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*2022/992SHB2/P*0687*00***

Reason for extension/refusal/withdrawal [1]: ***- N/A***

SECTION I

1.1.	Make (trade name(s) of manufacturer):	BISON
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):	***See item 1.5 of manufacturer's information document***
1.6.	~~Engine type designation/engine family designation/~~FT ([1]):	*Engine family*: ***BS80*** *Parent engine*: ***BS80i-4*** *Commercial names*: ***BS80#-#, BS80#-##, BS80##- #, BS80##-##*** *Engine within family*: ***1) BS80i, 2) BS80-i, 3) BS60i 4) BS56i*** *Commercial names*: ***1)BS80#, BS80##, 2)BS80-#, BS80-##, 3)BS60#, BS60##, 4)BS56#, BS56##***
1.7.	Category and sub-category of the ~~engine type~~/engine family [1] [4]:	***Category: NRSh*** ***Sub-category: NRSh-v-1b***
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]

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

EU Type Approval No: ***e24*2016/1628*2022/992SHB2/P*0687*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):	***14.03.2024***
3.	Number(s) of test report(s):	***24-00297-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:	***09th May, 2024***

NATIONAL STANDARDS AUTHORITY OF IRELAND NSAI Certification TRANSPORT DEPARTMENT

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:

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

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]'.
EU Type Approval No: ***e24*2016/1628*2022/992SHB2/P*0687*00***

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/~~pressure charged/ 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:	***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)~~*** [1]
2.9.	Engine management systems:	***mechanical/~~electronic control strategy~~*** [1]

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

EU Type Approval No: ***e24*2016/1628*2022/992SHB2/P*0687*00***

2.10.	Miscellaneous devices:	~~***Yes***~~***/No*** [1]
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):	***No***
2.11.9.	Other devices or features that have a strong influence on emissions (specify):	***N/A***

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

EU Type Approval No: ***e24*2016/1628*2022/992SHB2/P*0687*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:	***BS80i-4***	*	*
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. No.001***	*	*
3.2.1.	Declared rated speed (rpm):	***5200***	*	*
3.2.1.2.	Declared rated net Power (kW):	***2.4***	*	*
3.2.2.	Maximum power speed (rpm):	***5200***	*	*
3.2.2.2.	Maximum net power (kW):	***2.4***	*	*
3.2.3.	Declared maximum torque speed (rpm):	***3500***	*	*
3.2.3.2.	Declared maximum torque (Nm):	***4.6***	*	*
3.6.3.	Number of Cylinders:	***1***	*	*
3.6.4.	Engine total swept volume (cm^3):	***79.8***	*	*
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, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

EU Type Approval No: ***e24*2016/1628*2022/992SHB2/P*0687*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:	***-0.4***	*	*
3.8.3.2.	Maximum charge air cooler outlet temperature at 100 % speed and 100 % load (deg. C):	***N/A***	*	*
3.8.3.3.	Maximum allowable pressure drop across charge cooler at 100 % engine speed and at 100 % load (kPa) (if applicable):	***N/A***	*	*
3.9.3.	Maximum permissible exhaust gas backpressure at 100 % engine speed and at 100 % load (kPa):	*7*	*	*
3.9.3.1	Location of measurement:	***Exhaust pipe***	*	*
3.11.1.2.	Maximum temperature drop from exhaust system or turbine outlet to first exhaust after-treatment system (deg. C) if stated:	***N/A***	*	*
3.11.1.2.1.	Test conditions for measurement:	***N/A***	*	*

**** - See test report 24-00297-CX-SHA-00 and accompanying information document 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 × ECU torque: ~~***Yes***~~***/No*** [1]

3.8.2. ECU torque correction factor in case that dynamometer torque less than 0,93 × 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.	***373.4***	***-***	***-***	***19.1***	***N/A***	***N/A***	***G3***
NRTC Final test result with DF	***-***	***-***	***-***	***-***	***-***	***-***	***-***

11.2. CO_2 result: ***NRSC: 821 g/kWh***
NRTC: - g/kWh

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

EU Type Approval No: ***e24*2016/1628*2022/992SHB2/P*0687*00***

11.3. In service monitoring reference values [9]

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

11.3.2. Reference CO_2 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.

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

EU Type Approval No: ***e24*2016/1628*2022/992SHB2/P*0687*00***

Index to the Information Package

Date of issue:	***09th May, 2024***
Date of latest amendment:	***N/A***
Reason for extension/revision:	***N/A***

1. Additional conditions, and advisory notes on legal alternatives.

2. Test report(s)

- numbers(s):	***24-00297-CX-SHA-00***
- date of issue:	***14.03.2024***
- date of latest amendment:	***N/A***

3. Information document

- number(s):	***BS80-ext.00***
- date of issue:	***02.01.2024***
- date of latest amendment:	***N/A***

Documentation: ***76 pages***

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

EU Type Approval No: ***e24*2016/1628*2022/992SHB2/P*0687*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.

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

Test Report

No.: 24-00297-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)	:	
~~Engine type designation/engine family designation/~~FT	:	Engine family: BS80 Parent engine: BS80i-4 Commercial names: BS80#-#, BS80#-##, BS80##-#, BS80##-## Engine within family: 1) BS80i, 2) BS80-i, 3) BS60i 4) BS56i Commercial names: 1)BS80#, BS80##, 2)BS80-#, BS80-##, 3)BS60#, BS60##, 4)BS56#, BS56## Note: postfix '#' is the designation for future non-emission and non-performance related revision change. It may be an uppercase or lowercase letter from A to Z, or a number from 1 to 9
Engine Category and subcategory	:	Category: NRSh Sub-category: NRSh-v-1b
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. BS80-ext.00 dated 02.01.2024 (dd.mm.yyyy)

IV. Statement of conformity

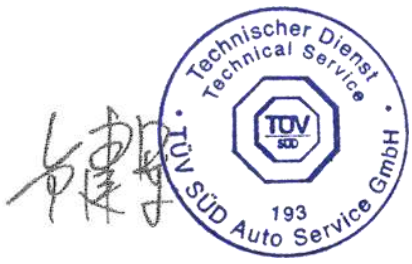
The mentioned information folder and the type described therein are in accordance with the test basis mentioned above. Sampling plan or method result from the requirements of the test basis. The worst-case configuration was selected in accordance with process description "Requirements for Test Reports (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, 14.03.2024 (dd.mm.yyyy)

Jianjun Lu

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	:	05.01.2024 - 01.02.2024
1.8.	Test report number	:	24-00297-CX-SHA-00
1.9.	Information document reference number (if available)	:	BS80-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: BS80 Parent engine: BS80i-4 Commercial names: BS80#-#, BS80#-##, BS80##-#, BS80##-## Engine within family: 1) BS80i, 2) BS80-i, 3) BS60i 4) BS56i Commercial names: 1)BS80#, BS80##, 2)BS80-#, BS80-##, 3)BS60#, BS60##, 4)BS56#, BS56## Note: postfix '#' is the designation for future non-emission and non-performance related revision change. It may be an uppercase or lowercase letter from A to Z, or a number from 1 to 9
2.2.	Engine identification number	:	23120062
2.3.	Engine category and subcategory	:	Category: NRSh Sub-category: NRSh-v-1b
2.4.	Worst case rationale	:	Tests are carried out on the parent engine. Carburettor (Make: SP, Type: P16) 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 / QC100-3 / 111008-1 [Valid until: 07.08.2024]

3. Documentation and information Check list (primary test only)

3.1.	Engine mapping documentation reference	:	G3 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
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 × 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/m^3)	:	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/m^3)	:	N/A
4.3.	*Gaseous fuel – LPG*		
4.3.1.	Make	:	N/A
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 Sλ 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)	:	5200
6.1.1.	100% speed determined by	:	Declared rated speed~~/Declared MTS/Measured MTS~~
6.1.2.	Adjusted MTS if applicable (rpm)	:	N/A
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)	:	3300

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 ($P_{f,i}$):~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~

~~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 absored 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 ($P_{r,i}$):~~	-	-	-	-	-	-	-

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 ($P_{m,i}$)	---	2.4	2.4
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 $Pi = P_{m,i} - P_{f,i} + P_{r,i}$	---	2.4	2.4

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 altitude of test facility and dry atmospheric pressure : N/A

8.2. Applicable intake air temperature range : 20 to 30/~~0 to -5(snow throwers only)/-5 to -15(snowmobiles only)/20 to 35(NRE greater than 560 kW only)~~ : Yes

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%	-	-	-	-	-	-
25%	-	-	-	-	-	-
50%	-	-	-	-	-	-
75%	-	-	-	-	-	-
100%	-	-	-	-	-	2.4

(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 mult~~/add~~	CO	HC	NO_x	HC+NO_x	PM	PN
	1.05	-*	-*	1.07	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	354.12	10.90	7.02	17.92	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	373.4	-*	-*	19.1	N/A	N/A

9.3.3. Cycle weighted CO_2 (g/kWh) : 821

9.3.4. Cycle weighted NH_3 (ppm) : N/A

~~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~~

10.3. NRTC emission results

Table 9

DF values and the emission results for 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
Cold start	-	-	-	-	-	-
Hot start test result with/without regeneration	-	-	-	-	-	-
Weighted test result	-	-	-	-	-	-
k_{ru}/k_{rd} mult/add	-	-	-	-	-	-
Weighted test result with IRAFs	-	-	-	-	-	-
Final test result with DF	-	-	-	-	-	-

10.3.1 Hot cycle CO_2 (g/kWh) :

10.3.2. Cycle weighted NH_3 (ppm) :

10.3.3. Cycle work for hot start test (kWh) :

10.3.4. Cycle CO_2 for hot start test (g) :

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 CO_2 (g/kWh) :

10.4.2. Cycle NH_3 (ppm) :

10.4.3. Cycle work (kWh) :

10.4.4. Cycle CO_2 (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).	373.4	-*	-*	19.1	N/A	N/A	G3
NRTC Final test result with DF(3)	-	-	-	-	-	-	-

11.2 CO_2 result (g/kWh) (4) : 821

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 CO 2 emissions values from the NRTC noted in point 10.3.4 or the CO 2 emissions values from the LSI-NRTC noted in point 10.4.4. For an engine only tested on an NRSC indicate the CO 2 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 CO 2 for hot start test value from the NRTC noted in point 10.3.4.

Appendix 1 Determination of deterioration factor

Engine type BS80i-4 (engine No: 23120062)

	New stabilized engine	engine after 125 hours' aging cycle	DF
CO	354.12 g/kWh	373.43 g/kWh	1.05
HC	10.90 g/kWh	11.61 g/kWh	-*
NO_x	7.02 g/kWh	7.48 g/kWh	-*
HC + NOx	17.92 g/kWh	19.09 g/kWh	1.07

* Separate DF for HC and NOx 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 08.01.2024)
[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 (℃)	Barometric Pressure (kPa)	Ambient Temperature (℃)	Air Relative Humidity (%)
2024/1/8	1	08:00-09:00	5205	2.49	4.57	1.099	214.4	102.9	20.8	54.8
2024/1/8	2	09:00-10:00	5206	2.48	4.56	1.097	215.5	102.8	20.9	54.8
2024/1/8	3	10:00-11:00	5205	2.49	4.56	1.095	216.0	102.6	21.0	55.1
2024/1/8	4	11:00-12:00	5208	2.48	4.56	1.092	215.5	102.8	21.5	55.1
2024/1/8	5	12:00-13:00	5202	2.48	4.56	1.095	215.0	102.9	21.0	54.6
2024/1/8	6	13:00-14:00	5203	2.48	4.56	1.096	214.4	102.6	21.1	54.1
2024/1/8	7	14:00-15:00	5204	2.49	4.56	1.097	214.6	102.8	21.3	54.3
2024/1/8	8	15:00-16:00	5204	2.49	4.56	1.099	216.1	103.0	21.6	54.1
2024/1/8	9	16:00-17:00	5206	2.49	4.57	1.093	215.8	102.9	21.4	55.2
2024/1/8	10	17:00-18:00	5208	2.49	4.57	1.092	216.4	103.0	21.4	54.6
2024/1/8	/	18:00-19:00	Oil change, checking air filter, fuel pipe, spark plug, fuel tank filter and fuel							
2024/1/8	11	19:00-20:00	5204	2.48	4.55	1.098	215.2	103.0	21.1	54.7
2024/1/8	12	20:00-21:00	5201	2.49	4.57	1.093	214.8	103.1	21.0	54.2
2024/1/8	13	21:00-22:00	5205	2.48	4.55	1.098	216.8	103.0	21.4	54.0
2024/1/8	14	22:00-23:00	5202	2.49	4.57	1.098	216.5	102.6	21.1	54.8
2024/1/8	15	23:00-00:00	5203	2.48	4.56	1.096	216.6	102.9	21.2	54.1
2024/1/9	16	00:00-01:00	5208	2.48	4.56	1.091	216.5	102.7	21.2	54.3
2024/1/9	17	01:00-02:00	5203	2.49	4.57	1.099	216.1	102.9	21.0	55.2
2024/1/9	18	02:00-03:00	5208	2.49	4.56	1.100	214.6	103.0	21.0	54.1
2024/1/9	19	03:00-04:00	5204	2.48	4.55	1.091	214.3	103.0	21.0	54.3
2024/1/9	20	04:00-05:00	5207	2.48	4.55	1.097	216.3	102.7	21.2	55.3
2024/1/9	21	05:00-06:00	5202	2.49	4.56	1.090	216.5	103.0	21.0	54.6
2024/1/9	22	06:00-07:00	5203	2.48	4.55	1.091	216.4	102.9	21.2	55.0
2024/1/9	23	07:00-08:00	5205	2.48	4.56	1.095	215.3	102.9	21.6	54.9

2024/1/10	51	13:00-14:00	5207	2.47	4.54	1.098	215.4	102.7	21.5	54.9
2024/1/10	52	14:00-15:00	5205	2.47	4.54	1.099	214.4	102.6	20.9	54.9
2024/1/10	53	15:00-16:00	5207	2.47	4.53	1.095	214.8	103.1	21.5	54.9
2024/1/10	54	16:00-17:00	5202	2.47	4.53	1.098	214.6	102.7	20.9	54.4
2024/1/10	55	17:00-18:00	5207	2.46	4.52	1.092	214.2	102.9	21.3	54.0
2024/1/10	56	18:00-19:00	5202	2.46	4.52	1.099	216.5	103.0	21.5	54.4
2024/1/10	57	19:00-20:00	5204	2.47	4.54	1.099	214.5	103.0	21.5	54.7
2024/1/10	58	20:00-21:00	5204	2.46	4.52	1.094	216.4	103.0	20.8	55.4
2024/1/10	59	21:00-22:00	5202	2.47	4.53	1.098	216.6	102.7	21.0	54.7
2024/1/10	60	22:00-23:00	5205	2.46	4.52	1.099	216.5	102.6	21.1	54.0
2024/1/10	61	23:00-00:00	5204	2.47	4.54	1.094	214.7	103.0	21.3	54.4
2024/1/11	62	00:00-01:00	5208	2.47	4.53	1.093	216.7	102.8	21.0	54.4
2024/1/11	63	01:00-02:00	5208	2.47	4.53	1.099	214.6	102.9	21.4	54.4
2024/1/11	64	02:00-03:00	5202	2.47	4.53	1.097	216.2	102.9	21.4	55.2
2024/1/11	65	03:00-04:00	5204	2.47	4.53	1.093	215.7	103.0	20.9	55.2
2024/1/11	66	04:00-05:00	5204	2.47	4.53	1.090	214.4	102.9	21.3	54.4
2024/1/11	67	05:00-06:00	5203	2.46	4.52	1.095	216.4	103.1	21.5	54.9
2024/1/11	68	06:00-07:00	5202	2.47	4.53	1.095	215.0	103.0	21.1	54.1
2024/1/11	69	07:00-08:00	5202	2.47	4.54	1.095	216.7	103.0	20.8	55.3
2024/1/11	70	08:00-09:00	5208	2.45	4.49	1.100	214.9	102.6	21.2	55.0
2024/1/11	71	09:00-10:00	5202	2.45	4.50	1.093	214.9	102.8	21.0	55.3
2024/1/11	72	10:00-11:00	5204	2.44	4.48	1.096	216.1	102.7	20.8	54.6

2024/1/13	101	08:00-09:00	5204	2.41	4.43	1.085	216.7	102.9	21.5	54.4
2024/1/13	102	09:00-10:00	5202	2.42	4.44	1.083	217.4	102.7	20.9	55.0
2024/1/13	103	10:00-11:00	5205	2.43	4.46	1.086	215.4	102.9	21.5	55.0
2024/1/13	104	11:00-12:00	5207	2.42	4.45	1.086	216.1	103.0	21.1	55.1
2024/1/13	105	12:00-13:00	5208	2.43	4.46	1.082	215.5	103.0	20.9	54.8
2024/1/13	106	13:00-14:00	5201	2.42	4.44	1.089	216.7	102.7	21.5	55.2
2024/1/13	107	14:00-15:00	5204	2.45	4.49	1.081	217.7	102.6	20.9	54.4
2024/1/13	108	15:00-16:00	5203	2.42	4.45	1.081	216.3	103.0	21.4	54.3
2024/1/13	109	16:00-17:00	5208	2.43	4.46	1.081	216.6	103.1	20.9	55.3
2024/1/13	110	17:00-18:00	5205	2.44	4.47	1.087	216.0	102.7	21.2	54.5
2024/1/13	111	18:00-19:00	5206	2.43	4.46	1.083	216.3	103.0	20.8	54.4
2024/1/13	112	19:00-20:00	5205	2.39	4.38	1.089	216.0	102.8	20.9	54.1
2024/1/13	113	20:00-21:00	5206	2.40	4.40	1.087	216.6	102.7	21.2	55.2
2024/1/13	114	21:00-22:00	5206	2.41	4.43	1.089	215.8	103.1	21.5	54.9
2024/1/13	115	22:00-23:00	5205	2.38	4.37	1.082	216.1	102.8	21.1	54.9
2024/1/13	116	23:00-00:00	5201	2.39	4.40	1.086	217.0	102.7	21.3	55.0
2024/1/14	117	00:00-01:00	5205	2.40	4.41	1.087	217.4	102.9	20.8	55.1
2024/1/14	118	01:00-02:00	5208	2.41	4.42	1.085	216.9	102.9	20.9	54.7
2024/1/14	119	02:00-03:00	5201	2.39	4.39	1.086	217.4	103.0	21.4	54.3
2024/1/14	120	03:00-04:00	5204	2.40	4.40	1.085	217.9	102.9	21.4	54.8
2024/1/14	121	04:00-05:00	5204	2.40	4.40	1.082	216.1	103.0	21.1	55.1
2024/1/14	122	05:00-06:00	5201	2.40	4.40	1.084	215.7	103.0	20.9	55.2
2024/1/14	123	06:00-07:00	5202	2.39	4.38	1.083	217.1	102.7	21.1	54.2
2024/1/14	124	07:00-08:00	5203	2.39	4.38	1.087	217.0	102.7	21.2	54.3
2024/1/14	125	08:00-09:00	5204	2.41	4.42	1.087	217.1	102.9	21.5	55.2
2024/1/14	/	/	Oil change, clean air filter and spark plug fouling, checking fuel pipe, fuel tank filter and fuel							

Note: 1. The engine runs at idle speed for 3 minutes after each starting.
2. Maintenance after 125 hours is performed only when emission testing is required.

PARTIAL TYPE INFORMATION DOCUMENT

No.: BS80-ext.00

Taizhou Bison Machinery Co., Ltd.

ENGINE FAMILY	**:**	**BS80**
SUBJECT	**:**	**NRMM EMISSION**
LEGAL BASIS	**:**	**2016/1628/EU**

Date	:	2024-01-02[YYYY-MM-DD]
Approval	:	Du Jinzhong

AMENDMENT

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

CONTENT

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: BS80 Parent engine: BS80i-4 Commercial names: BS80#-#, BS80#-##, BS80##-#, BS80##-## Engine within family: 1) BS80i, 2) BS80-i, 3) BS60i 4) BS56i Commercial names: 1)BS80#, BS80##, 2)BS80-#, BS80-##, 3)BS60#, BS60##, 4)BS56#, BS56## Note: postfix '#' is the designation for future non-emission and non-performance related revision change. It may be an uppercase or lowercase letter from A to Z, or a number from 1 to 9
1.7.	Category and sub-category of the~~ engine type/~~engine family	:	Category: NRSh Sub-category: NRSh-v-1b
1.8.	Emissions durability period category	:	125hCat 2 (Semi-professional 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 (if yes, complete section 3.10.2. and provide a schematic diagram of the location and order of the devices)	:	No
2.10.3.	Air injection: Yes/No (if yes, complete section 3.10.3. and provide a schematic diagram of the location and order of the devices)	:	No
2.10.4.	Others: Yes/No (if yes, complete section 3.10.4 and provide a schematic diagram of the location and order of the devices)	:	No
2.11.	**Exhaust after-treatment system** (if yes provide a schematic diagram of the location and order of the devices)	:	**~~Yes/~~No**
2.11.1.	Oxidation catalyst (if yes, complete section 3.11.2.)	:	~~Yes~~/No
2.11.2.	DeNOx system with selective reduction of NOx (addition of reducing agent) (if yes, complete section 3.11.3.)	:	~~Yes/~~No
2.11.3.	Other DeNOx systems (if yes, complete section 3.11.3.)	:	~~Yes/~~No
2.11.4.	Three-way catalyst combining oxidation and NOx reduction (if yes, complete section 3.11.3.)	:	~~Yes/~~No
2.11.5.	Particulate after-treatment system with passive regeneration (if yes, complete section 3.11.4.)	:	~~Yes/~~No
2.11.5.1.	Wall-flow/non-wall-flow	:	N/A
2.11.6.	Particulate trap with active regeneration (if yes, complete section 3.11.4.)	:	~~Yes/~~No
2.11.6.1.	Wall-flow/non-wall-flow	:	N/A
2.11.7.	Other particulate after-treatment systems (if yes, complete section 3.11.4.)	:	~~Yes/~~No
2.11.8.	Other after-treatment devices (specify) (if yes, complete section 3.11.5.)	:	~~Yes/~~No
2.11.9.	Other devices or features that have a strong influence on emissions (if yes, complete section 3.11.7.)	:	~~Yes/~~No

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
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			5200	5000	4500	5000	4800
3.2.1.1.	~~Fuel delivery/stroke (mm^3) for diesel engine,~~ fuel flow (g/h) for other engines, at rated net power:			X	1092	1000	950	1000	850
3.2.1.2.	Declared rated net power (kW):	X			2.4	2.3	2.1	1.5	1.1
3.2.2.	Maximum power speed(rpm):			X	Same as above 3.2.1.				
3.2.2.1.	~~Fuel delivery/stroke (mm^3) 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			3500	3500	3500	3500	3500
3.2.3.1.	~~Fuel delivery/stroke (mm^3) for diesel engine,~~ fuel flow (g/h) for other engines, at maximum torque speed:			X	860	840	850	430	420
3.2.3.2.	Declared maximum torque (Nm):	X			4.6	4.6	4.6	3.1	1.3

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
3.2.4.	Declared 100% test speed:	X			5200	5000	4500	5000	4800
3.2.5.	Declared Intermediate test speed:	X			N/A				
3.2.6.	Idle speed (rpm)	X			3300±300	3000±300	3000±200	3000±200	4000±400
3.2.7.	Maximum no load speed (rpm):	X			5200	5000	4650	5000	4800
3.2.8.	Declared minimum torque (Nm)	X			N/A				
3.3.	**Run-in procedure**								
3.3.1.	Run in time:	X			1 hour				
3.3.2.	Run-in cycle:	X			G3				
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				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
3.4.5.	Number of pre-conditioning cycles prior to transient test	X			N/A				
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.	*Lubricant temperature*								
3.5.1.1.	Minimum (deg. °C):	X			-5				
3.5.1.2.	Maximum (deg. °C):	X			160				
3.6.	**Combustion Cylinder**								
3.6.1.	Bore(mm):			X	48.6	48.6	48.6	45	45
3.6.2.	Stroke(mm):			X	43	43	43	38	35.5
3.6.3.	Number of cylinders:			X	1				
3.6.4.	Engine total swept volume (cm^3):			X	79.8	79.8	79.8	60	56
3.6.5.	Swept volume per cylinder as % of parent engine:			X	100	100	100	75	70
3.6.6.	Volumetric compression ratio:			X	10.5±0.5：1	9: 1	8.7±0.2: 1	8.2: 1	8.2: 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				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
3.6.9.	Minimum cross sectional area of inlet and outlet ports (mm^2):			X	Inlet: 284 mm^2, Outlet: 201 mm^2	Inlet: 234.3 mm^2, Outlet: 242.6 mm^2	Inlet: 176.5 mm^2, Outlet: 153 mm^2	Inlet: 164 mm^2, Outlet: 143 mm^2	Inlet: 200 mm^2, Outlet: 150 mm^2
3.6.10.	*Valve timing*								
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				
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.	positon, size and number:			X	Refer to drawing No. 002				
3.7.	**Cooling system**								
3.7.1.	*Liquid cooling*				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							

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
3.7.2.	*Air cooling*								
3.7.2.1.	fan: Yes/No			X	Yes				
3.7.2.1.0.	Make:			X	Chongqing Yinwang, Chongqing Yonggang, Chongqing Langrun, Chongqing Runtong,CX，LR，Wenjun, LY, MD, Xinjuxin,JX, Yunren, Jinhua,Mingheng, Sheng Yifeng				
3.7.2.1.1.	type(s):			X	19352-ZC7,19352-ZDA	H80i	13510-Z80	13510-Z90	19352-Z5N
3.7.2.1.2.	Drive ratio(s):			X	1:1				
3.7.2.2.	Maximum temperature at reference point (deg. °C):			X	270				
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		-0.4	1.49	0.5	1	2.4
3.8.1.2.	With dirty air cleaner:	X	X		-0.4	1.49	0.5	1	2.4
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				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
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				
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, Chongqing AOFSE, LR, Hongding, Wenjun, LY, Cangjie, Sheng Yifeng				
3.8.7.1.	Type:			X	17151-ZC7	H80i	17100-Z80	17100-Z90	17100-Z5N
3.8.8.	Intake air-silencer				No				
3.8.8.0.	Make:			X	N/A				
3.8.8.1.	Type:			X	N/A				
3.9.	**Exhaust 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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
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			700	600	427	427	560
3.9.3.	Maximum permissible exhaust backpressure at 100% engine speed and at 100% load (kPa):	X	X		7	4.84	5.9	5.3	3
3.9.3.1.	Location of measurement:	X	X		Exhaust pipe				
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.	*Exhaust gas recirculation (EGR)*				N/A				
3.10.1.1.	Characteristics: cooled/uncooled, high pressure/low pressure/other (specify):			X	N/A				
3.10.2.	*Water injection*				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				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
3.11.	**Exhaust after-treatment system**								
3.11.1.	*Location*		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.	*Catalytic exhaust gas after treatment system for NO_x or three way catalyst*				N/A				
3.11.3.0.	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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
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				
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				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
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				
3.11.3.14.1.	Type:			X	N/A				
3.11.3.14.2.	Location(s):			X	N/A				
3.11.4.	*Particulate trap*				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				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
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				
3.11.4.11.2.	Location(s):			X	N/A				
3.11.5.	*Other systems*				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.	*Feed pump*				N/A				
3.12.1.1.	Pressure (kPa) or characteristic diagram:			X	N/A				
3.12.2.	*Injection system*				N/A				
3.12.2.1.	Pump				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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
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				
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.	*Injector(s)*				N/A				
3.12.2.0.	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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
3.12.3.1.	Type(s):			X	N/A				
3.12.3.2.	Opening pressure (kPa):			X	N/A				
3.12.4.	*Electronic control unit (ECU): Yes/No*			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.	*Governor*				N/A				
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.	*Cold-start system: Yes/No*			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				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
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.	*Carburettor*				Refer to drawing No. 004				
3.13.1.0.	Make:			X	RUIXING, HUAYI, saipu, BIG DINT, YINBA, G, SPD, SP, FULIN, KEIMA				
3.13.1.1.	Type(s):			X	16100-ZC7, P16	P16	16100-Z80, 16100-Z3G	16100-Z90	16100-Z5N
3.13.2.	*Port fuel injection:*				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.	*Direct injection:*				N/A				
3.13.3.0.	Make:			X	N/A				
3.13.3.1.	Type(s):			X	N/A				
3.13.4.	*Fuel temperature at location specified by manufacturer*				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				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
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.	*Fuel: LPG /NG-H/NG-L /NG-HL/LNG/Fuel specific LNG*	X		X	N/A				
3.14.2.	*Pressure regulator(s)/vaporiser(s)*				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.	*Fuelling system: mixing unit/gas injection/liquid injection/direct injection*			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.	*Mixing unit*				N/A				
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				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
3.14.4.3.	Location:			X	N/A				
3.14.4.4.	Adjustment possibilities:			X	N/A				
3.14.5.	*Inlet manifold injection*				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.	*Direct injection*				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				
3.14.6.1.2.	Injection timing (specify):			X	N/A				

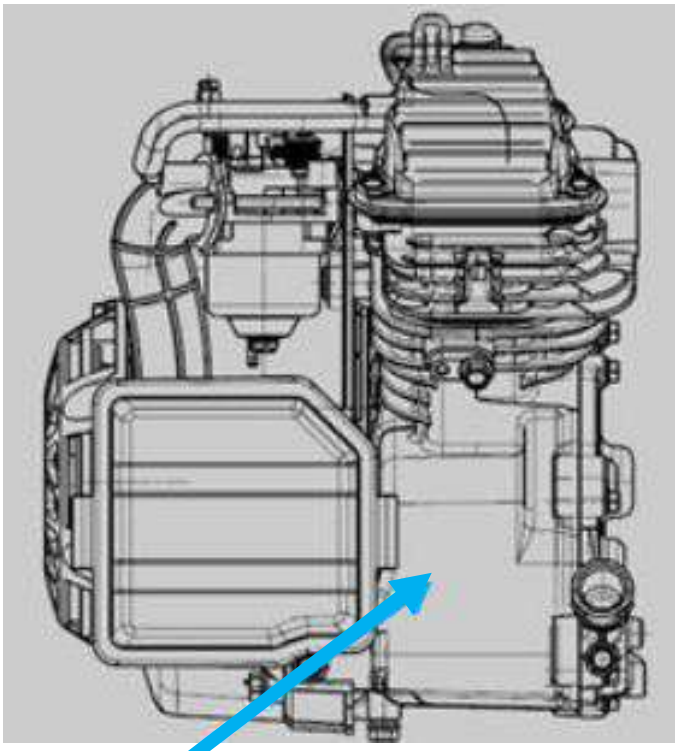
Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)			
						Type 1	Type 2	Type 3	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
3.14.6.2.	Injector(s)				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.	*Electronic Control Unit (ECU)*				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.	*Approvals of engines for several fuel compositions*				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.	*Fuel temperature pressure regulator final stage*				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.	*Ignition coil(s)*								
3.15.1.0.	Make:			X	ZD, YP, LH, Lihua, Qiujing, SM, Jiuyong, CQJY				

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	Type 4
3.1	**Engine Identification**								
3.1.1.	Engine type designation			X	BS80i-4	BS80i	BS80-i	BS60i	BS56i
3.15.1.1.	Type(s):			X	30400-ZC7	H80i	30400-Z80	30400-Z90	30400-Z5N
3.15.1.2.	Number:			X	1				
3.15.2.	*Spark plug(s)*								
3.15.2.0.	Make:			X	LG, BODE, TORCH, NGK, RISO, BoXing, BOSCH				
3.15.2.1.	Type(s):			X	A5RTC, CR6HSA, F6TC, F6RTC, F7RTC, BP6ES, BPR6ES, E5TC, E5RTC，E5RTJC, E5TJC				
3.15.2.2.	Gap setting:			X	0.6~0.8 mm				
3.15.3.	*Magneto*			X	N/A				
3.15.3.0.	Make:			X	N/A				
3.15.3.1.	Type(s):			X	N/A				
3.15.4.	*Ignition timing control: Yes/No*			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.

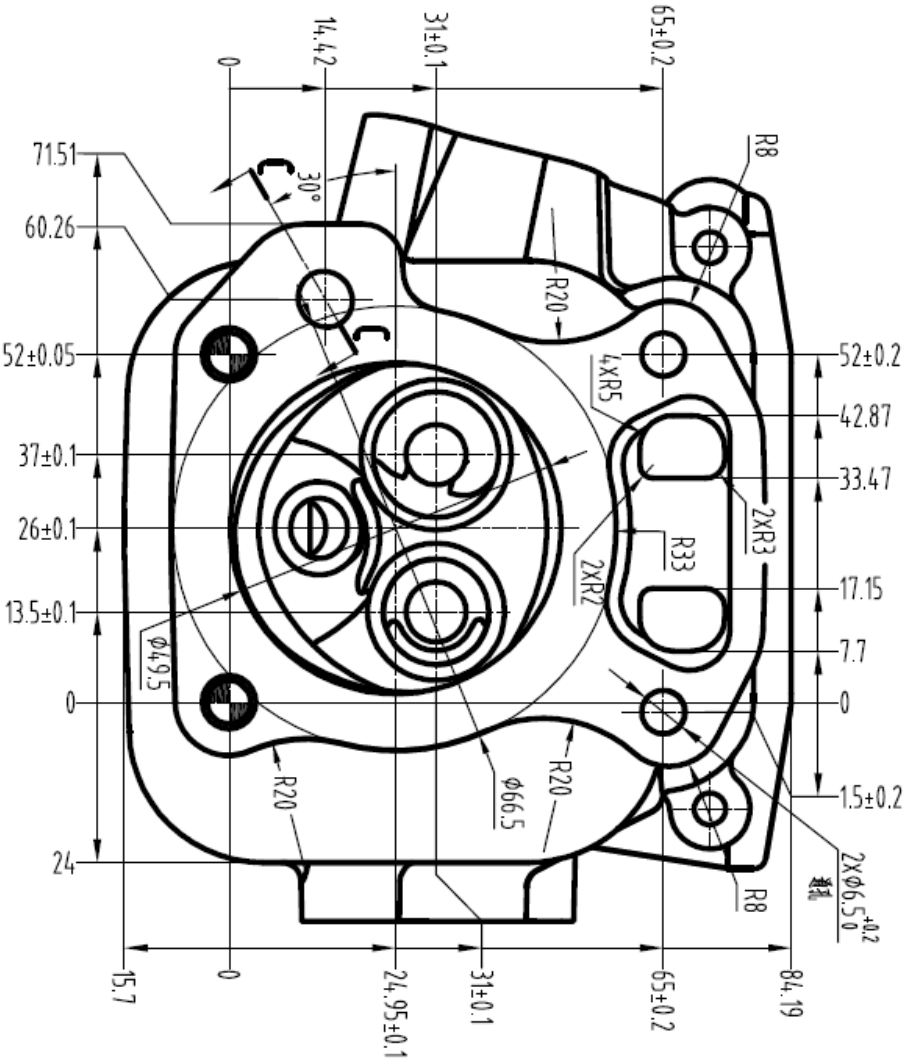
Attachment 2 Drawings of the engines



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

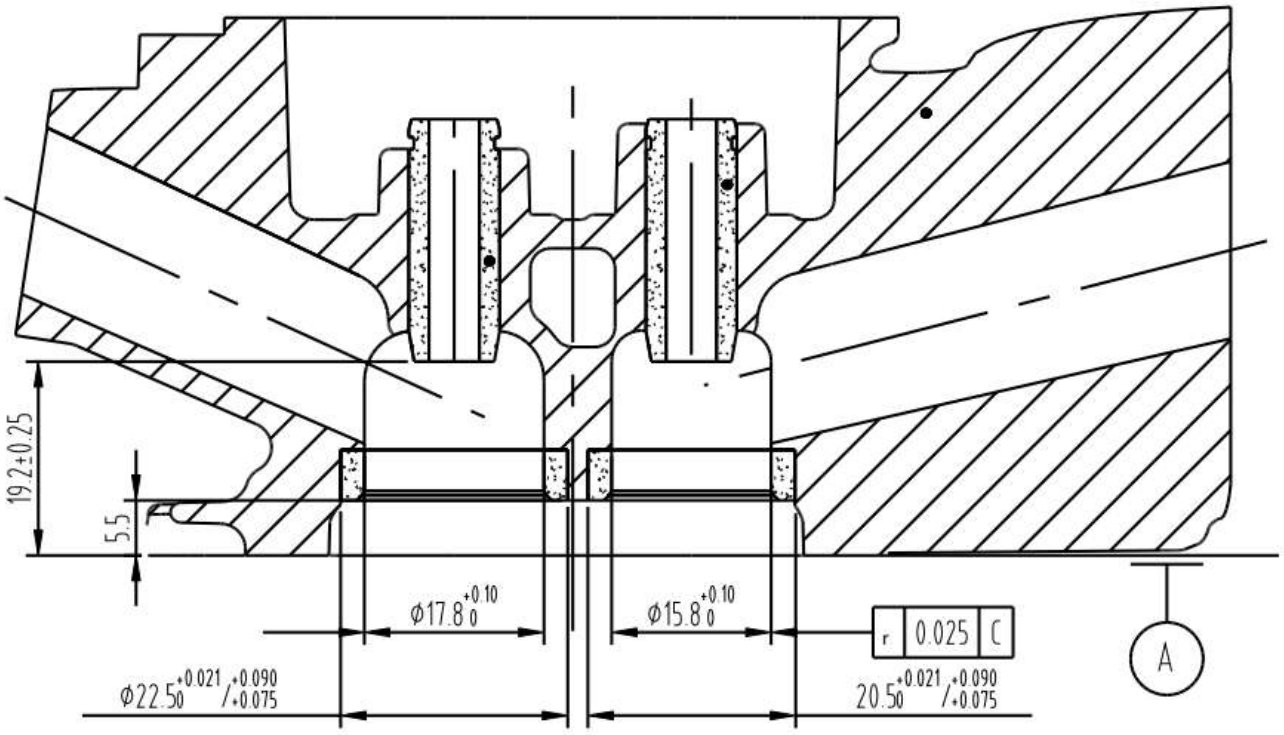
Remarks: this sample only shows the contents that need to be included on the engine marking, the actual position may adjust according manufacturer's requirement.

Engine family	BS80
Position of statutory marking Position of engine identification number.	
Drawing No.	001



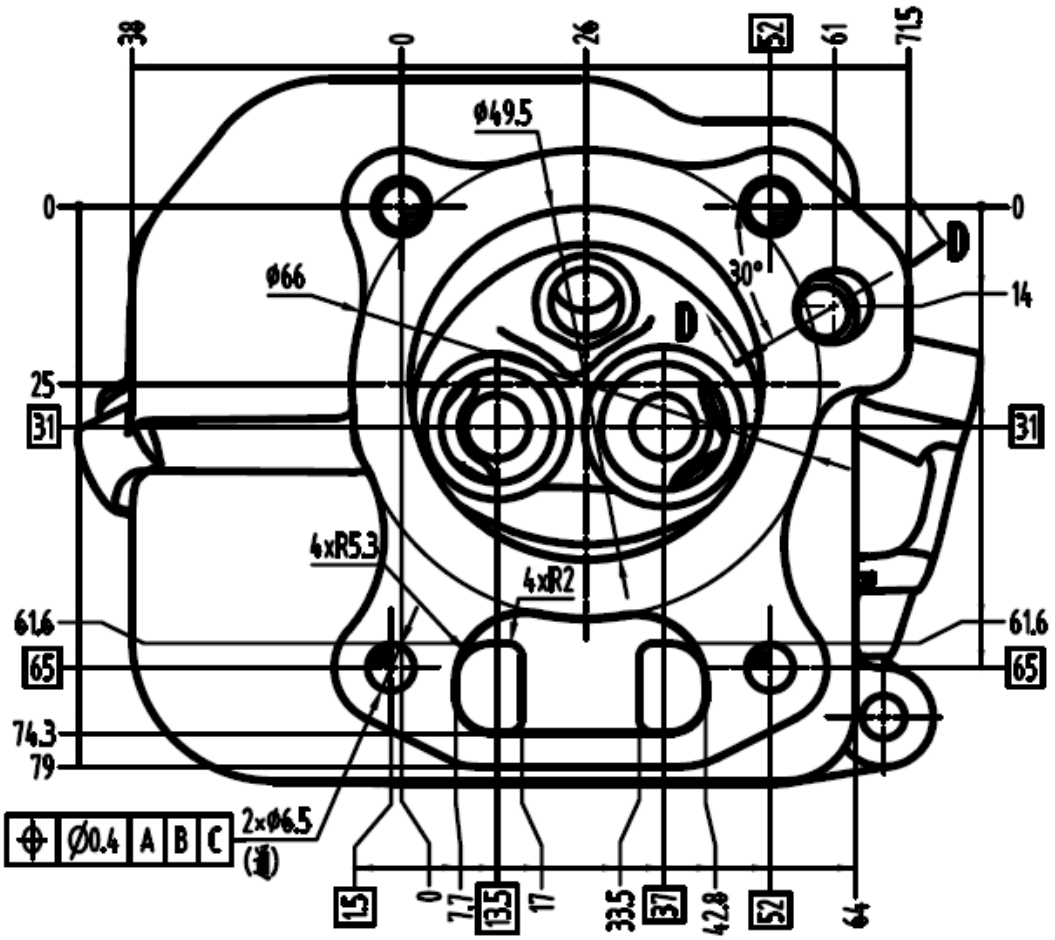
Part No.: 12141-ZC70110

Engine type	BS80i-4
Combustion chamber Valve and port configuration	
Drawing No.	002



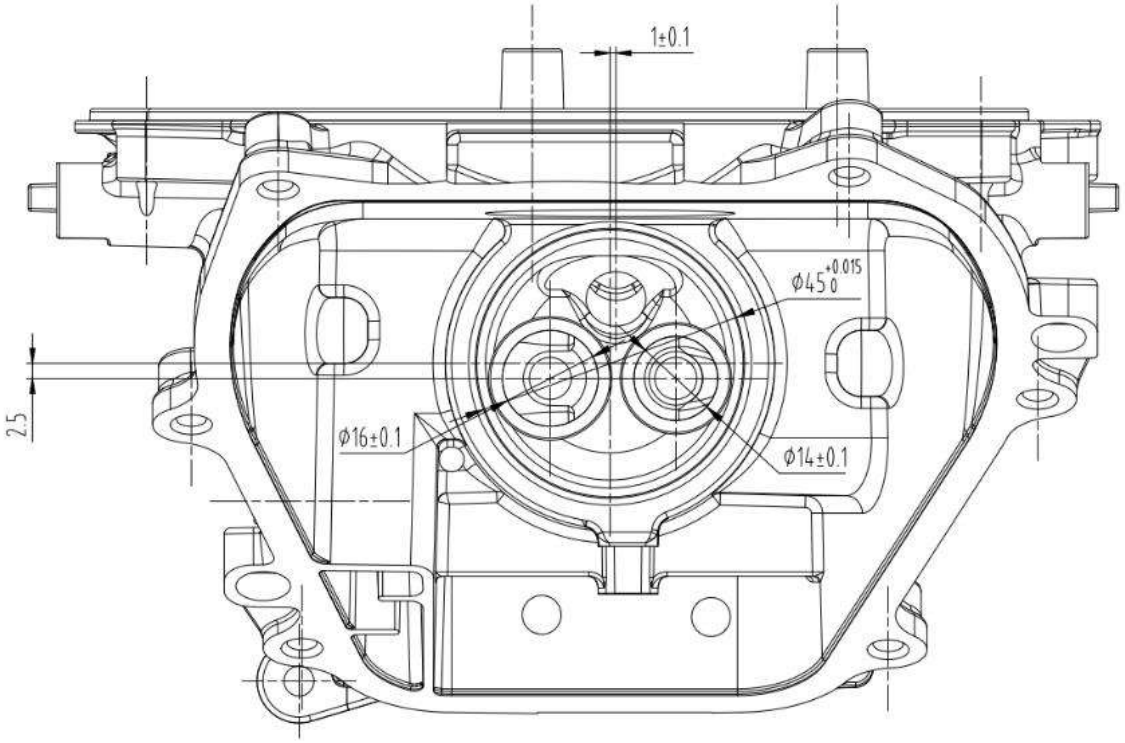
Part No.: 12141-Z800110

Engine type	BS80i
Combustion chamber Valve and port configuration	
Drawing No.	002



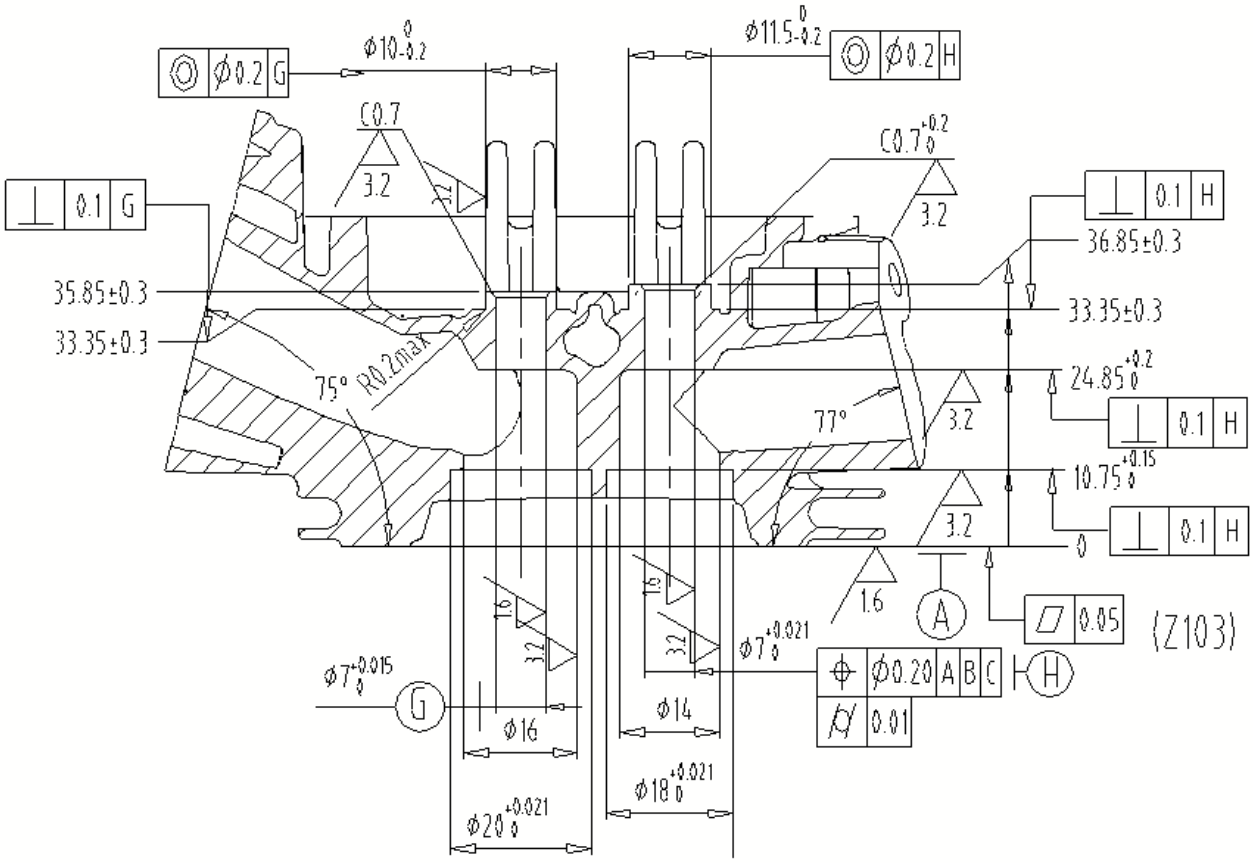
Part No.: 11310-Z900110

Engine type	BS80-i
Combustion chamber Valve and port configuration	
Drawing No.	002



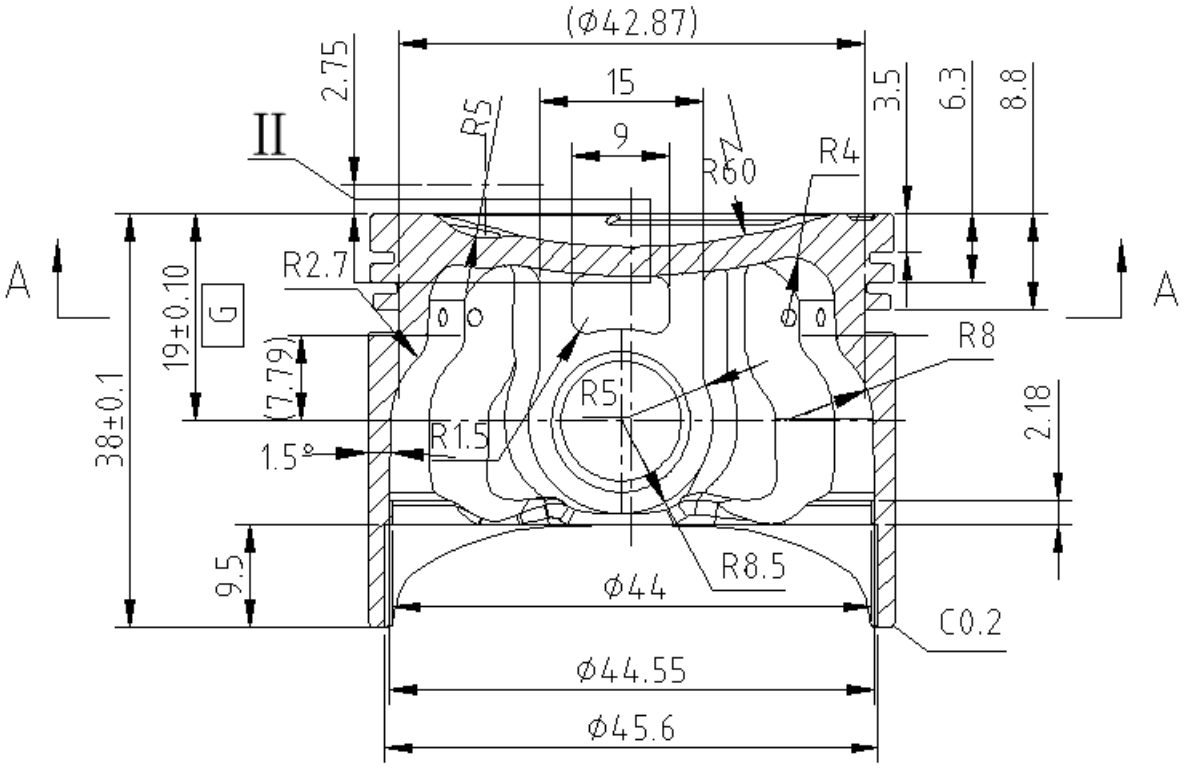
Part No.: 12141-Z5N0110

Engine type	BS60i
Combustion chamber Valve and port configuration	
Drawing No.	002



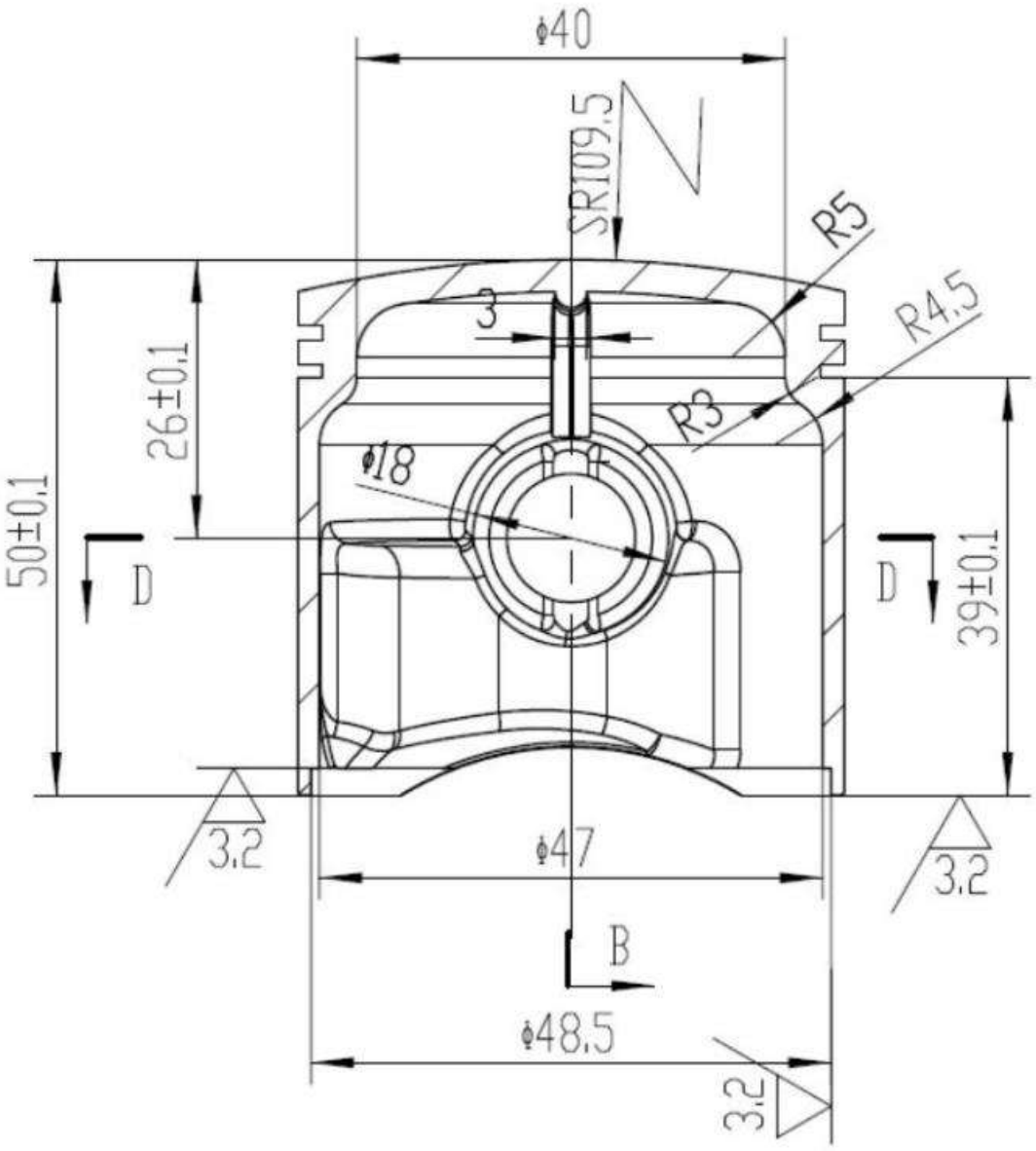
Part No.: 12141-Z5N0111

Engine type	BS56i
Combustion chamber Valve and port configuration	
Drawing No.	002



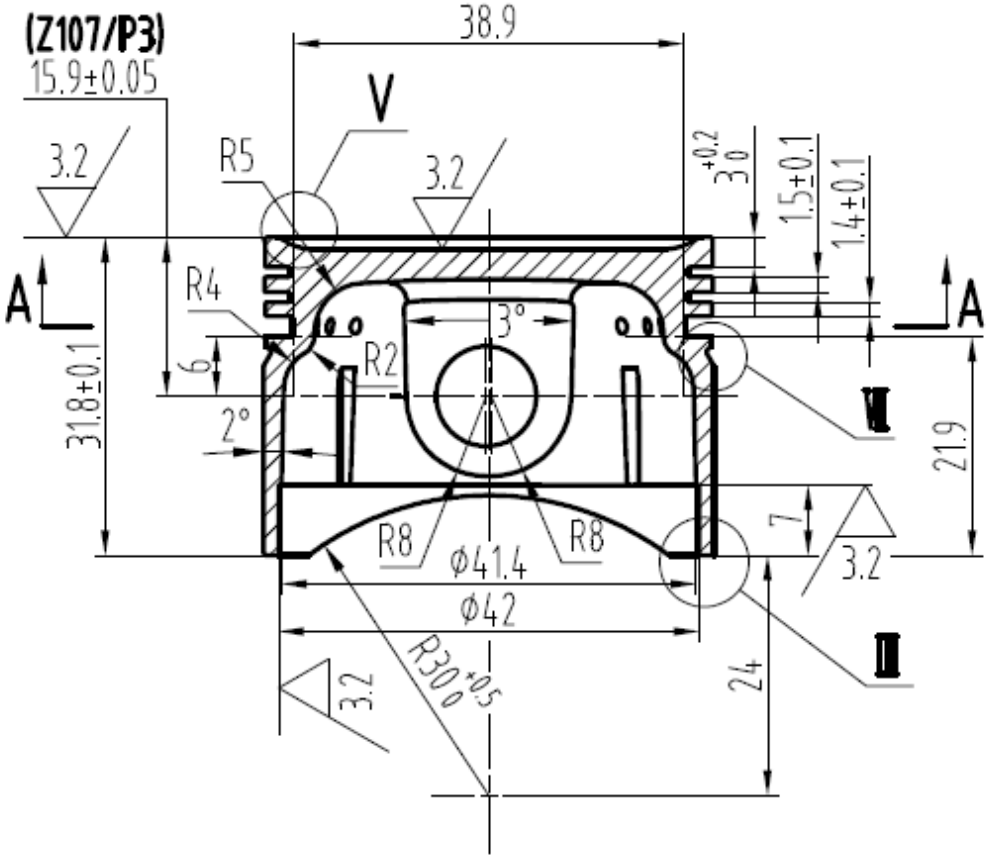
Part No.: 15100-E180010

Engine type	BS80i-4, BS80-i
Piston	
Drawing No.	003



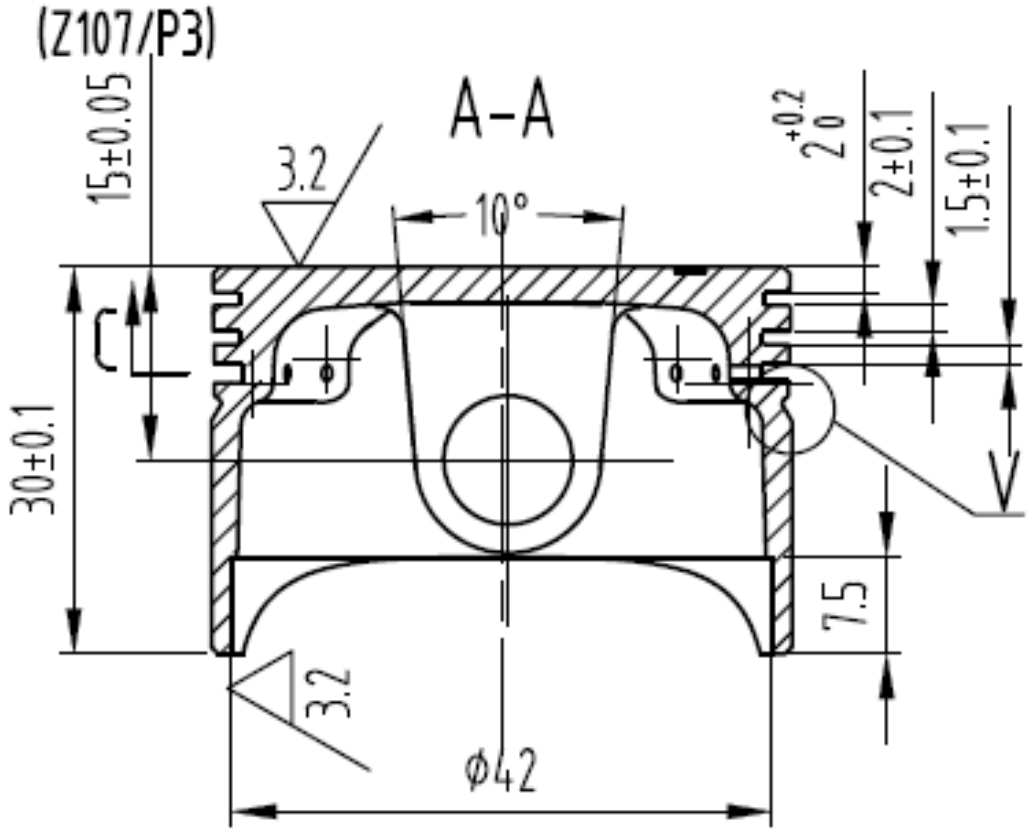
Part No.: 13111-Z900120

Engine type	BS80i
Piston	
Drawing No.	003



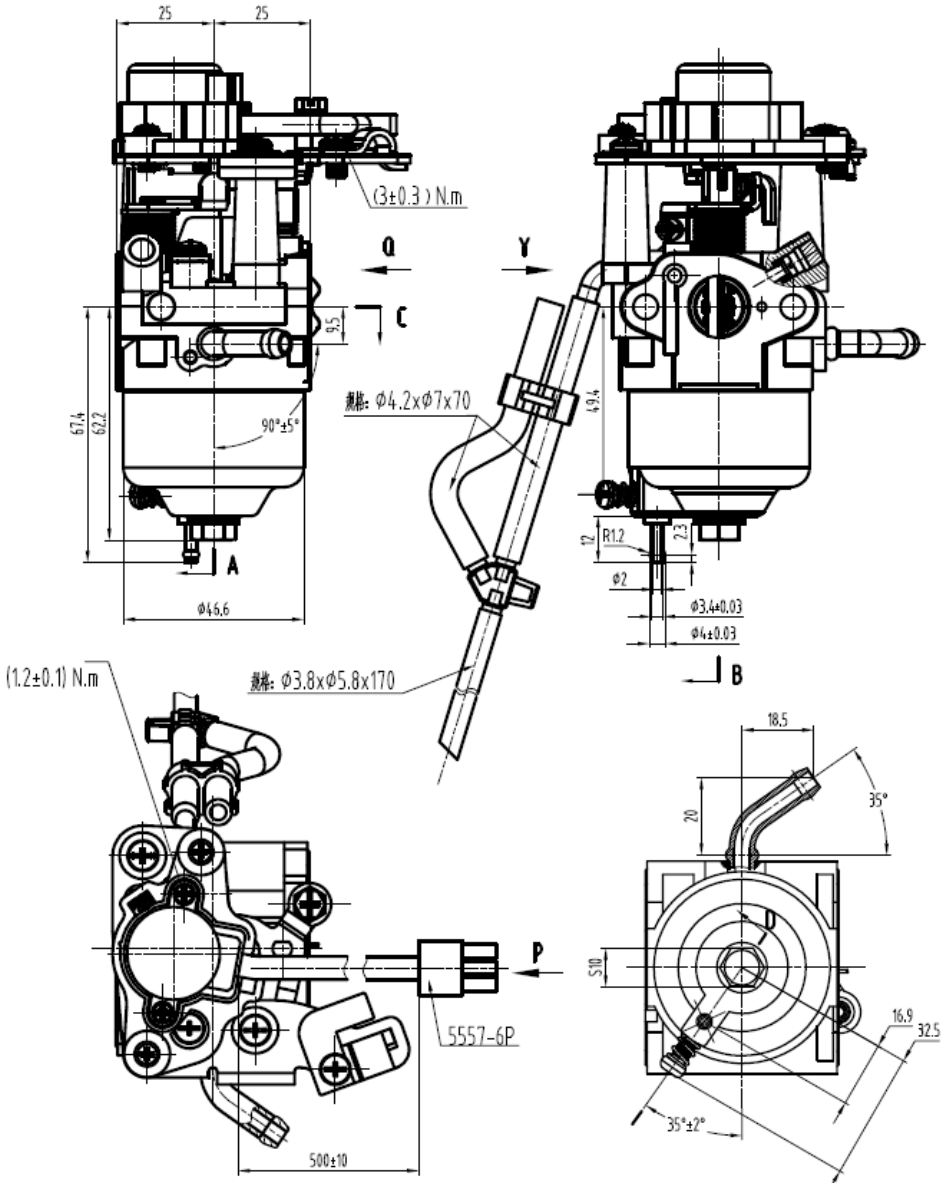
Part No.: 13111-Z5N0110

Engine type	BS60i
Piston	
Drawing No.	003

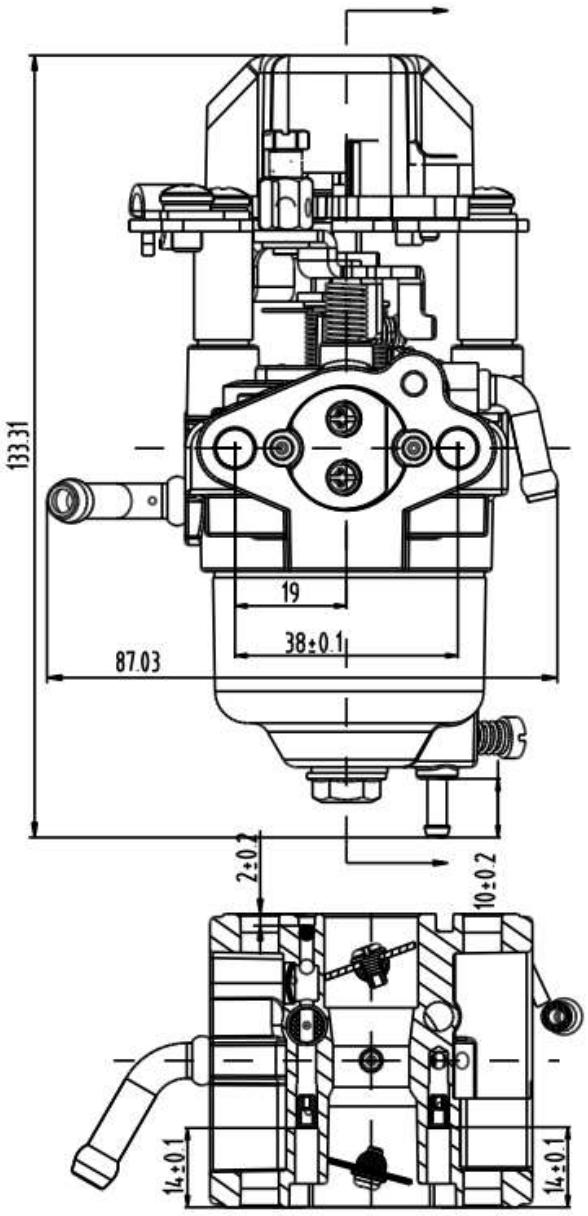


Part No.: 13111-Z5N0111

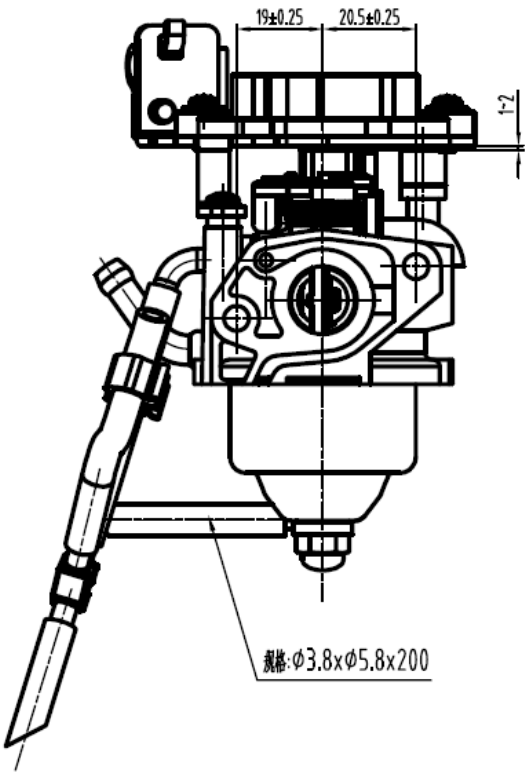
Engine type	BS60i
Piston	
Drawing No.	003

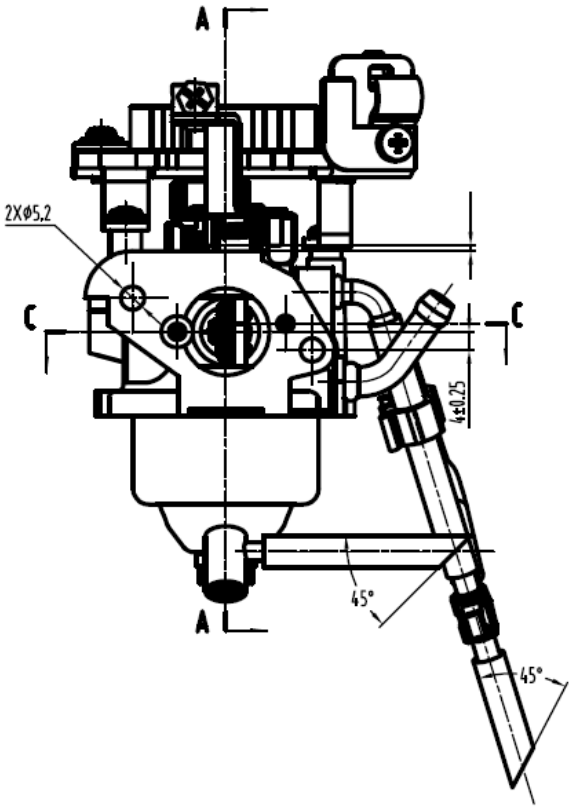


Engine type	BS80i-4, BS80-i
Carburetor	
Drawing No.	004

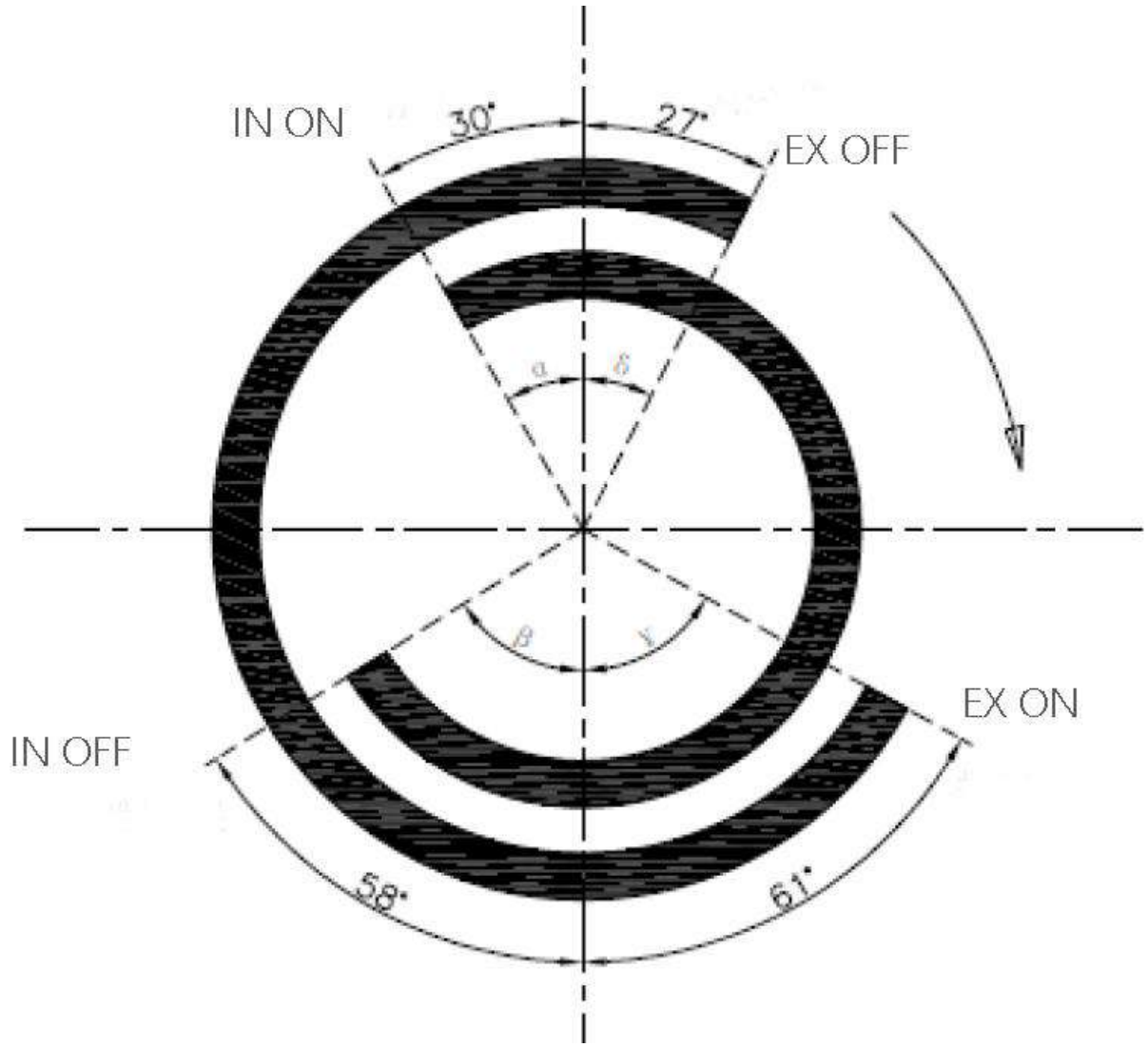


Engine type	BS60i
Carburetor	
Drawing No.	004

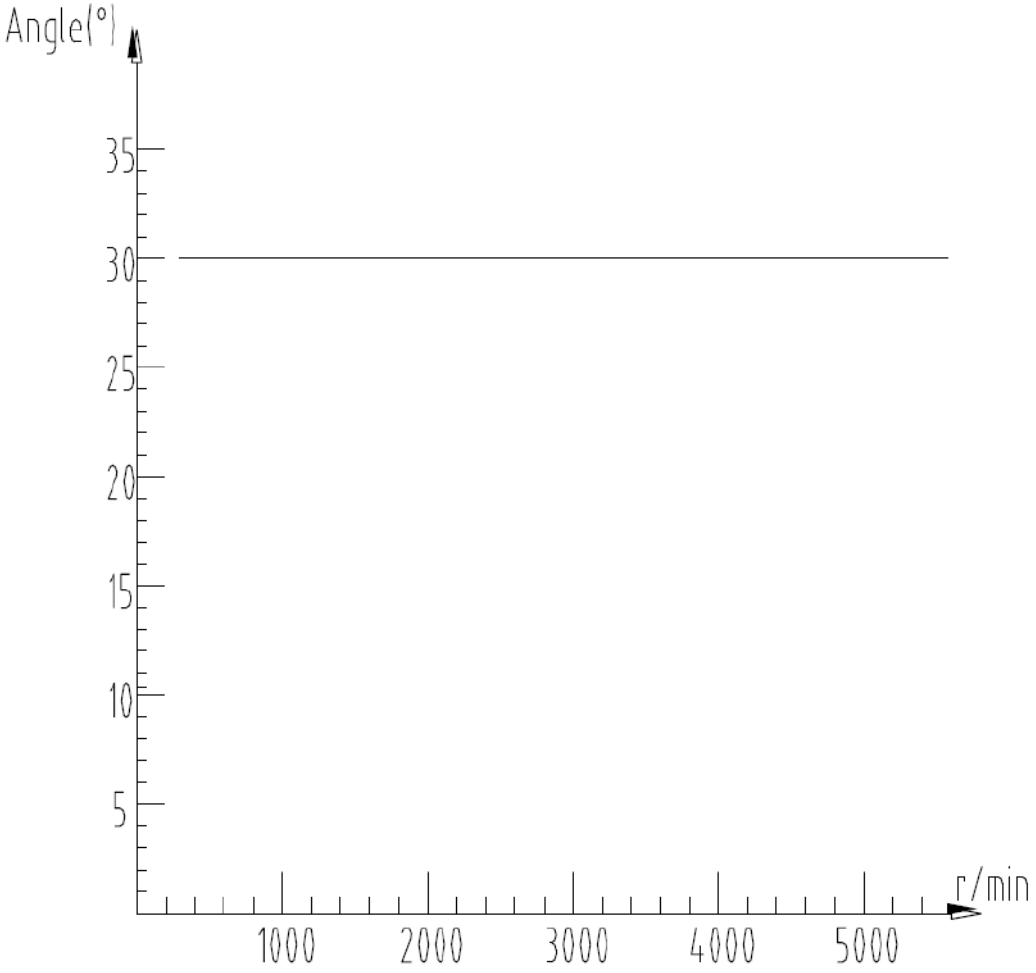




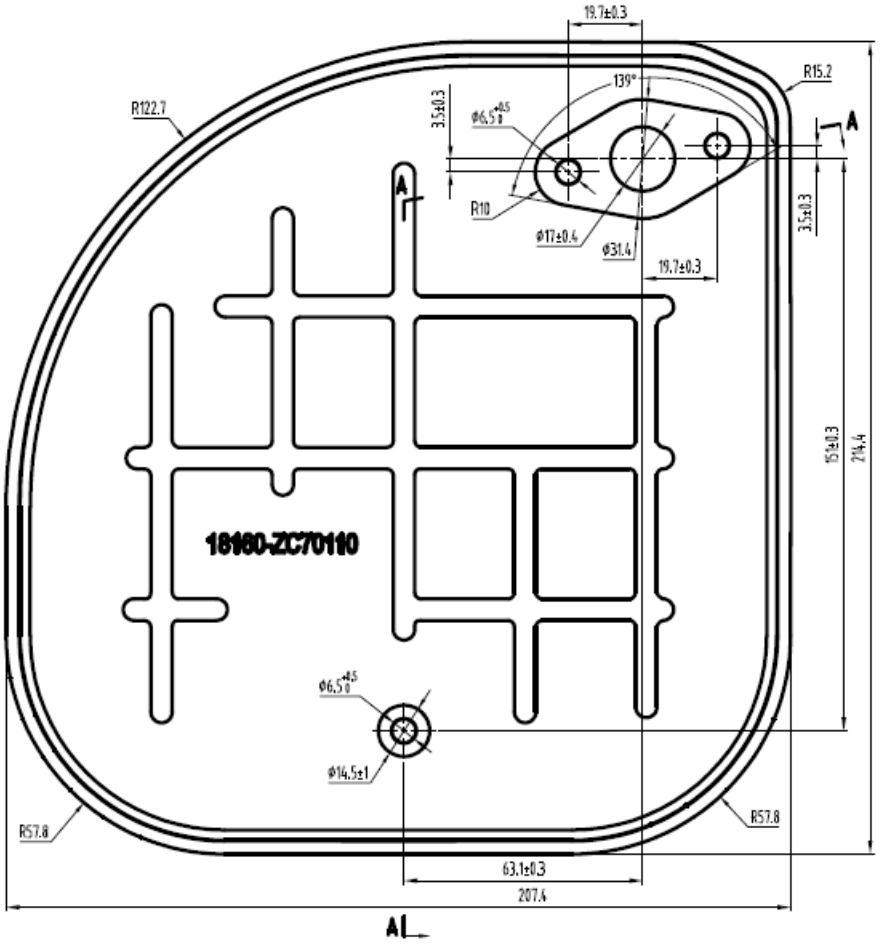
Engine type	BS56i, BS60i
Carburetor	
Drawing No.	004



Engine family	BS80
Valve timing	
Drawing No.	005

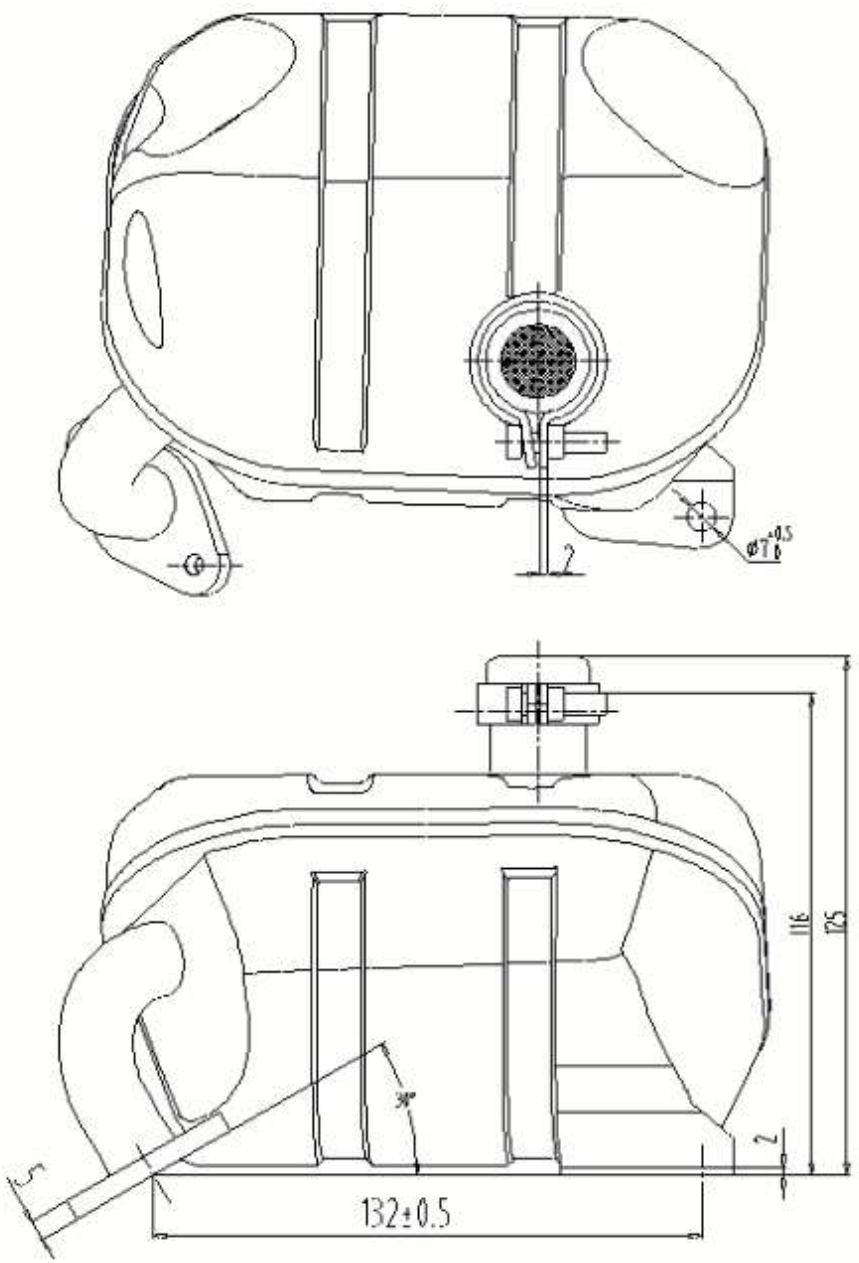


Engine family	BS80
Ignition advance curve	
Drawing No.	006



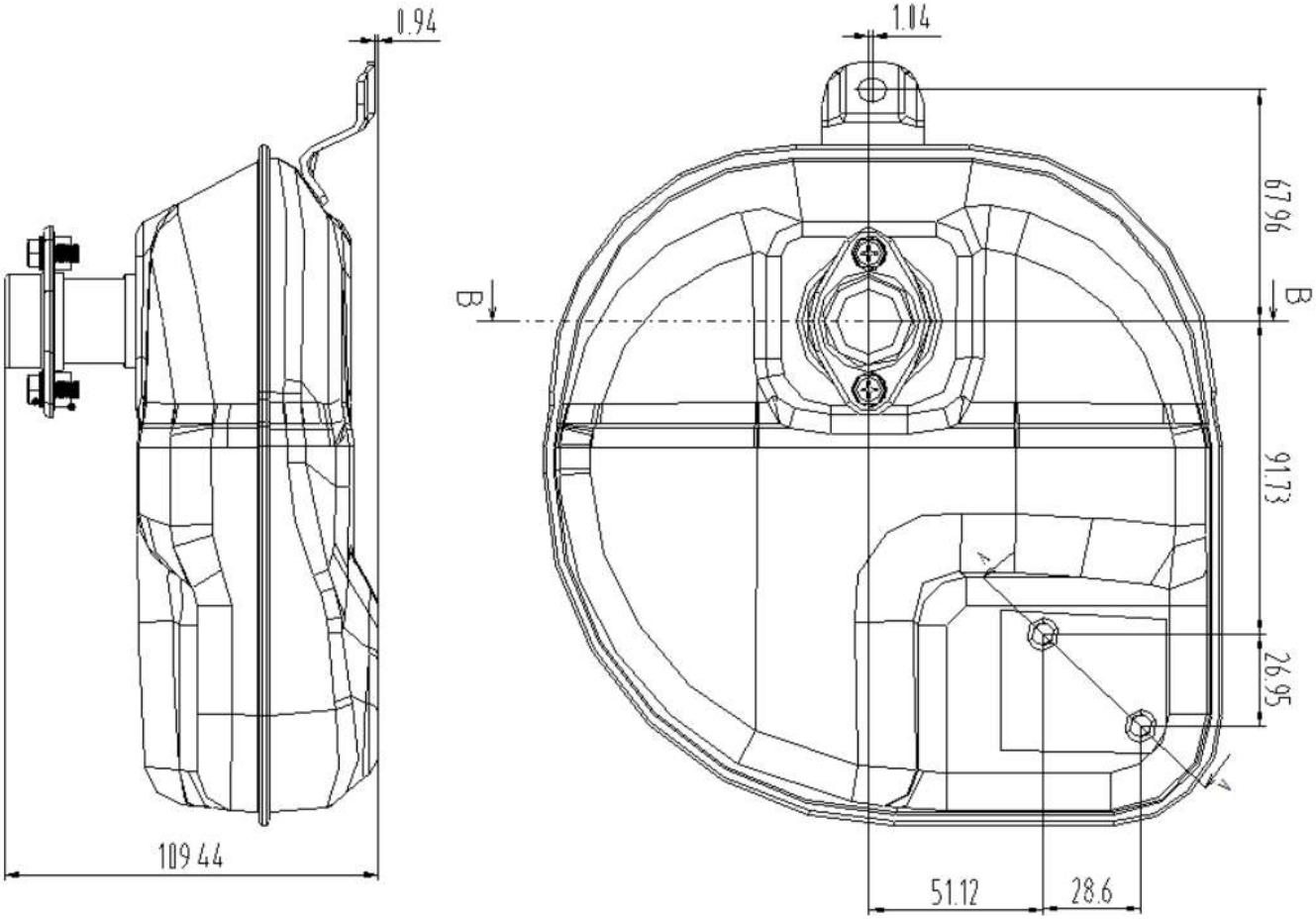
Part No.: 18100-ZC70110

Engine type	BS80i-4
Exhaust System	
Drawing No.	007



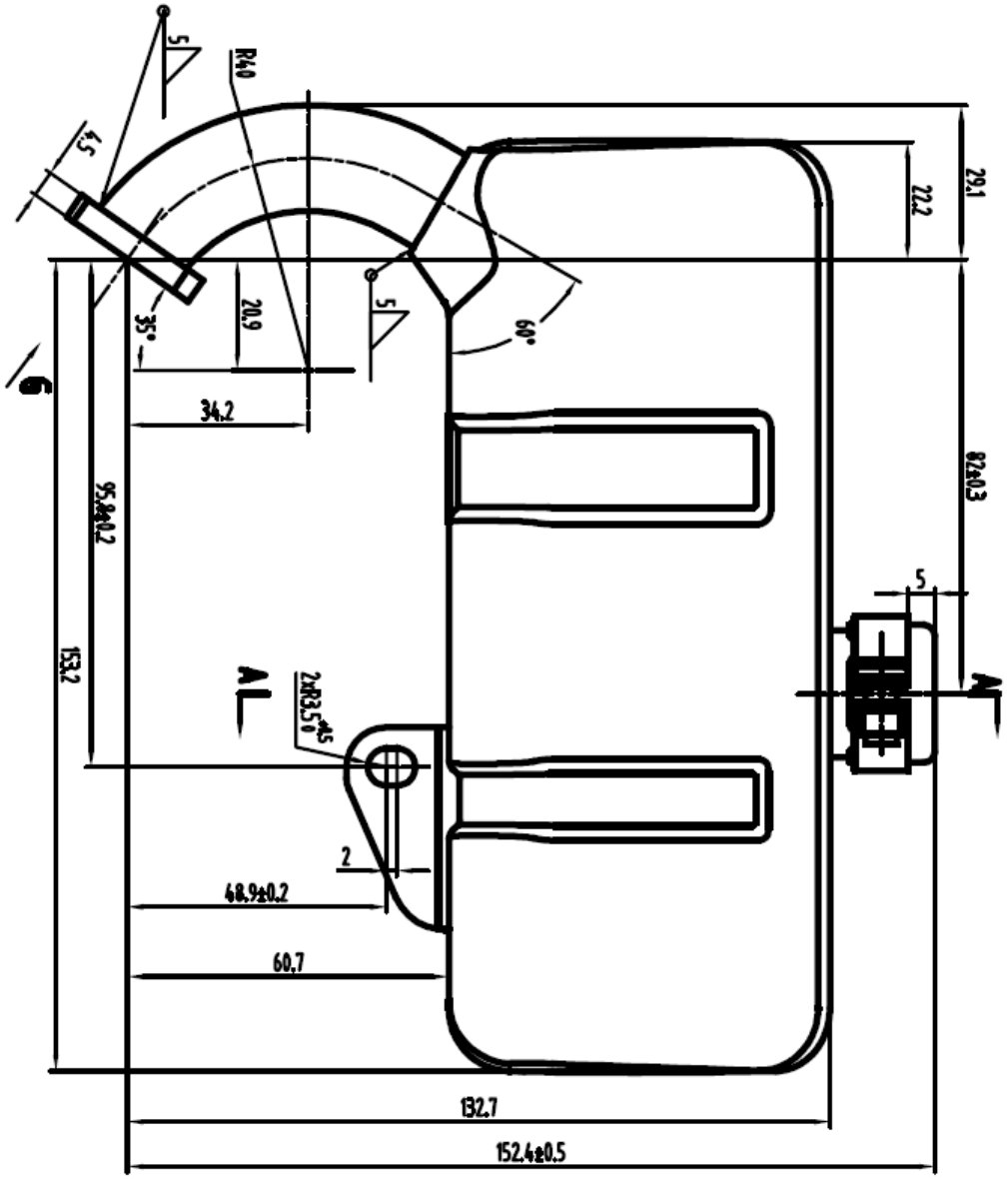
Part No.: 18100-Z900110

Engine type	BS80-i
Exhaust System	
Drawing No.	007



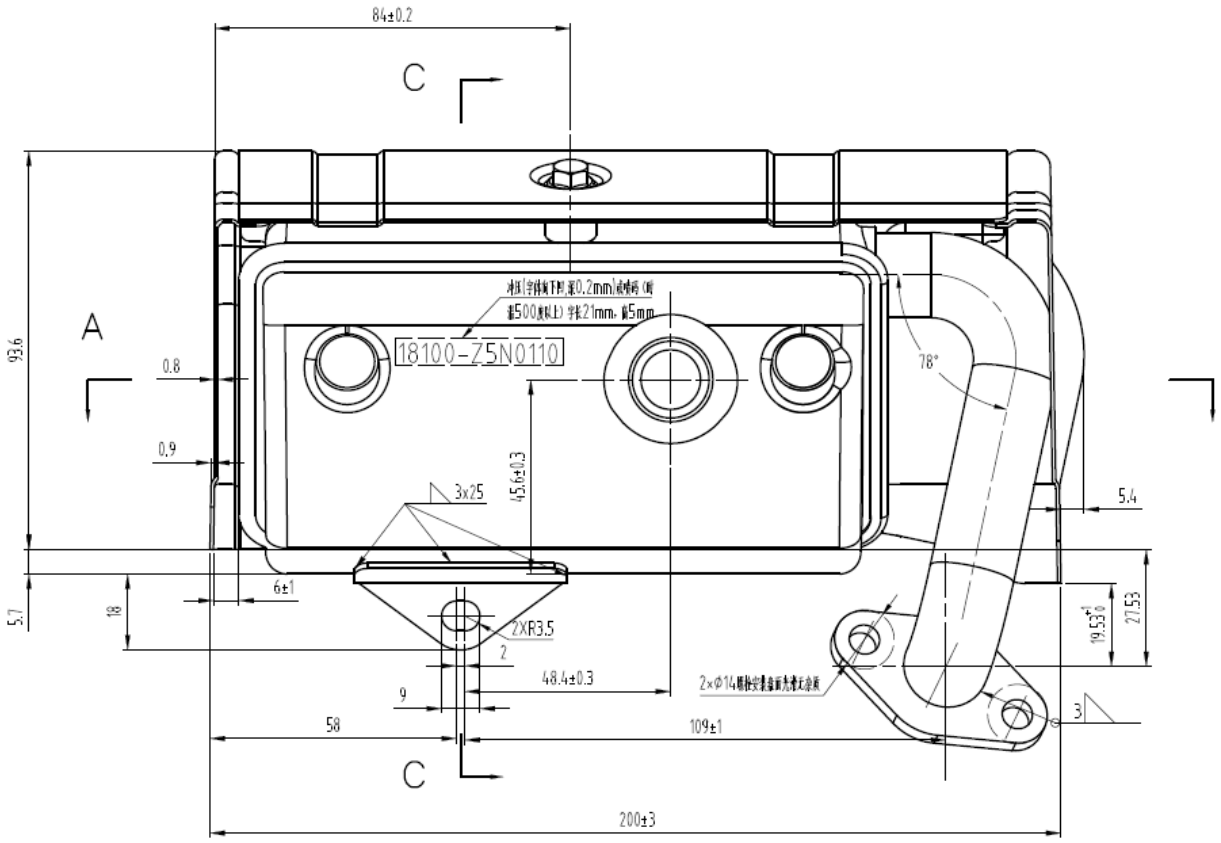
Part No.: 18100-Z900111

Engine type	BS80i
Exhaust System	
Drawing No.	007



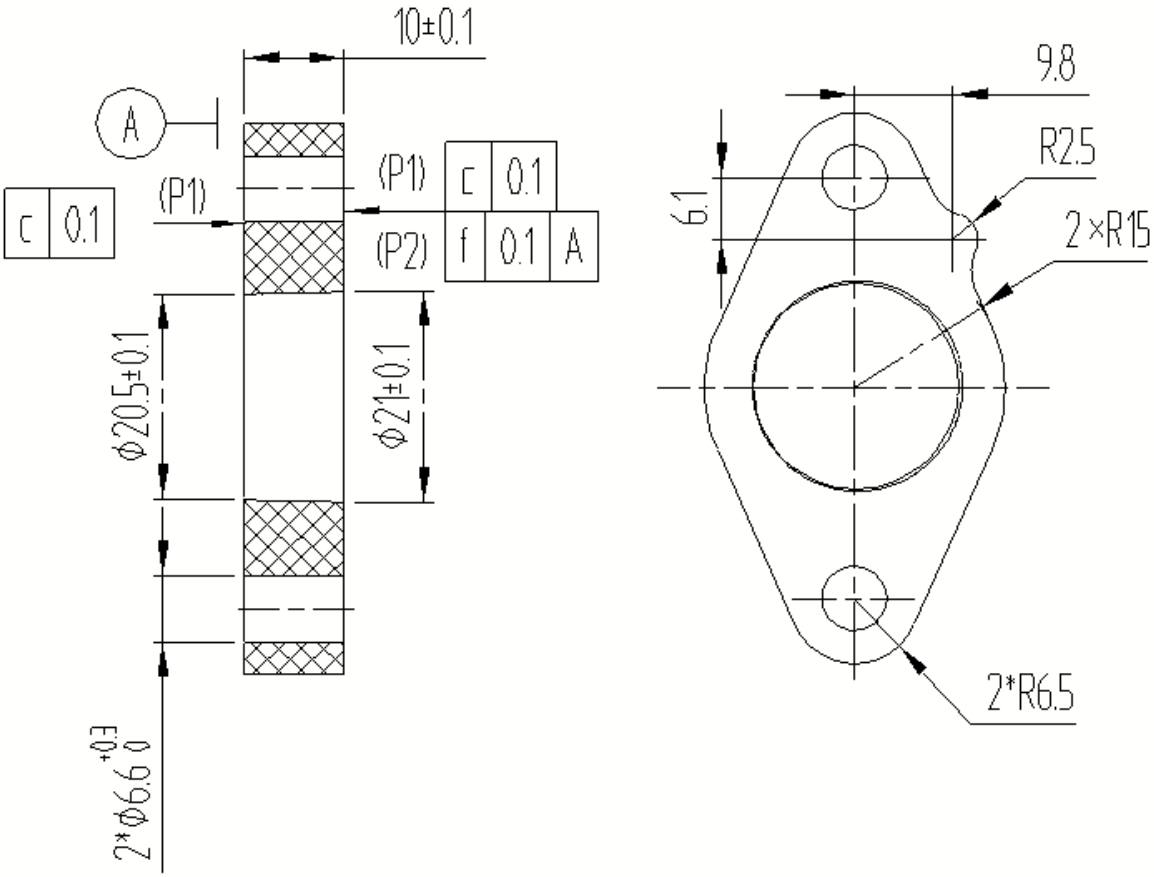
Part No.: 18100-Z5N0110

Engine type	BS60i
Exhaust System	
Drawing No.	007



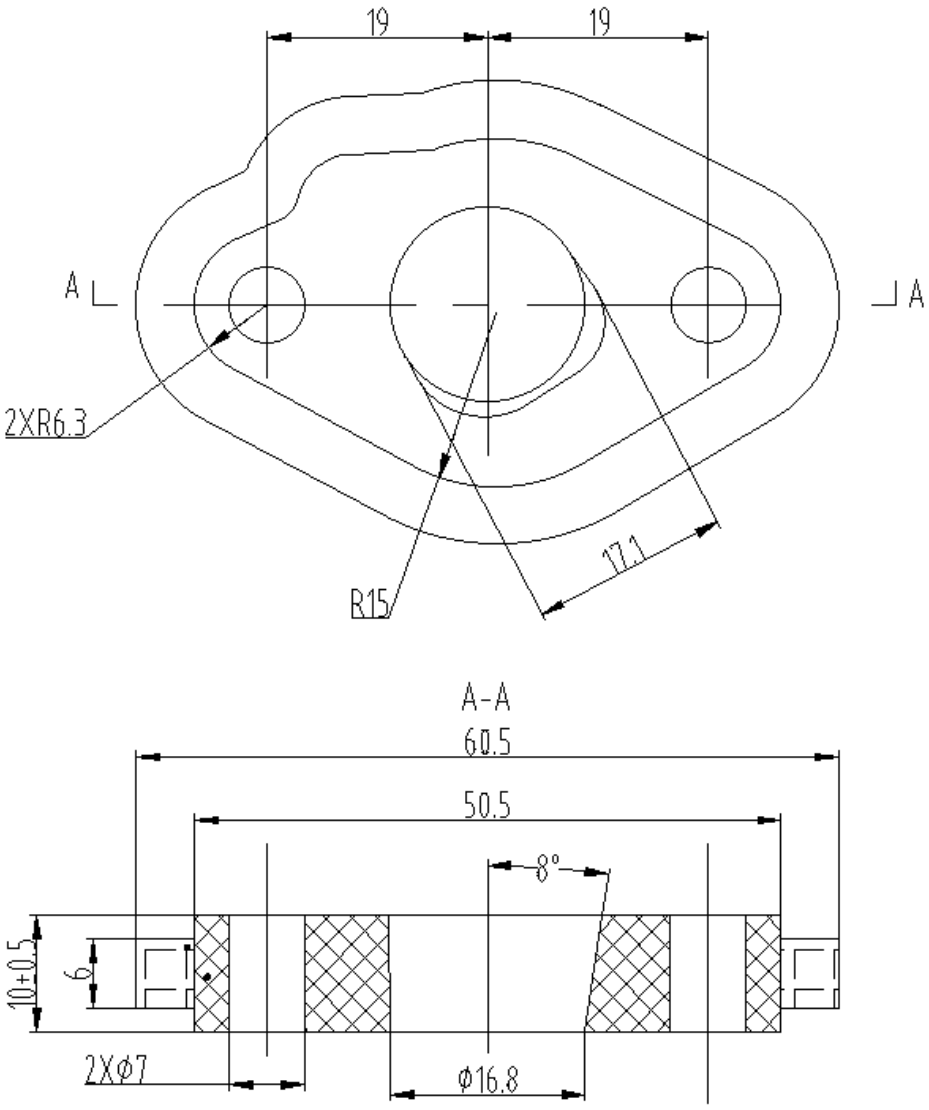
Part No.: 18100-Z5N0111

Engine type	BS56i
Exhaust System	
Drawing No.	007



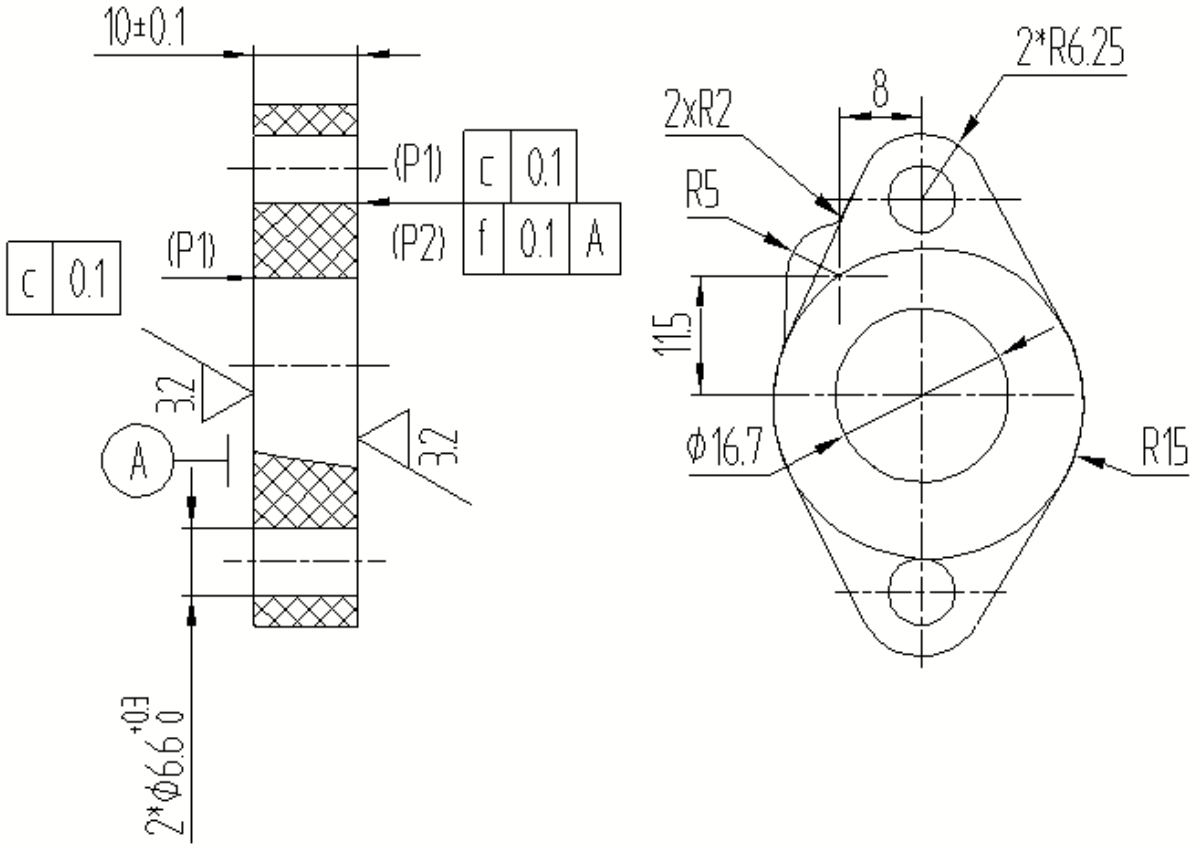
Part No.: 22006-E180010

Engine type	BS80i-4
Inlet path	
Drawing No.	008



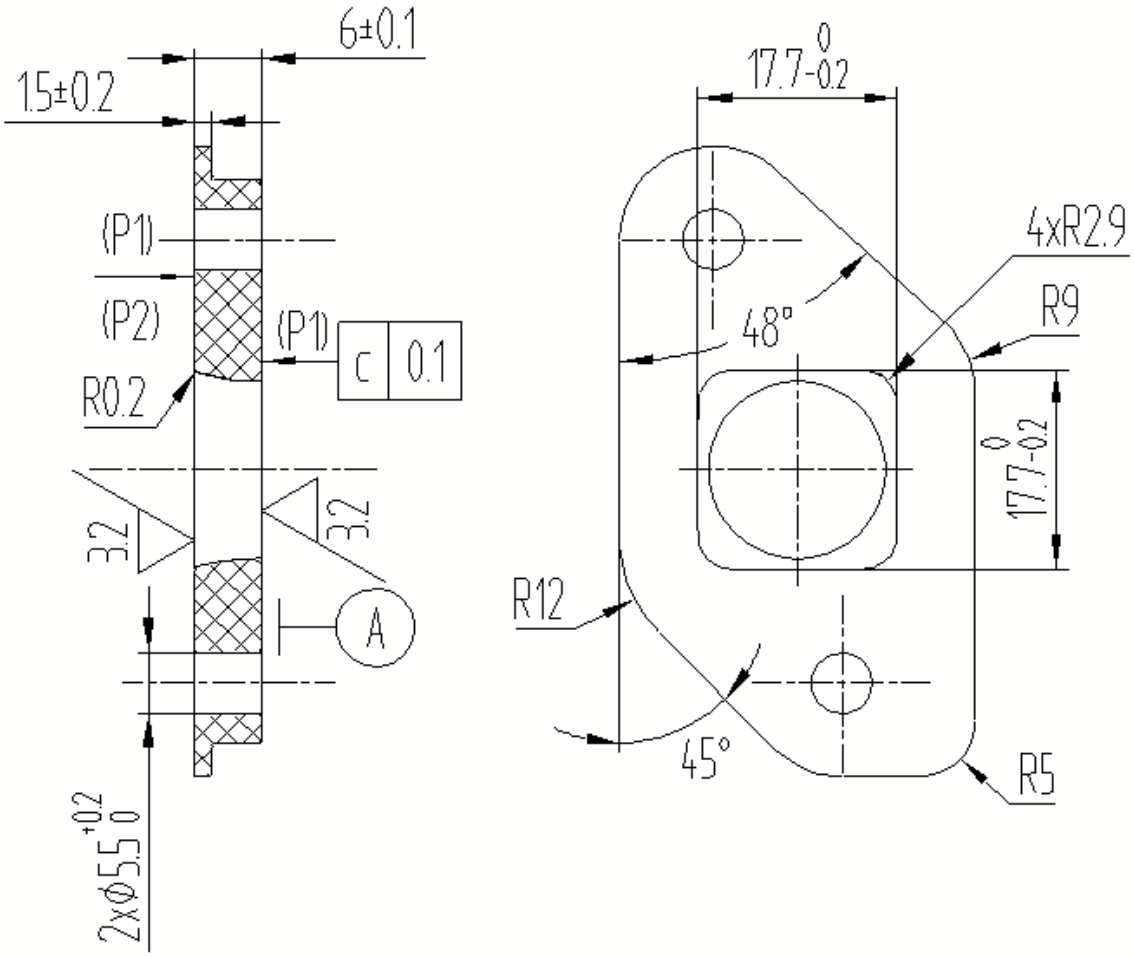
Part No.: 22006-E180011

Engine type	BS80-i
Inlet path	
Drawing No.	008



Part No.: 22006-E180012

Engine type	BS80i
Inlet path	
Drawing No.	008



Part No.: 22006-E180013

Engine type	BS60i, BS56i
Inlet path	
Drawing No.	008

The crankcase gas passes through the cylinder head cover, and then flows through the exhaust pipe leading into the air filter before reaching the carburettor, where it is finally burned in the combustion chamber.

Engine type	BS80i-4
Device for recycling crankcase gases	
Drawing No.	009

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)	:	BISON
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: BS80 Parent engine: BS80i-4 Commercial names:BS80#-#, BS80#-##, BS80##-#, BS80##-## Engine within family: 1) BS80i, 2) BS80-i, 3) BS60i, 4) BS56i Commercial names: 1)BS80#, BS80##, 2)BS80-#, BS80-##, 3)BS60#, BS60##, 4)BS56#, BS56## Note: postfix '#' is the designation for future non-emission and non-performance related revision change. It may be an uppercase or lowercase letter from A to Z, or a number from 1 to 9

Place : Taizhou City

Date : 2024-01-02

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: BS80 Parent engine: BS80i-4 Commercial names:BS80#-#, BS80#-##, BS80##-#, BS80##-## Engine within family: 1) BS80i, 2) BS80-i, 3) BS60i, 4) BS56i Commercial names: 1)BS80#, BS80##, 2)BS80-#, BS80-##, 3)BS60#, BS60##, 4)BS56#, BS56## Note: postfix '#' is the designation for future non-emission and non-performance related revision change. It may be an uppercase or lowercase letter from A to Z, or a number from 1 to 9
1.7.	Category and sub-category of the ~~engine type/~~engine family	:	Category: NRSh Sub-category: NRSh-v-1b
1.8.	EDP hours	:	125h

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

Place : Taizhou City

Date : 2024-01-02

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: BS80 Parent engine: BS80i-4 Commercial names:BS80#-#, BS80#-##, BS80##-#, BS80##-## Engine within family: 1) BS80i, 2) BS80-i, 3) BS60i, 4) BS56i Commercial names: 1)BS80#, BS80##, 2)BS80-#, BS80-##, 3)BS60#, BS60##, 4)BS56#, BS56## Note: postfix '#' is the designation for future non-emission and non-performance related revision change. It may be an uppercase or lowercase letter from A to Z, or a number from 1 to 9

	Photograph	Description
		The mixing ratio adjustment screws are blocked after tuning and are no longer adjustable.

Place : Taizhou City

Date : 2024-01-02

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 BS80i-4

Carburetor Make	Model	Max torque speed	Fuel flow(g/h)
BIG DINT	16100-ZC7	860 N.m / 3500rpm	830
	P16		820
SP	16100-ZC7		840
	P16		**860**
YINBA	16100-ZC7		830
	P16		820
SPD	16100-ZC7		830
	P16		820
RUIXING	16100-ZC7		830
	P16		820
FULIN	16100-ZC7		830
	P16		820
KEIMA	16100-ZC7		830
	P16		820
saipu	16100-ZC7		830
	P16		820
G	16100-ZC7		830
	P16		820
Huayi	16100-ZC7		830
	P16		820

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

Place : Taizhou City

Date : 2024-01-02

Signature : Du Jinzhong