



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) 2018/989 ⁽¹⁾⁽²⁾ (of the European Parliament and of the Council) ⁽¹⁾

EU Type Approval No: e24*2016/1628*2018/989SYBI/P*0153*01

Reason for extension/refusal/withdrawal ⁽¹⁾:

- 1. Change the manufacturer's authorised representative.**
- 2. Correct the trade name "LAUTOP" into "LAUNTOP"**
- 3. Add a new carburetor brand.**
- 4. Correct the carburetor brand "YINLONG" into "YINBA"**
- 5. Add the drawing of piston and header of GK225.**

SECTION I

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

GENKINS, LEEGA, LAUNTOP

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

N/A

1.3. Company name and address of manufacturer:

**Chongqing Genkins Power Ltd.
1-1, 2-1, 3-1, 1-2, 2-2, 3-2, 1-3, 2-3, 3-3, 1-4, 2-4, 3-4, 5th BUILDING NO.6,
GANGCHENG EAST LOOP ROAD,
JIANGBEI DISTRICT, CHONGQING,
CHINA**

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

**Patrice LE PONNER
53 route de Foecy-Zi des Forges 18100
VIERZON,
FRANCE**



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- 1.5. Name(s) and address(es) of assembly/manufacture plant(s):
- Fujian Everstrong Lega Power Equipments Co., Ltd.
Hongkuan Industrial Park,
Yangxia Town, Fuqing, Fuzhou,
Fujian 350323,
P.R. China*
- Chongqing Genkins Power Ltd.
1-1, 2-1, 3-1, 1-2, 2-2, 3-2, 1-3, 2-3, 3-3, 1-4, 2-4, 3-4, 5th BUILDING NO.6,
GANGCHENG EAST LOOP ROAD,
JIANGBEI DISTRICT, CHONGQING,
CHINA*
- 1.6. ~~Engine type designation~~/engine family designation/FF⁽¹⁾:
- Parent engine: GK460
Commercial names: N/A
Engine within family: GK420, GK390
Commercial names: N/A*
- 1.7. Category and sub-category of the engine type/~~engine family~~⁽¹⁾⁽⁴⁾:
- Category: NRS
Sub-category: NRS-vi-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⁾*

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SECTION II

- | | | |
|----|---|--|
| 1. | Technical service responsible for carrying out the tests: | <i>TÜV SÜD Auto Service GmbH,
Westendstraße 199,
D-80686 München,
Germany.</i> |
| 2. | Date(s) of test report(s): | <i>As before and 15.05.2019</i> |
| 3. | Number(s) of test report(s): | <i>18-02011-CX-SHA up to 01</i> |

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⁾.

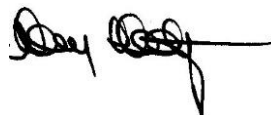
- | | | |
|----|--|---|
| 1. | The engine type /engine family ⁽¹⁾ meets/ does not meet ⁽¹⁾ the requirements laid down in Regulation (EU) 2016/1628. | |
| 2. | The approval is: | <i>granted/extended/refused/withdrawn</i> ⁽¹⁾ |
| 3. | The approval is granted in accordance with Article 35 of Regulation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

Place: *Dublin.*

Date: *04th July, 2019.*

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⁾*

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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

EU Type Approval No: e24*2016/1628*2018/989SYB1/P*0153*01

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:	GK460	GK420	GK390
3.1.2.	Engine type designation shown on engine mark: Yes/No ⁽¹⁾	Yes	Yes	Yes
3.1.3.	Location of the manufacturer's statutory marking:	Refer to drawing No. GK460-1	Refer to drawing No. GK460-1	Refer to drawing No. GK460-1
3.2.1.	Declared rated speed (rpm):	3600	3600	3600
3.2.1.2.	Declared rated net Power (kW):	9.8	7.6	7.1
3.2.2.	Maximum power speed (rpm):	3800	3800	3800
3.2.2.2.	Maximum net power (kW):	10.3	8.2	7.6
3.2.3.	Declared maximum torque speed (rpm):	2500	2500	2500
3.2.3.2.	Declared maximum torque (Nm):	28.0	25.0	23.0
3.6.3.	Number of Cylinders:	1	1	1
3.6.4.	Engine total swept volume (cm ³):	458	419	389
3.8.5.	Device for recycling crankcase gases: Yes /No ⁽¹⁾	No	No	No
3.11.3.12.	Consumable reagent: Yes /No ⁽¹⁾	No	No	No
3.11.3.12.1.	Type and concentration of reagent needed for catalytic action:	N/A	N/A	N/A
3.11.3.13.	NOx sensor(s): Yes /No ⁽¹⁾	No	No	No
3.11.3.14.	Oxygen sensor: Yes /No ⁽¹⁾	No	No	No
3.11.4.7.	Fuel borne catalyst (FBC): Yes /No ⁽¹⁾	No	No	No

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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	- 2.0	- 2.0
3.8.3.2.	Maximum charge air cooler outlet temperature at 100 % speed and 100 % load (deg. C):	N/A	N/A	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	N/A	N/A
3.9.3.	Maximum permissible exhaust gas backpressure at 100 % engine speed and at 100 % load (kPa):	10.0	10.0	10.0
3.9.3.1	Location of measurement:	Exhaust manifold	Exhaust manifold	Exhaust manifold
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	N/A	N/A
3.11.1.2.1.	Test conditions for measurement:	N/A	N/A	N/A

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.	292.3	-*	-*	6.0	N/A	N/A	G1
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: **850 g/kWh**



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- 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>21st December, 2018</i>
Date of latest amendment:	<i>04th July, 2019.</i>
Reason for extension/revision:	<i>1. Change the manufacturer's authorised representative. 2. Correct the trade name "LAUTOP" into "LAUNTOP" 3. Add a new carburetor brand. 4. Correct the carburetor brand "YINLONG" into "YINBA" 5. Add the drawing of piston and header of GK225.</i>
1. Additional conditions, and advisory notes on legal alternatives.	
2. Test report(s)	
- numbers(s):	<i>18-02011-CX-SHA up to 01</i>
- date of issue:	<i>02.11.2018</i>
- date of latest amendment:	<i>15.05.2019</i>
3. Information document	
- number(s):	<i>GK460- up to ext.01</i>
- date of issue:	<i>16.05.2018</i>
- date of latest amendment:	<i>11.04.2019</i>
Documentation:	<i>61 pages</i>



EU Type Approval No: e24*2016/1628*2018/989SYB1/P*0153*01

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.



Techn. Report No.: 18-02011-CX-SHA-01
Manufacturer: Chongqing Genkins Power Ltd.
Type: GK460

TECHNICAL REPORT

No.: 18-02011-CX-SHA-01

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**

Including all amendments of Commission Delegated/Implementing up to

Regulation (EU) 2018/987 dated **27.04.2018**

Regulation (EU) 2018/988 dated **27.04.2018**

Regulation (EU) 2018/989 dated **18.05.2018**

Approvals granted up to now		
EC	Number of approval ---	Date ---

Techn. Report No.: 18-02011-CX-SHA-01
Manufacturer: Chongqing Genkins Power Ltd.
Type: GK460

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1. General information

- 1.1. Make (trade name(s) of manufacturer) : GENKINS, LEEGA, LAUNTOP
- 1.2. Commercial name(s) (if applicable) : N/A
- 1.3. Company name and address of manufacturer : Chongqing Genkins Power Ltd.
1-1, 2-1, 3-1, 1-2, 2-2, 3-2, 1-3, 2-3, 3-3,
1-4, 2-4, 3-4, 5th BUILDING NO.6,
GANGCHENG EAST LOOP ROAD,
JIANGBEI DISTRICT, CHONGQING,
CHINA
- 1.4. Name and address of manufacturer's authorised representative (if any) : Patrice LE PONNER
53 route de Foecy-Zi des Forges 18100
VIERZON, FRANCE
- 1.5. Name(s) and address(es) of assembly/manufacture plant(s) : Fujian Everstrong Lega Power Equipments Co., Ltd.
Hongkuan Industrial Park, Yangxia Town,
Fuqing, Fuzhou, Fujian 350323, P.R.
China
Chongqing Genkins Power Ltd.
1-1, 2-1, 3-1, 1-2, 2-2, 3-2, 1-3, 2-3, 3-3,
1-4, 2-4, 3-4, 5th BUILDING NO.6,
GANGCHENG EAST LOOP ROAD,
JIANGBEI DISTRICT, CHONGQING,
CHINA
- 1.6. Name of technical service : TÜV SÜD Auto Service GmbH
- 1.7. Address of technical service : Nanjing Depurate Catalyst Co., Ltd.
TÜV SÜD Certification and Testing
(China) Co., Ltd. Shanghai Branch,
Shanghai, P.R. China
- 1.8. Location of test : Nanjing Depurate Catalyst Co., Ltd.
- 1.9. Date of test : 17.07.2018 - 29.09.2018
15.05.2019
- 1.10. Test report number : 18-02011-CX-SHA-01

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- 1.11. Information document reference number (if available) : GK460-ext.01
- 1.12. Test report type : Primary test/~~additional test~~/~~supplementary test~~
- 1.12.1. Description of the purpose of the test : Extension, the changes have no obvious influence to the original type approval and the original test results remain valid, refer to reasons for extension behind this report.

2. General engine information (test engine)

- 2.1. ~~Engine type designation~~/engine family designation/~~FT~~ : Parent engine: GK460
Commercial names: N/A
Engine within family: GK420, GK390
Commercial names: N/A
- 2.2. Engine identification number : 2018050000018
- 2.3. Engine Category and subcategory : Category: NRS
Sub-category: NRS-vi-1b
- 2.4. Worst Case Rationale : Test carried out on parent engine

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

- 3.1. Engine mapping documentation reference : G1 cycle, tested at intermediate speed.
- 3.2. Deterioration factor determination documentation reference : See Annex
- 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

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- 3.5. Particulate control diagnostic : N/A
demonstration documentation reference,
where applicable
- 3.6. For engine types and engine families that : N/A
use an Electronic Control Unit (ECU) as
part of the emission control system anti-
tampering declaration documentation
reference
- 3.7. For engine types and engine families that : Tamper-proof carburetor, the carburetor
use mechanical devices as part of the : can't be adjusted by common tools, also it
emission control system anti-tampering : can't be broken with hands.
and adjustable parameters declaration
and demonstration documentation
reference
- 3.8. Manufacturer intends to use Electronic : Yes/No
Control Unit (ECU) torque signal for in-
service monitoring
- 3.8.1. Dynamometer torque greater than or : Yes/No
equal to $0.93 \times$ Electronic Control Unit
(ECU) torque
- 3.8.2. Electronic Control Unit (ECU) torque : N/A
correction factor in case that
dynamometer torque less than $0.93x$
Electronic Control Unit (ECU) torque
- 4. Reference fuel(s) used for test (complete relevant subparagraph(s))**
- 4.1. *Liquid fuel for spark-ignition engines*
- 4.1.1. Make : Anhui Super Beauty Chemical Science
Co., Ltd.
- 4.1.2. Type : E10
- 4.1.3. Octane number RON : 96.4
- 4.1.4. Octane number MON : 86.3

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 Type: GK460

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- 4.1.5. Ethanol content (%) : 9.9
- 4.1.6. Density at 15 Deg.C (kg/m³) : 746.2
- 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
- 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/G₂₃/G₂₅/G₂₀ : 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)*

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Manufacturer: Chongqing Genkins Power Ltd.
Type: GK460

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4.5.1. Gas energy ratio on test cycle : N/A

5. Lubricant

5.1. Make(s) : SINOPEC

5.2. Type(s) : SF

5.3. SAE viscosity : 10W/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

6.2. Intermediate speed (rpm) : 3060

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) : 1800 ± 400

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

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

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

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

7.2. Engine net power to be stated in Table 3

Table 3

Condition	Power setting at indicated engine speed (kW) (complete relevant columns)		
	Intermediate	Max. power	100%
Maximum power measured at specified test speed (P _{m,i}) (kW)	9.16	N/A	N/A
Total auxiliary power from table 1 (P _{f,i})	N/A	N/A	N/A
Total auxiliary power from table 2 (P _{r,i})	N/A	N/A	N/A
Net engine power (kW) P _i = P _{m,i} - P _{f,i} + P _{r,i}	9.16	N/A	N/A

8. Conditions at test

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

Techn. Report No.: 18-02011-CX-SHA-01
 Manufacturer: Chongqing Genkins Power Ltd.
 Type: GK460

- 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 : 25.2 °C
 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)

Table 4

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)

Table 5

% Load at point or % of rated power (as applicable)	Dynamometer setting (kW) at indicated engine speed after adjustment for auxiliary power (complete relevant columns)					
	Idle	63%	80%	91%	Inter-mediate	100%
0%	-	-	-	-	0	-
5%	-	-	-	-	N/A	-
10%	-	-	-	-	0.92	-
25%	-	-	-	-	2.30	-
50%	-	-	-	-	4.61	-
75%	-	-	-	-	6.97	-
100%	-	-	-	-	9.16	-

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

DF	CO	HC	NO _x	HC+NO _x	PM	PN
mult/add	1.08	-*	-*	1.01	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	270.87	2.67	3.27	5.94	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 IRAFs	N/A	N/A	N/A	N/A	N/A	N/A
Final test result with DF	292.3	-*	-*	6.0	N/A	N/A

* No DF given in the regulations.

9.3.3. Cycle weighted CO₂ (g/kWh) : 850

9.3.4. Cycle weighted NH₃ (ppm) : N/A

9.4. Additional control-area test points (if applicable)

Table 7

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



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Manufacturer: Chongqing Genkins Power Ltd.
Type: GK460

- 9.5.1. Gaseous emissions : Sample system: HORIBA-CVS7100
Analyse system: MEXA-7200D
Dynamometer: ACD 11kW
- 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)~~

Table 8

NRTC	-
LSI-NRTC	-

10.2. ~~NRTC emission results~~

10.2.1. ~~Deterioration Factor (DF) : calculated/fixe~~

10.2.2. ~~DF values and the emissions results to be stated in Table 9 or in Table 10, as applicable (NRTC or LSI-NRTC):~~

10.3. ~~NRTC emission results~~

Table 9: Table 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_{fu}/k_{fd} 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) ÷
- 10.4. LSI-NRTC emission results

Table 10: Table for NRTC-LSI

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
test result with/without regeneration	-	-	-	-	-	-
k_{fu}/k_{fd} 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

Table 11

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⁾ .	292.3	-*	-*	6.0	N/A	N/A	G1
NRTC Final test result with DF ⁽³⁾	-	-	-	-	-	-	-

11.2 CO₂ result (g/kWh) ⁽⁴⁾ : 850

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

Emission limits

	CO	HC	NO _x	HC+NO _x	PM	PN
NRSh-v-1a	805	-	-	50	-	-
NRSh-v-1b	603	-	-	72	-	-
NRS-vr-1a	610	-	-	10	-	-
NRS-vr-1b	610	-	-	8	-	-
NRS-vi-1a	610	-	-	10	-	-
NRS-vi-1b	610	-	-	8	-	-
NRS-v-2a	610	-	-	8	-	-
NRS-v-2b	4,40(*)	-	-	2,70(*)	-	-
NRS-v-3	4,40(*)	-	-	2,70(*)	-	-

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

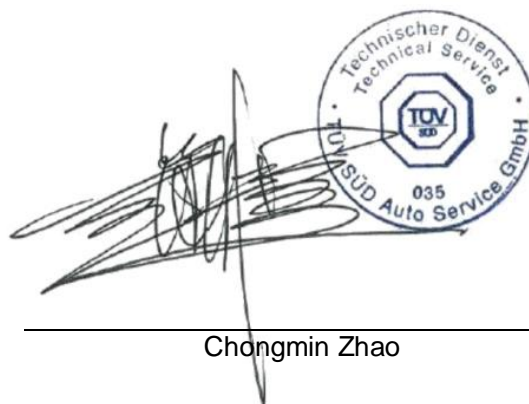
12. Statement of conformity

The information folder as mentioned above and the type described therein are in compliance with the test specification mentioned above. The worst-case was selected in accordance with document "Preparation of Test Reports".

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

Approval authority	Country	Registration-number
Kraftfahrt-Bundesamt (KBA)	Deutschland/ Germany	KBA-P 00100-10
Vehicle Certification Agency (VCA)	Vereintes Königreich/ United Kingdom	VCA-TS-006
Approval Authority of the Netherlands (RDW)	Niederlande/ The Netherlands	RDWT-082-XX
National Standards Authority of Ireland (NSAI)	Irland/ Ireland	Technical Service Number: 49
Vehicle Safety Certification Center (VSCC)	Taiwan/ Taiwan	DE04-06-2



München, 15.05.2019

Chongmin Zhao

- (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.

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Determination of deterioration factor

GK460 parent engine (engine No: 2018050000018)

	New stabilized engine	engine after 250 aging cycle	DF
CO	270.87 g/kWh	292.25 g/kWh	1.08
HC	2.67 g/kWh	2.80 g/kWh	-*
NO _x	3.27 g/kWh	3.20 g/kWh	-*
HC + NOx	5.94 g/kWh	6.00 g/kWh	1.01

* No DF given in the regulations.

Aging cycle (started at 18.07.2018)

GK460				Durability test equipment No: GA-11					Run By: chenliang; liulongpin					
									Record by: chenliang; liulongpin					
Durability data	Durability hours	Load percent	Durability time	parameters										Durability time record
	h	%	min	Engine speed	torque	power	Fuel flow	Fuel flow rate	Temperature of spark plug washer	Air pressure	Ambient temperature	Relative humidity		
				r/min	N.m	kW	kg/h	g/kW.h	°C	kPa	°C	%		
2018.07.18	0	100	2	3602	23.89	9.01	3.7	411	218	96.7	28.1	74.6	8:00	
	2	100	2	3612	23.90	9.04	3.6	403	217	96.7	24.6	74.5	10:00	
	4	100	2	3608	23.85	9.01	3.6	402	216	96.7	25.2	74.7	12:00	
	6	100	2	3608	23.85	9.01	3.6	402	219	96.6	25.5	74.6	14:00	
	8	100	2	3609	23.79	8.99	3.7	413	222	96.6	25.6	74.5	16:00	
	10	100	2	3610	23.89	9.03	3.7	412	221	96.5	25.6	74.7	18:00	
	12	100	2	3609	23.87	9.02	3.5	393	219	96.5	25.5	74.8	20:00	
	14	100	2	3610	23.86	9.02	3.7	408	216	96.4	25.6	74.7	22:00	
	16	100	2	3598	23.89	9	3.7	413	228	96.4	25.7	74.6	24:00	
	18	100	2	3602	23.89	9.01	3.6	404	222	96.3	25.5	74.6	00:00	
	20	100	2	3612	23.82	9.01	3.7	411	225	96.3	25.6	74.8	02:00	
	22	100	2	3611	23.86	9.02	3.7	413	224	96.2	25.8	74.6	04:00	
2018.07.19	24	100	2	3610	23.91	9.04	3.7	406	224	96.2	26.1	74.5	8:00	
	26	100	2	3598	23.89	9	3.7	413	224	96.1	26.5	74.7	10:00	
	28	100	2	3612	23.82	9.01	3.6	404	224	96.1	26.6	74.6	12:00	
	30	100	2	3612	23.88	9.03	3.7	409	225	96	26.6	74.8	14:00	
	32	100	2	3611	23.78	8.99	3.7	408	225	96	26.5	74.7	16:00	
	34	100	2	3610	23.84	9.01	3.6	401	225	95.9	26.6	74.6	18:00	
	36	100	2	3599	23.80	8.97	3.6	398	225	95.9	26.7	74.5	20:00	
	38	100	2	3602	23.89	9.01	3.7	411	218	96.7	28.1	74.6	22:00	
	40	100	2	3612	23.90	9.04	3.6	403	217	96.7	24.6	74.5	24:00	
	42	100	2	3608	23.85	9.01	3.6	402	216	96.7	25.2	74.7	00:00	



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2018.07.22	76	100	2	3613	23.76	8.99	3.6	402	225	95.8	26.7	74.7	8:00
	78	100	2	3610	23.84	9.01	3.6	401	225	95.9	26.6	74.6	10:00
	80	100	2	3599	23.80	8.97	3.6	398	225	95.9	26.7	74.5	12:00
	82	100	2	3613	23.76	8.99	3.6	402	225	95.8	26.7	74.7	14:00
	84	100	2	3610	23.84	9.01	3.6	401	225	95.9	26.6	74.6	16:00
	86	100	2	3599	23.80	8.97	3.6	398	225	95.9	26.7	74.5	18:00
	88	100	2	3613	23.76	8.99	3.6	402	225	95.8	26.7	74.7	20:00
	90	100	2	3610	23.86	9.02	3.6	400	216	97.6	24.6	74.6	22:00
	92	100	2	3607	23.86	9.01	3.7	416	218	97.6	25.2	74.8	24:00
	94	100	2	3601	23.92	9.02	3.7	410	218	97.8	25.6	74.6	00:00
	96	100	2	3598	23.89	9	3.7	415	217	97.6	25.6	74.5	02:00
	98	100	2	3602	23.89	9.01	3.7	409	216	97.1	25.5	74.7	04:00
	100	100	2	3612	23.85	9.02	3.7	411	219	97.6	25.6	74.6	06:00
Emission test (100h)													
2018.07.23	102	100	2	3598	23.89	9	3.6	405	218	97.4	25.9	74.6	8:00
	104	100	2	3606	23.89	9.02	3.7	411	218	97.3	26.1	74.8	10:00
	106	100	2	3605	23.82	8.99	3.7	408	219	97.3	26.3	74.6	12:00
	108	100	2	3613	23.82	9.01	3.6	401	219	97.2	26.4	74.5	14:00
	110	100	2	3602	23.86	9	3.6	402	219	97.2	26.6	74.7	16:00
	112	100	2	3601	23.92	9.02	3.7	410	219	97.1	26.8	74.6	18:00
	114	100	2	3605	23.82	8.99	3.7	416	223	97.1	27.0	74.5	20:00
	116	100	2	3606	23.89	9.02	3.7	408	220	97.0	27.1	74.7	22:00
	118	100	2	3606	23.89	9.02	3.7	411	212	97.0	27.3	74.8	24:00
	120	100	2	3606	23.86	9.01	3.6	404	226	96.9	27.5	74.7	00:00
	122	100	2	3603	23.88	9.01	3.7	409	220	96.9	27.6	74.6	02:00
	124	100	2	3607	23.86	9.01	3.7	411	229	96.8	27.8	74.6	04:00
	126	100	2	3598	23.89	9	3.6	405	221	96.8	28.0	74.8	06:00
2018.07.24	128	100	2	3598	23.89	9	3.6	405	218	97.4	25.9	74.6	08:00
	216	100	2	3612	23.85	9.02	3.7	3612	221	97.6	25.6	74.6	22:00
	218	100	2	3598	23.89	9	3.6	3598	218	97.4	25.9	74.6	24:00
	220	100	2	3606	23.89	9.02	3.7	3606	218	97.3	26.1	74.8	02:00
	222	100	2	3605	23.82	8.99	3.7	3605	219	97.3	26.3	74.6	04:00
	224	100	2	3613	23.82	9.01	3.6	3613	219	97.2	26.4	74.5	06:00
2018.07.28	226	100	2	3602	23.86	9	3.6	3602	219	97.2	26.6	74.7	8:00
	228	100	2	3601	23.92	9.02	3.7	3601	219	97.1	26.8	74.6	10:00
	230	100	2	3605	23.82	8.99	3.7	3605	220	97.1	27.0	74.5	12:00
	232	100	2	3606	23.89	9.02	3.7	3606	220	97.0	27.1	74.7	14:00
	234	100	2	3606	23.89	9.02	3.7	3606	220	97.0	27.3	74.8	16:00
	236	100	2	3606	23.86	9.01	3.6	3606	223	96.9	27.5	74.7	18:00
	238	100	2	3603	23.88	9.01	3.7	3603	220	96.9	27.6	74.6	20:00
	240	100	2	3607	23.86	9.01	3.7	3607	221	96.8	27.8	74.6	22:00
	242	100	2	3598	23.89	9	3.6	3598	221	96.8	28.0	74.8	24:00
	244	100	2	3611	23.78	8.99	3.6	3611	224	96.8	28.0	74.8	02:00
	246	100	2	3602	23.81	8.98	3.6	3602	225	96.8	28.2	74.8	04:00
	248	100	2	3598	23.89	9	3.6	3598	218	97.4	25.9	74.6	06:00
	250	100	2	3606	23.89	9.02	3.7	3606	218	97.3	26.1	74.8	08:00
Emission test (250h)													



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Type:	GK460	Page 1 of 1

Reasons for extension

It is corrected:

Correct the trade name “LAUTOP” into “LAUNTOP”

Correct the carburetor brand “YINLONG” into “YINBA”

It is changed:

Change the manufacturer’s authorised representative

It is added:

Add a new carburetor brand

Add the drawing of piston and header of GK460

It is cancelled: No cancellation

PARTIAL MODEL INFORMATION DOCUMENT

No.:GK460 ext.01

GENKINS

Chongqing Genkins Power Ltd.

ENGINE TYPE : GK460

SUBJECT : NRMM EMISSION

LEGAL BASIS : 2016/1628/EU

Date : 2019-4-11

Approval : Huang Yong

Position : Engineer

AMENDMENT

Version	Approval No.	Modification / Correction	Date
00	e24*2016/1628*2018/989SYB1/P*01 53*00	New approval	2018-5-16
01	<u>e24*2016/1628*2018/989SYB1/P*01 53*01</u>	1. <u>Change the manufacturer's authorised representative.</u> 2. <u>Correct the trade name "LAUNTOP" into "LAUNTOP"</u> 3. <u>Add a new carburetor brand.</u> 4. <u>Correct the carburetor brand "YINLONG" into "YINBA"</u> 5. <u>Add the drawing of header and piston of GK225.</u>	<u>2019-4-11</u>

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Part A

1. General information

- 1.1. Make (trade name(s) of manufacturer) : GENKINS, LEEGA, LAUNTOP
- 1.2. Commercial name(s) (if applicable) : N/A
- 1.3. Company name and address of manufacturer : Chongqing Genkins Power Ltd.
 1-1, 2-1, 3-1, 1-2, 2-2, 3-2, 1-3, 2-3, 3-3, 1-4, 2-4, 3-4, 5th BUILDING NO.6, GANGCHENG EAST LOOP ROAD, JIANGBEI DISTRICT, CHONGQING, CHINA
- 1.4. Name and address of manufacturer's authorised representative (if any) : Patrice LE PONNER
53 route de Foecy-Zi des Forges 18100 VIERZON, FRANCE
- 1.5. Name(s) and address(es) of assembly/manufacture plant(s) : Fujian Everstrong Lega Power Equipments Co., Ltd.
 Hongkuan Industrial Park, Yangxia Town, Fuqing, Fuzhou, Fujian 350323, P.R. China
 Chongqing Genkins Power Ltd.
 1-1, 2-1, 3-1, 1-2, 2-2, 3-2, 1-3, 2-3, 3-3, 1-4, 2-4, 3-4, 5th BUILDING NO.6, GANGCHENG EAST LOOP ROAD, JIANGBEI DISTRICT, CHONGQING, CHINA
- 1.6. ~~Engine type designation/~~engine family designation/~~FF~~ : Parent engine: GK460
 Commercial names: N/A
 Engine within family: GK420, GK390
 Commercial names: N/A
- 1.7. Category and sub-category of the engine type/engine family : Category: NRS
 Sub-category: NRS-vi-1b
- 1.8. Emissions durability period category : ~~Not Applicable/~~
 Cat 1 (Consumer products)/
 Cat 2 (Semi-professional products)/
 Cat 3 (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. GK460-02
- 2.4.3. Number of valves per cylinder : 2
- 2.5. Range of individual cylinder displacement (cm³) : 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 : Yes
(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 : Yes/No**
(if yes 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 trap 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 traps : 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)		
3.1	Engine Identification							
3.1.1.	Engine type designation			X	GK460	GK420	GK390	
3.1.2.	Engine type designation shown on engine marking:			X	Yes	Yes	Yes	
3.1.3.	Location of the statutory marking: yes/no			X	Refer to drawing No. GK460-1	Refer to drawing No. GK460-1	Refer to drawing No. GK460-1	
3.1.4.	Method of attachment of the statutory marking:			X	Engraved or Paste	Engraved or Paste	Engraved or Paste	
3.1.5.	Drawings of the location of the engine identification number (complete example with dimensions):			X	Refer to drawing No. GK460-01	Refer to drawing No. GK460-01	Refer to drawing No. GK460-01	
3.2.	Performance Parameters							
3.2.1.	Declared rated speed (rpm):	X			3600	3600	3600	
3.2.1.1.	Fuel delivery/stroke (mm ³) for diesel engine, fuel flow (g/h) for other engines, at rated net power:			X	3600	3000	2800	
3.2.1.2.	Declared rated net power (kW):	X			9.8	7.6	7.1	
3.2.2.	Maximum power speed(rpm):			X	3800	3800	3800	
3.2.2.1.	Fuel delivery/stroke (mm ³) for diesel engine, fuel flow (g/h) for other engines, at maximum net power:			X	3800	3300	2800	
3.2.2.2.	Maximum net power (kW):	X		X	10.3	8.2	7.6	
3.2.3.	Declared maximum torque speed (rpm):	X			2500	2500	2500	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.2.3.1.	Fuel delivery/stroke (mm ³) for diesel engine, fuel flow (g/h) for other engines, at maximum torque speed:			X	3000	2600	2400	
3.2.3.2.	Declared maximum torque (Nm):	X			28.0	25.0	23.0	
3.2.4.	Declared 100% test speed:	X			N/A	N/A	N/A	
3.2.5.	Declared Intermediate test speed:	X			3060	3060	3060	
3.2.6.	Idle speed (rpm)	X			1800±400	1800±400	1800±400	
3.2.7.	Maximum no load speed (rpm):	X			3900 ± 100	3900 ± 100	3900 ± 100	
3.2.8.	Declared minimum torque (Nm)	X			N/A	N/A	N/A	
3.3.	Run-in procedure							
3.3.1.	Run in time:	X			N/A	N/A	N/A	
3.3.2.	Run-in cycle:	X			N/A	N/A	N/A	
3.4.	Engine test							
3.4.1.	Specific fixture required: Yes/No	X			Yes/No	Yes/No	Yes/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	N/A	N/A	
3.4.2.	Exhaust mixing chamber permitted by manufacturer: Yes/No	X			No	No	No	
3.4.2.1.	exhaust mixing chamber description, photograph and/or drawing:	X			N/A	N/A	N/A	
3.4.3.	Manufacturers chosen NRSC: RMC/Discrete mode	X			Discrete mode	Discrete mode	Discrete mode	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.4.4.	Additional NRSC: E2/D2/C1	X			N/A	N/A	N/A	
3.4.5.	Number of pre-conditioning cycles prior to transient test	X			N/A	N/A	N/A	
3.4.6.	Pre-conditioning for RMC NRSC: Steady-state operation/RMC	X			N/A	N/A	N/A	
3.4.6.1	In case of RMC, number of pre-conditioning RMC prior to RMC NRSC test	X			N/A	N/A	N/A	
3.5.	Lubrication system							
3.5.1.	<i>Lubricant temperature</i>							
3.5.1.1.	Minimum (deg. C):	X			-5	-5	-5	
3.5.1.2.	Maximum (deg. C):	X			150	150	150	
3.6.	Combustion Cylinder							
3.6.1.	Bore(mm):			X	92	90	88	
3.6.2.	Stroke(mm):			X	69	66	64	
3.6.3.	Number of cylinders:			X	1	1	1	
3.6.4.	Engine total swept volume (cm ³):			X	458	419	389	
3.6.5.	Swept volume per cylinder as % of parent engine:			X	100%	91%	85%	
3.6.6.	Volumetric compression ratio:			X	(8.7±0.2) : 1	(8.2±0.2) : 1	(8.0±0.2) : 1	
3.6.7.	Combustion system description:			X	N/A	N/A	N/A	
3.6.8.	Drawings of combustion chamber and piston crown:			X	Refer to drawing no. GK460-02 and GK460-03	Refer to drawing no. GK460-02 and GK420-01	Refer to drawing no. GK460-02 and GK390-01	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.6.9.	Minimum cross sectional area of inlet and outlet ports (mm ²):			X	Inlet 706 mm ² , Outlet 530 mm ²	Inlet 706 mm ² , Outlet 530 mm ²	Inlet 706 mm ² , Outlet 530 mm ²	
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	Lift inlet:7.2± 0.2mm Lift outlet:7.2± 0.2mm Refer to drawing No. GK460-05	Lift inlet:7.2 ± 0.2mm Lift outlet:7.2 ± 0.2mm Refer to drawing No. GK460-05	Lift inlet:7.2 ± 0.2mm Lift outlet:7.2 ± 0.2mm Refer to drawing No. GK460-05	
3.6.10.2.	Reference and/or setting range:			X	N/A	N/A	N/A	
3.6.10.3.	Variable valve timing system: Yes/No			X	No	No	No	
3.6.10.3.1.	Type: continuous/(on/off)			X	N/A	N/A	N/A	
3.6.10.3.2.	Cam phase shift angle:			X	N/A	N/A	N/A	
3.6.11.	<i>Porting configuration</i>							
3.6.11.1.	position, size and number:			X	Refer to drawing No. GK460-02	Refer to drawing No. GK460-02	Refer to drawing No. GK460-02	
3.7.	Cooling system							
3.7.1.	<i>Liquid cooling</i>							
3.7.1.1.	Nature of liquid:			X	N/A	N/A	N/A	
3.7.1.2.	Circulating pumps: Yes/No			X	No	No	No	
3.7.1.2.1.	type(s):			X	N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.7.1.2.2.	Drive ratio(s):			X	N/A	N/A	N/A	
3.7.1.3.	Minimum coolant temperature at outlet (deg. C):	X			N/A	N/A	N/A	
3.7.1.4.	Maximum coolant temperature at outlet (deg. C):	X			N/A	N/A	N/A	
3.7.2.	<i>Air cooling</i>							
3.7.2.1.	fan: Yes/No			X	Yes	Yes	Yes	
3.7.2.1.0.	Make:			X	N/A	N/A	N/A	
3.7.2.1.1.	type(s):			X	G1935E02	G1935E02	G1935E02	
3.7.2.1.2.	Drive ratio(s):			X	1:1	1:1	1:1	
3.7.2.2.	Maximum temperature at reference point (deg. C):			X	270	270	270	
3.7.2.2.1.	Reference point location			X	Spark plug washer	Spark plug washer	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		-2.0kPa	-2.0kPa	-2.0kPa	
3.8.1.2.	With dirty air cleaner:	X	X		-2.0kPa	-2.0kPa	-2.0kPa	
3.8.1.3.	Location, of measurement:	X	X		Intake manifold	Intake manifold	Intake manifold	
3.8.2.	Pressure charger(s): Yes/No			X	No	No	No	
3.8.2.0.	Make:			X	N/A	N/A	N/A	
3.8.2.1.	Type(s):			X	N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
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	N/A	N/A	
3.8.3.	Charge air cooler: Yes/No	X	X		No	No	No	
3.8.3.1.	Type: air-air/air-water/other(specify)		X		N/A	N/A	N/A	
3.8.3.2.	Maximum charge air cooler outlet temperature at 100% speed and 100% load (deg. C):	X	X		N/A	N/A	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	N/A	N/A	
3.8.4.	Intake throttle valve: Yes/No			X	Yes	Yes	Yes	
3.8.5.	Device for recycling crankcase gases: Yes/No			X	No	No	No	
3.8.5.1.	If yes, description and drawings:			X	N/A	N/A	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	N/A	N/A	
3.8.6.	<i>Inlet path</i>							
3.8.6.1.	Description of inlet path, (with drawings, photographs and/or part numbers):			X	N/A	N/A	N/A	
3.8.7.	Air filter			X	Yes	Yes	Yes	
3.8.7.0.	Make:			X	N/A	N/A	N/A	
3.8.7.1.	Type:			X	G1710E02	G1710E02	G1710E02	
3.8.8.	Intake air-silencer							
3.8.1.0.	Make:			X	N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.8.1.1.	Type:			X	N/A	N/A	N/A	
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. GK460-07	Refer to drawing No. GK460-07	Refer to drawing No. GK460-07	
3.9.2.	Maximum exhaust temperature (deg. C):	X			450	450	450	
3.9.3.	Maximum permissible exhaust backpressure at 100% engine speed and at 100% load (kPa):	X	X		10.0	10.0	10.0	
3.9.3.1.	Location of measurement:	X	X		Exhaust manifold	Exhaust manifold	Exhaust manifold	
3.9.4.	Exhaust backpressure at loading level specified by manufacturer for variable restriction after-treatment at start of test (kPa):	X			N/A	N/A	N/A	
3.9.4.1.	Location and speed/load conditions:	X			N/A	N/A	N/A	
3.9.5.	Exhaust throttle valve: Yes/No			X	No	No	No	
3.10.	Miscellaneous devices: Yes/No				No	No	No	
3.10.1.	<i>Exhaust gas recirculation (EGR)</i>				N/A	N/A	N/A	
3.10.1.1.	Characteristics: cooled/uncooled, high pressure/low pressure/other (specify):			X	N/A	N/A	N/A	
3.10.2.	<i>Water injection</i>				N/A	N/A	N/A	
3.10.2.1.	Operation principle:			X	N/A	N/A	N/A	
3.10.3.	Air injection				N/A	N/A	N/A	
3.10.3.1.	Operation principle:			X	N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.10.4.	Other(s)				N/A	N/A	N/A	
3.10.4.1.	Type(s):			X	N/A	N/A	N/A	
3.11.	Exhaust after-treatment system							
3.11.1.	<i>Location</i>		X		N/A	N/A	N/A	
3.11.1.1.	Place(s) and maximum/minimum distance(s) from engine to first after-treatment device:		X		N/A	N/A	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	N/A	N/A	
3.11.1.2.1.	Test conditions for measurement:	X	X		N/A	N/A	N/A	
3.11.1.3.	Minimum temperature at inlet to first after-treatment device (deg. C), if stated:	X	X		N/A	N/A	N/A	
3.11.1.3.1.	Test conditions for measurement:							
3.11.2.	Oxidation catalyst							
3.11.2.0.	Make/type:			X	N/A	N/A	N/A	
3.11.2.1.	Number of catalytic converters and elements:			X	N/A	N/A	N/A	
3.11.2.2.	Dimensions and volume of the catalytic converter(s):			X	N/A	N/A	N/A	
3.11.2.3.	Total charge of precious metals:			X	N/A	N/A	N/A	
3.11.2.4.	Relative concentration of each compound:			X	N/A	N/A	N/A	
3.11.2.5.	Substrate (structure and material):			X	N/A	N/A	N/A	
3.11.2.6.	Cell density:			X	N/A	N/A	N/A	
3.11.2.7.	Type of casing for the catalytic converter(s):			X	N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.11.3.	<i>Catalytic exhaust gas after treatment system for NO_x or three way catalyst</i>				N/A	N/A	N/A	
3.11.3.0.	Make:			X	N/A	N/A	N/A	
3.11.3.1.	Type:			X	N/A	N/A	N/A	
3.11.3.2.	Number of catalytic converters and elements:			X	N/A	N/A	N/A	
3.11.3.3.	Type of catalytic action:			X	N/A	N/A	N/A	
3.11.3.4.	Dimensions and volume of the catalytic converter(s):			X	N/A	N/A	N/A	
3.11.3.5.	Total charge of precious metals:			X	N/A	N/A	N/A	
3.11.3.6.	Relative concentration of each compound:			X	N/A	N/A	N/A	
3.11.3.7.	Substrate (structure and material):			X	N/A	N/A	N/A	
3.11.3.8.	Cell density:			X	N/A	N/A	N/A	
3.11.3.9.	Type of casing for the catalytic converter(s):			X	N/A	N/A	N/A	
3.11.3.10.	Method of regeneration:	X		X	N/A	N/A	N/A	
3.11.3.10.1.	Infrequent regeneration: Yes/No:	X			No	No	No	
3.11.3.11.	Normal operating temperature range (deg. C):	X	X		N/A	N/A	N/A	
3.11.3.12.	Consumable reagent: Yes/No			X	No	No	No	
3.11.3.12.1.	Type and concentration of reagent needed for catalytic action:			X	N/A	N/A	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	N/A	N/A	
3.11.3.12.3.	Normal operational temperature range of reagent:		X		N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.11.3.12.4.	International standard:		X	X	N/A	N/A	N/A	
3.11.3.13.	NO _x sensor(s): Yes/No			X	No	No	No	
3.11.3.13.0.	Make:			X	N/A	N/A	N/A	
3.11.3.13.1.	Type:			X	N/A	N/A	N/A	
3.11.3.13.2.	Location(s)			X	N/A	N/A	N/A	
3.11.3.14.	Oxygen sensor(s): Yes/No			X	No	No	No	
3.11.3.14.0.	Make:			X	N/A	N/A	N/A	
3.11.3.14.1.	Type:			X	N/A	N/A	N/A	
3.11.3.14.2.	Location(s):			X	N/A	N/A	N/A	
3.11.4.	<i>Particulate after-treatment system</i>				N/A	N/A	N/A	
3.11.4.1.	Type of filtration: wall-flow/ non-wall-flow/other (specify)			X	N/A	N/A	N/A	
3.11.4.2'. 3.11.4.2.	Make: Type:			X X	N/A N/A	N/A N/A	N/A N/A	
3.11.4.3.	Dimensions and capacity of the particulate after-treatment system:			X	N/A	N/A	N/A	
3.11.4.4.	Location place(s) and maximum and minimum distance(s) from engine:		X		N/A	N/A	N/A	
3.11.4.5.	Method or system of regeneration, description and/or drawing:			X	N/A	N/A	N/A	
3.11.4.5.1.	Infrequent regeneration: Yes/No			X	No	No	No	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.11.4.5.2.	Minimum exhaust gas temperature for initiating regeneration procedure (deg. C):			X	N/A	N/A	N/A	
3.11.4.6.	Catalytic coating: Yes/No			X	No	No	No	
3.11.4.6.1.	Type of catalytic action:			X	N/A	N/A	N/A	
3.11.4.7.	Fuel borne catalyst (FBC): Yes/No			X	No	No	No	
3.11.4.8.	Normal operating temperature range (deg. C):			X	N/A	N/A	N/A	
3.11.4.9.	Normal operating pressure range (kPa)			X	N/A	N/A	N/A	
3.11.4.10.	Storage capacity soot/ash [g]:			X	N/A	N/A	N/A	
3.11.4.11	Oxygen sensor(s): Yes/No			X	No	No	No	
3.11.4.11.1	Type:			X	N/A	N/A	N/A	
3.11.4.11.2	Location(s):			X	N/A	N/A	N/A	
3.11.5.	<i>Other systems</i>				N/A	N/A	N/A	
3.11.5.1.	Description and operation:			X	N/A	N/A	N/A	
3.11.6.	Infrequent Regeneration				N/A	N/A	N/A	
3.11.6.1.	Number of cycles with regeneration	X			N/A	N/A	N/A	
3.11.6.2.	Number of cycles without regeneration	X			N/A	N/A	N/A	
3.11.7.	Other device(s) or feature(s)				N/A	N/A	N/A	
3.11.7.1.	Type(s):			X	N/A	N/A	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	N/A	N/A	
3.12.1.1.	Pressure (kPa) or characteristic diagram:			X	N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.12.2.	<i>Injection system</i>				N/A	N/A	N/A	
3.12.2.1.	Pump				N/A	N/A	N/A	
3.12.2.1.0.	Make:			X	N/A	N/A	N/A	
3.12.2.1.1.	Type(s):			X	N/A	N/A	N/A	
3.12.2.1.2.	Rated pump speed (rpm):			X	N/A	N/A	N/A	
3.12.2.1.3.	mm ³ per stroke or cycle at full injection at rated pump speed:			X	N/A	N/A	N/A	
3.12.2.1.4.	Torque peak pump speed (rpm):			X	N/A	N/A	N/A	
3.12.2.1.5.	mm ³ per stroke or cycle at full injection at torque peak pump speed			X	N/A	N/A	N/A	
3.12.2.1.6.	Characteristic diagram:			X	N/A	N/A	N/A	
3.12.2.1.7.	Method used: on engine/on pump bench			X	N/A	N/A	N/A	
3.12.2.2.	Injection timing				N/A	N/A	N/A	
3.12.2.2.1.	Injection timing curve:			X	N/A	N/A	N/A	
3.12.2.2.2.	Static Timing:			X	N/A	N/A	N/A	
3.12.2.3.	Injection piping				N/A	N/A	N/A	
3.12.2.3.1.	Length(s) (mm):			X	N/A	N/A	N/A	
3.12.2.3.2.	Internal diameter (mm):			X	N/A	N/A	N/A	
3.12.2.4.	Common rail: Yes/No			X	No	No	No	
3.12.2.4.0.	Make:			X	N/A	N/A	N/A	
3.12.2.4.1.	Type:			X	N/A	N/A	N/A	
3.12.3.	<i>Injector(s)</i>				N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.12.2.0.	Make:			X	N/A	N/A	N/A	
3.12.3.1.	Type(s):			X	N/A	N/A	N/A	
3.12.3.2.	Opening pressure (kPa):			X	N/A	N/A	N/A	
3.12.4.	<i>Electronic control unit (ECU): Yes/No</i>			X	No	No	No	
3.12.4.0.	Make:			X	N/A	N/A	N/A	
3.12.4.1.	Type(s):			X	N/A	N/A	N/A	
3.12.4.2.	Software calibration number(s):			X	N/A	N/A	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	N/A	N/A	
3.12.5.	<i>Governor</i>				N/A	N/A	N/A	
3.12.5.0.	Make:			X	N/A	N/A	N/A	
3.12.5.1.	Type(s):			X	N/A	N/A	N/A	
3.12.5.2.	Speed at which cut-off starts under full load:			X	N/A	N/A	N/A	
3.12.5.3.	Maximum no-load speed:			X	N/A	N/A	N/A	
3.12.5.4.	Idle speed:			X	N/A	N/A	N/A	
3.12.6.	<i>Cold-start system: Yes/No</i>			X	No	No	No	
3.12.6.0.	Make:			X	N/A	N/A	N/A	
3.12.6.1.	Type(s):			X	N/A	N/A	N/A	
3.12.6.2.	Description:			X	N/A	N/A	N/A	
3.12.7.	<i>Fuel temperature at the inlet to the fuel injection pump</i>				N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.12.7.1.	Minimum (deg. C):	X			N/A	N/A	N/A	
3.12.7.2.	Maximum (deg. C):	X			N/A	N/A	N/A	
3.13.	Fuel feed for liquid fuel spark ignition engine							
3.13.1.	<i>Carburettor</i>				Refer to drawing No. GK460-04	Refer to drawing No. GK460-04	Refer to drawing No. GK460-04	
3.13.1.0.	Make:			X	HUAYI SP RUIXIN <u>Kafka</u> <u>YINBA</u>	HUAYI SP RUIXIN <u>Kafka</u> <u>YINBA</u>	HUAYI SP RUIXIN <u>Kafka</u> <u>YINBA</u>	
3.13.1.1.	Type(s):			X	G1610E04	G1610E02	G1610E09	
3.13.2.	<i>Port fuel injection:</i>				N/A	N/A	N/A	
3.13.2.1.	single-point / multi-point			X	N/A	N/A	N/A	
3.13.2.2.	Make:			X	N/A	N/A	N/A	
3.13.2.2.	Type(s):			X	N/A	N/A	N/A	
3.13.3.	<i>Direct injection:</i>				N/A	N/A	N/A	
3.13.3.0.	Make:			X	N/A	N/A	N/A	
3.13.3.1.	Type(s):			X	N/A	N/A	N/A	
3.13.4.	<i>Fuel temperature at location specified by manufacturer</i>				N/A	N/A	N/A	
3.13.4.1.	Location:	X			N/A	N/A	N/A	
3.13.4.2.	Minimum (deg. C)	X			N/A	N/A	N/A	

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.13.4.3.	Maximum (deg. C)	X			N/A	N/A	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	N/A	N/A	
3.14.2.	<i>Pressure regulator(s)/vaporiser(s)</i>				N/A	N/A	N/A	
3.14.2.0.	Make:			X	N/A	N/A	N/A	
3.14.2.1.	Type(s):			X	N/A	N/A	N/A	
3.14.2.2.	Number of pressure reduction stages			X	N/A	N/A	N/A	
3.14.2.3.	Pressure in final stage minimum and maximum. (kPa)			X	N/A	N/A	N/A	
3.14.2.4.	Number of main adjustment points:			X	N/A	N/A	N/A	
3.14.2.5.	Number of idle adjustment points:			X	N/A	N/A	N/A	
3.14.3.	<i>Fuelling system: mixing unit/gas injection/liquid injection/direct injection</i>			X	N/A	N/A	N/A	
3.14.3.1.	Mixture strength regulation				N/A	N/A	N/A	
3.14.3.1.1.	System description and/or diagram and drawings:			X	N/A	N/A	N/A	
3.14.4.	<i>Mixing unit</i>				N/A	N/A	N/A	
3.14.4.1.	Number:			X	N/A	N/A	N/A	
3.14.4.2'.	Make:			X	N/A	N/A	N/A	
3.14.4.2.	Type(s):			X	N/A	N/A	N/A	

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

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.14.6.2.0.	Make:			X	N/A	N/A	N/A	
3.14.6.2.1.	Type(s):			X	N/A	N/A	N/A	
3.14.6.2.2.	Opening pressure or characteristic diagram :			X	N/A	N/A	N/A	
3.14.7.	<i>Electronic Control Unit (ECU)</i>				N/A	N/A	N/A	
3.14.7.0.	Make:			X	N/A	N/A	N/A	
3.14.7.1.	Type(s):			X	N/A	N/A	N/A	
3.14.7.2.	Adjustment possibilities:			X	N/A	N/A	N/A	
3.14.7.3.	Software calibration number(s):			X	N/A	N/A	N/A	
3.14.8.	<i>Approvals of engines for several fuel compositions</i>				N/A	N/A	N/A	
3.14.8.1.	Self-adaptive feature: Yes/No	X	X	X	No	No	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	N/A	N/A	
3.14.8.3.	Transformation for a specific gas composition: NG-HT/NG-LT/NG-HLT	X	X	X	N/A	N/A	N/A	
3.14.9.	<i>Fuel temperature pressure regulator final stage</i>				N/A	N/A	N/A	
3.14.9.1.	Minimum (deg. C):	X			N/A	N/A	N/A	
3.14.9.2.	Maximum (deg. C):	X			N/A	N/A	N/A	
3.15.	Ignition system							
3.15.1.	<i>Ignition coil(s)</i>							
3.15.1.0.	Make:			X	LIHUA	LIHUA	LIHUA	
3.15.1.1.	Type(s):			X	G1506E02	G1506E02	G1506E02	
3.15.1.2.	Number:			X	1	1	1	

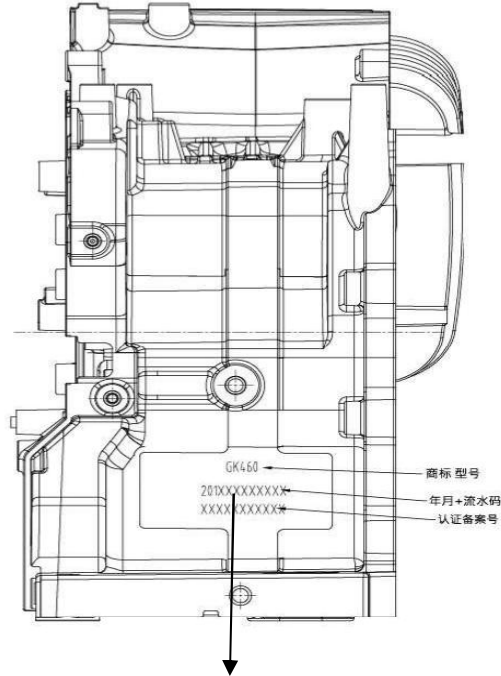
Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)		
3.15.2.	<i>Spark plug(s)</i>							
3.15.2.0.	Make:			X	LG RISO TORCH NGK BODE	LD RISO TORCH NGK BODE	LD RISO TORCH NGK BODE	
3.15.2.1.	Type(s):			X	F6TC F6RTC F7TC F7RTC BP6RES BP7RES	F6TC F6RTC F7TC F7RTC BP6RES BP7RES	F6TC F6RTC F7TC F7RTC BP6RES BP7RES	
3.15.2.2.	Gap setting:			X	0.7—0.8mm	0.7—0.8mm	0.7—0.8mm	
3.15.3.	<i>Magneto</i>							
3.15.3.0.	Make(s):			X	N/A	N/A	N/A	
3.15.3.1.	Type(s):			X	N/A	N/A	N/A	
3.15.4.	<i>Ignition timing control: Yes/No</i>			X	Yes	Yes	Yes	
3.15.4.1.	Static advance with respect to top dead centre (crank angle degrees):			X	25°	25°	25°	
3.15.4.2.	Advance curve or map:			X	Refer to drawing No. GK460-06	Refer to drawing No. GK460-06	Refer to drawing No. GK460-06	
3.15.4.3.	Electronic control: Yes/No			X	No	No	No	

Attachment 1 Photographs of the engines

GK460/ GK420/GK390



Attachment 2 Drawings of the engines

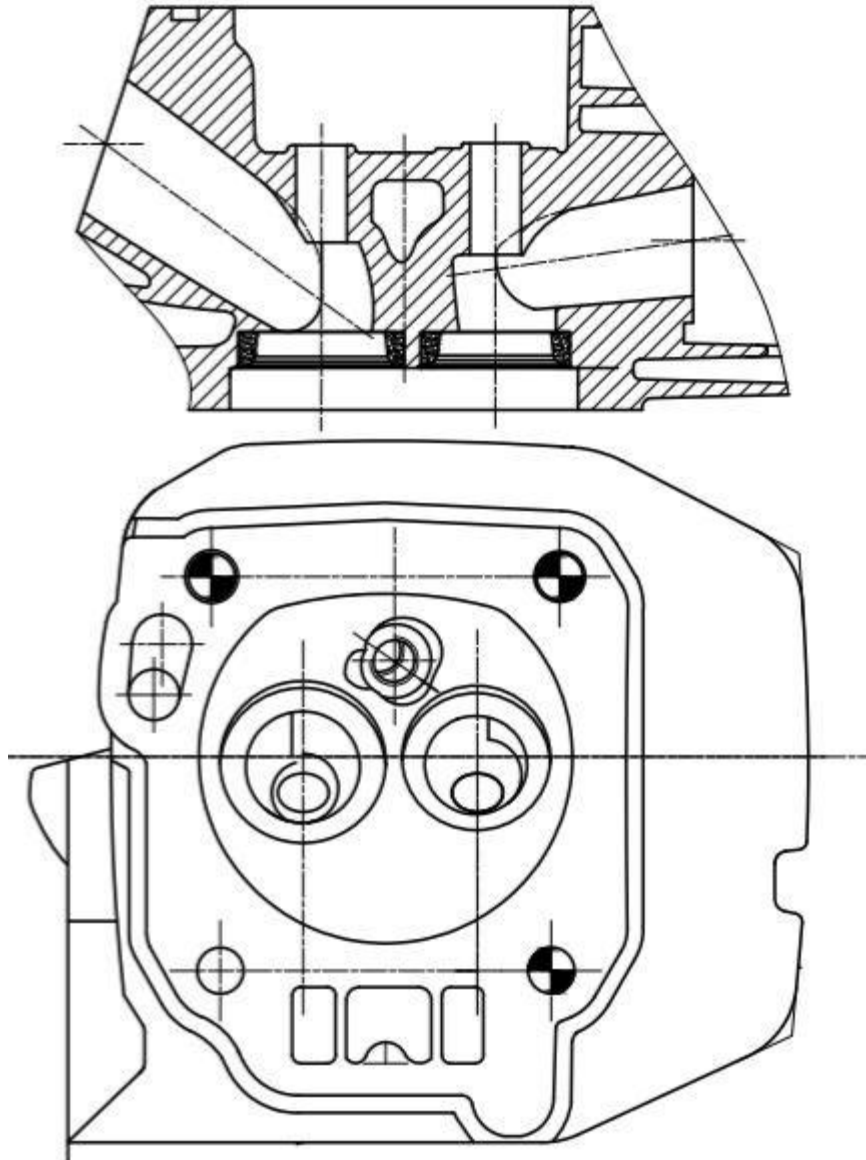


Trade name/Trade mark/Manufacturer name
 Engine model
 Engine identification number (production data inc.)
 Approval No./Approval mark: e24*2016/1628*XXXXXXXX*XXXX*00 or
e24 XXX/P V-XXX

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

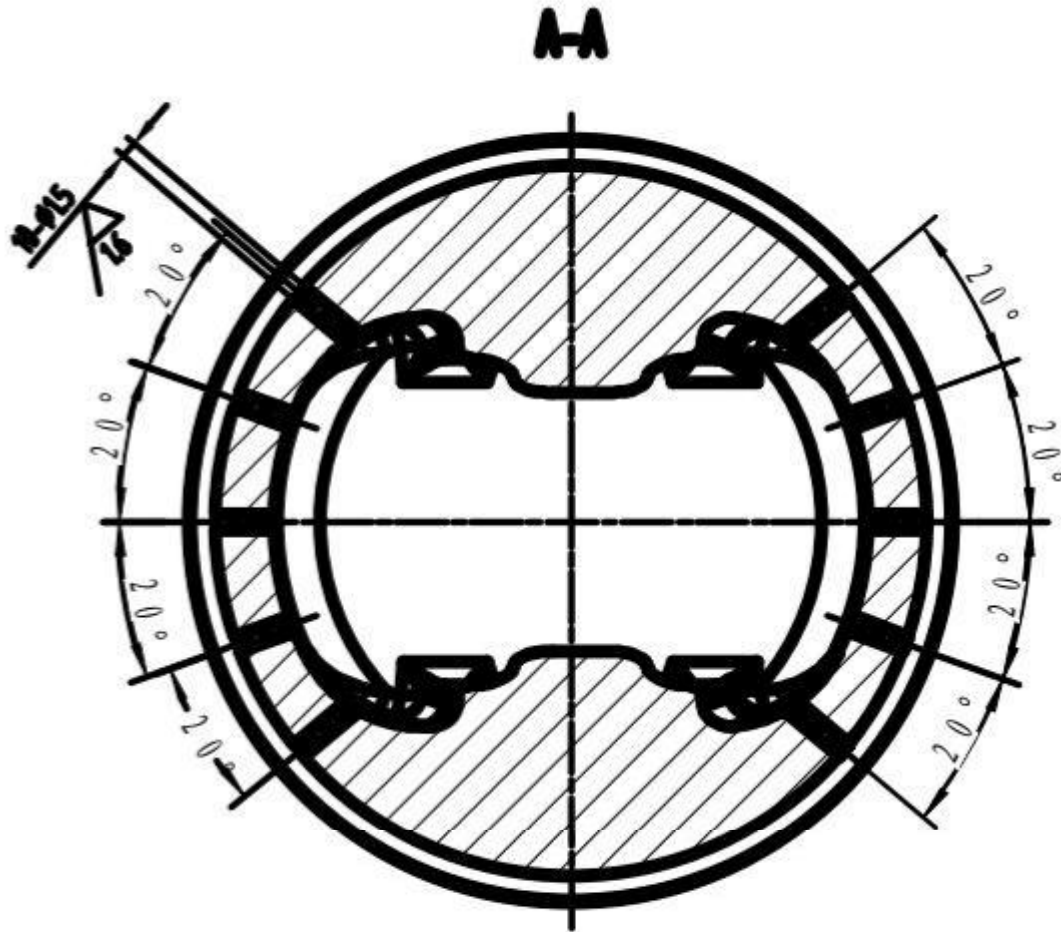
Engine type	GK460
Position of engine No. and EC approval No.	
Drawing No.	GK460-01

Part No: GK460-G1214E04

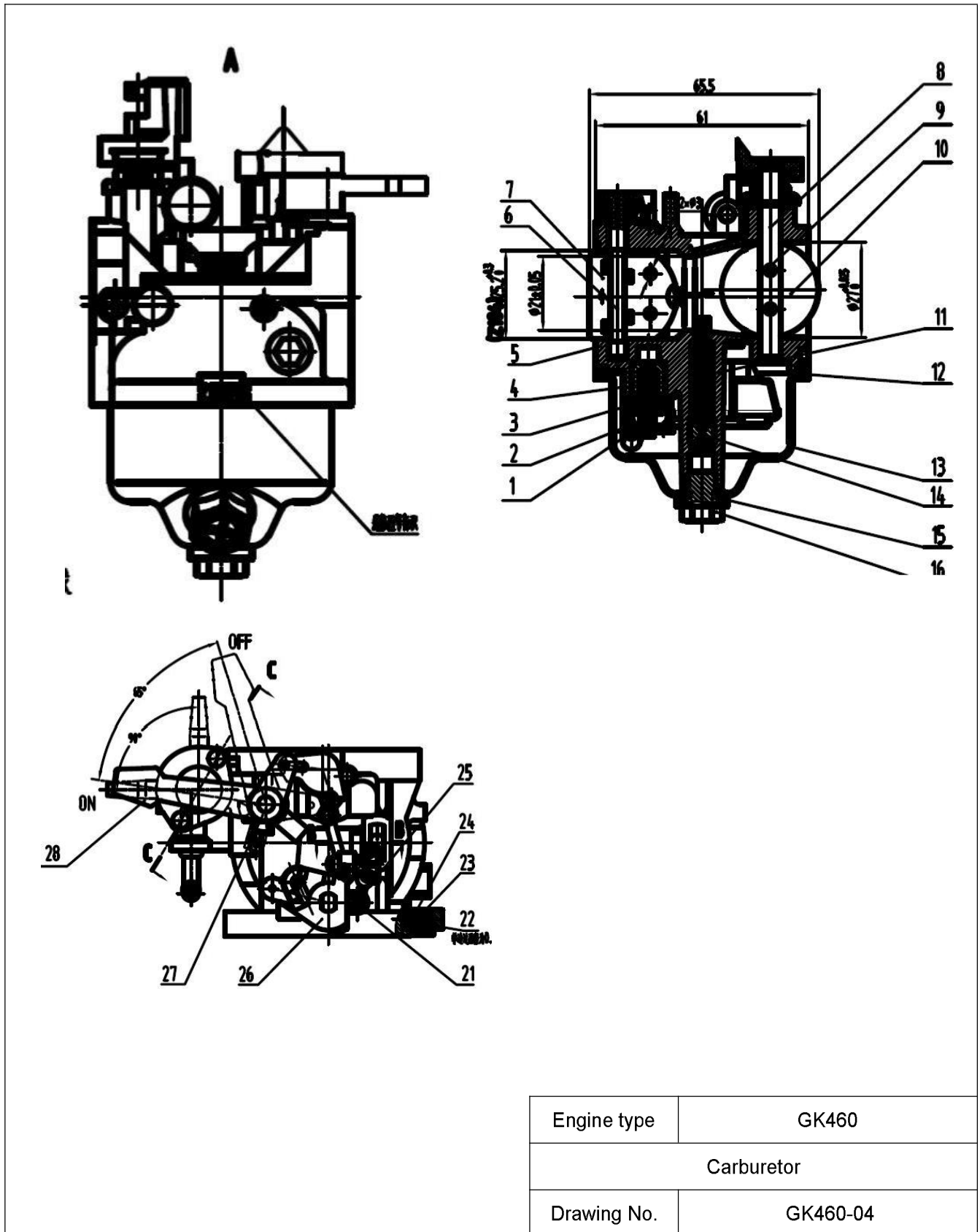


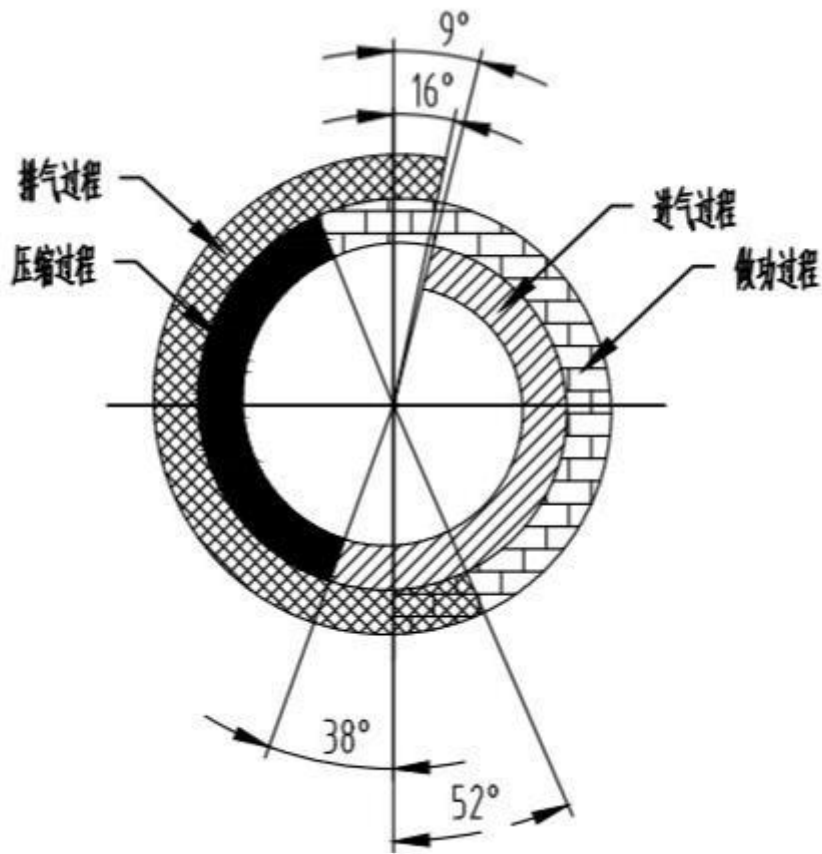
Engine type	GK460
Header	
Drawing No.	GK460-02

Part No: GK460-G1311E04

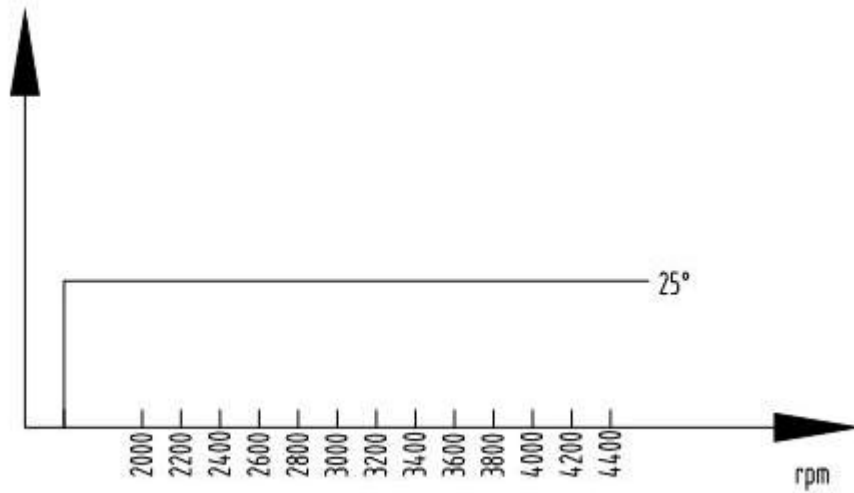


Engine type	GK460
Piston	
Drawing No.	GK460-03



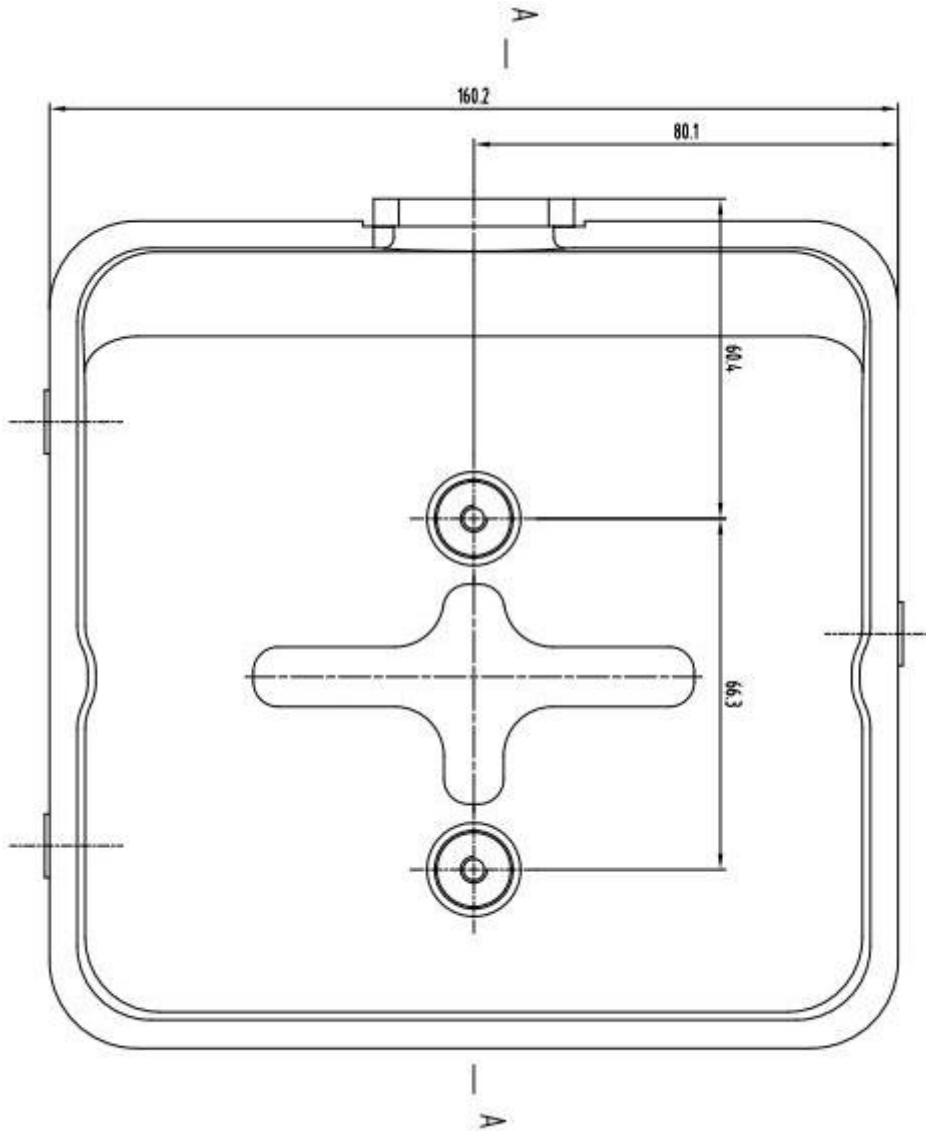


Engine type	GK460
Valve timing	
Drawing No.	GK460-05



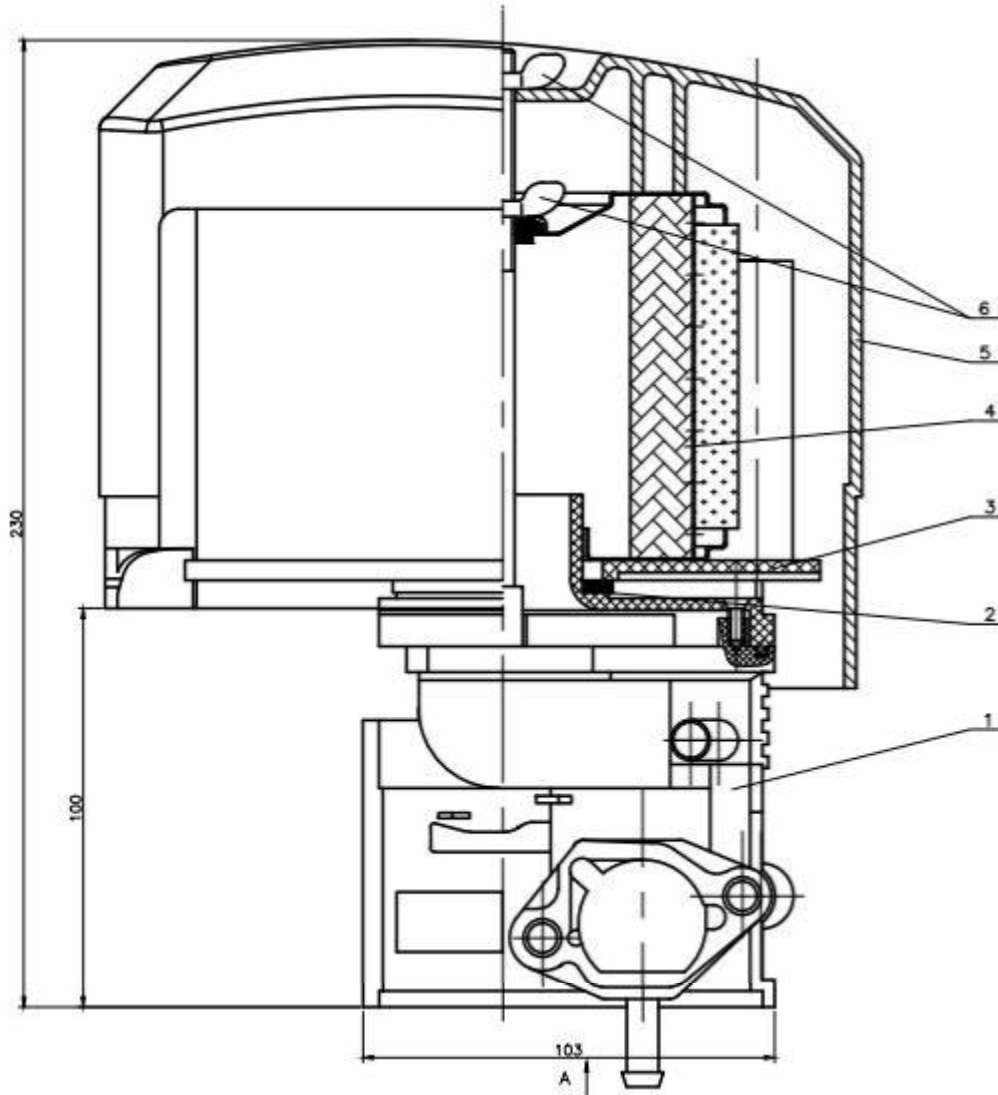
Engine type	GK460
Ignition advance curve	
Drawing No.	GK460-06

Part No: GK460-G1810E02

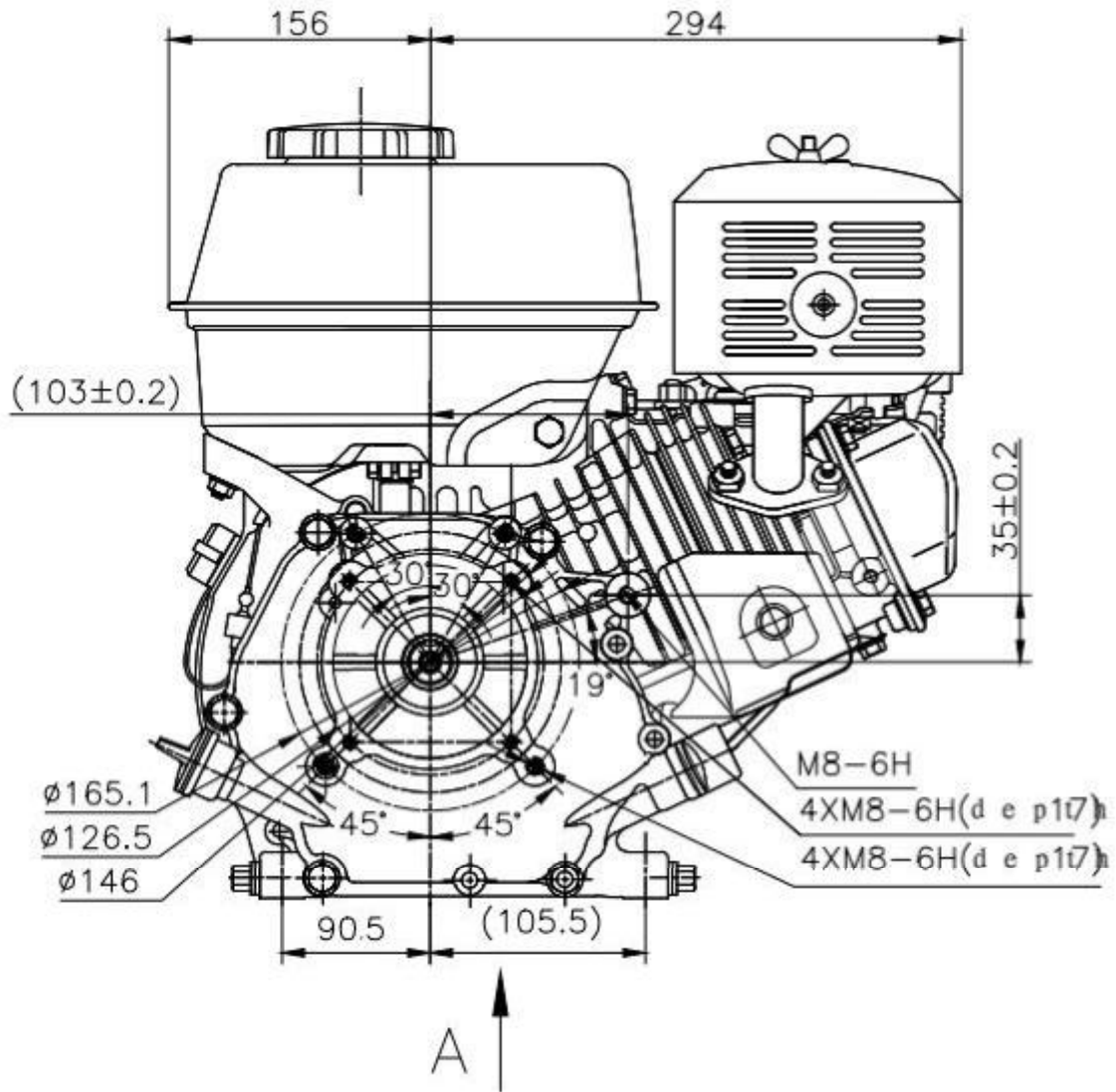


Engine type	GK460
Muffler	
Drawing No.	GK460-07

Part No: GK460-G1710E02

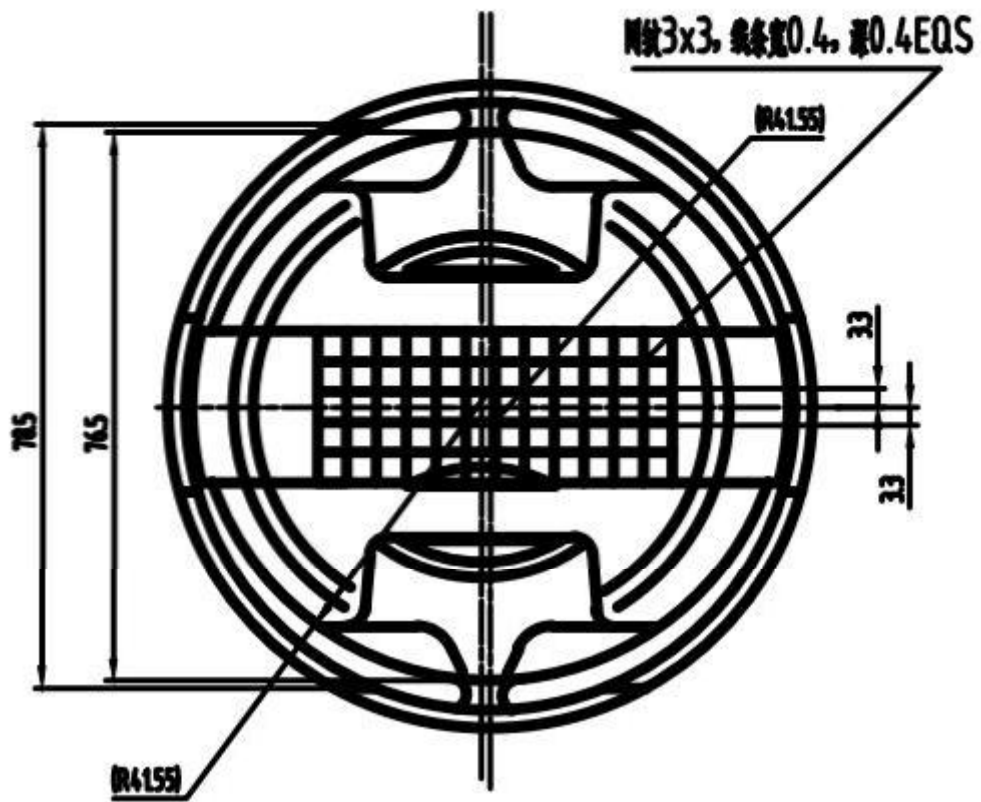


Engine type	GK460
Air filter	
Drawing No.	GK460-08



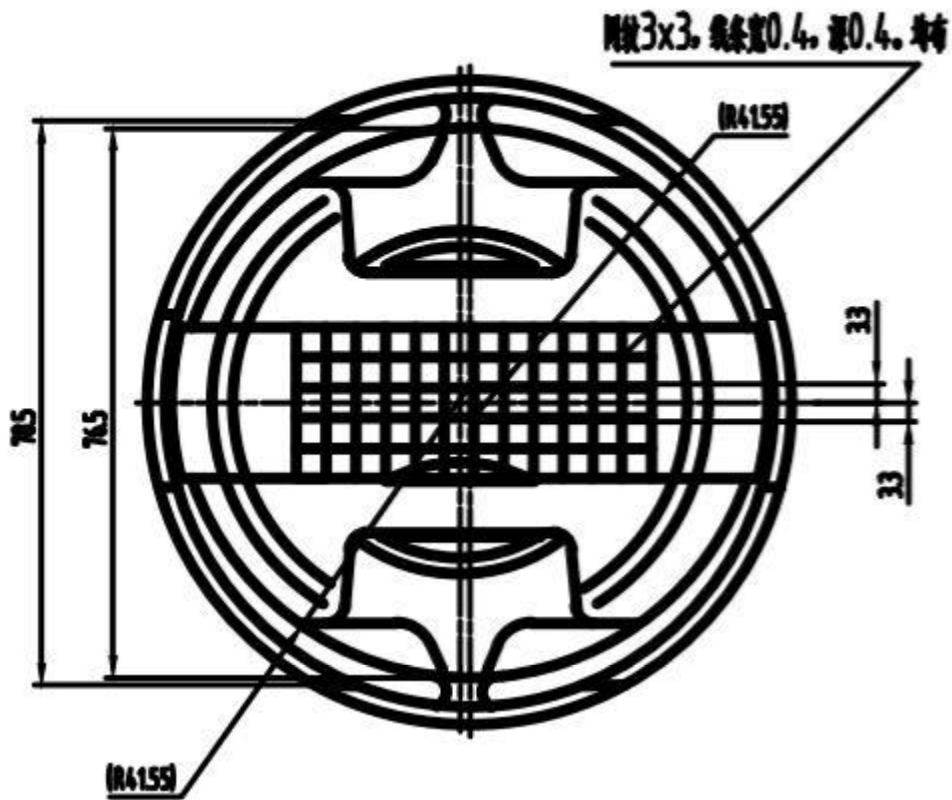
Engine type	GK460
Engine structure	
Drawing No.	GK460-09

Part No: GK420-G1311E02



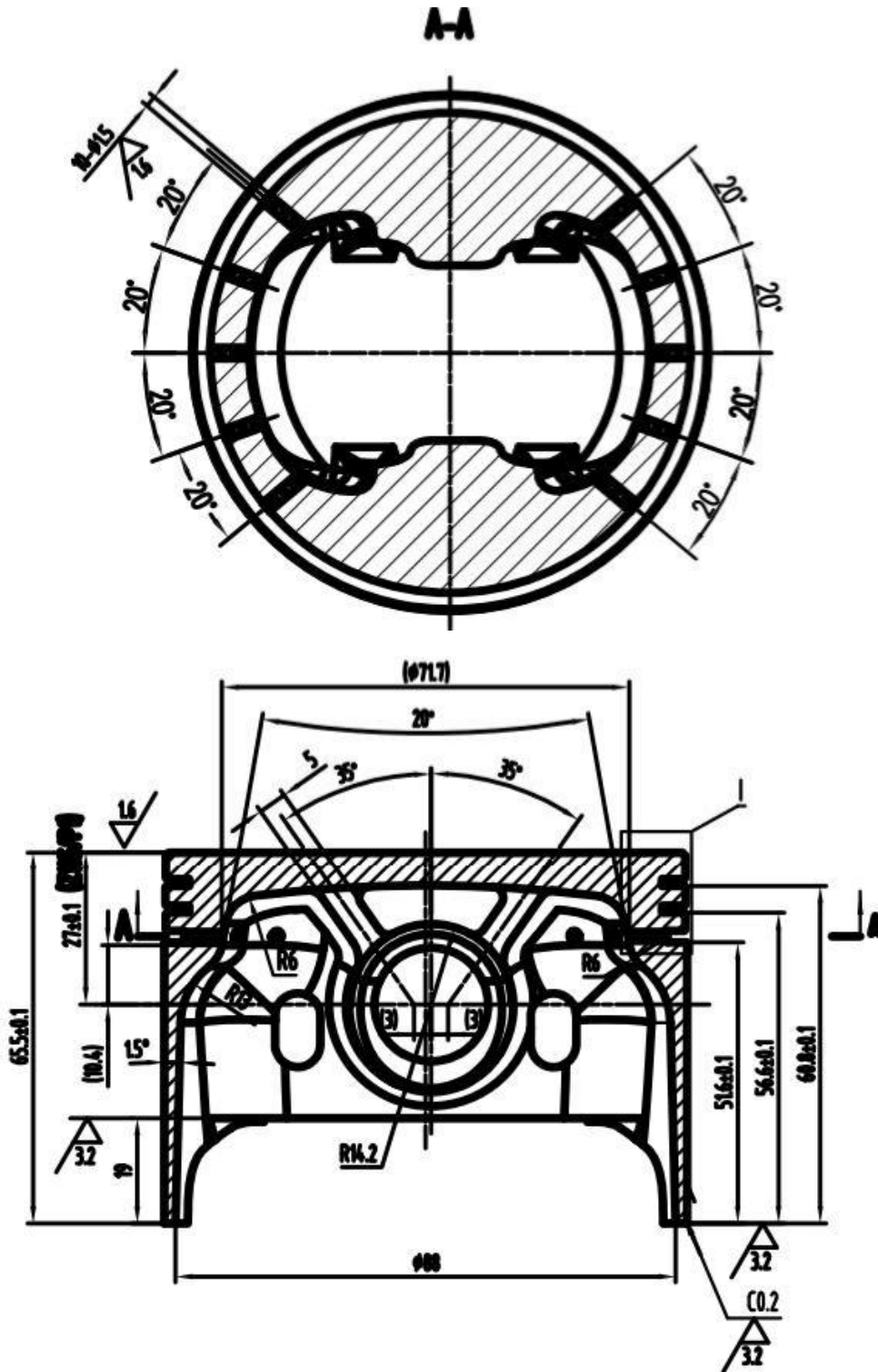
Engine type	GK420
Piston	
Drawing No.	GK420-1

Part No: GK390-G1311E09



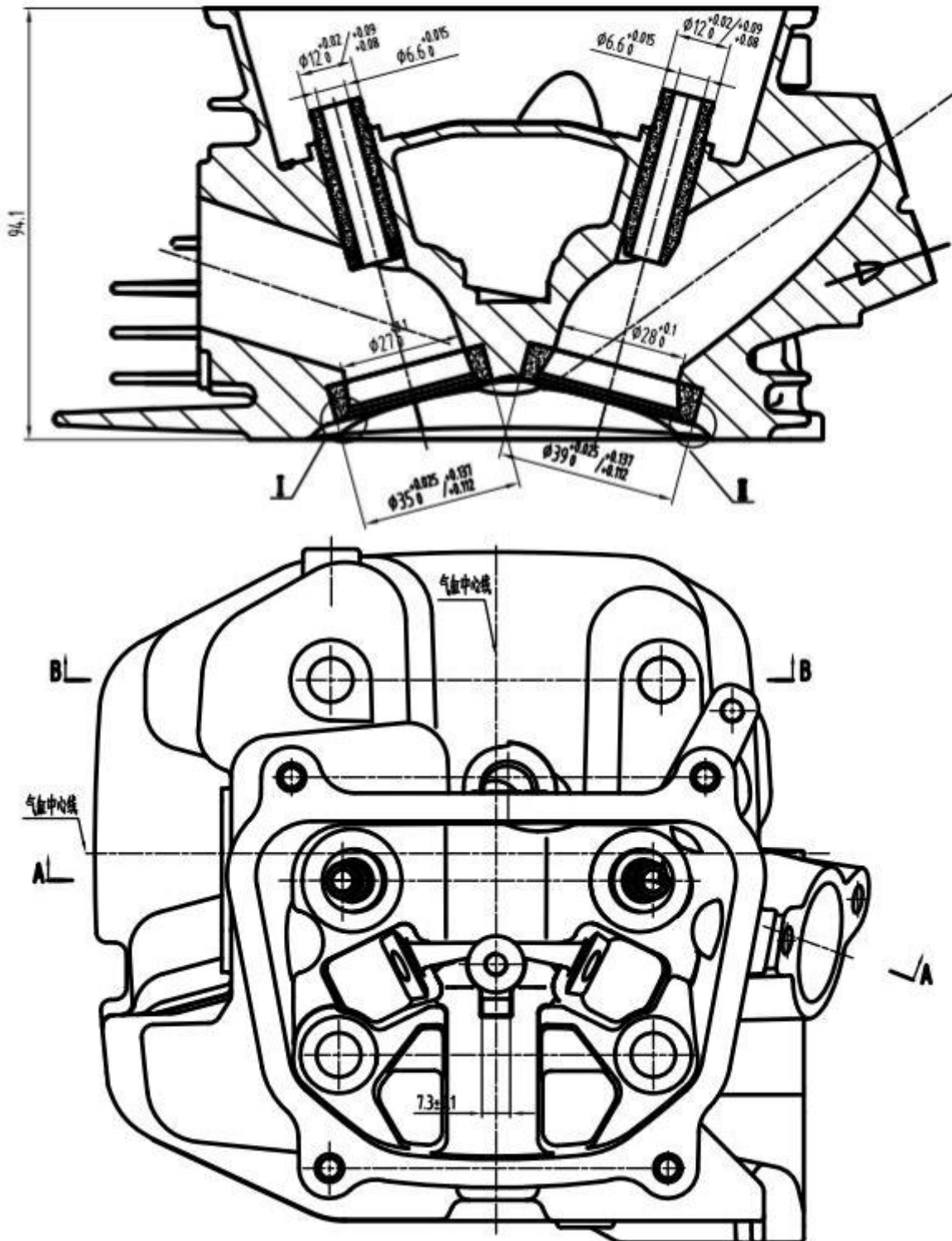
Engine type	GK390
Piston	
Drawing No.	GK390-01

Part No: GK460-G1311E04



Engine type	GK460
Piston	
Drawing No.	GK460-03-1

Part No: GK460-G1214E04



Engine type	GK460
Header	
Drawing No.	GK460-02-1

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

We, CHONGQING GENKINS POWER 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) : GENKINS, LEEGA, LAUNTOP
- 1.2. Commercial name(s) (if applicable) : N/A
- 1.3. Company name and address of manufacturer : Chongqing Genkins Power Ltd.
1-1, 2-1, 3-1, 1-2, 2-2, 3-2, 1-3, 2-3, 3-3, 1-4, 2-4, 3-4, 5th BUILDING NO.6, GANGCHENG EAST LOOP ROAD, JIANGBEI DISTRICT, CHONGQING, CHINA
- 1.4. Name and address of manufacturer's authorised representative (if any) : Patrice LE PONNER
53 route de Foecy-Zi des Forges 18100 VIERZON, FRANCE
- 1.6. Engine type designation/engine family designation/~~FF~~ : Parent engine: GK460
Commercial names: N/A
Engine within family: GK420, GK390
Commercial names: N/A

Place : Chongqing, China

Date : 2019-4-11

Signature: Huang Yong

Engineer



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 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

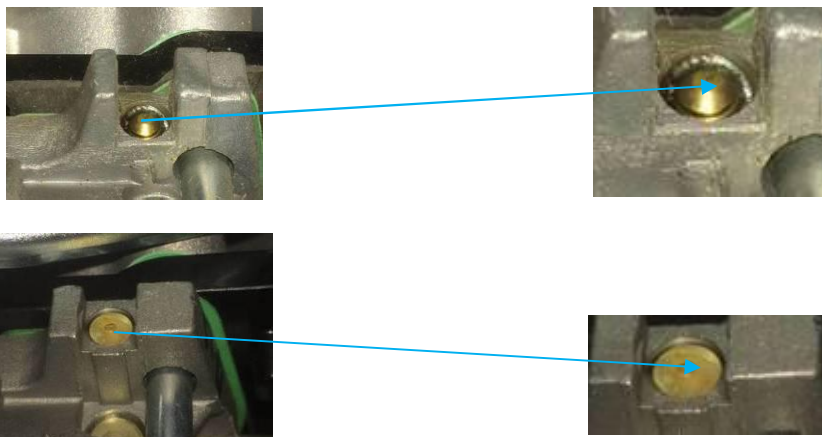
To whom it may concern

We, CHONGQING GENKINS POWER 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) : GENKINS, LEEGA, LAUNTOP .
- 1.2. Commercial name(s) (if applicable) : N/A
- 1.3. Company name and address of manufacturer : Chongqing Genkins Power Ltd.
1-1, 2-1, 3-1, 1-2, 2-2, 3-2, 1-3, 2-3, 3-3, 1-4, 2-4, 3-4, 5th BUILDING NO.6, GANGCHENG EAST LOOP ROAD, JIANGBEI DISTRICT, CHONGQING, CHINA
- 1.4. Name and address of manufacturer's authorised representative (if any) : Patrice LE PONNER
53 route de Foecy-Zi des Forges 18100 VIERZON, FRANCE
- 1.6. Engine type designation/engine family designation/~~ET~~ : Parent engine: GK460
Commercial names: N/A
Engine within family: GK420, GK390
Commercial names: N/A

Technical details:

The Air-fuel flow mixture screw will be broken after the adjustment.



Place : Chongqing, China
Date : 2019-4-11
Signature : Huang Yong
Position : Engineer



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.

Frequency		Every time	First month or 10 hrs of operation	Thereafter, every 3 months or 30hrs of operation	Every 6 months or 50 hrs of operation	Every year or 100 hrs of operation
Engine oil	Check-Refill	√				
	Change		√	√		
Air filter element	Check	√				
	Clean			√		
	Change				√	
Spark plug	Clean-adjust				√*	
Spark arrester	Clean				√	
Valve clearance**	Check-adjust					√
Fuel hose	Check	Every 2 years (change if necessary)				
Cylinder head, Piston**	Remove carbon deposits	Every 250 hours				
<p>* These items should be replaced by new ones if necessary.</p> <p>** These items should be serviced by a mechanically proficient person or by our authorized servicing dealer.</p>						

Declaration

To whom it may concern,

We 'Chongqing Genkins Power Ltd.' Hereby declare that, the new brand carburetors have same emission performance as those type approved ones, it will not do an adverse effect on the engine emission results. This conclusion is based on our laboratory test results.

Signature:

Quality: Engineer
Chongqing Genkins Power Ltd.

