(s): Yes/No			X	N/A			
3.11.4.11.1.	Type:			X	N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.11.4.11.2.	Location(s):			X	N/A			
3.11.5.	<i>Other systems</i>				N/A			
3.11.5.1.	Description and operation:			X	N/A			
3.11.6.	Infrequent Regeneration				N/A			
3.11.6.1.	Number of cycles with regeneration	X			N/A			
3.11.6.2.	Number of cycles without regeneration	X			N/A			
3.11.7.	Other device(s) or feature(s)				N/A			
3.11.7.1.	Type(s):			X	N/A			
3.12.	Fuel feed for liquid-fuelled CI or, where applicable, dual-fuel engines							
3.12.1.	<i>Feed pump</i>				N/A			
3.12.1.1.	Pressure (kPa) or characteristic diagram:			X	N/A			
3.12.2.	<i>Injection system</i>				N/A			
3.12.2.1.	Pump				N/A			
3.12.2.1.0.	Make:			X	N/A			
3.12.2.1.1.	Type(s):			X	N/A			
3.12.2.1.2.	Rated pump speed (rpm):			X	N/A			
3.12.2.1.3.	mm ³ per stroke or cycle at full injection at rated pump speed:			X	N/A			
3.12.2.1.4.	Torque peak pump speed (rpm):			X	N/A			
3.12.2.1.5.	mm ³ per stroke or cycle at full injection at torque peak pump speed			X	N/A			
3.12.2.1.6.	Characteristic diagram:			X	N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.12.2.1.7.	Method used: on engine/on pump bench			X	N/A			
3.12.2.2.	Injection timing				N/A			
3.12.2.2.1.	Injection timing curve:			X	N/A			
3.12.2.2.2.	Static Timing:			X	N/A			
3.12.2.3.	Injection piping				N/A			
3.12.2.3.1.	Length(s) (mm):			X	N/A			
3.12.2.3.2.	Internal diameter (mm):			X	N/A			
3.12.2.4.	Common rail: Yes/No			X	No			
3.12.2.4.0.	Make:			X	N/A			
3.12.2.4.1.	Type:			X	N/A			
3.12.3.	<i>Injector(s)</i>				N/A			
3.12.2.0.	Make:			X	N/A			
3.12.3.1.	Type(s):			X	N/A			
3.12.3.2.	Opening pressure (kPa):			X	N/A			
3.12.4.	<i>Electronic control unit (ECU): Yes/No</i>			X	No			
3.12.4.0.	Make:			X	N/A			
3.12.4.1.	Type(s):			X	N/A			
3.12.4.2.	Software calibration number(s):			X	N/A			
3.12.4.3.	Communication standard(s) for access to data stream information: ISO 27145 with ISO 15765-4 (CAN-based)/ISO 27145 with ISO 13400 (TCP/IP-based)/SAE J1939-73	X		X	N/A			
3.12.5.	<i>Governor</i>				N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.12.5.0.	Make:			X	N/A			
3.12.5.1.	Type(s):			X	N/A			
3.12.5.2.	Speed at which cut-off starts under full load:			X	N/A			
3.12.5.3.	Maximum no-load speed:			X	N/A			
3.12.5.4.	Idle speed:			X	N/A			
3.12.6.	<i>Cold-start system: Yes/No</i>			X	No			
3.12.6.0.	Make:			X	N/A			
3.12.6.1.	Type(s):			X	N/A			
3.12.6.2.	Description:			X	N/A			
3.12.7.	Fuel temperature at the inlet to the fuel injection pump				N/A			
3.12.7.1.	Minimum (deg. °C):	X			N/A			
3.12.7.2.	Maximum (deg. °C):	X			N/A			
3.13.	Fuel feed for liquid fuel spark ignition engine							
3.13.1.	<i>Carburettor</i>				Refer to drawing No. 004			
3.13.1.0.	Make:			X	RUIXING, HUAYI, SP, Yinba, G, SPD			
3.13.1.1.	Type(s):			X	16100, P19	P19	P19	P19
3.13.2.	<i>Port fuel injection:</i>				N/A			
3.13.2.1.	single-point / multi-point			X	N/A			
3.13.2.2'.	Make:			X	N/A			
3.13.2.2.	Type(s):			X	N/A			
3.13.3.	<i>Direct injection:</i>				N/A			
3.13.3.0.	Make:			X	N/A			
3.13.3.1.	Type(s):			X	N/A			

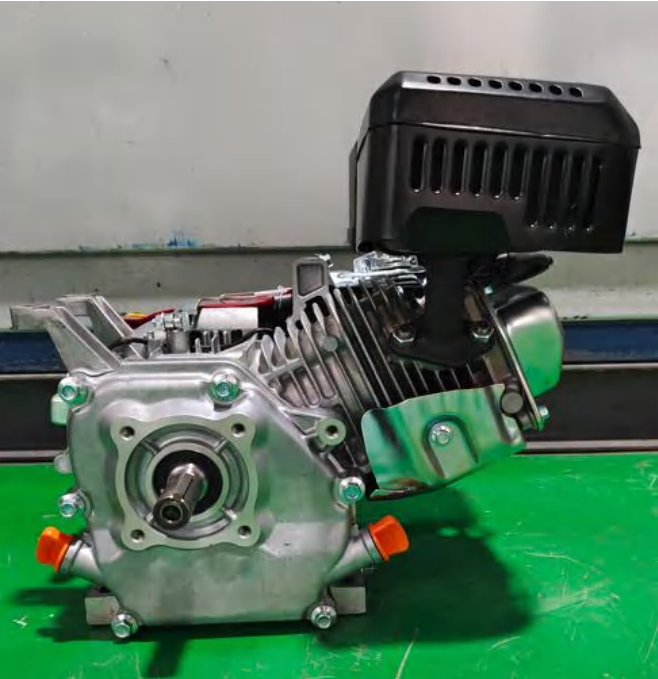
Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.13.4.	<i>Fuel temperature at location specified by manufacturer</i>				N/A			
3.13.4.1.	Location:	X			N/A			
3.13.4.2.	Minimum (deg. °C)	X			N/A			
3.13.4.3.	Maximum (deg. °C)	X			N/A			
3.14.	Fuel feed for gaseous fuel engines or where applicable, dual fuel engines (in the case of systems laid out in a different manner, supply equivalent information)							
3.14.1.	<i>Fuel: LPG /NG-H/NG-L /NG-HL/LNG/Fuel specific LNG</i>	X		X	N/A			
3.14.2.	<i>Pressure regulator(s)/vaporiser(s)</i>				N/A			
3.14.2.0.	Make:			X	N/A			
3.14.2.1.	Type(s)			X	N/A			
3.14.2.2.	Number of pressure reduction stages			X	N/A			
3.14.2.3.	Pressure in final stage minimum and maximum. (kPa)			X	N/A			
3.14.2.4.	Number of main adjustment points:			X	N/A			
3.14.2.5.	Number of idle adjustment points:			X	N/A			
3.14.3.	<i>Fuelling system: mixing unit/gas injection/liquid injection/direct injection</i>			X	N/A			
3.14.3.1.	Mixture strength regulation				N/A			
3.14.3.1.1.	System description and/or diagram and drawings:			X	N/A			
3.14.4.	<i>Mixing unit</i>				N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.14.4.1.	Number:			X	N/A			
3.14.4.2.	Make:			X	N/A			
3.14.4.2.	Type(s):			X	N/A			
3.14.4.3.	Location:			X	N/A			
3.14.4.4.	Adjustment possibilities:			X	N/A			
3.14.5.	<i>Inlet manifold injection</i>				N/A			
3.14.5.1.	Injection: single-point/multi-point			X	N/A			
3.14.5.2.	Injection: continuous/simultaneously timed/ sequentially timed			X	N/A			
3.14.5.3.	Injection equipment				N/A			
3.14.5.3.0.	Make:			X	N/A			
3.14.5.3.1.	Type(s):			X	N/A			
3.14.5.3.2.	Adjustment possibilities:			X	N/A			
3.14.5.4.	Supply pump				N/A			
3.14.5.4.0.	Make:			X	N/A			
3.14.5.4.1.	Type(s):			X	N/A			
3.14.5.5.	Injector(s)				N/A			
3.14.5.5.0.	Make:			X	N/A			
3.14.5.5.1.	Type(s):			X	N/A			
3.14.6.	<i>Direct injection</i>				N/A			
3.14.6.1.	Injection pump/pressure regulator			X	N/A			
3.14.6.1.0.	Make:			X	N/A			
3.14.6.1.1.	Type(s):			X	N/A			

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.14.6.1.2.	Injection timing (specify):			X	N/A			
3.14.6.2.	Injector(s)				N/A			
3.14.6.2.0.	Make:			X	N/A			
3.14.6.2.1.	Type(s):			X	N/A			
3.14.6.2.2.	Opening pressure or characteristic diagram :			X	N/A			
3.14.7.	<i>Electronic Control Unit (ECU)</i>				N/A			
3.14.7.0.	Make:			X	N/A			
3.14.7.1.	Type(s):			X	N/A			
3.14.7.2.	Adjustment possibilities:			X	N/A			
3.14.7.3.	Software calibration number(s):			X	N/A			
3.14.8.	<i>Approvals of engines for several fuel compositions</i>				N/A			
3.14.8.1.	Self-adaptive feature: Yes/No	X	X	X	No			
3.14.8.2.	Calibration for a specific gas composition: NG-H/NG-L/NG-HL/ LNG/Fuel specific LNG	X	X	X	N/A			
3.14.8.3.	Transformation for a specific gas composition: NG-HT/NG-LT/NG-HLT	X	X	X	N/A			
3.14.9.	<i>Fuel temperature pressure regulator final stage</i>				N/A			
3.14.9.1.	Minimum (deg. °C):	X			N/A			
3.14.9.2.	Maximum (deg. °C):	X			N/A			
3.15.	Ignition system							
3.15.1.	<i>Ignition coil(s)</i>							
3.15.1.0.	Make:			X	Chongqing SANMU HUARUI, Chongqing Lihua, Chongqing Yuxin Pingrui, Chongqing Lilan			

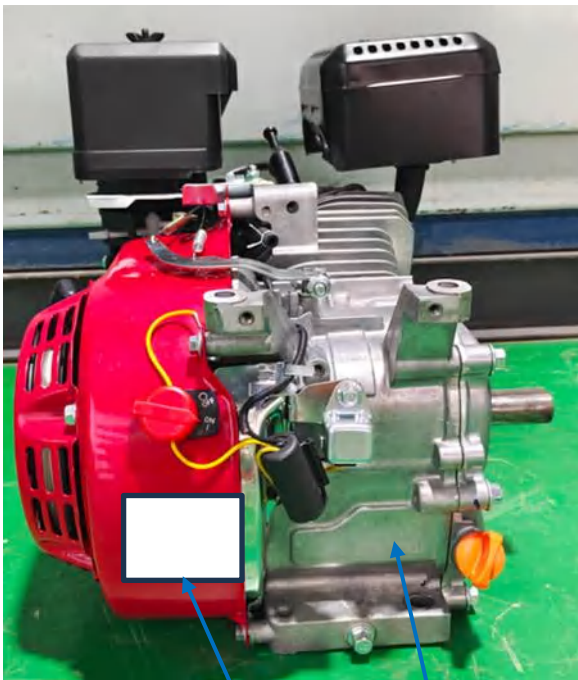
Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
						Type 1	Type 2	Type 3
3.15.1.1.	Type(s):			X	30400-Z44,30400-Z01, 30400-Z30,30400-Z54, 30400-Z43,30400-Z95, 30400-Z1D,30400-Z4W, 30400-Z6R,30400-Z2M, 30400-Z4A, 168F	168F	168F	168F
3.15.1.2.	Number:			X	1			
3.15.2.	<i>Spark plug(s)</i>							
3.15.2.0.	Make:			X	LG / LD / NGK / SAP			
3.15.2.1.	Type(s):			X	F7RTC, F6RTC, F7TC, F6TC			
3.15.2.2.	Gap setting:			X	0.7~0.8 mm			
3.15.3.	<i>Magneto</i>			X	N/A			
3.15.3.0.	Make:			X	N/A			
3.15.3.1.	Type(s):			X	N/A			
3.15.4.	<i>Ignition timing control: Yes/No</i>			X	Yes			
3.15.4.1.	Static advance with respect to top dead centre (crank angle degrees):			X	N/A			
3.15.4.2.	Advance curve or map:			X	Refer to drawing No. 006			
3.15.4.3.	Electronic control: Yes/No			X	No			

Attachment 1 Photographs of the engines



Note: photographs of the engines are for reference only, and the appearance may vary depending on customer needs.

Attachment 2 Drawings of the engines



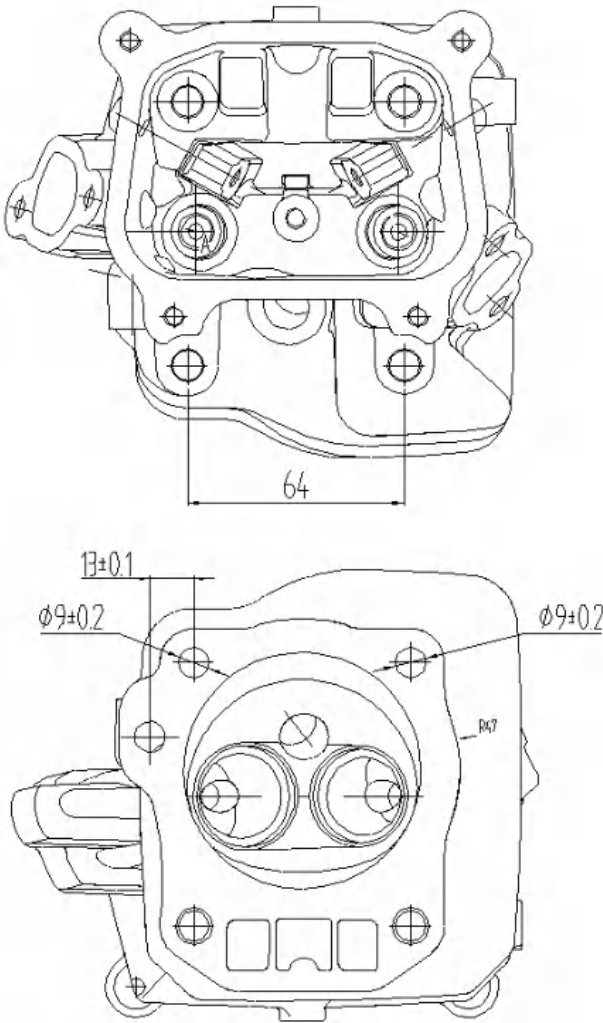
Trade name/Trade mark/Manufacturer name
Engine type
Engine identification number: Manufacture date + Engine serial number.
Approval No./Approval mark: e24*2016/1628*XXXXXXX*XXXX*00 or

e24

 XXXX/P V-XXXX

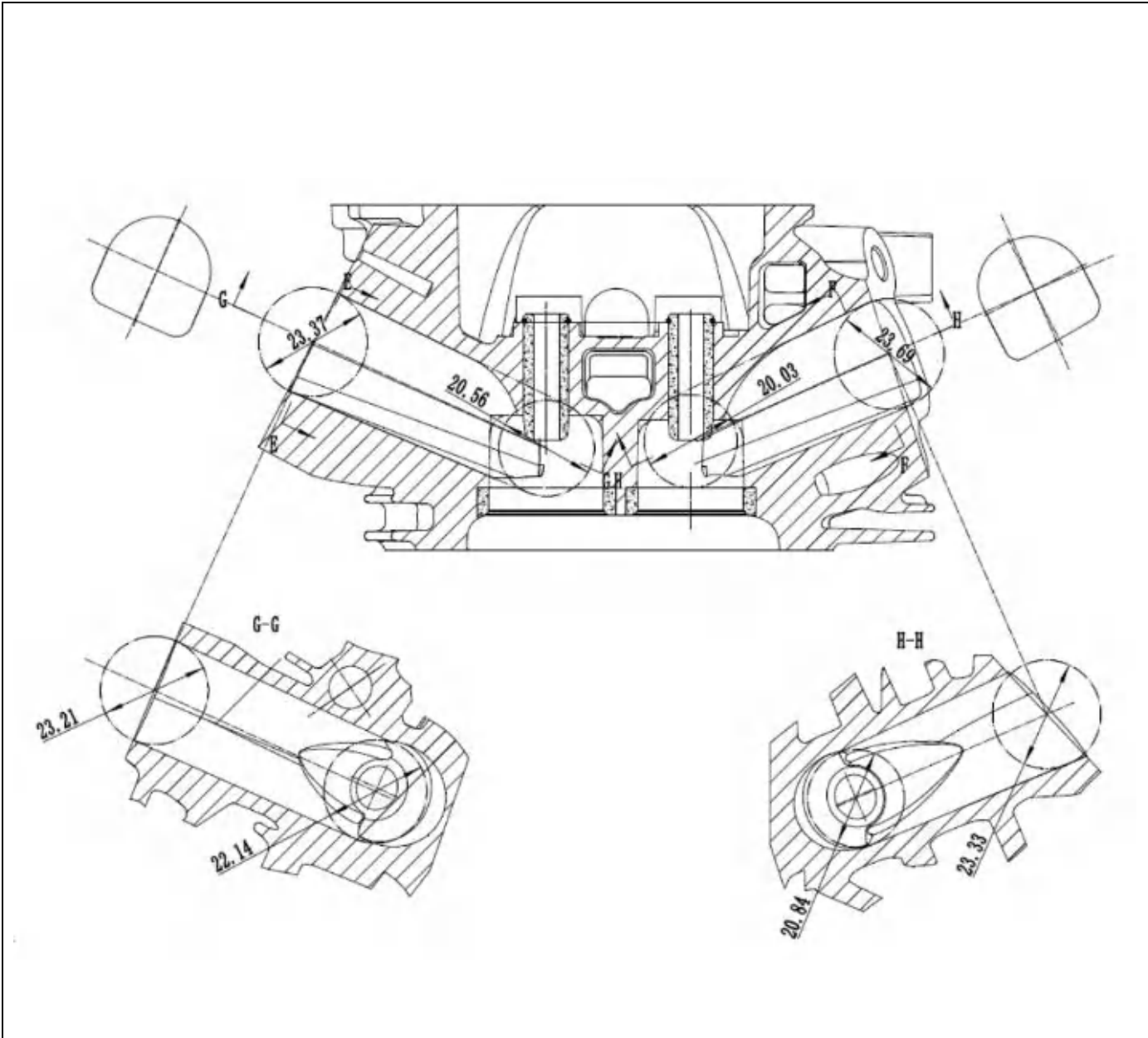
Remarks: this sample only shows the contents that need to be included on the engine marking, the actual position may adjust according manufacturer’s requirement.

Engine family	BS225
Position of statutory marking Position of engine identification number.	
Drawing No.	001



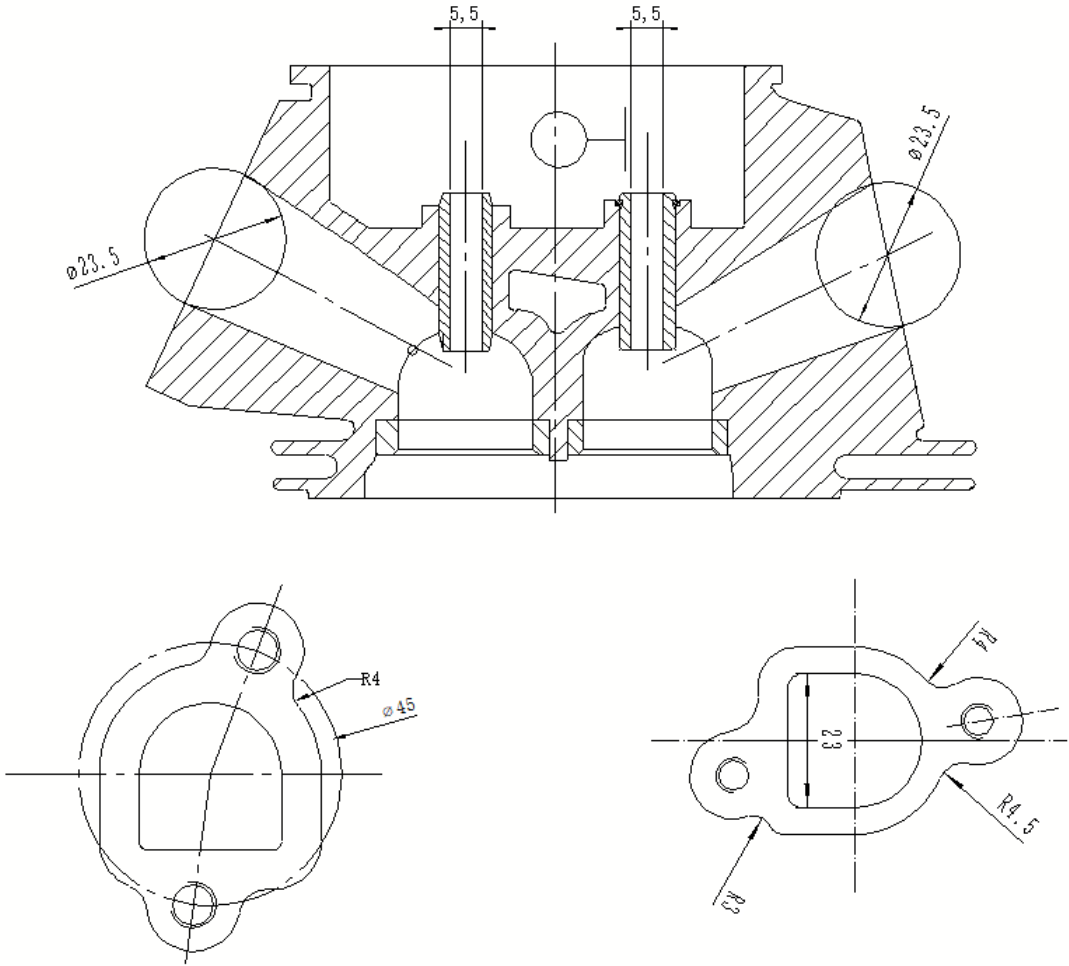
Part No.: BS172F-001

Engine type	BS172F
Combustion chamber	
Valve and port configuration	
Drawing No.	002



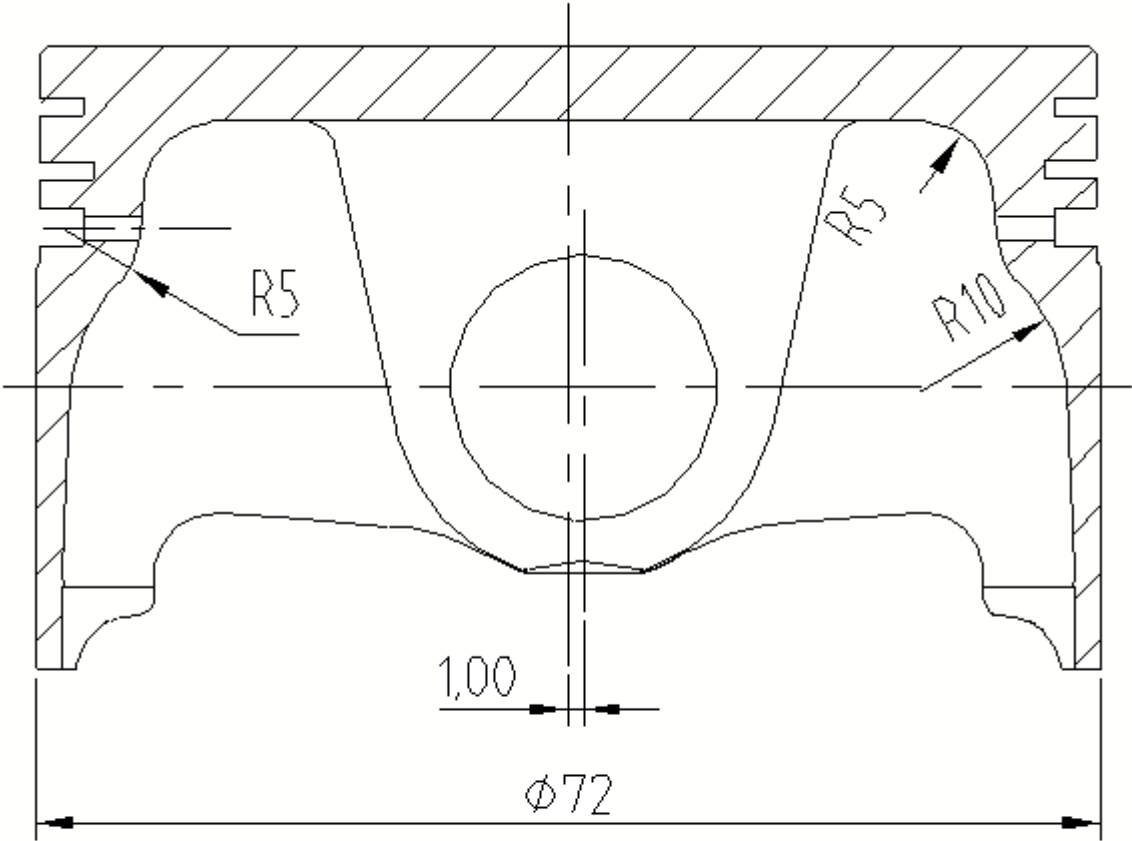
Part No.: BS170F-1-001

Engine type	BS170F-1
Combustion chamber	
Valve and port configuration	
Drawing No.	002



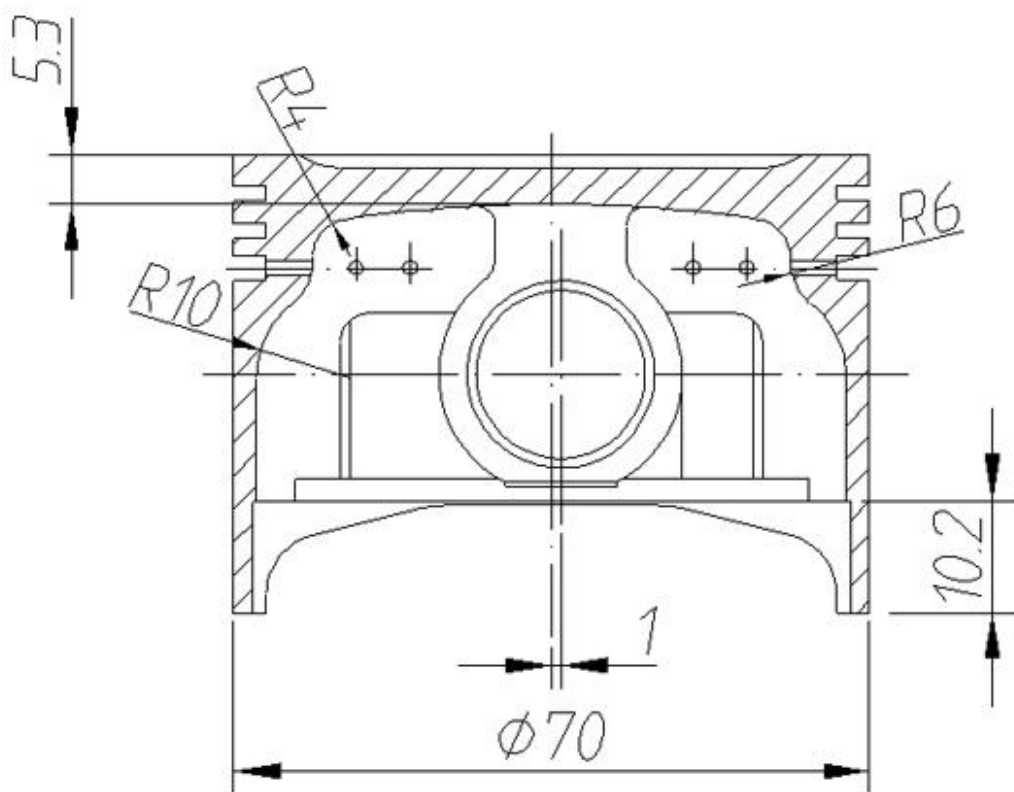
Part No.: BS168F-1-001

Engine type	BS168F-1
Combustion chamber	
Valve and port configuration	
Drawing No.	002



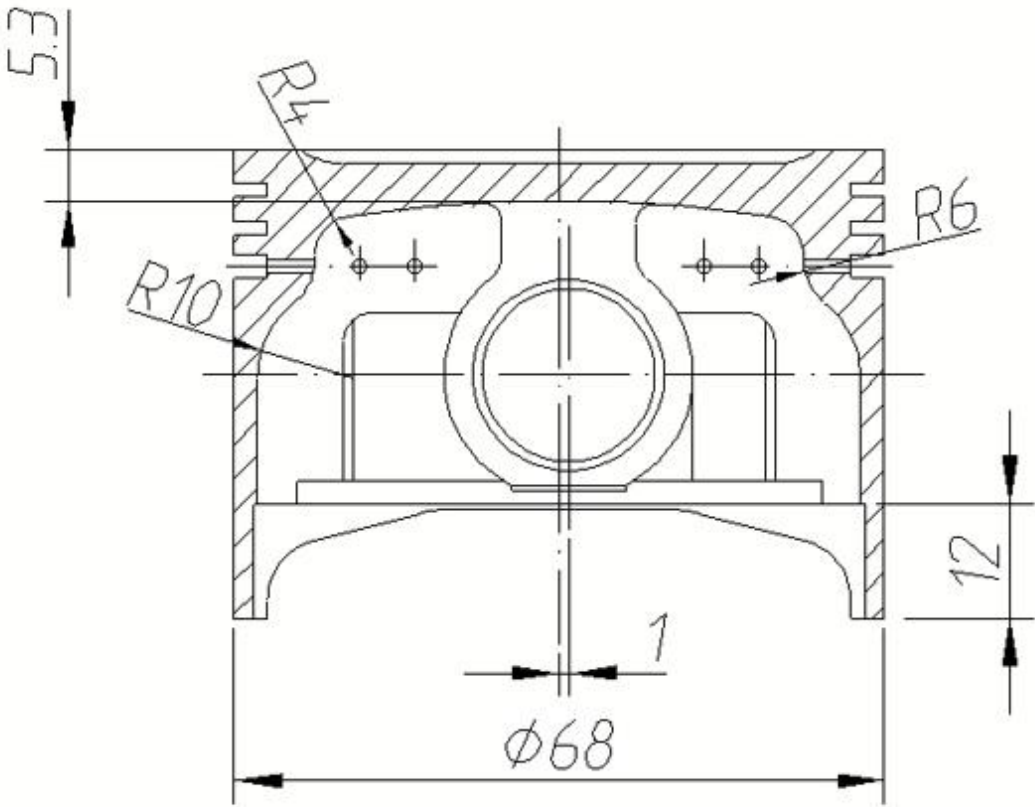
Part No.: BS172F-002

Engine type	BS172F
Piston	
Drawing No.	003



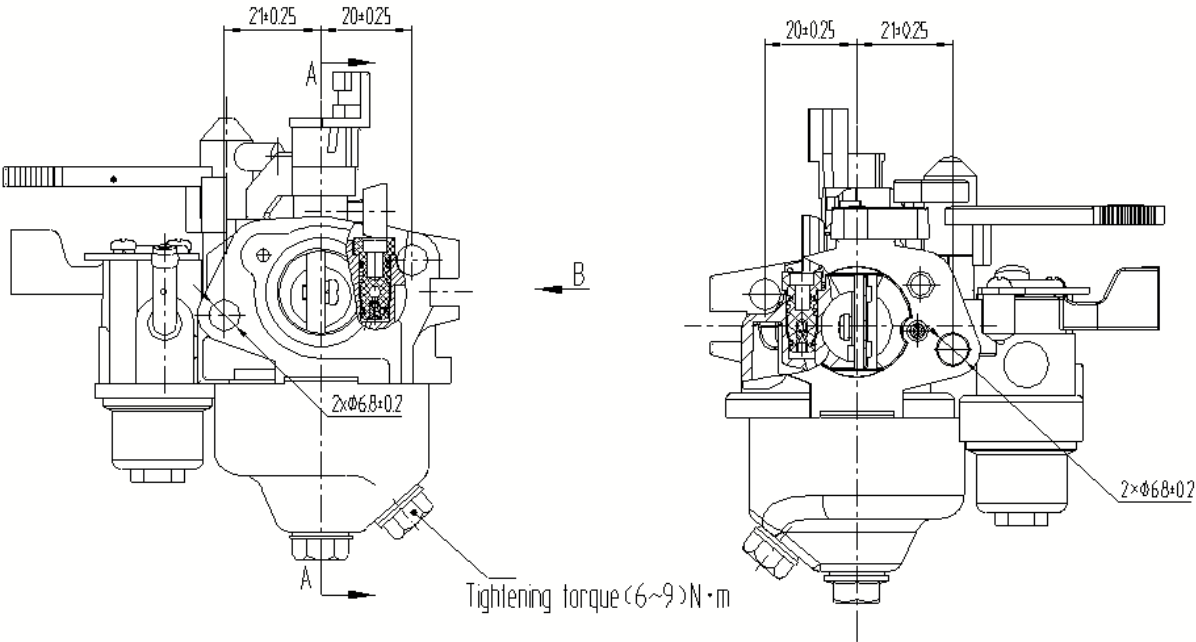
Part No.: BS170F-1-002

Engine type	BS170F-1
Piston	
Drawing No.	003



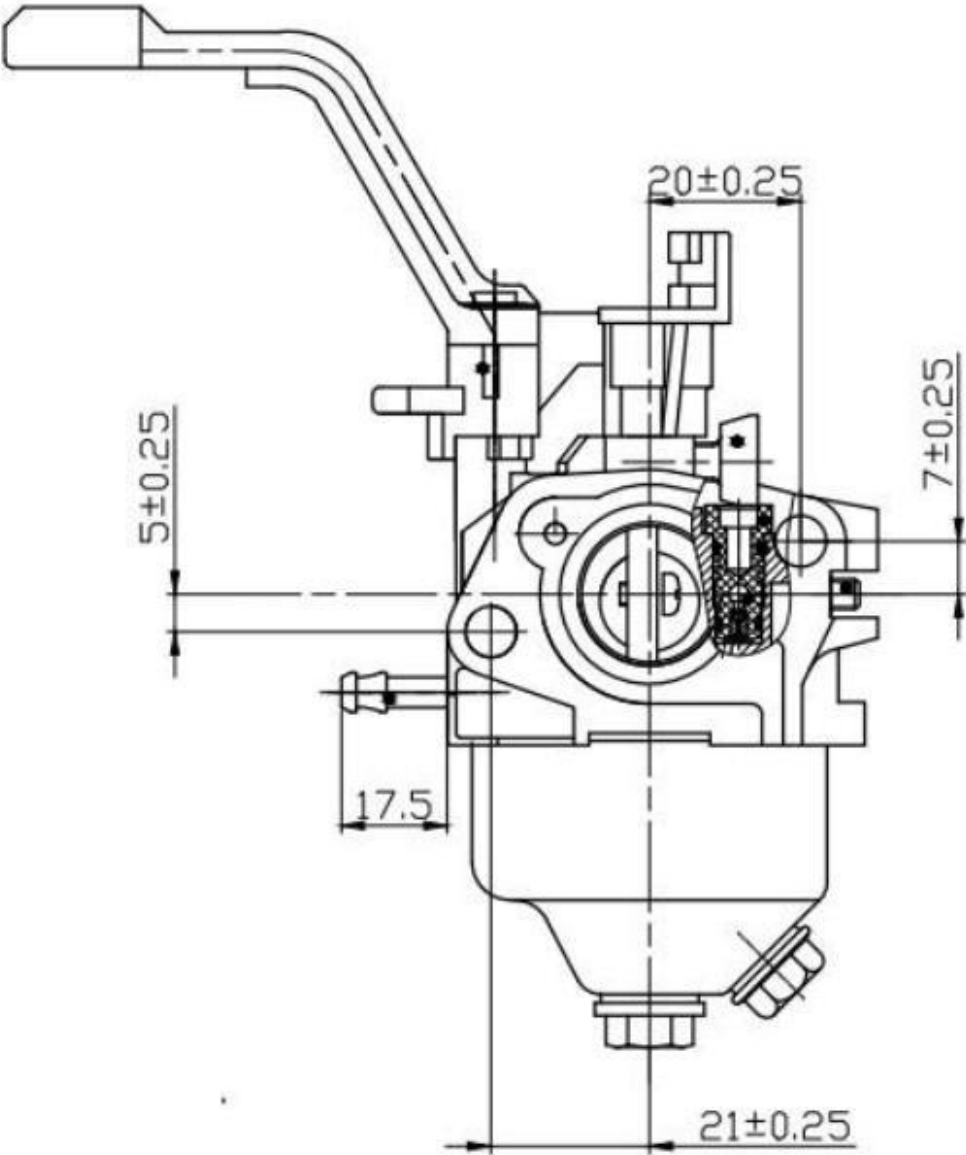
Part No.: BS168F-1-002

Engine type	BS168F-1
Piston	
Drawing No.	003



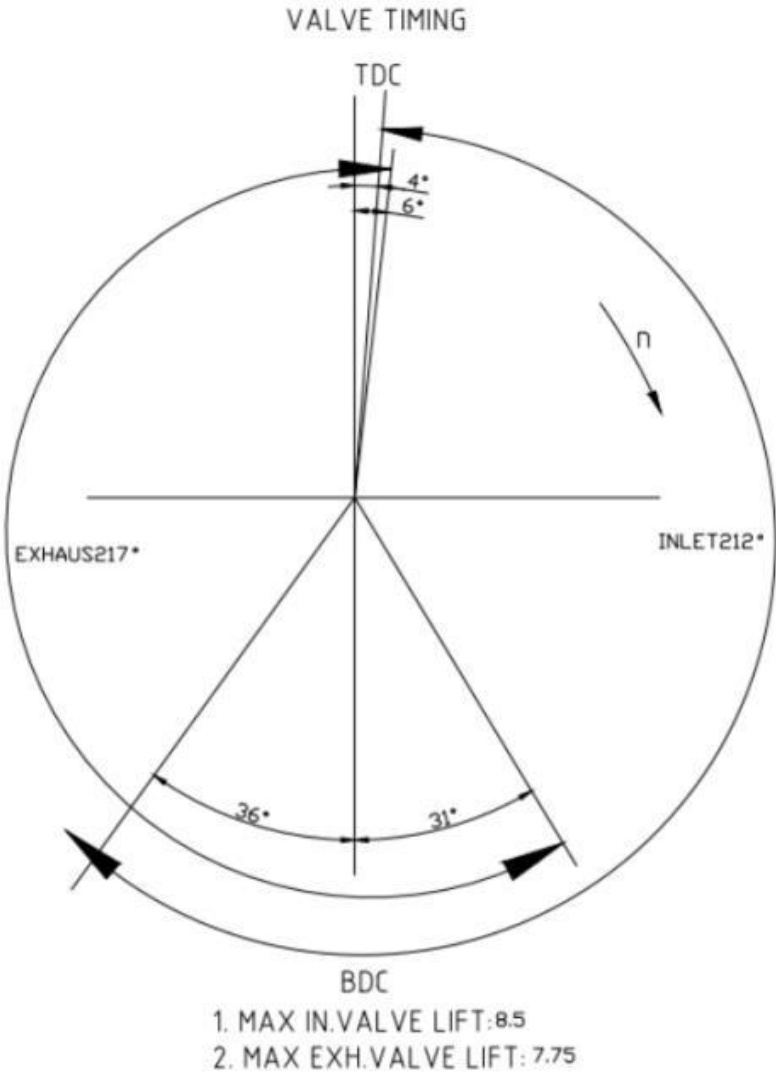
16100

Engine family	BS225
Carburetor	
Drawing No.	004

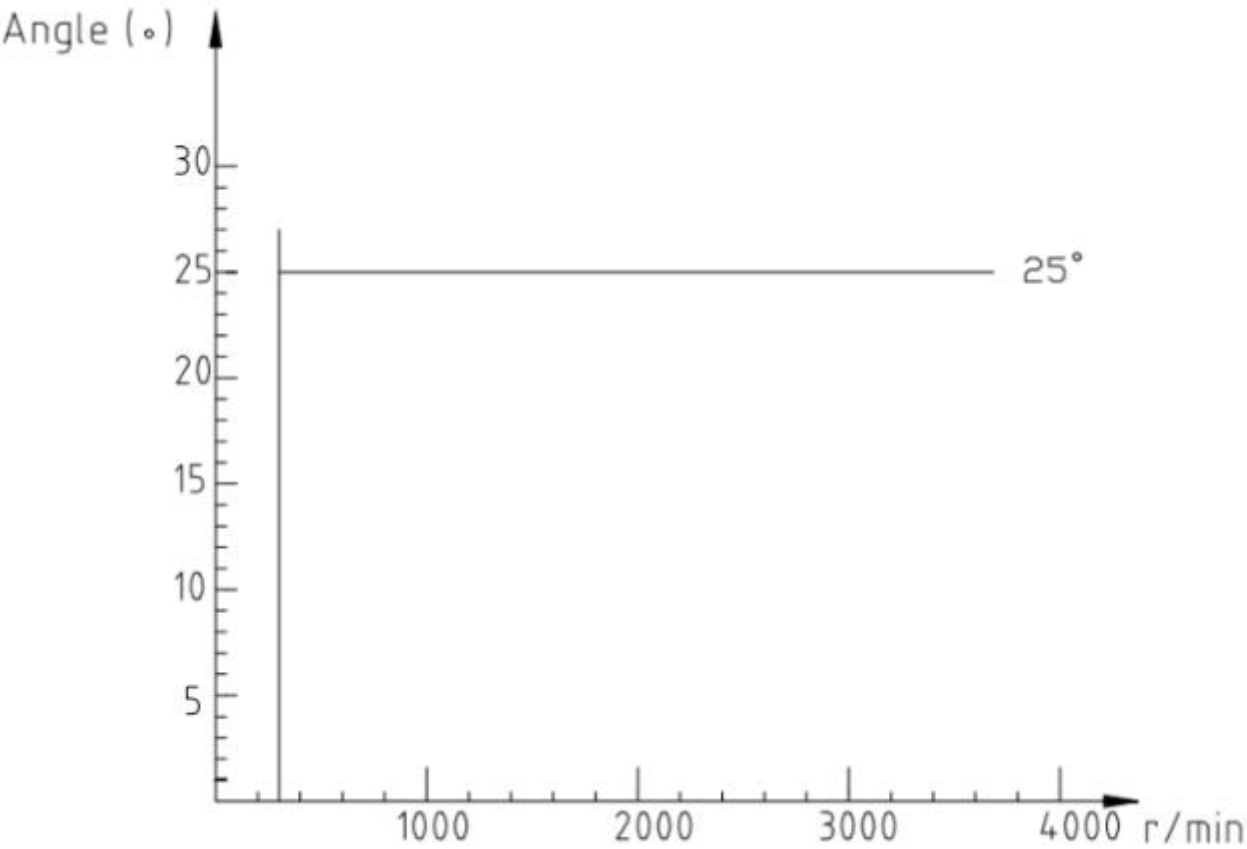


P19

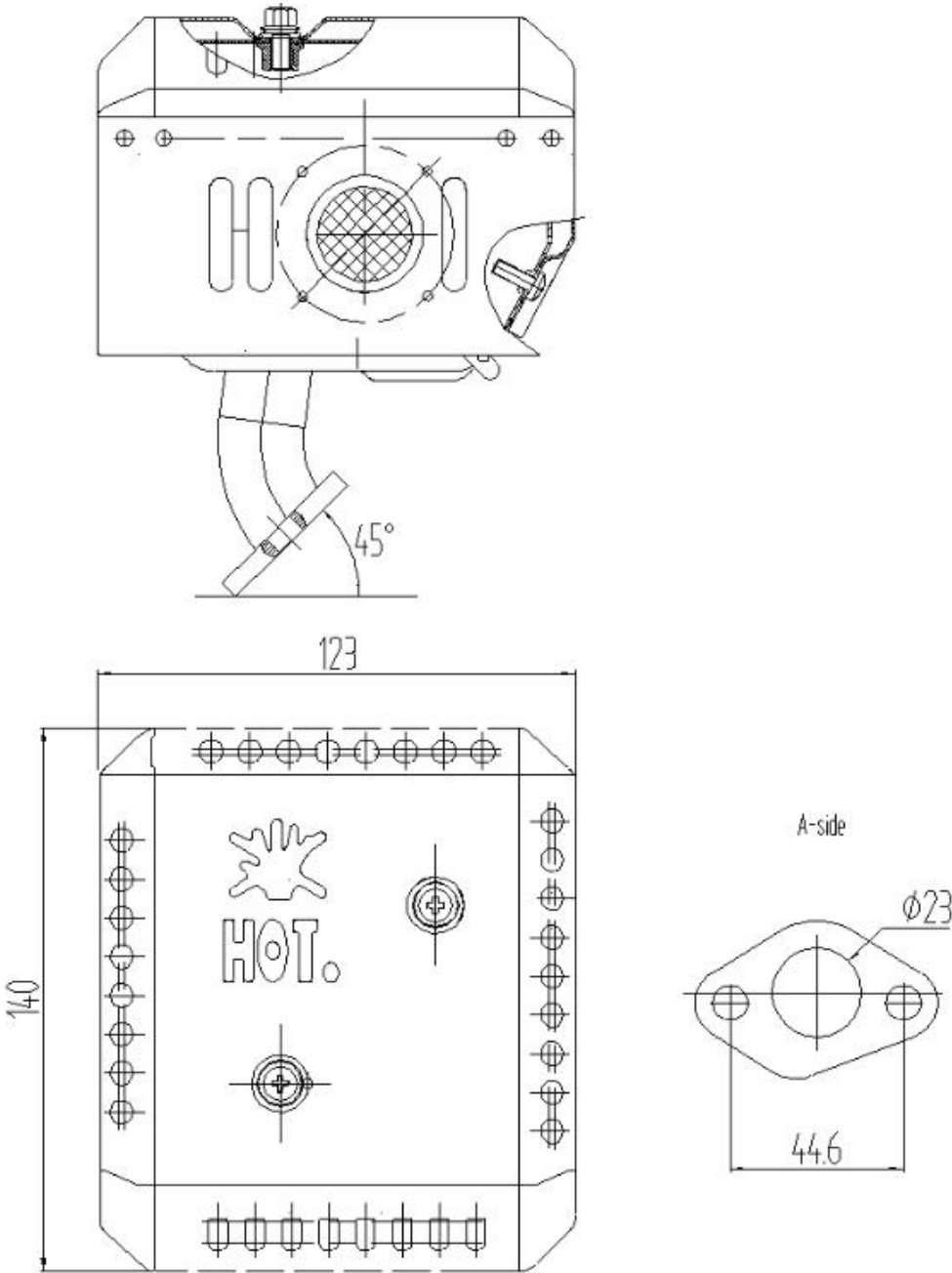
Engine family	BS225
Carburetor	
Drawing No.	004



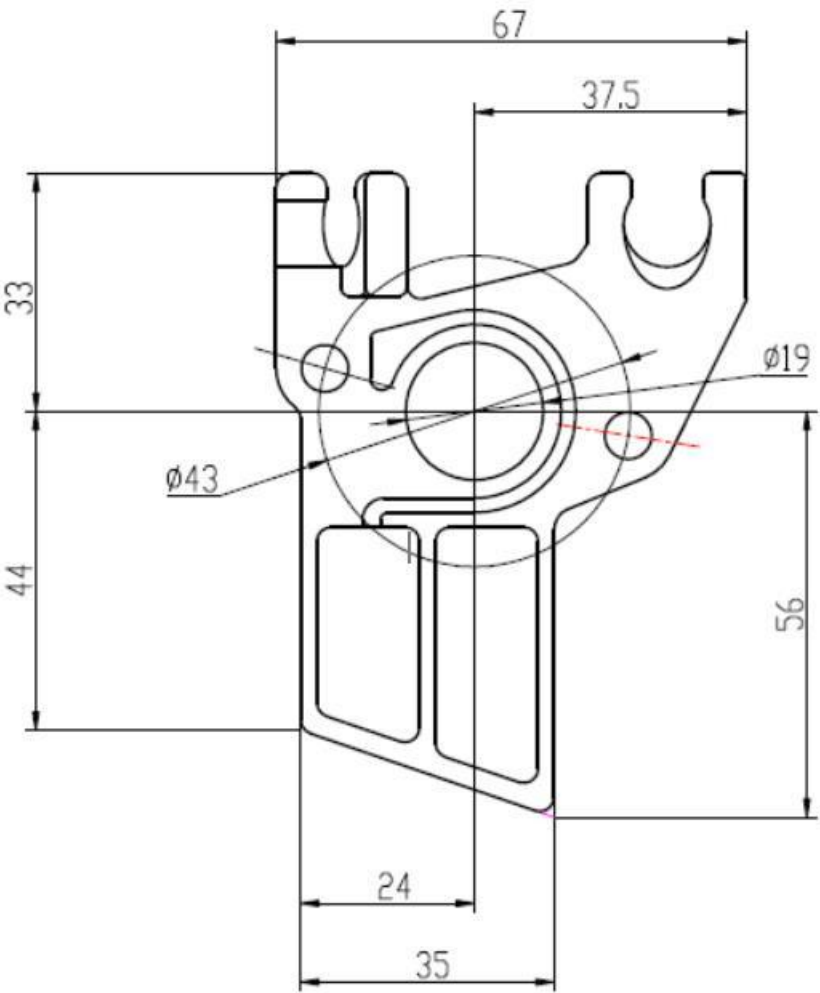
Engine family	BS225
Valve timing	
Drawing No.	005



Engine family	BS225
Ignition advance curve	
Drawing No.	006



Engine family	BS225
Exhaust System	
Drawing No.	007



Part No./Factory internal Drawing No.: BS225-06

Engine family	BS225
Inlet path	
Drawing No.	008

Attachment 3 Manufacturer's declaration on compliance with Regulation (EU) 2016/1628

We, Taizhou Bison Machinery Co., Ltd., Hereby declares that the following ~~engine type~~/engine family complies in all respects with the requirements of Regulation (EU) 2016/1628 of the European Parliament and of the Council, Commission Delegated Regulation (EU) 2017/654, Commission Delegated Regulation (EU) 2017/655 and Commission Implementing Regulation (EU) 2017/656 and does not use any defeat strategy. All emission control strategies comply, where applicable, with the requirements for Base Emission Control Strategy (BECS) and Auxiliary Emission Control Strategy (AECS) set-out in section 2 of Annex IV to Delegated Regulation (EU) 2017/654, and have been disclosed in accordance with that Annex and with Annex I to Implementing Regulation (EU) 2017/656.

- 1.1. Make (trade name(s) of manufacturer) : 
- 1.2. Commercial name(s) (if applicable) : N/A
- 1.3. Company name and address of manufacturer : Taizhou Bison Machinery Co., Ltd.
Building 8, No. 1515. Feng Nan Dong Road,
Jiaojiang District, Taizhou City, Zhejiang Province,
China P.C 318000
- 1.4. Name and address of manufacturer's
authorised representative (if any) : TAGMA D.O.O
SMARSKA CESTA 7C, 6000, KOPER, SLOVENIA
- 1.6. ~~Engine type designation/engine family~~
~~designation/FT~~ : Engine family: BS225
Parent engine: BS172F
Engine within family: BS170F-1, BS170F,
BS168F-1
Commercial names: 1)BS170FE-1, BS223,
2)BS170FE, BS210, 3)BS168FE-1, BS196

Place : Taizhou City

Date : 2023-11-01

Signature : Du Jinzhong



Attachment 4 Manufacturer's statement on compliance with the exhaust emission limits when use fuels other than the reference fuels

N/A

Attachment 5 Overview of the emission control strategy for electronically controlled engines

N/A

Attachment 6 The functional operational characteristics of the NOx control measures and inducement system

N/A

Attachment 7 The functional operational characteristics of the particulate control measures

N/A

Attachment 8 Manufacturer's declaration, and supporting test reports or data, on deterioration factors

We, Taizhou Bison Machinery Co., Ltd., hereby declare that the EDP we chosen is most closely approximates the expected useful lives of the equipment into which the engines are expected to be installed. This conclusion is based on the surveys of the life spans of the equipment in which the subject engines are installed.

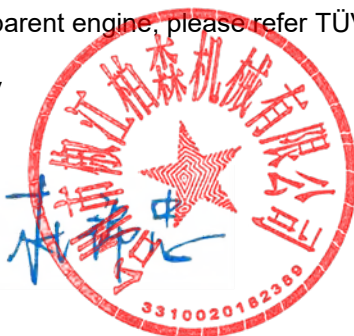
- 1.1. Make (trade name(s) of manufacturer) : 
- 1.2. Commercial name(s) (if applicable) : N/A
- 1.3. Company name and address of manufacturer : Taizhou Bison Machinery Co., Ltd.
Building 8, No. 1515. Feng Nan Dong Road,
Jiaojiang District, Taizhou City, Zhejiang
Province, China P.C 318000
- 1.4. Name and address of manufacturer's authorised representative (if any) : TAGMA D.O.O
SMARSKA CESTA 7C, 6000, KOPER,
SLOVENIA
- 1.6. ~~Engine type designation/engine family designation/FT~~ : Engine family: BS225
Parent engine: BS172F
Engine within family: BS170F-1, BS170F,
BS168F-1
Commercial names: 1)BS170FE-1, BS223,
2)BS170FE, BS210, 3)BS168FE-1, BS196
- 1.7. Category and sub-category of the ~~engine type/engine family~~ : Category: NRS
Sub-category: NRS-vr-1a
- 1.8. EDP hours : 125hCat 1 (Consumer products)

The EDP is carried out on parent engine, please refer TÜV SÜD's test report for details.

Place : Taizhou City

Date : 2023-11-01

Signature : Du Jinzhong



Attachment 9 Manufacturer's declaration, and supporting test reports or data, of the infrequent regeneration adjustment factors

N/A

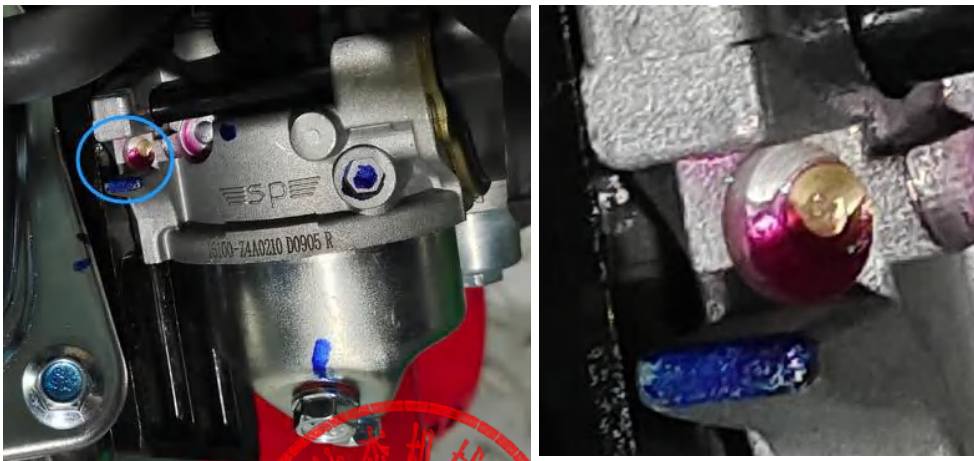
Attachment 10 The physical connector required to receive the torque signal from the engine Electronic control Unit (ECU) during the in-service monitoring test

N/A

Attachment 11 Manufacturer's declaration and supporting data on tampering prevention for emission control systems

We, Taizhou Bison Machinery Co., Ltd., Hereby declares that the emission control strategies of the following ~~engine-~~
~~type/engine~~ family fitted are designed in such a way as to prevent tampering to the extent possible, as referred to in
 Article 18(4) of Regulation (EU) 2016/1628 of the European Parliament and of the Council and Annex X of
 Commission Implementing Regulation (EU) 2017/656.

- 1.1. Make (trade name(s) of manufacturer) : 
- 1.2. Commercial name(s) (if applicable) : N/A
- 1.3. Company name and address of manufacturer : Taizhou Bison Machinery Co., Ltd.
 Building 8, No. 1515. Feng Nan Dong Road, Jiaojiang District, Taizhou City, Zhejiang Province, China P.C 318000
- 1.4. Name and address of manufacturer's authorised representative (if any) : TAGMA D.O.O
 SMARSKA CESTA 7C, 6000, KOPER, SLOVENIA
- 1.6. ~~Engine type designation/engine family-~~
~~designation/FT~~ : Engine family: BS225
 Parent engine: BS172F
 Engine within family: BS170F-1, BS170F, BS168F-1
 Commercial names: 1)BS170FE-1, BS223, 2)BS170FE, BS210, 3)BS168FE-1, BS196

	Photograph	Description
		The mixing ratio adjusting screw is broken and it is stuck by glue. The glue has very good fixed performance and it can't be destroyed by water or petrol.

Place : Taizhou City

Date : 2023-11-01

Signature : Du Jinzhong



Attachment 12 List of scheduled for emission-related maintenance requirements

Proper maintenance is essential for safe, economical and trouble-free operation. It also helps reduce air pollution. In order to keep your gasoline engine in good working condition, it must be periodically serviced. The following maintenance schedule and routine inspection procedures must be carefully followed.

Item	Routine	Pre-operation check (daily)	First month or 25 hrs of operation	6 months or 50 Hr	12 months or 100 Hr
engine oil	Check the oil level	✓			
	Replace		✓	✓ (*1)	
Fuel	Check	✓			
The fuel oil pipe	Check	✓			
Spark plug	Clean-adjust				✓
Air filter inspection	Check	✓	✓		
	Clean			✓ (*2)	
Fuel tank filter	Clean or replace if necessary				✓
Valve clearance	Check-adjust			✓	✓
Spark eliminator	Check-adjust	✓		✓	
Cylinder head & piston	Clean carbon deposit			✓	✓

NOTICE:

*1-- the first oil change should be done one month before or 10 hours after operation

*2-- air filters should be cleaned more frequently when used in damp or dusty places

- If working under high temperature or load frequently, oil should be changed every 25 hours.
- If working frequently in dusty or harsh conditions, the air filter element should be cleaned every 10 hours and replaced every 25 hours if necessary.
- The inspection period and time should be the current maintenance.

If the maintenance cycle time has passed, should be implemented as soon as possible according to the above table maintenance.

Attachment 13 Declaration of fuel delivery with carburettors

According to fuel delivery with carburettor types, we use the highest fuel delivery one to emission test. The following are the fuel delivery test data. Please check.

For type BS172F

Carburetor Make	Model	Max torque speed	Fuel flow(g/h)
RUIXING	P19	14.5 N.m / 2500rpm	1400
	16100		1390
SP	P19		1410
	16100		1420
YINBA	P19		1400
	16100		1400
SPD	P19		1410
	16100		1400
G	P19		1410
	16100		1400
Huayi	P19		1400
	16100		1410

We confirm that quality control and performance are completely identical for the all carburetors.

Place

Date

Signature

: Taizhou City

: 2023-11-01

: Du Jinzhong

