GRAND-DUCHÉ DE LUXEMBOURG

Ministère du Développement durable et des Infrastructures
Département des Transports

L-2938 Luxembourg

SOCIÉTÉ NATIONALE DE CERTIFICATION ET D'HOMOLOGATION
s.à r.l.
Registre de Commerce: B 27180

L-5201 Sandweiler

Référence: e13*2016/1628*2017/656SRB1/P*0073*00

Annexes: - Rapport technique
- Fiche de renseignements du constructeur

Luxembourg, le 19 mars 2018

CERTIFICAT DE RECEPTION UE PAR TYPE
EU TYPE-APPROVAL CERTIFICATE

Communication concernant (1): / Communication concerning the (1):

- la réception UE par type / EU type-approval
- ~~l'extension de la réception UE par type~~ / ~~extension of EU type-approval~~
- ~~le refus de la réception UE par type~~ / ~~refusal of EU type-approval~~
- ~~le retrait de la réception UE par type~~ / ~~withdrawal of EU type-approval~~

d'un type de moteurs / ~~d'une famille de moteurs~~ (1), en ce qui concerne les émissions de gaz polluants et de particules polluantes conformément au règlement (UE) 2016/1628, modifié en dernier lieu par le règlement (délégué) (1) 2017/656 (de la Commission) (1) (~~du Parlement européen et du Conseil~~) (1)
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 2017/656 (1) (~~of the European Parliament and of the Council~~) (1)

Numéro de réception UE par type (3):
EU type-approval number (3): e13*2016/1628*2017/656SRB1/P*0073*00

Motif de l'extension/du refus/du retrait (1):
Reason for extension/refusal/withdrawal (1): not applicable

SECTION I
SECTION I

1.1.	**Marque(s) [dénomination(s) commerciale(s) du constructeur]:** Make (trade name(s) of manufacturer):	Loncin
1.2.	**Appellation(s) commerciale(s) (le cas échéant):** Commercial name(s) (if applicable):	not applicable
1.3.	**Nom et adresse du constructeur:** Company name and address of manufacturer:	Loncin Motor Co., Ltd. No. 99, Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P.R. China
1.4.	**Nom et adresse du représentant agréé du constructeur (s'il y a lieu):** Name and address of manufacturer's authorised representative (if any):	CMD Costruzioni Motori Diesel Spa Nucleo Industriale Valle di Vitalba – 85020 – Atella (Potenza) - Italy

1.5.	**Nom(s) et adresse(s) des usines d'assemblage/de fabrication:** Name(s) and address(es) of assembly/manufacture plant(s):	Loncin Motor Co., Ltd. No. 99, Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P.R. China
1.6.	**~~Désignation du type de moteurs~~ / désignation de la famille de moteurs / ~~FT~~ (1):** ~~Engine type designation~~ / engine family designation / ~~FT~~ (1):	**NRS.420A**
	Type du moteur représentatif: *Parent engine type:*	*G420FA*
	Types des moteurs de la famille: *Engine types within the family:*	*G420FA-D, G420FDA, G420FDA-D,* *G390FA, G390FDA,* *G300FA, G300FDA, G300FA-C, G300FDA-C,* *G300FA-B, G300FDA-B*
1.7.	**Catégorie et sous-catégorie ~~du type de moteurs~~ / de la famille de moteurs (1)(4):** Category and sub-category of the ~~engine type~~ / engine family (1)(4):	NRS-vr-1b
1.8.	**Catégorie de période de durabilité des caractéristiques d'émission:** Emissions durability period category:	~~not applicable~~ / Cat 1 / ~~Cat 2~~ / ~~Cat 3~~ (1)
1.9.	**Phase d'émissions:** Emissions stage:	V / ~~SPE~~
1.10.	**Moteur destiné aux fraises à neige (5):** Engine for snow throwers (5):	~~Yes~~ / No (1)

SECTION II
SECTION II

1.	***Autorité déléguée:*** *Assigned authority:*	*Société Nationale de Certification et d'Homologation* *L-5201 Sandweiler*
	Service technique responsable de la réalisation du ou des essais: Technical service responsible for carrying out the test(s):	TÜV Rheinland Luxemburg GmbH 2a, Kalchesbruck L-1852 Luxembourg
2.	**Date(s) du/des rapport(s) d'essai:** Date(s) of the test report(s):	09.02.2018
3.	**Numéro(s) du/des rapport(s) d'essai:** Number(s) of the test report(s):	87-2016/1628-0182/18-00

SECTION III
SECTION III

Le soussigné certifie, par la présente, l'exactitude de la description, faite par le constructeur dans la fiche de renseignements en annexe, ~~du type de moteurs~~ / de la famille de moteurs (1) décrit(e) ci-dessus, dont un ou plusieurs échantillons représentatifs, choisis par l'autorité compétente en matière de réception, ont été présentés en tant que prototypes, ainsi que l'applicabilité ~~au type de moteurs~~ / à la famille de moteurs (1) des résultats d'essai en annexe.
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.	**~~Le type de moteurs~~ / la famille de moteurs (1) satisfait / ~~ne satisfait pas~~ (1) aux exigences définies dans le règlement (UE) 2016/1628.** The ~~engine type~~ / engine family (1) meets / ~~does not meet~~ (1) the requirements laid down in Regulation (EU) 2016/1628.	meets
2.	**La réception est accordée/~~étendue~~/~~refusée~~/~~retirée~~ (1).** The approval is granted/~~extended~~/~~refused~~/~~withdrawn~~ (1).	granted/~~extended~~/~~refused~~/~~withdrawn~~ (1)
3.	**La réception est accordée conformément à l'article 35 du règlement (UE) 2016/1628 et sa validité expire, dès lors, le jj/mm/aaaa (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).	not applicable
4.	**Restrictions de validité (3)(6):** Restrictions to validity (3)(6):	not applicable
5.	**Dérogations appliquées (3)(6):** Exemptions applied (3)(6):	not applicable
	Lieu: Place:	Luxembourg
	Date: Date:	19 mars 2018
	Signature: Signature:	

Pour le Ministre du Développement durable et des Infrastructures

Grand-Duché de Luxembourg Ministère du Développement durable et des Infrastructures Département des transports

Marco FELTES
Inspecteur Principal 1er en rang

Pour la SNCH

Société Nationale de Certification et d'Homologation snch

Laurent LINDEN
Attaché de Direction

OLAS OFFICE LUXEMBOURGEOIS D'ACCREDITATION ET DE SURVEILLANCE ACCREDITATION NUMBER: 5/001 ISO/IEC 17065

Pièces jointes:
Attachements:

- **Dossier de réception**.
  Information package.
- **Rapport(s) d'essai.**
  Test report(s).
- **Le cas échéant, nom et spécimen de signature de la ou des personnes habilitées à signer les déclarations de conformité, ainsi qu'indication de leur fonction dans la société.**
  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.
- **Le cas échéant, spécimen rempli de déclaration de conformité**.
  Where applicable, a completed specimen of a statement of conformity.

N.B.:
Si le présent modèle est utilisé pour la réception UE par type d'un moteur dans le cadre d'une dérogation pour de nouvelles technologies ou de nouveaux concepts, conformément à l'article 35, paragraphe 4, du règlement (UE) 2016/1628, l'intitulé du certificat est le suivant: «CERTIFICAT DE RÉCEPTION UE PAR TYPE PROVISOIRE, VALABLE UNIQUEMENT SUR LE TERRITOIRE DE LA/DU …» [7].
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
ADDENDUM

PARTIE A — CARACTÉRISTIQUES DU ~~TYPE DE MOTEURS~~ / DE LA FAMILLE DE MOTEURS (1)
PART A — CHARACTERISTICS OF THE ~~ENGINE TYPE~~ / ENGINE FAMILY (1)

2.	**Paramètres de conception communs ~~du type de moteurs~~ / de la famille de moteurs (1)** Common design parameters of the ~~engine type~~ / engine family (1)	
2.1.	**Cycle de combustion:** Combustion Cycle:	four stroke cycle / ~~two-stroke cycle~~ / ~~rotary~~/~~other~~ (1)
2.2.	**Modes d'allumage:** Ignition Type:	~~Compression ignition~~ / spark ignition (1)
2.3.1.	**Disposition des cylindres dans le bloc:** Position of the cylinders in the block:	~~V~~ / ~~in-line~~ / ~~radial~~ / other (describe) (1): single
2.6.	**Moyen principal de refroidissement:** Main Cooling medium:	Air / ~~Water~~ / ~~Oil~~ (1)
2.7.	**Mode d'aspiration de l'air:** Method of air aspiration:	naturally aspirated / ~~pressure-charged~~ / ~~pressure-charged with charge-cooler~~ (1)
2.8.1.	**Type(s) de carburant:** 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.	**Sous-type de carburant (uniquement gaz naturel/biométhane):** 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)~~ (1)
2.8.2.	**Alimentation en carburant:** 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.	**Liste des autres carburants pouvant être utilisés par le moteur déclarés par le constructeur conformément à l'annexe I, point 1, du règlement délégué (UE) 2017/654 (indiquer la référence à une norme ou à des spécifications reconnues):** 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):	not applicable
2.8.4.	**Lubrifiant ajouté au carburant:** Lubricant added to fuel:	~~Yes~~ / No (1)
2.8.5.	**Système d'alimentation en carburant:** 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.	**Systèmes de gestion du moteur:** Engine management systems:	Mechanical / ~~electronic control strategy~~ (1)

2.10.	**Dispositifs divers:** Miscellaneous devices:	~~Yes~~ / No (1)
2.10.1.	**Système de recyclage des gaz d'échappement (EGR):** Exhaust gas recirculation (EGR):	~~Yes~~ / No (1)
2.10.2.	**Injection d'eau:** Water injection:	~~Yes~~ / No (1)
2.10.3.	**Injection d'air:** Air injection:	~~Yes~~ / No (1)
2.10.4.	**Autres (préciser):** Others (specify):	not applicable
2.11.	**Système de post-traitement des gaz d'échappement:** Exhaust after-treatment system:	~~Yes~~ / No (1)
2.11.1.	**Catalyseur d'oxydation:** Oxidation catalyst:	~~Yes~~ / No (1)
2.11.2.	**Système réducteur de NO_x avec réduction sélective des NO_x (adjonction d'un agent réducteur):** $DeNO_x$ system with selective reduction of NO_x (addition of reducing agent):	~~Yes~~ / No (1)
2.11.3.	**Autre système réducteur de NO_x:** Other $DeNO_x$ systems:	~~Yes~~ / No (1)
2.11.4.	**Catalyseur à trois voies combinant oxydation et réduction des émissions de NO_x:** Three-way catalyst combining oxidation and NO_x reduction:	~~Yes~~ / No (1)
2.11.5.	**Système de post-traitement des particules avec régénération passive:** Particulate after-treatment system with passive regeneration:	~~Yes~~ / No (1)
2.11.6.	**Système de post-traitement des particules avec régénération active:** Particulate after-treatment system with active regeneration:	~~Yes~~ / No (1)
2.11.7.	**Autres systèmes de post-traitement des particules:** Other particulate after-treatment systems:	~~Yes~~ / No (1)
2.11.8.	**Catalyseur à trois voies combinant oxydation et réduction des émissions de NO_x:** Three-way catalyst combining oxidation and NO_x reduction:	~~Yes~~ / No (1)
2.11.9.	**Autres dispositifs de post-traitement (préciser):** Other after-treatment devices (specify):	not applicable
2.11.10.	**Autres dispositifs ou caractéristiques qui ont une forte incidence sur le niveau des émissions (préciser):** Other devices or features that have a strong influence on emissions (specify):	not applicable

3. Caractéristiques principales du ou des types de moteurs
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:	G420FA	G420FA-D	G420FDA	G420FDA-D	G390FA	G390FDA	G300FA	G300FDA	G300FA-C	G300FDA-C	G300FA-B	G300FDA-B
3.1.2.	Engine type designation shown on engine mark: ~~Yes~~ / No (1)	No	No			No		No					
3.1.3.	Location of the manufacturer's statutory marking:	Protective cover or crankcase	Protective cover or crankcase			Protective cover or crankcase		Protective cover or crankcase					
3.2.1.	Declared rated speed (rpm)	3600	3600			3600		3600					
3.2.1.2.	Declared rated net Power (kW):	9,2	9,2			8,5		6,8					
3.2.2.	Maximum power speed (rpm):	3600	3600			3600		3600					
3.2.2.2.	Maximum net power (kW):	9,2	9,2			8,5		6,8					
3.2.3.	Declared maximum torque speed (rpm):	2500	2500			2500		2500					
3.2.3.2.	Declared maximum torque (Nm):	26,8	26,8			25,8		20,3					
3.6.3.	Number of Cylinders:	1	1			1		1					
3.6.4.	Engine Displacement (cm^3):	420	420			389		302					
3.8.5.	Device for recycling crankcase gases: Yes / ~~No~~ (1)	Yes	Yes			Yes		Yes					
3.11.3.12.	Consumable reagent: ~~Yes~~ / No (1)	No	No			No		No					
3.11.3.12.1.	Type and concentration of reagent needed for catalytic action:	not applicable	not applicable			not applicable		not applicable					
3.11.3.13.	NO_x sensor(s): ~~Yes~~ / No (1)	No	No			No		No					
3.11.3.14.	Oxygen sensor: ~~Yes~~ / No (1)	No	No			No		No					
3.11.4.7.	Fuel borne catalyst (FBC): ~~Yes~~ / No (1)	No	No			No		No					

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)									
3.1.1.	Engine Type Designation:	G420FA	G420FA-D	G420FDA	G420FDA-D	G390FA	G390FDA	G300FA	G300FDA	G300FA-C	G300FDA-C	G300FA-B	G300FDA-B
3.8.1.1.	Maximum allowable intake depression at 100 % engine speed and at 100 % load (kPa) with clean air cleaner:	0,5	0,5			0,5		0,4					
3.8.3.2.	Maximum charge air cooler outlet temperature at 100 % speed and 100 % load (deg. C):	not applicable	not applicable			not applicable		not applicable					
3.8.3.3.	Maximum allowable pressure drop across charge cooler at 100 % engine speed and at 100 % load (kPa) (if applicable):	not applicable	not applicable			not applicable		not applicable					
3.9.3.	Maximum permissible exhaust gas backpressure at 100 % engine speed and at 100 % load (kPa):	9,0	9,0			9,0		5,3					
3.9.3.1.	Location of measurement:	Exhaust port nearby	Exhaust port nearby			Exhaust port nearby		Exhaust port nearby					
3.11.1.2.	Maximum temperature drop from exhaust system or turbine outlet to first exhaust after-treatment system (deg. C) if stated:	not applicable	not applicable			not applicable		not applicable					
3.11.1.2.1.	Test conditions for measurement:	not applicable	not applicable			not applicable		not applicable					

PARTIE B — RESULTATS DES ESSAIS
PART B — TEST RESULTS

3.8. **Le constructeur a l'intention d'utiliser le signal UCE du couple pour la surveillance en service:**
Manufacturer intends to use ECU torque signal for in-service monitoring: ~~Yes~~ / No (1)

3.8.1. **Couple mesuré au dynamomètre supérieur ou égal à 0,93 × couple UCE:**
Dynamometer torque greater than or equal to 0,93 × ECU torque: ~~Yes~~ / No (1)

3.8.2. **Facteur de correction du couple UCE si le couple mesuré au dynamomètre est inférieur à 0,93 × couple UCE:**
ECU torque correction factor in case that dynamometer torque less than 0,93 × ECU torque: not applicable

11.1. **Résultats relatifs aux émissions sur le cycle**
Cycle 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 (8)
NRSC final result with DF	378,42	3,72	2,78	6,47	---	---	G2
NRTC Final test result with DF	---	---	---	---	---	---	---

11.2. **Résultat concernant le CO_2:**
CO_2 result: 817,85 g/kWh

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(1) Biffer les options non utilisées ou n'indiquer que la ou les options retenues.
Strike out the unused options, or only show the used option(s).

(2) Indiquer uniquement la dernière modification dans le cas d'une modification portant sur un ou plusieurs articles du règlement (UE) 2016/1628, en fonction de la modification appliquée pour la réception UE par type.
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) Supprimer cette indication si elle n'a pas lieu d'être.
Delete this entry when not applicable.

(4) Indiquer l'option appropriée pour la catégorie et la sous-catégorie conformément au point 1.7 de la fiche de renseignements figurant dans la partie A de l'appendice 3 de l'annexe I.
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) Indiquer si la réception s'applique à une famille de moteurs de catégorie NRS (<19 kW) constituée exclusivement de types de moteurs destinés aux fraises à neige.
Indicate whether the approval is for NRS (<19 kW) engine family consisting exclusively of engine type for snow throwers.

(6) Applicable uniquement pour la réception UE par type d'un type de moteurs ou d'une famille de moteurs bénéficiant d'une dérogation pour de nouvelles technologies ou de nouveaux concepts, conformément à l'article 35 du règlement (UE) 2016/1628.
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 2016/1628.

(7) Indiquer l'Etat membre.
Indicate the Member State.

(8) Indiquer le cycle d'essai conformément à la cinquième colonne des tableaux figurant à l'annexe IV du règlement (UE) 2016/1628.
Indicate the test cycle in accordance with the fifth column of the Tables set out in Annex IV to Regulation (EU) 2016/1628.

GRAND-DUCHÉ DE LUXEMBOURG

Ministère du Développement durable et des Infrastructures
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L-2938 Luxembourg

SOCIÉTÉ NATIONALE DE CERTIFICATION ET D'HOMOLOGATION
s.à r.l.
Registre de Commerce: B 27180

L-5201 Sandweiler

Référence: e13*2016/1628*2017/656SRB1/P*0073*00

Annexes: - Rapport technique
- Fiche de renseignements du constructeur

Luxembourg, le 19 mars 2018

INDEX DU DOSSIER DE RECEPTION
INDEX TO TYPE-APPROVAL REPORT

	Numéro de réception: Approval number:	e13*2016/1628*2017/656SRB1/P*0073*00
	Révision: Revision:	00
	Marque de fabrique: *Trade name or mark:*	*Loncin*
	Désignation de la famille de moteurs: *Engine family designation:*	***NRS.420A***
1.	**Procès-verbal d'essai:** Test report:	Nº 87-2016/1628-0182/18-00
	- Test report: - List of modifications:	Page(s) 1 to 10; Appendix 0 - Page(s) 11.
2.	**Dossier du constructeur:** Report of the manufacturer:	Nº 2016/1628-NRS.420A-00
	- Manufacturer's information document: - Attachments to the information document:	Page(s) 1 to 17; see: Index of attachments, page(s) 1.
3.	**Autres documents annexés:** Other documents annexed:	not applicable
4.	**Date de délivrance de la réception initiale:** Date of issue of initial type approval:	19.03.2018
5.	**Date de la dernière délivrance de pages révisées:** Date of last issue of revised pages:	not applicable
6.	**Date de la dernière délivrance d'une réception révisée:** Date of last extension:	not applicable

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.420A
Parent engine type designation : G420FA

TEST REPORT

according to Regulation of the European Parliament and of the Council

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

(EU) 2016/1628

including all amendments until

(EU) 2017/656

Approval status	
EU type – approval	: ---

Structure of report:

1.	**General information**		
1.1	Make (trade name of the manufacturer)	:	Loncin
1.2	Commercial name(s) (if applicable)	:	---
1.3	Company name and address of manufacturer	:	Loncin Motor Co., Ltd. No.99 Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P. R. China
1.4	Name of technical service	:	TÜV Rheinland Luxemburg GmbH
1.5	Address of technical service	:	2a, Kalchesbruck L-1852 Luxembourg
1.6.	Location of test	:	Loncin Motor Co., Ltd. No.99 Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P. R. China
1.7	Date of test	:	December 15, 2017
1.8.	Test report number	:	87-2016/1628-0182/18-00
1.9.	Information document reference number (if available)	:	2016/1628-NRS.420A-00
1.10	Test report type:	:	Primary test~~/additional test/supplementary test~~
1.10.1.	Description of the purpose of the test	:	Type approval test
2.	**General engine information (test engine)**		
2.1.	Engine type designation~~/engine family designation/FT~~	:	G420FA
2.2.	Engine identification number	:	T1240017110026775
2.3.	Engine Category and subcategory	:	NRS-vr-1b
2.4.	Condition of object(s)	:	new~~, used, pretested~~
2.5.	Worst case selection	:	The determination of "worst case scenario" was done according to internal procedures of the Technical Service (QMA 1.301.005, section 6.2.2.2.).
2.6.	Remark	:	---
3.	**Documentation and information Check list (primary test only)**		
3.1.	Engine mapping documentation reference	:	See information document No.2016/1628-NRS.420A-00
3.2	Deterioration factor determination documentation reference	:	See information document No.2016/1628-NRS.420A-00
3.3.	Infrequent regeneration factors determination documentation reference, where applicable	:	---

3.4.	NOx control diagnostic demonstration documentation reference, where applicable	:	---
3.5.	Particulate control diagnostic demonstration documentation reference, where applicable	:	---
3.6.	For engine types and engine families that use an ECU as part of the emission control system anti-tampering declaration documentation reference	:	---
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	:	See information document No.2016/1628-NRS.420A-00
3.8.	Manufacturer intends to use ECU torque signal for in-service monitoring	:	~~Yes/~~No
3.8.1.	dynamometer torque greater than or equal to 0,93 × ECU torque	:	~~Yes/~~No
3.8.2.	ECU torque correction factor in case that dynamometer torque less than 0,93 × 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	:	SBF
4.1.2.	Type	:	E10
4.1.3.	Octane number RON	:	95.8
4.1.4.	Octane number MON	:	86.0
4.1.5.	Ethanol content (%)	:	9.6
4.1.6.	Density at 15 Deg.C (kg/m^3)	:	0.7452
4.2.	*Liquid fuel for compression-ignition engines*	:	---
4.2.1.	Make	:	---
4.2.2.	Type	:	---
4.2.3.	Cetane number	:	---
4.2.4.	Fame content (%)	:	---
4.2.5.	Density at 15 Deg.C (kg/m3)	:	---
4.3.	*Gaseous fuel — LPG*	:	---
4.3.1.	Make	:	---

4.3.2.	Type	:	---
4.3.3.	Reference fuel type	:	~~Fuel A/Fuel B~~
4.3.4.	Octane number MON	:	---
4.4.	*Gaseous fuel- Methane/biomethane*	:	---
4.4.1.	Reference fuel type	:	~~GR/G23/G25/G20~~
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	:	---
4.4.3.2.	Type	:	---
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	:	---
4.4.4.3.	The Methane Number (MN) of the resulting fuel blend	:	---
4.5.	*Dual fuel engine (in addition to relevant sections above)*	:	---
4.5.1.	Gas energy ratio on test cycle	:	---
5.	**Lubricant**		
5.1.	Make(s)	:	MOBIL
5.2.	Type(s)	:	15W-40
5.3.	SAE viscosity	:	12.5-16.3 mm^2/sec
5.4.	Lubricant and fuel are mixed	:	~~Yes/~~No
5.4.1.	Percentage of oil in mixture	:	
6.	**Engine Speed**		
6.1.	100 % speed (rpm):	:	3600
6.1.1.	100 % speed determined by	:	Declared rated speed~~/Declared maximum test speed (MTS)/Measured MTS~~
6.1.2.	Adjusted MTS if applicable (rpm)	:	---
6.2.	Intermediate speed	:	---
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 : 1800±150

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 stated in Table 1:

Table 1 Power absorbed by engine auxiliaries

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 the operation of the non-road mobile machinery that cannot be removed for the test (as specified by the manufacturer) to be stated in Table 2:

Table 2 Power absorbed by non-road mobile machinery auxiliaries

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 Engine net power

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)	---	---	9.20
Total auxiliary power from table 1 ($P_{f,i}$)	---	---	---
Total auxiliary power from table 2 ($P_{r,i}$)	---	---	---
Net engine power (kW) $P_i = P_{m,i} - P_{f,i} + P_{r,i}$	---	---	9.20

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 : ---

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)~~

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	---	---	---	---	---	---	---	---	---	---

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 various engine speeds taking account of net engine power (1) from Table 3 (complete relevant columns)					
	Idle	63%	80%	91%	Inter-mediate	100%
5%	---	---	---	---	---	---
10%	---	---	---	---	---	0.92
25%	---	---	---	---	---	2.30
50%	---	---	---	---	---	4.60
75%	---	---	---	---	---	6.90
100%	---	---	---	---	---	9.20
(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 Emissions results

9.3.1. Deterioration Factor (DF) : calculated/~~assigned~~

9.3.2. DF values and the cycle weighted emissions results to be stated in Table 6:
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
	1.08	1.05	1.11	--	---	---
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	350.39	3.54	2.50	6.04	---	---
k_{ru}/k_{rd} mult/add	---	---	---	---	---	---
test result with IRAF	---	---	---	---	---	---
Final test result with DF	378.42	3.72	2.78	6.47	---	---

9.3.3. Cycle weighted CO_2 (g/kWh) : 817.85

9.3.4. Cycle weighted NH_3 (ppm) : ---

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 : CVS

9.5.2. PM : ---

9.5.2.1 Method : ~~single/multiple filter~~

9.5.3. Particle number : ---

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 NRTC test cycle

NRTC	---
LSI-NRTC	---

10.2. NRTC emissions results

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, as applicable (NRTC or LSI-NRTC):

Table 9 DF values and the emissions 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 IRAF	---	---	---	---	---	---
Final test result with DF	---	---	---	---	---	---

10.2.3 Hot cycle CO_2 (g/kWh) : ---

10.2.4. Cycle weighted NH_3 (ppm) : ---

10.2.5. Cycle work for hot start test (kWh) : ---

10.2.6. Cycle CO_2 for hot start test (g) : ---

Table 10 DF values and the emissions results for NRTC-LSI

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	---	---	---	---	---	---
Test result with IRAF	---	---	---	---	---	---
Final test result with DF	---	---	---	---	---	---

10.3. Cycle CO_2 (g/kWh) : ---

10.4. Cycle NH_3 (ppm) : ---

10.4.1. Cycle work (kWh) : ---

10.4.2.	Cycle CO_2 (g)	:	---
10.5.	Sampling system used for the NRTC test	:	---
10.6.	Gaseous emissions	:	---
10.7.	PM	:	---
10.7.1.	Method	:	~~single/multiple filter~~
10.8.	Particle number	:	---

11. **Final emissions results**

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 (1).	378.42	3.72	2.78	6.47	---	---	G2
NRTC final test result with DF (3)	---	---	---	---	---	---	---

11.2 CO_2 result (4) (g/kWh) : 817.85

(1) For NRSC note the cycle indicated in point 9.1; for NRTC note cycle indicated in point 10.1.
(2) Copy the results from Table 9.3.2.
(3) Copy the results from Table 10.2.2 or 10.3.6, as applicable
(4) For an engine type or engine family that is tested on both the NRTC and NRSC, indicate the hot cycle CO_2 emissions values from the NRTC noted in point 10.3 or the NRTC-LSI noted in point 10.4. For an engine only tested on an NRSC indicate the CO_2 emissions values given in that cycle from point 9.3.3.

	Remark concerning extension	:	~~The vehicle type has been tested according to the modification(s) mentioned in appendix 0.~~ ~~The new parts meet the requirements of the regulation.~~ ~~An actual practical test of the vehicle was not necessary. The results of the previous test(s) are still valid.~~
11.3	Additional information	:	The results of the test refer exclusively to the object(s) mentioned under section 2.2 of this report.
11.4	Remark	:	---
12.	**Remarks concerning tested object(s)**	:	All version of the type as stated in the information document are covered with the tested version(s) and test object(s) respectively.

13. **Appendices**

Appendix 0 List of modifications

Information folder: 2016/1628-NRS.420A-00

14. **Statement of conformity**

The section 1.9 mentioned information document and the type described in that comply with the requirements mentioned on page 1. The mentioned test results refer to the vehicle(s)/object(s) described under point 2.1 of this report. With regard to the required level of performance to be achieved, the tested samples were representative for the type to be approved (see section 2.5).

Engineering Center Shanghai, February 09, 2018

Jinbiao Zhang
Expert Technical Service

List of modifications

Appendix 0

Correction of : ---

Modification of : ---

Addition of : ---

Deletion of : ---

Contents

Declaration by manufacturer on compliance with Regulation (EU) 2016/1628

The undersigned (full name and position): Huang Wan / QM Manager

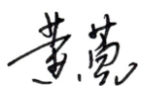
Hereby declares that the following ~~engine type/~~engine family complies in all respects with the requirements of Regulation (EU) 2016/1628 of the European Parliament and of the Council, Commission Delegated Regulation (EU) 2017/654, Commission Delegated Regulation (EU) 2017/655 and Commission Implementing 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):	Loncin
1.2.	Commercial name(s) (if applicable):	Not applicable
1.3.	Company name and address of manufacturer:	Loncin Motor Co., Ltd. No.99 Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P.R.China
1.4.	Name and address of manufacturer's authorized representative (if any):	CMD CostruzioniMotori Diesel Spa Nucleo Industriale Valle di Vitalba -85020- Atella(Potenza) –Italy
1.6.	~~Engine type designation/~~ engine family designation~~/ FT~~:	NRS.420A
	Parent engine type:	G420FA
	Engine types within the family:	G420FA-D, G420FDA, G420FDA-D, G390FA G390FDA, G300FA, G300FDA, G300FA-C, G300FDA-C, G300FA-B, G300FDA-B

(Place) (Date) Chongqing January 30, 2018

Signature (or visual representation of an ‘advanced electronic signature’ according to Regulation (EU) No 910/2014 of the European Parliament and of the Council (5), including data for verification):



Part A

1.	**GENERAL INFORMATION**	
1.1.	Make (trade name(s) of manufacturer)	Loncin
1.2.	Commercial name(s) (if applicable)	n.a.
1.3.	Company name and address of manufacturer	Loncin Motor Co., Ltd. No.99 Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P.R. China
1.4.	Name and address of manufacturer's authorised representative (if any)	CMD CostruzioniMotori Diesel Spa Nucleo Industriale Valle di Vitalba - 85020-Atella(Potenza) –Italy
1.5.	Name(s) and address(es) of ~~assembly~~/manufacture plant(s)	No.99 Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P.R. China
1.6.	~~Engine type designation/~~ engine family designation ~~/FT~~	NRS.420A
	Parent engine	G420FA
	Engine types within the family	G420FA-D, G420FDA, G420FDA-D, G390FA G390FDA, G300FA, G300FDA, G300FA-C, G300FDA-C, G300FA-B, G300FDA-B
1.7.	Category and sub-category of the ~~engine type/~~engine family	NRS-vr-1b
1.8.	Emissions durability period category	Cat 1 (Consumer products)
1.9.	Emissions stage	V
1.10.	In case of NRS <19 kW only, engine family consisting exclusively of engine types for snow throwers	No
1.11.	Reference power is	Rated net power
1.12.	Primary NRSC test cycle	G2
1.12.1.	In case of variable speed IWP category only, Additional propulsion test cycle	Not applied
1.12.2.	In case of IWP category only, additional auxiliary NRSC test cycle	Not applied
1.13.	Transient test cycle	Not applicable
1.14.	Restrictions on use (if applicable)	n.a.

Part B

2.	**COMMON DESIGN PARAMETERS OF ENGINE FAMILY(1)**	
2.1.	Combustion Cycle	Four stroke cycle
2.2.	Ignition Type	Spark ignition
2.3.	Configuration of the cylinders	
2.3.1.	Position of the cylinders in the block	Single
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)	n.a.
2.4.2.	Valve and porting configuration	Refer to drawing No. NRS.420A-02
2.4.3.	Number of valves per cylinder	2
2.5.	Range of individual cylinder displacement (cm^3)	302~420
2.6.	Main Cooling medium	Air
2.7.	Method of air aspiration	Naturally aspirated
2.8.	Fuel	
2.8.1.	Fuel Type	Petrol (E10)
2.8.1.1.	Sub Fuel type (Natural gas/Biomethane only)	n.a.
2.8.2.	Fuelling arrangement	Liquid-fuel only
2.8.3.	List of additional fuels compatible with use by the engine declared by the manufacturer in accordance with point 1.4. of Annex I to Commission Delegated Regulation 2017/654 on technical and general requirements (provide reference to recognised standard or specification)	n.a.
2.8.4.	Lubricant added to fuel	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	Carburettor
2.9.	Engine management systems	Mechanical
2.10.	Miscellaneous devices	
2.10.1.	Exhaust gas recirculation (if yes, complete section 3.10.1. and provide a schematic diagram of the location and order of the devices)	No
2.10.2.	Water injection (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 (if yes, complete section 3.10.2. and provide a schematic diagram of the location and order of	No

	the devices)	
2.10.4.	H_2 injection (if yes, provide a schematic diagram of the location and order of the devices)	No
2.10.5.	Others (specify 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)	No
2.11.1.	Oxidation catalyst (if yes, complete section 3.11.2.)	No
2.11.2.	$DeNO_x$ system with selective reduction of NO_x (addition of reducing agent) (if yes, complete section 3.11.3.)	No
2.11.3.	Other $DeNO_x$ systems (if yes, complete section 3.11.3.)	No
2.11.4.	Three-way catalyst combining oxidation and NO_x reduction (if yes, complete section 3.11.3.)	No
2.11.5.	Particulate trap with passive regeneration (if yes, complete section 3.11.4.)	No
2.11.6.	Particulate trap with active regeneration (if yes, complete section 3.11.4.)	No
2.11.7.	Other particulate traps (if yes, complete section 3.11.4.)	No
2.11.8.	Other after-treatment devices (specify) (if yes, complete section 3.11.5.)	No
2.11.9.	Other devices or features that have a strong influence on emissions (specify)	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 2-4	*type 5-6*	*type 7-12*
3.1	**Engine Identification**							
3.1.1.	Engine type designation			X	G420FA	1. G420FA-D 2. G420FDA 3. G420FDA-D	1. G390FA 2. G390FDA	1. G300FA 2. G300FDA 3. G300FA-C 4. G300FDA-C 5. G300FA-B 6. G300FDA-B
3.1.2.	Engine type designation shown on engine marking: yes/no			X	No	No	No	No
3.1.3.	Location of the statutory marking:			X	protective cover or crankcase	protective cover or crankcase	protective cover or crankcase	protective cover or crankcase
3.1.4.	Method of attachment of the statutory marking:			X	Adhesive label or engraved	Adhesive label or engraved	Adhesive label or engraved	Adhesive label or engraved
3.1.5.	Drawings of the location of the engine identification number (complete example with dimensions):			X	Refer to drawing no. *NRS.420A* -01	Refer to drawing no. *NRS.420A* -01	Refer to drawing no. *NRS.420A* -01	Refer to drawing no. *NRS.420A* -01
3.2.	**Performance Parameters**							
3.2.1.	Declared rated speed (rpm):	X			3600	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	3460	3460	3450	2610
3.2.1.2.	Declared rated net power (kW):	X			9.2	9.2	8.5	6.8
3.2.2.	Maximum power speed(rpm):			X	3600	3600	3600	3600
3.2.2.1.	Fuel delivery/stroke (mm^3) for diesel engine, fuel flow (g/h) for other engines, at maximum net power:			X	3460	3460	3450	2610
3.2.2.2.	Maximum net power (kW):	X		X	9.2	9.2	8.5	6.8
3.2.3.	Declared maximum torque speed (rpm):	X			2500	2500	2500	2500

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ ~~engine type~~	Engine types within the engine family (if applicable)		
						type 2-4	*type 5-6*	*type 7-12*
3.2.3.1.	Fuel delivery/stroke (mm^3) for diesel engine, fuel flow (g/h) for other engines, at maximum torque speed:			X	2580	2580	2520	1880
3.2.3.2.	Declared maximum torque (Nm):	X			26.8	26.8	25.8	20.3
3.2.4.	Declared 100% test speed:	X			n.a.	n.a.	n.a.	n.a.
3.2.5.	Declared Intermediate test speed:	X			n.a.	n.a.	n.a.	n.a.
3.2.6.	Idle speed (rpm)	X			1800±150	1800±150	1800±150	1800±150
3.2.7.	Maximum no load speed (rpm):	X			n.a	n.a	n.a	n.a
3.2.8.	Declared minimum torque (Nm)	X			n.a.	n.a.	n.a.	n.a.
3.3.	**Run-in procedure**							
3.3.1.	Run in time:	X			5 hour	5 hour	5 hour	5 hour
3.3.2.	Run-in cycle:	X			G2	G2	G2	G2
3.4.	**Engine test**							
3.4.1.	Specific fixture required: Yes/No	X			No	No	No	No
3.4.1.1.	Engine fixture for test bench and power transmission shaft system to the dyno rotating system description, photograph and/or drawing:	X			n.a.	n.a.	n.a.	n.a.
3.4.2.	Exhaust mixing chamber permitted by manufacturer: Yes/No	X			No	No	No	No
3.4.2.1.	exhaust mixing chamber description, photograph and/or drawing:	X			n.a.	n.a.	n.a.	n.a.
3.4.3.	Manufacturers chosen NRSC: RMC/Discrete mode	X			Discrete mode	Discrete mode	Discrete mode	Discrete mode
3.4.4.	Additional NRSC: E2/D2/C1	X			n.a.	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.	n.a.
3.4.6.	Number of pre-conditioning RMC prior to RMC NRSC test	X			n.a.	n.a.	n.a.	n.a.
3.5.	**Lubrication system**							
3.5.1.	Lubricant temperature							
3.5.1.1.	Minimum (deg. C):	X			n.a.	n.a.	n.a.	n.a.
3.5.1.2.	Maximum (deg. C):	X			n.a.	n.a.	n.a.	n.a.
3.6.	**Combustion Cylinder**							
3.6.1.	Bore(mm):			X	90	90	88	80

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ ~~engine type~~	Engine types within the engine family (if applicable)		
						type 2-4	*type 5-6*	*type 7-12*
3.6.2.	Stroke(mm):			X	66	66	64	60
3.6.3.	Number of cylinders:			X	1	1	1	1
3.6.4.	Engine displacement (cm^3):			X	420	420	389	302
3.6.5.	Cylinder displacement as % of parent engine:			X	100%	100%	92.6%	71.9%
3.6.6.	Volumetric compression ratio:			X	12 :1	12 :1	12 :1	12 :1
3.6.7.	Combustion system description:			X	4-stroke	4-stroke	4-stroke	4-stroke
3.6.8.	Drawings of combustion chamber and piston crown:			X	Refer to drawing no. NRS.420A-02a and Refer to drawing no. NRS.420A-03a	Refer to drawing no. NRS.420A-02a and Refer to drawing no. NRS.420A-03a	Refer to drawing no. NRS.420A-02a and Refer to drawing no. NRS.420A-03b	Refer to drawing no. NRS.420A-02b and Refer to drawing no. NRS.420A-03c
3.6.9.	Minimum cross sectional area of inlet and outlet ports (mm^2):			X	Inlet: 549.3 mm^2 Outlet: 407.9 mm^2	Inlet: 549.3 mm^2 Outlet: 407.9 mm^2	Inlet: 549.3 mm^2 Outlet: 407.9 mm^2	Inlet: 389.5 mm^2 Outlet: 269.7 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. NRS.420A-05a	Refer to drawing no. NRS.420A-05a	Refer to drawing no. NRS.420A-05a	Refer to drawing no. NRS.420A-05b
3.6.10.2.	Reference and/or setting range:			X	TDC	TDC	TDC	TDC
3.6.10.3.	Variable valve timing system: Yes/No			X	No	No	No	No
3.6.10.3.1.	Type: continuous/(on/off)			X	n.a.	n.a.	n.a.	n.a.
3.6.10.3.2.	Cam phase shift angle:			X	n.a.	n.a.	n.a.	n.a.
3.6.11.	Porting configuration							
3.6.11.1.	positon, size and number:			X	n.a.	n.a.	n.a.	n.a.
3.7.	**Cooling system**							
3.7.1.	Liquid cooling							
3.7.1.1.	Nature of liquid:			X	n.a.	n.a.	n.a.	n.a.
3.7.1.2.	Circulating pumps: Yes/No			X	No	No	No	No
3.7.1.2.1.	type(s):			X	n.a.	n.a.	n.a.	n.a.
3.7.1.2.2.	Drive ratio(s):			X	n.a.	n.a.	n.a.	n.a.
3.7.1.3.	Minimum coolant temperature at outlet (deg. C):	X			n.a.	n.a.	n.a.	n.a.
3.7.1.4.	Maximum coolant temperature at outlet (deg. C):	X			n.a.	n.a.	n.a.	n.a.
3.7.2.	Air cooling							
3.7.2.1.	fan: Yes/No			X	Yes	Yes	Yes	Yes

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ ~~engine type~~	Engine types within the engine family (if applicable)		
						type 2-4	*type 5-6*	*type 7-12*
3.7.2.1.1.	type(s):			X	T110	T110	T110	T080
3.7.2.1.2.	Drive ratio(s):			X	1	1	1	1
3.7.2.2.	Maximum temperature at reference point (deg. C):			X	230	230	230	230
3.7.2.2.1.	Reference point location			X	Spark plug washer	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		0.5	0.5	0.5	0.4
3.8.1.2.	With dirty air cleaner:	X	X		0.5	0.5	0.5	0.4
3.8.1.3.	Location, of measurement:	X	X		Air inlet nearby	Air inlet nearby	Air inlet nearby	Air inlet nearby
3.8.2.	Pressure charger(s): Yes/No			X	No	No	No	No
3.8.2.1.	Type(s):			X	n.a.	n.a.	n.a.	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.	n.a.	n.a.	n.a.
3.8.3.	Charge air cooler: Yes/No			X	No	No	No	No
3.8.3.1.	Type: air-air/air-water/other(specify)			X	n.a.	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.	n.a.
3.8.3.4.	Maximum allowable pressure drop across charge cooler at 100% engine speed and at 100% load (kPa):	X	X		n.a.	n.a.	n.a.	n.a.
3.8.4.	Intake throttle valve: Yes/No			X	No	No	No	No
3.8.5.	Device for recycling crankcase gases: Yes/No			X	Yes	Yes	Yes	Yes
3.8.5.1.	If yes, description and drawings:			X	Through the pipe, the crankcase gases go into the air filter, and finally the gases burn in the combustion chamber. Refer to drawing no. NRS.420A-10			
3.8.5.2.	If no, compliance with paragraph 6.10 of Annex VI to Commission Delegated Regulation (EU) 2016/654 on technical and general requirements: Yes/No	X			n.a.	n.a.	n.a.	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. NRS.420A-08	Refer to drawing no. NRS.420A-08	Refer to drawing no. NRS.420A-08	Refer to drawing no. NRS.420A-08

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ ~~engine type~~	Engine types within the engine family (if applicable)		
						type 2-4	*type 5-6*	*type 7-12*
3.8.7.	Air filter			X				
3.8.7.1.	Type:			X	T116	T116	1. T116 2. T560	T09J
3.8.8.	Intake air-silencer							
3.8.1.1.	Type:			X	n.a.	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. NRS.420A-07	Refer to drawing no. NRS.420A-07	Refer to drawing no. NRS.420A-07	Refer to drawing no. NRS.420A-07
3.9.2.	Maximum exhaust temperature (deg. C):	X			800	800	800	800
3.9.3.	Maximum permissible exhaust backpressure at 100% engine speed and at 100% load (kPa):	X	X		9.0	9.0	9.0	5.3
3.9.3.1.	Location of measurement:	X	X		Exhaust port nearby	Exhaust port nearby	Exhaust port nearby	Exhaust port nearby
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.	n.a.
3.9.4.1.	Location and speed/load conditions:	X			n.a.	n.a.	n.a.	n.a.
3.9.5.	Exhaust throttle valve: Yes/No			X	No	No	No	No
3.10.	**Miscellaneous devices**							
3.10.1.	Exhaust gas recirculation							
3.10.1.1.	Characteristics: cooled/uncooled, high pressure/low pressure/other (specify):				n.a.	n.a.	n.a.	n.a.
3.10.2.	Water injection							
3.10.2.1.	Operation principle:			X	n.a.	n.a.	n.a.	n.a.
3.10.3.	H_2 injection	X			n.a.	n.a.	n.a.	n.a.
3.11.	**Exhaust after-treatment system**							
3.11.1.	Location		X					
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.	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.	n.a.

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ ~~engine type~~	Engine types within the engine family (if applicable)		
						type 2-4	*type 5-6*	*type 7-12*
3.11.1.2.1.	Test conditions for measurement:	X	X		n.a.	n.a.	n.a.	n.a.
3.11.1.3.	Minimum temperature at inlet to first after-treatment device at 100% load and speed (deg. C), if stated:	X	X		n.a.	n.a.	n.a.	n.a.
3.11.2.	Oxidation catalyst							
3.11.2.1.	Number of catalytic converters and elements:			X	n.a.	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.	n.a.
3.11.2.3.	Total charge of precious metals:			X	n.a.	n.a.	n.a.	n.a.
3.11.2.4.	Relative concentration of each compound:			X	n.a.	n.a.	n.a.	n.a.
3.11.2.5.	Substrate (structure and material):			X	n.a.	n.a.	n.a.	n.a.
3.11.2.6.	Cell density:			X	n.a.	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.	n.a.
3.11.3.	Catalytic exhaust gas after treatment system for NO_x or three way catalyst							
3.11.3.1.	Type:			X	n.a.	n.a.	n.a.	n.a.
3.11.3.2.	Number of catalytic converters and elements:			X	n.a.	n.a.	n.a.	n.a.
3.11.3.3.	Type of catalytic action:			X	n.a.	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.	n.a.
3.11.3.5.	Total charge of precious metals:			X	n.a.	n.a.	n.a.	n.a.
3.11.3.6.	Relative concentration of each compound:			X	n.a.	n.a.	n.a.	n.a.
3.11.3.7.	Substrate (structure and material):			X	n.a.	n.a.	n.a.	n.a.
3.11.3.8.	Cell density:			X	n.a.	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.	n.a.
3.11.3.10.	Method of regeneration:	X		X	n.a.	n.a.	n.a.	n.a.
3.11.3.10.1.	Infrequent regeneration: Yes/No:	X			No	No	No	No
3.11.3.11.	Normal operating temperature range (deg. C):	X	X		n.a.	n.a.	n.a.	n.a.
3.11.3.12.	Consumable reagent: Yes/No			X	No	No	No	No
3.11.3.12.1.	Type and concentration of reagent needed for catalytic action:			X	n.a.	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)		
						type 2-4	*type 5-6*	*type 7-12*
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.	n.a.
3.11.3.12.3.	Normal operational temperature range of reagent:		X		n.a.	n.a.	n.a.	n.a.
3.11.3.12.4.	International standard:		X	X	n.a.	n.a.	n.a.	n.a.
3.11.3.13.	NO_x sensor(s): Yes/No			X	No	No	No	No
3.11.3.13.1.	Type:			X	n.a.	n.a.	n.a.	n.a.
3.11.3.13.2.	Location(s)			X	n.a.	n.a.	n.a.	n.a.
3.11.3.14.	Oxygen sensor(s): Yes/No			X	No	No	No	No
3.11.3.14.1.	Type:			X	n.a.	n.a.	n.a.	n.a.
3.11.3.14.2.	Location(s):			X	n.a.	n.a.	n.a.	n.a.
3.11.4.	Particulate trap							
3.11.4.1.	Type of filtration: through flow/partial flow/wall flow/other (specify)			X	n.a.	n.a.	n.a.	n.a.
3.11.4.2.	Type:			X	n.a.	n.a.	n.a.	n.a.
3.11.4.3.	Dimensions and capacity of the particulate trap:			X	n.a.	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.	n.a.
3.11.4.5.	Method or system of regeneration, description and/or drawing:			X	n.a.	n.a.	n.a.	n.a.
3.11.4.5.1.	Infrequent regeneration: Yes/No			X	No	No	No	No
3.11.4.5.2.	Minimum exhaust gas temperature for initiating regeneration procedure (deg. C):			X	n.a.	n.a.	n.a.	n.a.
3.11.4.6.	Catalytic coating: Yes/No			X	No	No	No	No
3.11.4.6.1.	Type of catalytic action:			X	n.a.	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)		
						type 2-4	*type 5-6*	*type 7-12*
3.11.4.7.	Fuel borne catalyst (FBC): Yes/No			X	No	No	No	No
3.11.4.8.	Normal operating temperature range (deg. C):			X	n.a.	n.a.	n.a.	n.a.
3.11.4.9.	Normal operating pressure range (kPa)			X	n.a.	n.a.	n.a.	n.a.
3.11.4.10.	Storage capacity soot/ash [g]:			X	n.a.	n.a.	n.a.	n.a.
3.11.4.11.	Oxygen sensor(s): Yes/No			X	No	No	No	No
3.11.4.11.1.	Type:			X	n.a.	n.a.	n.a.	n.a.
3.11.4.11.2.	Location(s):			X	n.a.	n.a.	n.a.	n.a.
3.11.5.	Other systems							
3.11.5.1.	Description and operation:			X	n.a.	n.a.	n.a.	n.a.
3.11.6.	Infrequent Regeneration							
3.11.6.1.	Number of cycles with regeneration	X			n.a.	n.a.	n.a.	n.a.
3.11.6.2.	Number of cycles without regeneration	X			n.a.	n.a.	n.a.	n.a.
3.12.	**Fuel feed for diesel or, where applicable, dual fuel engines**							
3.12.1.	Feed pump							
3.12.1.1.	Pressure (kPa) or characteristic diagram:			X	n.a.	n.a.	n.a.	n.a.
3.12.2.	Injection system							
3.12.2.1.	Pump							
3.12.2.1.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.12.2.1.2.	Rated pump speed (rpm):			X	n.a.	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.	n.a.
3.12.2.1.4.	Torque peak pump speed (rpm):			X	n.a.	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.	n.a.
3.12.2.1.6.	Characteristic diagram:			X	n.a.	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.	n.a.
3.12.2.2.	Injection timing							
3.12.2.2.1.	Injection timing curve:			X	n.a.	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)		
						type 2-4	*type 5-6*	*type 7-12*
3.12.2.2.2.	Static Timing:			X	n.a.	n.a.	n.a.	n.a.
3.12.2.3.	Injection piping							
3.12.2.3.1.	Length(s) (mm):			X	n.a.	n.a.	n.a.	n.a.
3.12.2.3.2.	Internal diameter (mm):			X	n.a.	n.a.	n.a.	n.a.
3.12.2.4.	Common rail: Yes/No			X	No	No	No	No
3.12.2.4.1.	Type:			X	n.a.	n.a.	n.a.	n.a.
3.12.3.	Injector(s)				n.a.	n.a.	n.a.	n.a.
3.12.3.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.12.3.2.	Opening pressure (kPa):			X	n.a.	n.a.	n.a.	n.a.
3.12.4.	Electronic control unit (ECU): Yes/No			X	No	No	No	No
3.12.4.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.12.4.2.	Software calibration number(s):			X	n.a.	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.	n.a.
3.12.5.	Governor							
3.12.5.1.	Type(s):			X	n.a.	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.	n.a.
3.12.5.3.	Maximum no-load speed:			X	n.a.	n.a.	n.a.	n.a.
3.12.5.4.	Idle speed:			X	n.a.	n.a.	n.a.	n.a.
3.12.6.	Cold-start system: Yes/No			X	No	No	No	No
3.12.6.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.12.6.2.	Description:			X	n.a.	n.a.	n.a.	n.a.
3.12.7.	Fuel temperature at the inlet to the fuel injection pump							
3.12.7.1.	Minimum (deg. C):	X			n.a.	n.a.	n.a.	n.a.
3.12.7.2.	Maximum (deg. C):	X			n.a.	n.a.	n.a.	n.a.
3.13.	**Fuel feed for liquid fuel spark ignition engine**							
3.13.1.	Carburettor							

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ ~~engine type~~	Engine types within the engine family (if applicable)		
						type 2-4	*type 5-6*	*type 7-12*
3.13.1.1.	Type(s):			X	1. T124 2. T570 3. 139 4. P27 5. P27A	1. T124 2. T570 3. 139 4. P27 5. P27A	1. T110 2. T116 3. T560 4. P27	T09J
3.13.2.	Port fuel injection:							
3.13.2.1.	single-point / multi-point			X	n.a.	n.a.	n.a.	n.a.
3.13.2.2.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.13.3.	Direct injection:							
3.13.3.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.13.4.	Fuel temperature at location specified by manufacturer							
3.13.4.1.	Location:	X			Carburettor cup	Carburettor cup	Carburettor cup	Carburettor cup
3.13.4.2.	Minimum (deg. C)	X			30	30	30	30
3.13.4.3.	Maximum (deg. C)	X			38	38	38	38
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.	n.a.	n.a.	n.a.
3.14.2.	Pressure regulator(s) or vaporiser/pressure regulator(s)							
3.14.2.1.	Type(s)			X	n.a.	n.a.	n.a.	n.a.
3.14.2.2.	Number of pressure reduction stages			X	n.a.	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.	n.a.
3.14.2.4.	Number of main adjustment points:			X	n.a.	n.a.	n.a.	n.a.
3.14.2.5.	Number of idle adjustment points:			X	n.a.	n.a.	n.a.	n.a.
3.14.3.	Fuelling system: mixing unit/gas injection/liquid injection/direct injection			X	n.a.	n.a.	n.a.	n.a.
3.14.3.1.	Mixture strength regulation							
3.14.3.1.1.	System description and/or diagram and drawings:			X	n.a.	n.a.	n.a.	n.a.
3.14.4.	Mixing unit							
3.14.4.1.	Number:			X	n.a.	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)		
						type 2-4	*type 5-6*	*type 7-12*
3.14.4.2.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.14.4.3.	Location:			X	n.a.	n.a.	n.a.	n.a.
3.14.4.4.	Adjustment possibilities:			X	n.a.	n.a.	n.a.	n.a.
3.14.5.	Inlet manifold injection							
3.14.5.1.	Injection: single-point/multi-point			X	n.a.	n.a.	n.a.	n.a.
3.14.5.2.	Injection: continuous/simultaneously timed/ sequentially timed			X	n.a.	n.a.	n.a.	n.a.
3.14.5.3.	Injection equipment							
3.14.5.3.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.14.5.3.2.	Adjustment possibilities:			X	n.a.	n.a.	n.a.	n.a.
3.14.5.4.	Supply pump							
3.14.5.4.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.14.5.5.	Injector(s)							
3.14.5.5.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.14.6.	Direct injection							
3.14.6.1.	Injection pump/pressure regulator			X	n.a.	n.a.	n.a.	n.a.
3.14.6.1.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.14.6.1.2.	Injection timing (specify):			X	n.a.	n.a.	n.a.	n.a.
3.14.6.2.	Injector(s)							
3.14.6.2.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.14.6.2.2.	Opening pressure or characteristic diagram :			X	n.a.	n.a.	n.a.	n.a.
3.14.7.	Electronic Control Unit (ECU)							
3.14.7.1.	Type(s):			X	n.a.	n.a.	n.a.	n.a.
3.14.7.2.	Adjustment possibilities:			X	n.a.	n.a.	n.a.	n.a.
3.14.7.3.	Software calibration number(s):			X	n.a.	n.a.	n.a.	n.a.
3.14.8.	Approvals of engines for several fuel compositions							
3.14.8.1.	Self-adaptive feature: Yes/No	X	X	X	n.a.	n.a.	n.a.	n.a.
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.	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.	n.a.

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ ~~engine type~~	Engine types within the engine family (if applicable)		
						type 2-4	*type 5-6*	*type 7-12*
3.14.9.	Fuel temperature pressure regulator final stage							
3.14.9.1.	Minimum (deg. C):	X			n.a.	n.a.	n.a.	n.a.
3.14.9.2.	Maximum (deg. C):	X			n.a.	n.a.	n.a.	n.a.
3.15.	**Ignition system**							
3.15.1.	Ignition coil(s)							
3.15.1.1.	Type(s):			X	1. T110 2. 188F 3. 188	1. T110 2. 188F 3. 188	1. T110 2. 188F 3. 188	1. T080 2. 173F 3. 173
3.15.1.2.	Number:			X	1	1	1	1
3.15.2.	Spark plug(s)							
3.15.2.1.	Type(s):			X	1. F7RTC 2. RN9YC 3. BPR6ES	1. F7RTC 2. RN9YC 3. BPR6ES	1. F7RTC 2. RN9YC 3. BPR6ES	1. F7RTC 2. RN9YC 3. BPR6ES
3.15.2.2.	Gap setting:			X	0.7-0.8 mm	0.7-0.8 mm	0.7-0.8 mm	0.7-0.8 mm
3.15.3.	Magneto			X				
3.15.3.1.	Type(s):			X	1. T110 2. T111	1. T110 2. T111	1. T110 2. T111	T080
3.15.4.	Ignition timing control: Yes/No			X	Yes	Yes	Yes	Yes
3.15.4.1.	Static advance with respect to top dead centre (crank angle degrees):			X	23°	23°	23°	25°
3.15.4.2.	Advance curve or map:			X	Refer to drawing no. NRS.420A-06a	Refer to drawing no. NRS.420A-06a	Refer to drawing no. NRS.420A-06a	Refer to drawing no. NRS.420A-06b
3.15.4.3.	Electronic control: Yes/No			X	No	No	No	No

ENGINE TYPE	G420FA
PHOTOGRAPHS OF THE PARENT ENGINE	
PHOTOGRAPH NO.	Photo-01

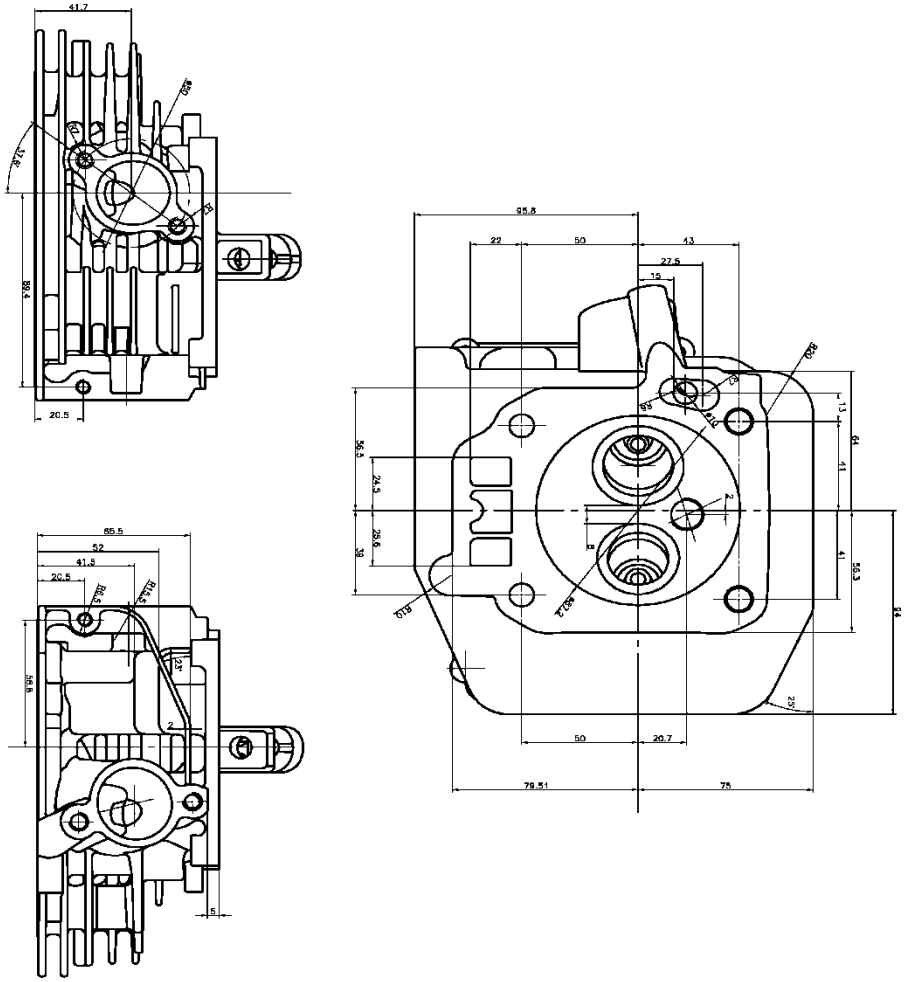
Engine type designation and engine no.

Location: Crankcase: Coding: type XXXXXXXXXXXXXXX; Method of affixing: Engraved (Engine coding: engine type /design no. /yy/mm/ sersial no., the first six numbers show design no., then the four numbers show production year and month, and the last seven numbers are serial no..)

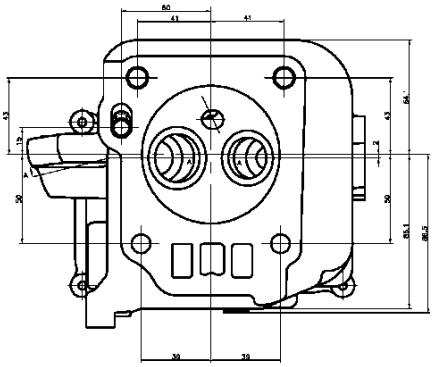
Label location

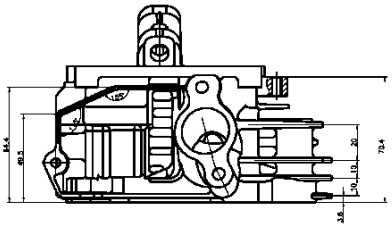
LONCIN Loncin Motor Co., Ltd.
EC 420/389/302 cc EURO V
e13*2016/1628*2017/656****/P*XXXX*00

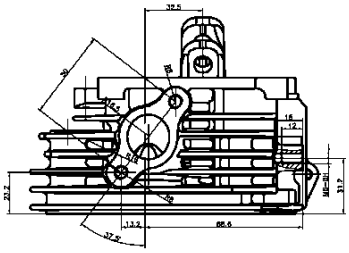
ENGINE TYPE	All Types
POSITION OF ENGINE NO. AND EU APPROVAL NO.	
DRAWING NO.	NRS.420A-01



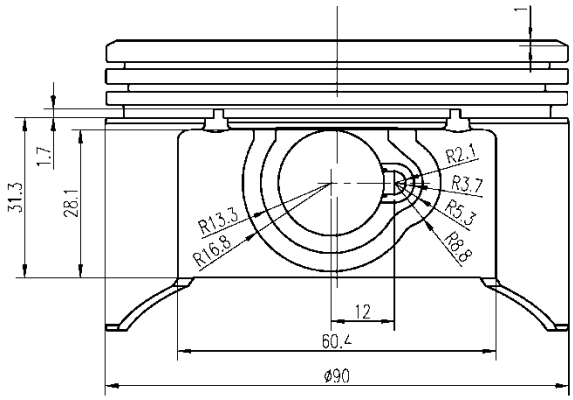
ENGINE TYPE	G420FA, G420FA-D, G420FDA, G420FDA-D, G390FA, G390FDA
CYLINDER	
DRAWING NO.	NRS.420A-02a

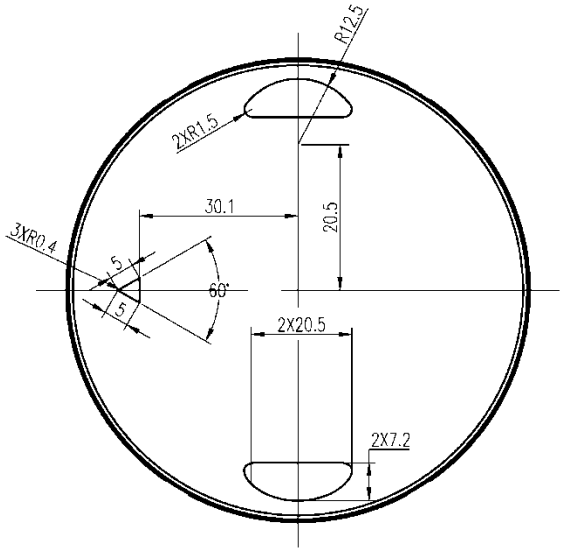




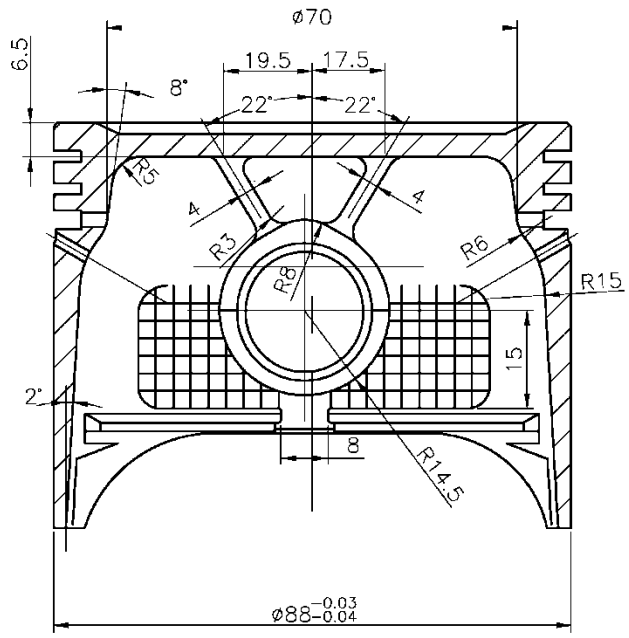


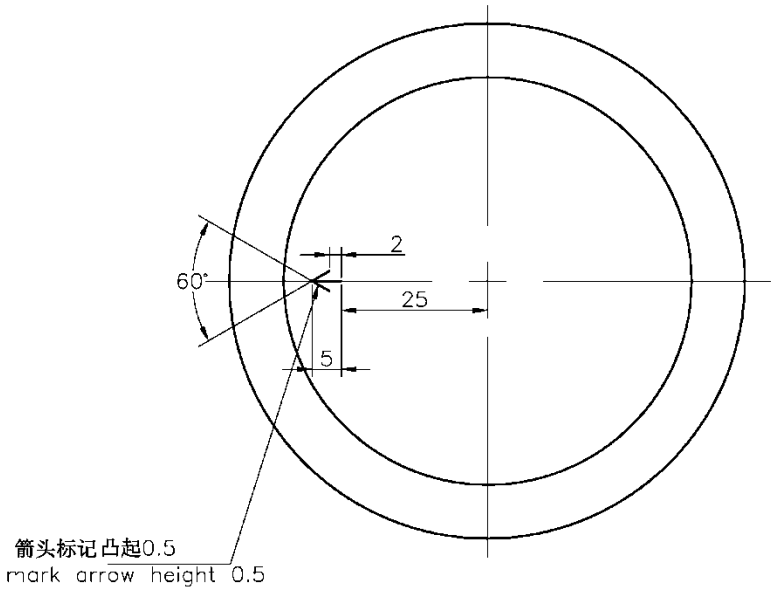
ENGINE TYPE	G300FA, G300FDA G300FA-C, G300FDA-C G300FA-B, G300FDA-B
CYLINDER	
DRAWING NO.	NRS.420A-02b



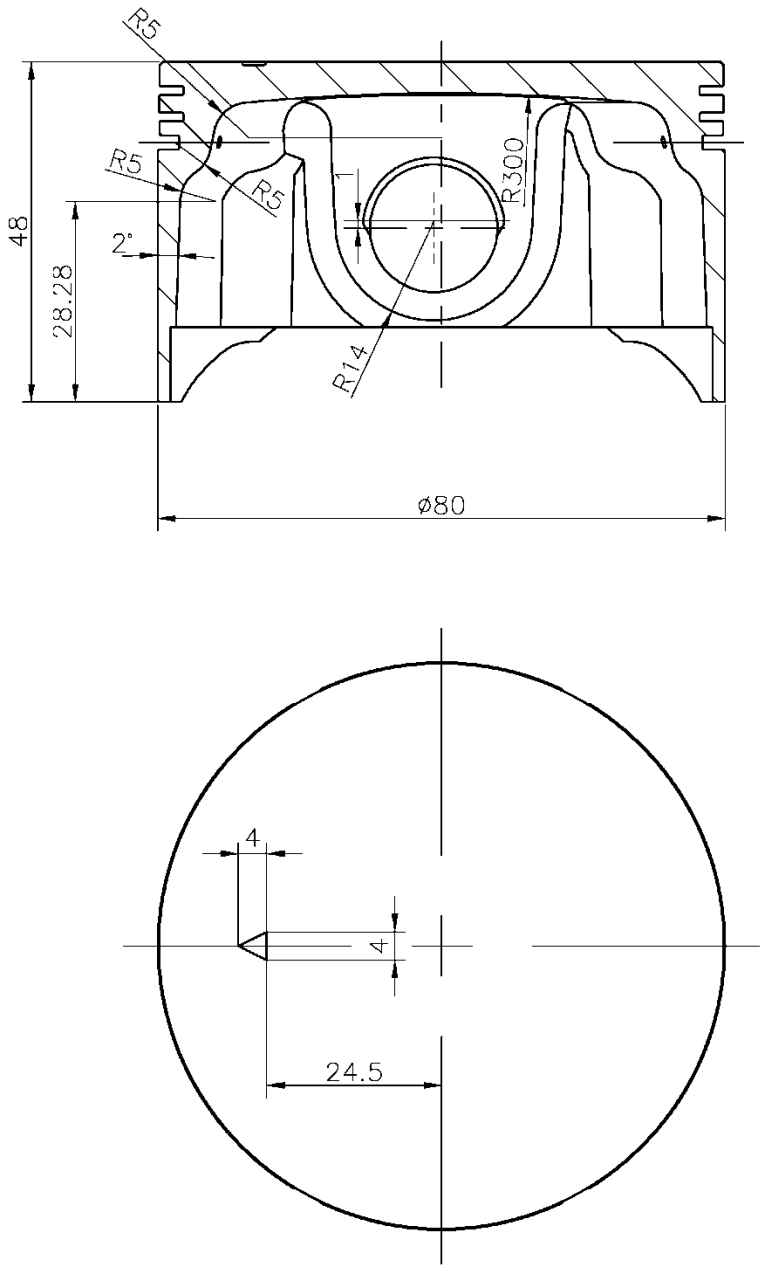


ENGINE TYPE	G420FA, G420FA-D, G420FDA, G420FDA-D
PISTON	
DRAWING NO.	NRS.420A-03[a]

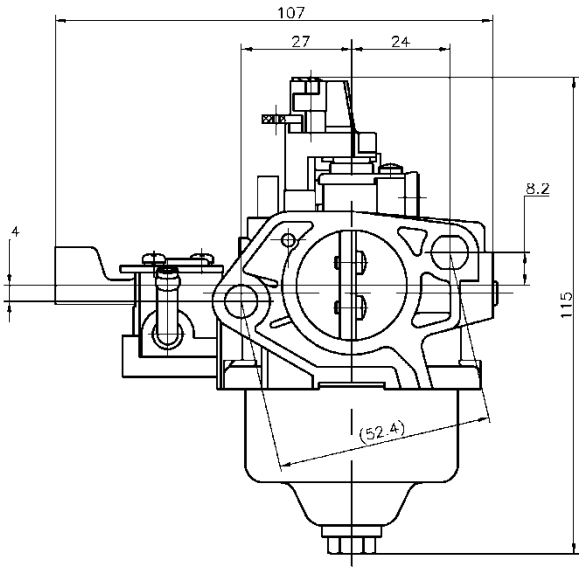


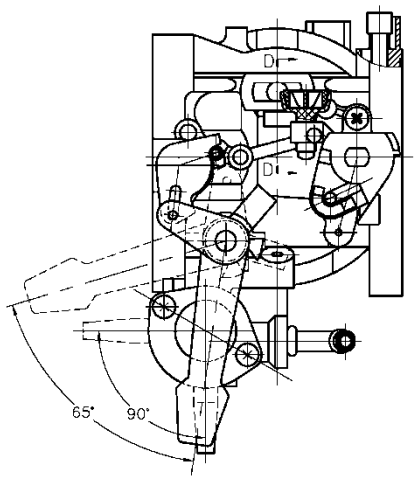


ENGINE TYPE	G390FA, G390FDA
PISTON	
DRAWING NO.	NRS.420A-03[b]

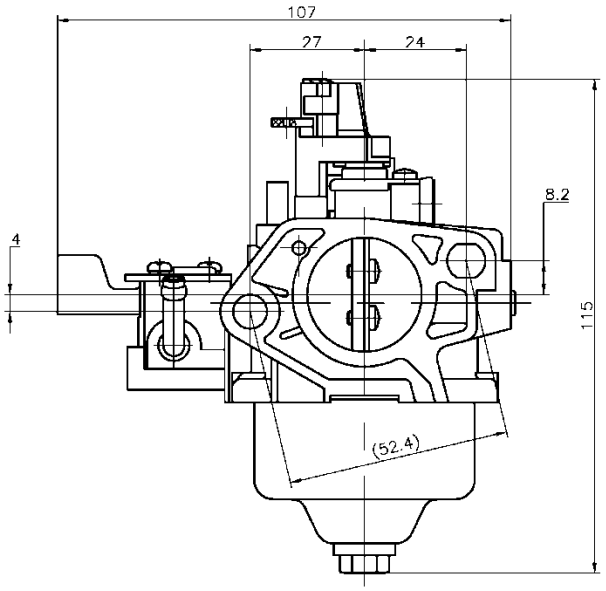


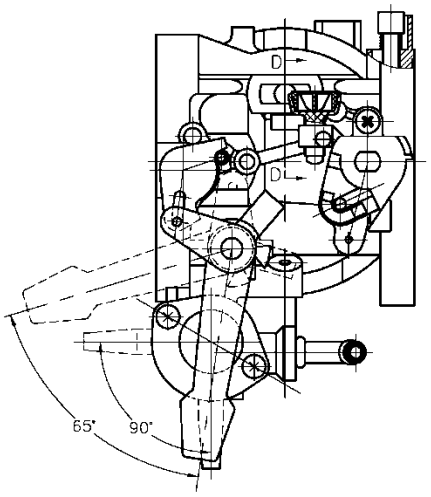
ENGINE TYPE	G300FA, G300FDA G300FA-C, G300FDA-C G300FA-B, G300FDA-B
PISTON	
DRAWING NO.	NRS.420A-03^{c}



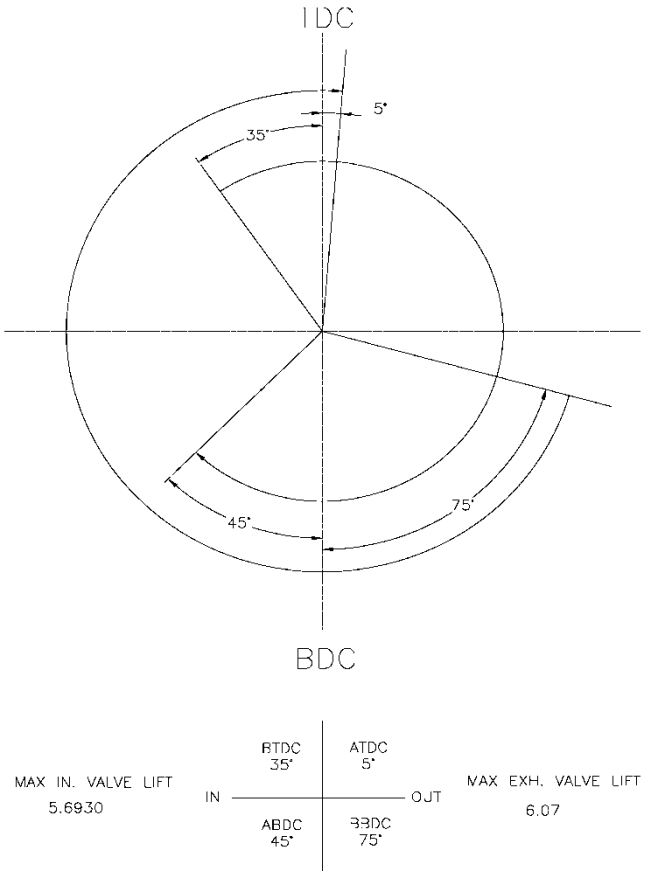


ENGINE TYPE	G420FA, G420FA-D, G420FDA, G420FDA-D G390FA, G390FDA
CARBURETTOR	
DRAWING NO.	NRS.420A-04ª

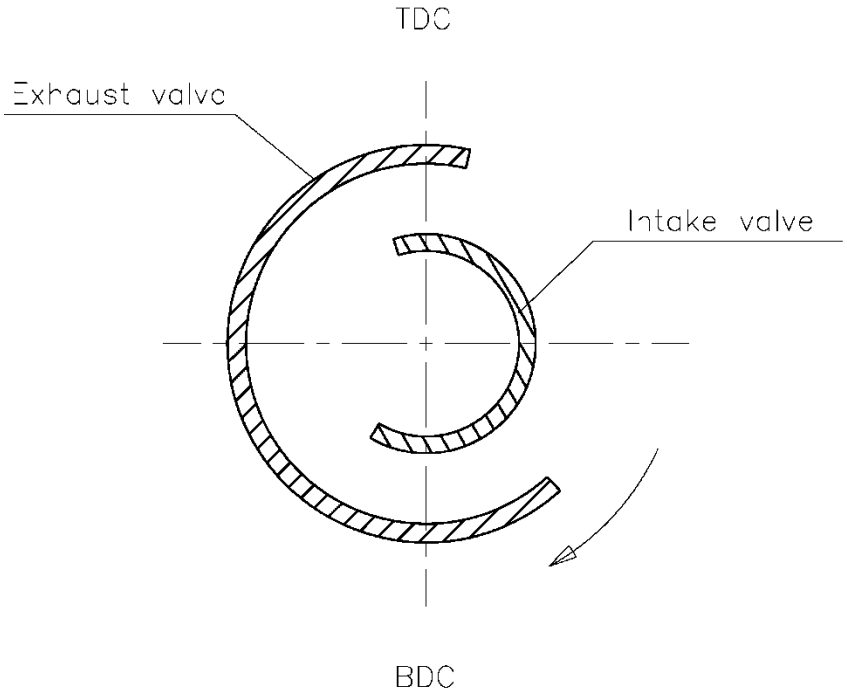


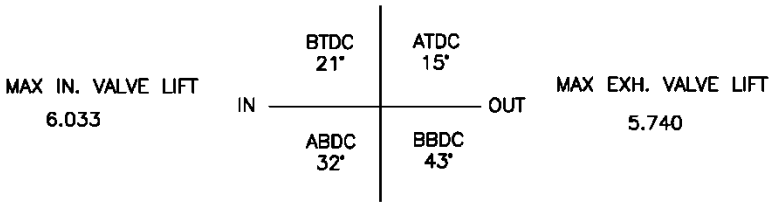


ENGINE TYPE	G300FA, G300FDA G300FA-C, G300FDA-C G300FA-B, G300FDA-B
CARBURETTOR	
DRAWING NO.	NRS.420A-04[b]

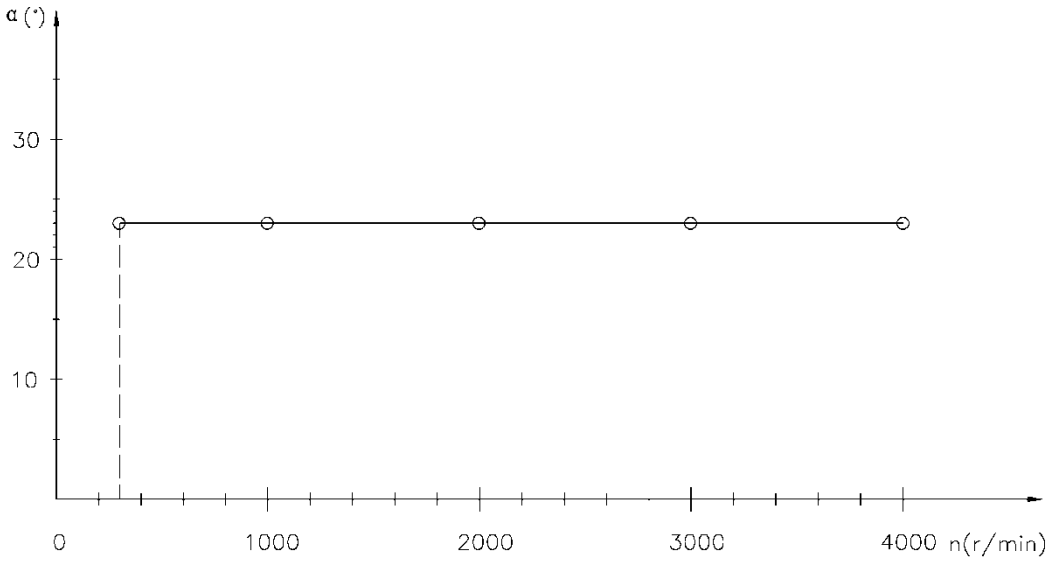


ENGINE TYPE	G420FA, G420FA-D G420FDA, G420FDA-D G390FA, G390FDA
TIMING DIAGRAM	
DRAWING NO.	NRS.420A-05[a]

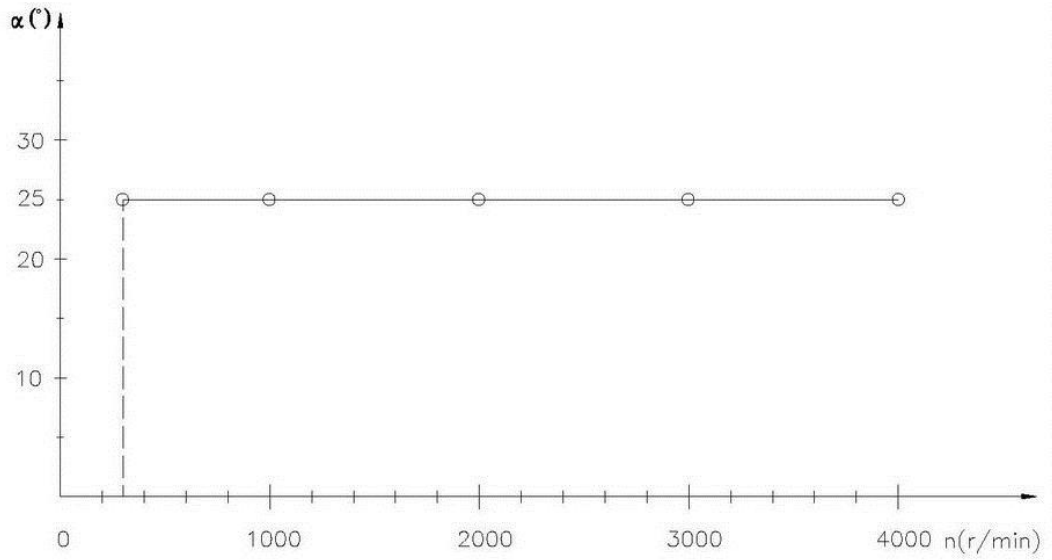




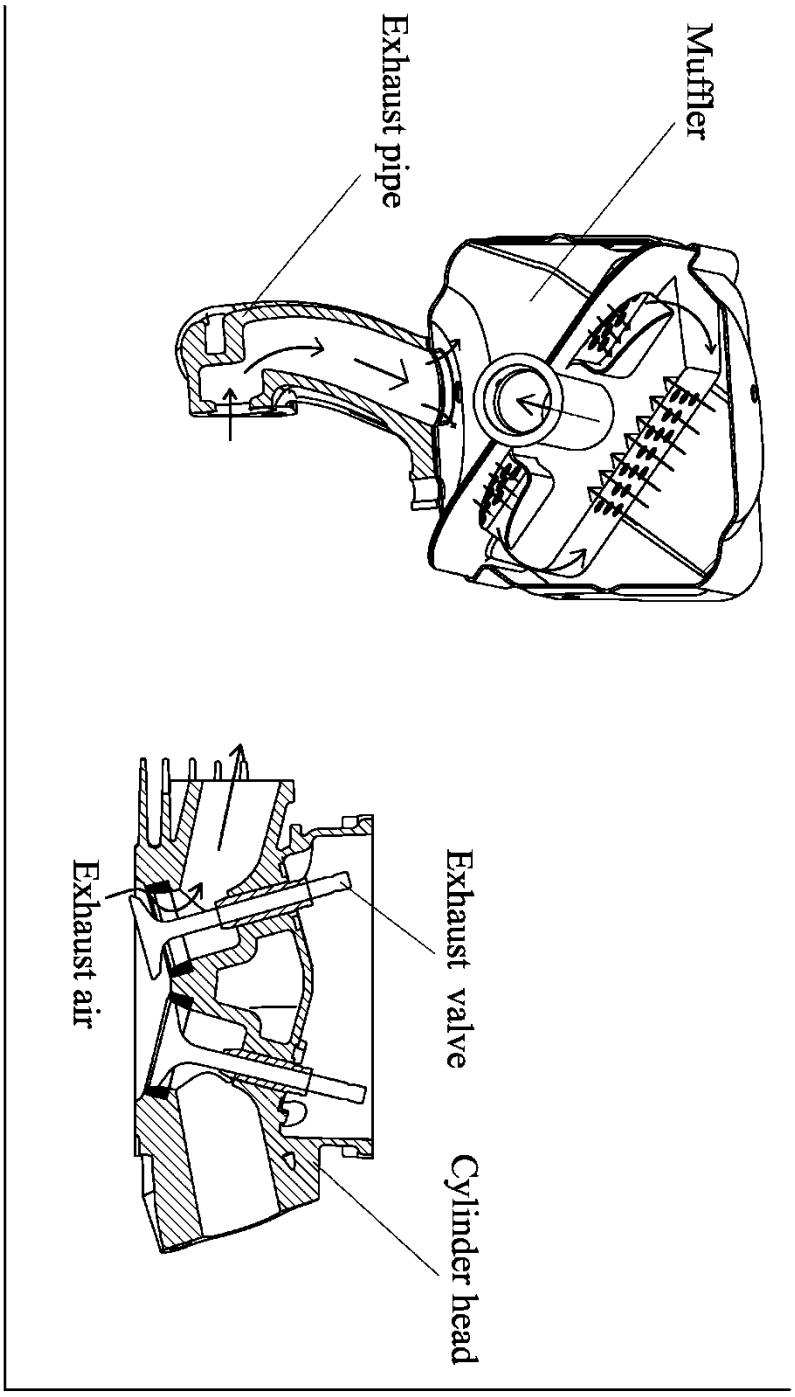
ENGINE TYPE	G300FA, G300FDA G300FA-C, G300FDA-C G300FA-B, G300FDA-B
TIMING DIAGRAM	
DRAWING NO.	NRS.420A-05[b]



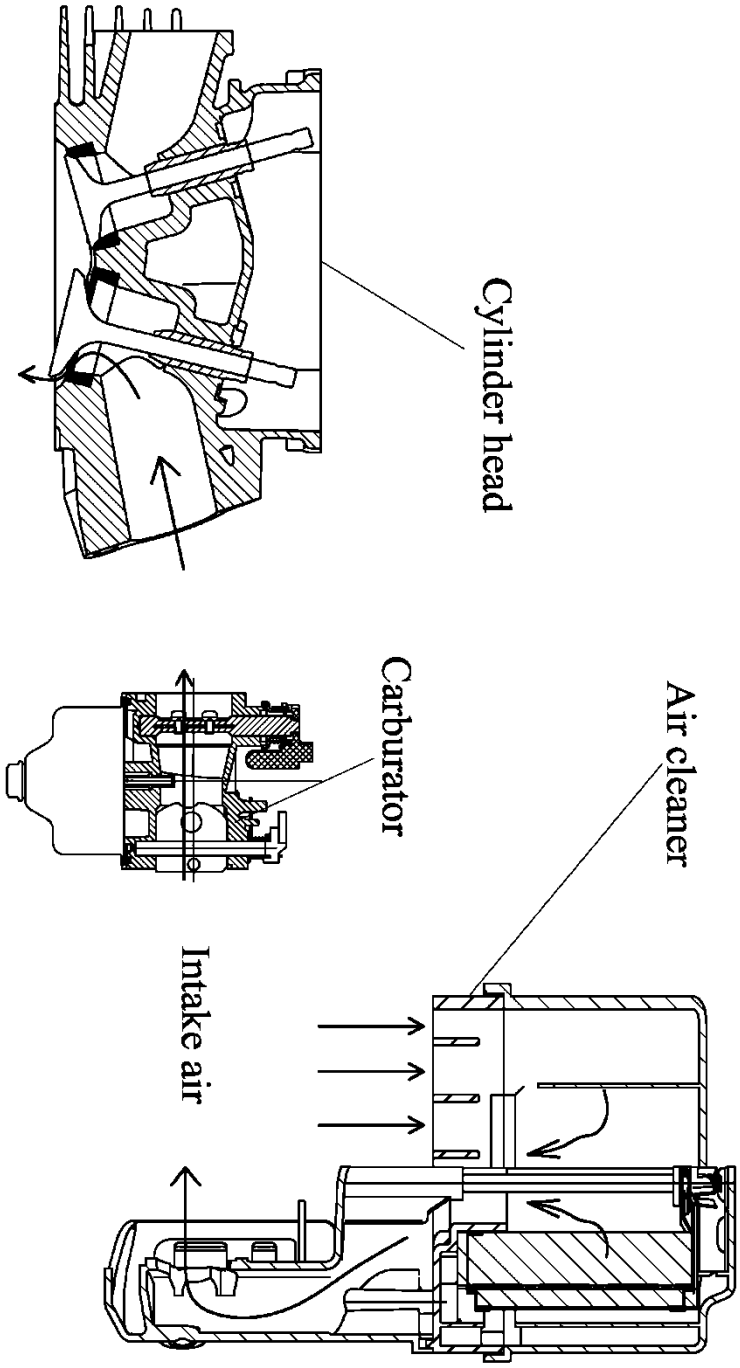
ENGINE TYPE	G420FA, G420FA-D, G420FDA,G420FDA-D G390FA, G390FDA
IGNITION ADVANCE CURVE	
DRAWING NO.	NRS.420A-06[a]



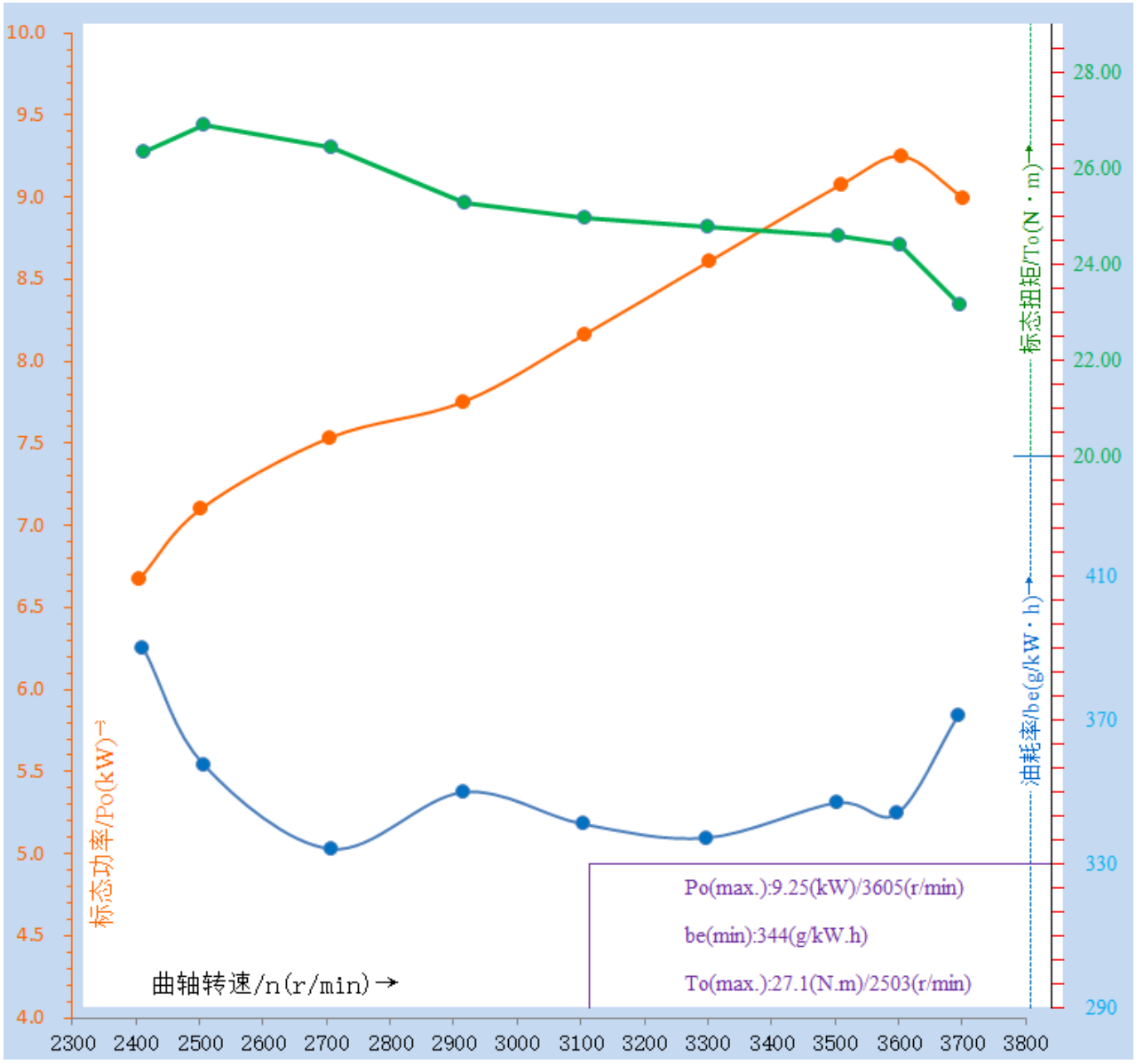
ENGINE TYPE	G300FA, G300FDA G300FA-C, G300FDA-C G300FA-B, G300FDA-B
IGNITION ADVANCE CURVE	
DRAWING NO.	NRS.420A-06[b]



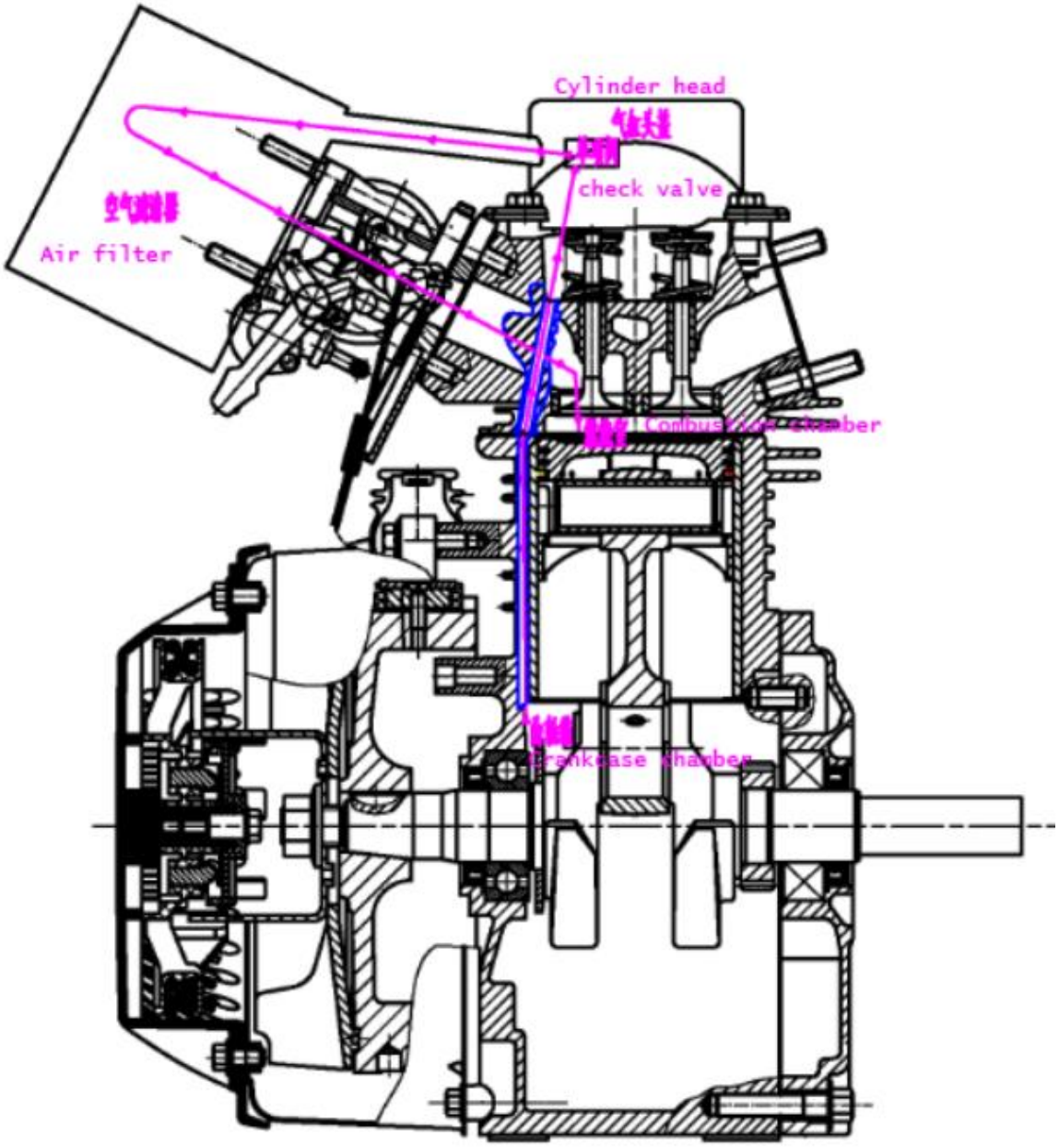
ENGINE FAMILY	NRS.420A
EXHAUST SYSTEM	
DRAWING NO.	NRS.420A-07



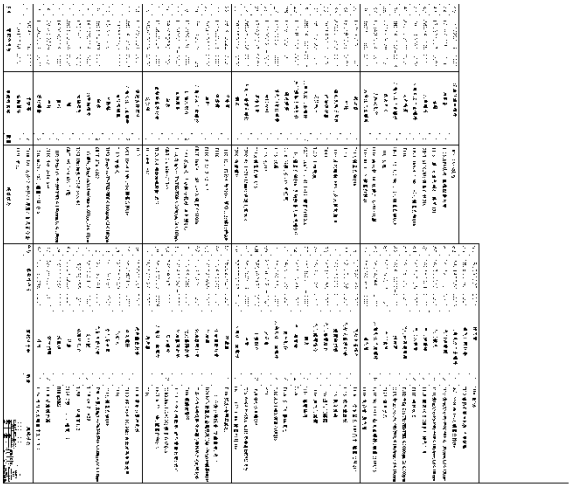
ENGINE FAMILY	NRS.420A
INLET PATH	
DRAWING NO.	NRS.420A-08



ENGINE FAMILY	NRS.420A
ENGINE MAPPING	
DRAWING NO.	NRS.420A-09



ENGINE FAMILY	NRS.420A
Device for recycling crankcase gases	
DRAWING NO.	NRS.420A-10



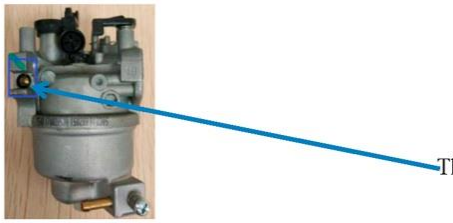
ENGINE FAMILY	NRS.420A
THE STRUCTURE OF ENGINES	
DRAWING NO.	NRS.420A-11

Declaration by manufacturer on prevention of tampering

The undersigned (full name and position): Huang Wan /QM Manager

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.	Maker (trade name(s) of manufacturer):	Loncin
1.2.	Commercial name(s) (if applicable):	Not applicable
1.3.	Company name and address of manufacturer:	Loncin Motor Co., Ltd. No.99 Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P.R.China
1.4.	Name and address of manufacturer's authorized representative (if any):	CMD CostruzioniMotori Diesel Spa Nucleo Industriale Valle di Vitalba -85020-Atella(Potenza) –Italy
1.6.	~~Engine type designation/ engine family designation/~~ FT:	NRS.420A
	Technical details:	The mixing ratio adjusting screw is broken and it is stuck by glue. The glue has very good fixed performance and it can't be destroyed by water and oil. The photo is as follow:



(Place) (Date) Chongqing / January 30, 2018

Signature: 黄莞

Statement considering emission durability test

To whom it may concern,

We, Loncin Motor Co., Ltd., hereby declare that the emission durability parameters are as below for the small gasoline engine family designation: NRS.420A;

Engine family designation	NRS.420A	
EDP category (hours)	Category 1, 250 hours	
DF (deterioration factor)	CO	1.08
	HC	1.05
	NOx	1.11

This statement refers exclusively to the emission durability report.

Sincerely yours

Date: December 10, 2018

Huang Wan /Manager

Make : **Loncin**

Name and address of the manufacturer : **No.99 Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P.R.China**

EMISSION DURABILITY TEST REPORT

according to Regulation of the European Parliament and of the Council relating to the Measures against the emissions of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery

2016/1628/EU

including all amendments until

2017/656/EU

0. General information

0.1	Make (trade name of the manufacturer)	:	Loncin
0.2	Engine family designation	:	NRS.420A
	Parent engine type designation	:	G420FA
0.3	Category and sub-category of engine	:	NRS-vr-1b
0.4	Name and address of the manufacturer	:	Loncin Motor Co., Ltd. No.99 Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, P.R.China
0.5	Specification of machinery to be propelled by the engine	:	Generator set

1. Test information

1.1	Test object(s)		
	identification number	:	T1240017110026775
	version	:	--
1.2	Test date	:	15.12.2017 –10.01.2018
1.3	Test site	:	Nanjing Depurate Catalyst Co., Ltd. No.18 Youshan Road, Gaochun Economic Develop Zone, Nanjing 211300, China
1.4	Test facilities	:	The test equipment used was in compliance with the requirements of the regulation.

1.5	Information concerning the conduct of the test(s)		
1.5.1	Reference fuel used for test		E10
1.5.1.1	Octane number		
	Ron	:	95.8
	Mon	:	86.0
1.5.1.2	State percentage of oil in mixture when lubricant and petrol are mixed as in the case of two stroke engines	:	n.a.
1.5.1.3	Density of petrol for four-stroke engines ~~and petrol/oil mixture for two-stroke engines~~	:	0.7452g/cm^3
1.5.2	Lubricant		
1.5.2.1	Make(s)	:	Mobil
1.5.2.2	Type(s)	:	15W-40
1.5.3	Emission durability test cycle	:	Rated Speed
1.6	Engine performance		
1.6.1	Engine speeds		
	Idle [min^{-1}]	:	1800±150
	Intermediate [min^{-1}]	:	n.a.
	Rated [min^{-1}]	:	3600
1.6.2	Rated power [kW]	:	9.2
1.7	Emission durability test		
1.7.1	Emission durability period [h]	:	250
1.7.2	Engine's maintenance rules during the emission durability test	:	Refer to appendix 1
1.7.3	The rule of emission durability test	:	Refer to appendix 2
1.7.4	Emission durability test record	:	Refer to appendix 3

2 Test result

Item	HC （g/kWh）	CO （g/kWh）	NOx （g/kWh）	HC+NOx （g/kWh）	CO_2 （g/kWh）
Emission test result （0 hour）	3.54	350.39	2.50	6.04	817.85
Emission test result （250 hours）	3.72	378.42	2.78	6.47	--
DF value	1.05	1.08	1.11	--	--

3 Appendixes

1) Engine’s maintenance rules during the emission durability test

2) The rule of emission durability test

3) Emission durability test record

Engine's maintenance rules during the emission durability test **Appendix 1**

First of all, for the purpose of protecting human and the product, and prevent the fire or bomb that maybe occurred, it need to ensure that the engine is stopped before any maintaining.		
No.	Time	Item
1	After 40 hours of first running	Changing oil
2	Maintain at every 20 hours running	checking oil level and bolts, cleaning air filter and spark plug fouling
3	Maintain at every 40 hours running	checking valve clearance
4	Maintain at every 100 hours running	Changing oil

The rule of emission durability test **Appendix 2**

Mode	Load (%)	Engine speed （min-1）	Torque （N.m）	Time ratio （%）	Time （min）
1	0	1800	0	5	12
2	10	3600	2.4	6	16
3	25	3600	6.0	30	72
4	50	3600	12.0	29	68
5	75	3600	18.0	20	48
6	100	3600	24.0	10	24
Each emission durability cycle is 4 hours					

Emission durability test record **Appendix 3**

Test Record

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 (%)
2017/12/26	1	08:00-09:00	3611	2.36	6.05	1.310	185.2	98.5	21.5	75
2017/12/26	2	09:00-10:00	3612	4.60	12.15	1.920	187.4	98.2	21.6	76
2017/12/26	3	10:00-11:00	3606	6.82	18.06	2.750	192.3	98.3	22.0	81
2017/12/26	4	11:00-12:00	3605	9.22	24.42	3.110	198.5	98.4	21.0	76
2017/12/26	5	12:00-13:00	3603	2.27	6.01	1.300	183.2	98.6	21.5	74
2017/12/26	6	13:00-14:00	3608	4.54	12.03	1.910	186.5	98.4	21.2	73
2017/12/26	7	14:00-15:00	3625	6.85	18.05	2.740	191.3	98.1	20.5	81
2017/12/26	8	15:00-16:00	3616	9.24	24.40	3.120	198.1	97.6	21.3	75
2017/12/26	9	16:00-17:00	3610	2.31	6.12	1.320	186.1	98.2	21.4	74
2017/12/26	10	17:00-18:00	3621	4.58	12.08	1.910	188.2	99.5	21.4	76
2017/12/26	11	18:00-19:00	3624	6.87	18.11	2.730	191.3	96.1	21.3	71
2017/12/26	12	19:00-20:00	3625	9.25	24.38	3.120	197.5	98.5	21.2	73
2017/12/26	13	20:00-21:00	3614	2.28	6.03	1.300	184.2	97.0	21.1	74
2017/12/26	14	21:00-22:00	3612	4.57	12.07	1.900	187.1	98.0	22.1	75
2017/12/26	15	22:00-23:00	3623	6.85	18.05	2.750	191.5	97.5	21.4	79
2017/12/26	16	23:00-00:00	3613	9.22	24.36	3.010	196.3	98.3	21.6	78
2017/12/27	17	00:00-01:00	3615	2.29	6.06	1.320	185.2	98.0	21.2	76
2017/12/27	18	01:00-02:00	3626	4.56	12.02	1.910	187.1	98.5	21.1	71
2017/12/27	19	02:00-03:00	3613	6.81	18.01	2.730	192.0	98.0	21.3	73
2017/12/27	20	03:00-04:00	3610	9.20	24.35	3.120	198.2	98.6	21.5	75
2017/12/27	/	04:00-05:00	Checking oil level and bolts, cleaning air filter and spark plug fouling							
2017/12/27	21	05:00-06:00	3614	2.30	6.08	1.320	185.2	97.2	22.3	85
2017/12/27	22	06:00-07:00	3610	4.52	11.96	1.900	187.1	95.0	22.4	76
2017/12/27	23	07:00-08:00	3615	6.82	18.02	2.720	192.3	98.0	21.3	74
2017/12/27	24	08:00-09:00	3612	9.22	24.38	3.110	195.6	98.0	21.5	78
2017/12/27	25	09:00-10:00	3604	2.25	5.96	1.310	186.2	98.2	21.2	84
2017/12/27	26	10:00-11:00	3610	4.51	11.93	1.920	188.0	95.7	21.1	82
2017/12/27	27	11:00-12:00	3620	6.82	17.99	2.710	192.0	96.0	21.3	83
2017/12/27	28	12:00-13:00	3614	9.22	24.36	3.010	198.2	97.2	22.3	84
2017/12/27	29	13:00-14:00	3603	2.24	5.94	1.300	182.3	98.4	21.5	85
2017/12/27	30	14:00-15:00	3612	4.49	11.87	1.910	186.0	95.1	21.0	86
2017/12/27	31	15:00-16:00	3621	6.76	17.83	2.740	191.0	94.8	21.4	85
2017/12/27	32	16:00-17:00	3610	9.23	24.42	3.120	196.0	95.7	21.6	85
2017/12/27	33	17:00-18:00	3615	2.30	6.08	1.320	185.1	97.2	21.2	84
2017/12/27	34	18:00-19:00	3612	4.52	11.95	1.910	187.0	96.3	22.1	82
2017/12/27	35	19:00-20:00	3615	6.80	17.96	2.730	191.3	95.4	23.5	83
2017/12/27	36	20:00-21:00	3602	9.23	24.47	3.120	195.0	98.0	21.4	79
2017/12/27	37	21:00-22:00	3610	2.32	6.14	1.300	185.2	95.2	22.1	76
2017/12/27	38	22:00-23:00	3605	4.55	12.05	1.900	187.0	94.3	21.5	92
2017/12/27	39	23:00-00:00	3612	6.78	17.93	2.750	191.2	91.8	21.4	81
2017/12/28	40	00:00-01:00	3618	9.19	24.26	3.010	197.1	96.3	21.6	85
2017/12/28	/	01:00-02:00	Changing oil, checking valve clearance and bolts, cleaning air filter and spark plug fouling							
2017/12/28	41	02:00-03:00	3610	2.24	5.93	1.310	182.3	96.0	21.1	76
2017/12/28	42	03:00-04:00	3610	4.49	11.88	1.920	186.0	97.2	21.3	74

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2017/12/28	43	04:00-05:00	3620	6.76	17.83	2.710	191.0	98.4	22.3	78
2017/12/28	44	05:00-06:00	3605	9.23	24.45	3.010	196.0	95.1	21.5	84
2017/12/28	45	06:00-07:00	3610	2.30	6.08	1.300	185.1	94.8	21.0	82
2017/12/28	46	07:00-08:00	3623	4.52	11.91	1.910	187.0	95.7	21.4	83
2017/12/28	47	08:00-09:00	3615	6.80	17.96	2.740	191.3	97.2	21.6	84
2017/12/28	48	09:00-10:00	3612	9.23	24.40	3.120	195.0	96.3	21.2	85
2017/12/28	49	10:00-11:00	3610	2.25	5.95	1.320	185.2	95.4	22.1	86
2017/12/28	50	11:00-12:00	3623	4.52	11.91	1.910	187.0	98.6	23.5	85
2017/12/28	51	12:00-13:00	3613	6.77	17.89	2.730	191.2	98.4	21.1	76
2017/12/28	52	13:00-14:00	3600	9.23	24.49	3.120	197.1	98.1	21.3	74
2017/12/28	53	14:00-15:00	3610	2.26	5.98	1.310	182.5	97.6	22.3	78
2017/12/28	54	15:00-16:00	3620	4.51	11.90	1.920	186.5	98.2	21.5	84
2017/12/28	55	16:00-17:00	3612	6.82	18.03	2.750	187.0	98.2	21.0	82
2017/12/28	56	17:00-18:00	3603	9.19	24.36	3.110	195.2	97.6	21.4	83
2017/12/28	57	18:00-19:00	3610	2.24	5.93	1.300	182.6	95.0	21.6	84
2017/12/28	58	19:00-20:00	3620	4.49	11.85	1.910	186.0	98.0	21.2	85
2017/12/28	59	20:00-21:00	3610	6.81	18.02	2.740	189.1	98.2	22.1	86
2017/12/28	60	21:00-22:00	3620	9.23	24.35	3.120	192.2	98.6	23.5	85
2017/12/28	/	22:00-23:00	Checking oil level and bolts, cleaning air filter and spark plug fouling							
2017/12/28	61	23:00-00:00	3611	2.25	5.95	1.310	185.1	98.6	22.1	85
2017/12/29	62	00:00-01:00	3620	4.52	11.92	1.910	187.0	98.7	22.2	84
2017/12/29	63	01:00-02:00	3620	6.77	17.86	2.720	191.3	98.6	22.1	76
2017/12/29	64	02:00-03:00	3610	9.23	24.42	3.110	195.0	98.4	22.3	74
2017/12/29	65	03:00-04:00	3610	2.26	5.98	1.300	185.2	99.1	22.1	78
2017/12/29	66	04:00-05:00	3613	4.51	11.92	1.920	187.0	98.7	22.1	84
2017/12/29	67	05:00-06:00	3622	6.65	17.53	2.710	191.2	98.6	22.5	82
2017/12/29	68	06:00-07:00	3612	9.21	24.35	3.110	195.2	98.8	22.4	83
2017/12/29	69	07:00-08:00	3621	2.26	5.96	1.310	184.2	99.2	22.1	84
2017/12/29	70	08:00-09:00	3614	4.51	11.92	1.920	186.0	98.5	22.3	85
2017/12/29	71	09:00-10:00	3615	6.68	17.65	2.710	188.5	98.6	22.5	86
2017/12/29	72	10:00-11:00	3622	9.23	24.34	3.110	193.0	98.7	22.3	85
2017/12/29	73	11:00-12:00	3613	2.21	5.84	1.320	182.3	98.4	21.2	85
2017/12/29	74	12:00-13:00	3614	4.53	11.97	1.910	186.0	98.2	21.5	79
2017/12/29	75	13:00-14:00	3625	6.67	17.57	2.730	189.2	98.5	21.6	82
2017/12/29	76	14:00-15:00	3615	9.18	24.25	3.120	192.1	98.5	21.3	86
2017/12/29	77	15:00-16:00	3613	2.25	5.95	1.320	182.1	98.6	22.3	87
2017/12/29	78	16:00-17:00	3626	4.51	11.88	1.910	185.3	98.7	22.1	83
2017/12/29	79	17:00-18:00	3621	6.75	17.80	2.750	189.1	98.4	21.5	85
2017/12/29	80	18:00-19:00	3630	9.21	24.23	3.110	192.4	98.2	21.2	84
2017/12/29	/	19:00-20:00	Checking oil level, valve clearance and bolts, cleaning air filter and spark plug fouling							
2017/12/29	81	20:00-21:00	3620	2.30	6.07	1.310	182.3	96.0	21.1	76
2017/12/29	82	21:00-22:00	3610	4.52	11.96	1.920	186.0	97.2	21.3	74
2017/12/29	83	22:00-23:00	3620	6.82	17.99	2.710	191.0	98.4	22.3	78
2017/12/29	84	23:00-00:00	3610	9.22	24.39	3.010	196.0	95.1	21.5	84
2017/12/30	85	00:00-01:00	3610	2.25	5.95	1.300	185.1	94.8	21.0	82
2017/12/30	86	01:00-02:00	3620	4.51	11.90	1.910	187.0	95.7	21.4	83
2017/12/30	87	02:00-03:00	3610	6.82	18.04	2.740	191.3	97.2	21.6	84
2017/12/30	88	03:00-04:00	3620	9.22	24.32	3.120	195.0	96.3	21.2	85

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2017/12/30	89	04:00-05:00	3610	2.24	5.93	1.320	185.2	95.4	22.1	86
2017/12/30	90	05:00-06:00	3620	4.49	11.85	1.910	187.0	98.6	23.5	85
2017/12/30	91	06:00-07:00	3610	6.76	17.88	2.730	191.2	98.4	21.1	76
2017/12/30	92	07:00-08:00	3620	9.23	24.35	3.120	197.1	98.1	21.3	74
2017/12/30	93	08:00-09:00	3620	2.30	6.07	1.310	182.5	97.6	22.3	78
2017/12/30	94	09:00-10:00	3620	4.52	11.92	1.920	186.5	98.2	21.5	84
2017/12/30	95	10:00-11:00	3617	6.80	17.95	2.750	187.0	98.2	21.0	82
2017/12/30	96	11:00-12:00	3615	9.23	24.38	3.110	195.2	97.6	21.4	83
2017/12/30	97	12:00-13:00	3620	2.32	6.12	1.300	182.6	95.0	21.6	84
2017/12/30	98	13:00-14:00	3620	4.55	12.00	1.910	186.0	98.0	21.2	85
2017/12/30	99	14:00-15:00	3610	6.78	17.94	2.740	189.1	98.2	22.1	86
2017/12/30	100	15:00-16:00	3620	9.19	24.24	3.120	192.2	98.6	23.5	85
2017/12/30	/	16:00-17:00	Changing oil, checking valve clearance and bolts, cleaning air filter and spark plug fouling							
2017/12/30	101	17:00-18:00	3618	2.24	5.91	1.310	185.1	98.6	22.1	85
2017/12/30	102	18:00-19:00	3610	4.49	11.88	1.910	186.0	98.7	22.2	84
2017/12/30	103	19:00-20:00	3615	6.76	17.86	2.720	192.0	98.6	22.1	76
2017/12/30	104	20:00-21:00	3620	9.23	24.35	3.110	195.0	98.4	21.0	85
2017/12/30	105	21:00-22:00	3618	2.30	6.07	1.300	185.2	99.1	22.1	78
2017/12/30	106	22:00-23:00	3618	4.52	11.93	1.920	187.0	98.7	22.1	84
2017/12/30	107	23:00-00:00	3620	6.80	17.94	2.710	191.2	98.6	22.5	82
2018/1/2	108	08:00-09:00	3612	9.23	24.40	3.110	195.2	98.8	22.4	83
2018/1/2	109	09:00-10:00	3620	2.25	5.94	1.310	184.2	99.2	22.1	86
2018/1/2	110	10:00-11:00	3615	4.52	11.94	1.920	186.0	97.2	22.3	85
2018/1/2	111	11:00-12:00	3610	6.77	17.91	2.710	188.5	96.0	22.5	86
2018/1/2	112	12:00-13:00	3622	9.23	24.34	3.110	193.0	89.2	22.3	85
2018/1/2	113	13:00-14:00	3610	2.26	5.98	1.320	182.3	95.6	21.2	85
2018/1/2	114	14:00-15:00	3620	4.51	11.90	1.910	186.0	97.1	21.5	79
2018/1/2	115	15:00-16:00	3615	6.82	18.02	2.730	188.0	96.2	21.6	82
2018/1/2	116	16:00-17:00	3610	9.19	24.31	3.120	193.0	98.5	21.3	86
2018/1/2	117	17:00-18:00	3618	2.24	5.91	1.320	182.1	98.6	22.3	87
2018/1/2	118	18:00-19:00	3615	4.49	11.86	1.910	185.3	98.7	22.1	83
2018/1/2	119	19:00-20:00	3618	6.81	17.98	2.750	189.1	98.4	21.5	85
2018/1/2	120	20:00-21:00	3615	9.23	24.38	3.110	192.4	98.2	21.2	84
2018/1/2	/	21:00-22:00	Checking oil level and bolts, cleaning air filter and spark plug fouling							
2018/1/2	121	22:00-23:00	3611	2.36	6.24	1.321	187.0	97.2	24.0	88
2018/1/2	122	23:00-00:00	3616	4.62	12.19	1.908	189.2	95.0	23.7	81
2018/1/3	123	00:00-01:00	3607	6.83	18.08	2.721	193.3	98.2	22.1	76
2018/1/3	124	01:00-02:00	3608	9.29	24.58	3.117	198.5	98.0	22.3	80
2018/1/3	125	02:00-03:00	3606	2.32	6.16	1.317	187.6	98.3	22.2	87
2018/1/3	126	03:00-04:00	3616	4.57	12.07	1.923	190.0	95.8	22.5	85
2018/1/3	127	04:00-05:00	3615	6.87	18.15	2.716	195.0	96.0	22.8	83
2018/1/3	128	05:00-06:00	3612	9.26	24.48	3.016	199.0	97.3	24.2	88
2018/1/3	129	06:00-07:00	3618	2.28	6.02	1.302	182.5	98.6	22.7	88
2018/1/3	130	07:00-08:00	3615	4.54	11.99	1.913	188.2	95.2	21.3	90
2018/1/3	131	08:00-09:00	3608	6.84	18.11	2.748	192.6	95.0	22.4	89
2018/1/3	132	09:00-10:00	3616	9.28	24.50	3.129	197.4	95.9	23.2	87
2018/1/3	133	10:00-11:00	3627	2.33	6.13	1.322	185.5	97.2	21.2	92
2018/1/3	134	11:00-12:00	3617	4.56	12.05	1.912	189.2	96.4	23.3	84
2018/1/3	135	12:00-13:00	3606	6.90	18.27	2.740	191.3	95.5	24.0	86
2018/1/3	136	13:00-14:00	3617	9.31	24.59	3.125	197.2	98.0	23.4	81

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2018/1/3	137	14:00-15:00	3627	2.36	6.21	1.302	186.3	95.3	22.2	81
2018/1/3	138	15:00-16:00	3616	4.62	12.21	1.901	187.1	94.5	22.5	92
2018/1/3	139	16:00-17:00	3620	6.86	18.11	2.753	192.3	91.8	22.8	85
2018/1/3	140	17:00-18:00	3615	9.27	24.49	3.013	197.5	96.5	21.6	90
2018/1/3	/	18:00-19:00	Changing oil, checking valve clearance and bolts, cleaning air filter and spark plug fouling							
2018/1/3	141	19:00-20:00	3617	2.40	6.33	1.330	186.4	97.4	22.8	87
2018/1/3	142	20:00-21:00	3619	4.57	12.05	1.902	187.5	95.2	23.2	76
2018/1/3	143	21:00-22:00	3611	6.83	18.07	2.727	192.5	98.1	22.6	80
2018/1/3	144	22:00-23:00	3612	9.32	24.64	3.119	196.0	98.2	23.1	81
2018/1/3	145	23:00-00:00	3624	2.27	5.99	1.315	189.1	98.3	21.5	84
2018/1/4	146	00:00-01:00	3620	4.53	11.94	1.921	190.1	95.8	23.1	84
2018/1/4	147	01:00-02:00	3607	6.85	18.14	2.715	194.8	96.2	21.6	87
2018/1/4	148	02:00-03:00	3614	9.31	24.61	3.014	200.1	97.3	23.3	86
2018/1/4	149	03:00-04:00	3624	2.32	6.11	1.302	183.5	98.6	22.0	90
2018/1/4	150	04:00-05:00	3615	4.53	11.96	1.911	187.0	95.2	22.7	92
2018/1/4	151	05:00-06:00	3613	6.84	18.08	2.747	193.3	94.9	21.5	90
2018/1/4	152	06:00-07:00	3622	9.33	24.60	3.126	197.8	95.8	22.5	90
2018/1/4	153	07:00-08:00	3614	2.31	6.11	1.323	186.4	97.4	23.6	91
2018/1/4	154	08:00-09:00	3612	4.57	12.09	1.905	188.6	95.0	23.2	79
2018/1/4	155	09:00-10:00	3619	6.81	17.97	2.724	193.5	98.1	23.2	78
2018/1/4	156	10:00-11:00	3609	9.33	24.69	3.114	198.1	98.1	21.5	79
2018/1/4	157	11:00-12:00	3620	2.35	6.21	1.317	188.3	98.3	22.5	84
2018/1/4	158	12:00-13:00	3622	4.65	12.26	1.928	189.7	95.9	21.3	87
2018/1/4	159	13:00-14:00	3618	6.88	18.15	2.712	193.8	96.1	21.5	85
2018/1/4	160	14:00-15:00	3614	9.24	24.42	3.014	201.2	97.2	24.1	90
2018/1/4	/	15:00-16:00	Checking oil level and bolts, cleaning air filter and spark plug fouling							
2018/1/4	161	16:00-17:00	3613	2.36	6.23	1.303	182.6	98.6	22.3	91
2018/1/4	162	17:00-18:00	3611	4.61	12.19	1.914	188.7	95.2	21.8	87
2018/1/4	163	18:00-19:00	3615	6.88	18.17	2.744	193.9	94.9	23.1	88
2018/1/4	164	19:00-20:00	3617	9.32	24.60	3.130	198.1	95.8	21.8	89
2018/1/4	165	20:00-21:00	3616	2.27	6.00	1.322	185.6	97.3	23.7	88
2018/1/4	166	21:00-22:00	3612	4.57	12.08	1.906	188.7	95.0	23.7	82
2018/1/4	167	22:00-23:00	3611	6.82	18.04	2.721	194.1	98.1	23.3	77
2018/1/4	168	23:00-00:00	3615	9.31	24.59	3.113	196.5	98.1	22.3	79
2018/1/5	169	00:00-01:00	3615	2.26	5.97	1.316	186.4	98.3	22.0	89
2018/1/5	170	01:00-02:00	3618	4.52	11.93	1.928	188.2	95.9	21.3	84
2018/1/5	171	02:00-03:00	3616	6.85	18.10	2.718	194.9	96.1	22.8	87
2018/1/5	172	03:00-04:00	3611	9.31	24.62	3.016	198.9	97.3	23.2	86
2018/1/5	173	04:00-05:00	3614	2.31	6.11	1.303	182.7	98.6	23.0	92
2018/1/5	174	05:00-06:00	3618	4.53	11.96	1.920	187.1	95.3	22.4	87
2018/1/5	175	06:00-07:00	3617	6.88	18.16	2.742	193.7	94.9	21.8	86
2018/1/5	176	07:00-08:00	3616	9.28	24.51	3.127	196.6	95.8	22.8	88
2018/1/5	177	08:00-09:00	3618	2.37	6.25	1.326	186.4	97.3	22.7	86
2018/1/5	178	09:00-10:00	3618	4.61	12.17	1.910	187.6	95.1	23.7	84
2018/1/5	179	10:00-11:00	3617	6.82	18.01	2.722	193.4	98.1	22.2	77
2018/1/5	180	11:00-12:00	3615	9.28	24.51	3.114	196.8	98.2	22.9	79
2018/1/5	/	12:00-13:00	Changing oil, checking valve clearance and bolts, cleaning air filter and spark plug fouling							
2018/1/5	181	13:00-14:00	3613	2.38	6.29	1.314	188.2	98.2	21.4	90
2018/1/5	182	14:00-15:00	3618	4.56	12.04	1.925	190.6	95.7	21.1	88
2018/1/5	183	15:00-16:00	3618	6.86	18.11	2.711	194.1	96.1	22.2	83
2018/1/5	184	16:00-17:00	3615	9.22	24.37	3.018	198.6	97.3	22.8	85
2018/1/5	185	17:00-18:00	3617	2.26	5.96	1.304	184.9	98.5	21.9	93
2018/1/5	186	18:00-19:00	3616	4.57	12.07	1.914	187.6	95.3	22.7	91
2018/1/5	187	19:00-20:00	3613	6.87	18.16	2.744	192.2	94.9	21.9	86
2018/1/5	188	20:00-21:00	3615	9.29	24.55	3.130	197.9	95.8	23.4	87

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2018/1/5	189	21:00-22:00	3605	2.33	6.18	1.329	188.2	97.2	23.3	91
2018/1/5	190	22:00-23:00	3614	4.51	11.92	1.902	187.2	95.2	24.3	78
2018/1/5	191	23:00-00:00	3610	6.78	17.93	2.726	193.8	98.1	22.1	78
2018/1/6	192	00:00-01:00	3608	9.27	24.53	3.110	197.7	98.1	21.9	83
2018/1/6	193	01:00-02:00	3604	2.31	6.13	1.318	186.6	98.3	22.8	85
2018/1/6	194	02:00-03:00	3611	4.54	12.02	1.926	189.5	95.7	21.7	86
2018/1/6	195	03:00-04:00	3616	6.81	17.99	2.711	193.0	96.1	22.5	87
2018/1/6	196	04:00-05:00	3618	9.24	24.40	3.015	201.0	97.3	23.5	92
2018/1/6	197	05:00-06:00	3621	2.35	6.20	1.307	183.2	98.6	22.1	90
2018/1/6	198	06:00-07:00	3620	4.65	12.26	1.920	188.2	95.3	22.9	93
2018/1/6	199	07:00-08:00	3612	6.86	18.13	2.750	193.2	94.9	23.2	90
2018/1/6	200	08:00-09:00	3615	9.24	24.41	3.120	196.9	95.9	22.7	87
2018/1/6	/	09:00-10:00	Changing oil, checking valve clearance and bolts, cleaning air filter and spark plug fouling							
2018/1/6	201	10:00-11:00	3625	2.39	6.29	1.325	185.9	97.3	22.2	85
2018/1/6	202	11:00-12:00	3615	4.60	12.14	1.917	187.7	96.4	23.3	88
2018/1/6	203	12:00-13:00	3610	6.84	18.08	2.734	192.0	95.5	24.0	88
2018/1/6	204	13:00-14:00	3618	9.25	24.43	3.130	197.9	98.1	22.9	86
2018/1/6	205	14:00-15:00	3629	2.36	6.22	1.306	186.1	95.4	22.9	82
2018/1/6	206	15:00-16:00	3616	4.65	12.27	1.908	187.9	94.3	23.1	96
2018/1/6	207	16:00-17:00	3617	6.87	18.13	2.758	192.2	91.8	21.5	85
2018/1/6	208	17:00-18:00	3611	9.22	24.37	3.016	197.8	96.4	22.3	93
2018/1/6	209	18:00-19:00	3620	2.30	6.08	1.324	187.9	97.2	23.0	88
2018/1/6	210	19:00-20:00	3617	4.56	12.05	1.908	189.3	95.1	22.5	81
2018/1/6	211	20:00-21:00	3609	6.83	18.08	2.722	193.0	98.0	22.0	80
2018/1/6	212	21:00-22:00	3614	9.25	24.45	3.115	195.7	98.2	23.0	85
2018/1/6	213	22:00-23:00	3624	2.33	6.15	1.314	188.1	98.3	21.4	91
2018/1/6	214	23:00-00:00	3622	4.55	11.99	1.929	190.8	95.9	21.6	87
2018/1/7	215	00:00-01:00	3605	6.92	18.33	2.711	194.0	96.2	21.8	91
2018/1/7	216	01:00-02:00	3620	9.26	24.44	3.013	200.2	97.3	24.1	84
2018/1/7	217	02:00-03:00	3628	2.25	5.92	1.308	183.3	98.5	22.2	87
2018/1/7	218	03:00-04:00	3615	4.55	12.03	1.916	187.9	95.2	22.6	92
2018/1/7	219	04:00-05:00	3613	6.77	17.89	2.742	193.7	95.0	21.5	86
2018/1/7	220	05:00-06:00	3617	9.23	24.37	3.124	197.9	95.8	22.2	87
2018/1/7	/	06:00-07:00	Checking oil level and bolts, cleaning air filter and spark plug fouling							
2018/1/7	221	07:00-08:00	3614	2.38	6.29	1.323	188.1	97.3	22.4	86
2018/1/7	222	08:00-09:00	3611	4.56	12.05	1.906	189.1	95.2	23.7	77
2018/1/7	223	09:00-10:00	3618	6.86	18.11	2.728	193.8	98.1	22.3	77
2018/1/7	224	10:00-11:00	3611	9.28	24.55	3.113	197.3	98.1	23.2	85
2018/1/7	225	11:00-12:00	3616	2.35	6.21	1.319	186.3	98.3	21.4	86
2018/1/7	226	12:00-13:00	3628	4.64	12.22	1.924	190.5	95.8	21.4	86
2018/1/7	227	13:00-14:00	3611	6.87	18.17	2.710	194.1	96.1	22.2	89
2018/1/7	228	14:00-15:00	3616	9.28	24.50	3.020	200.4	97.3	23.5	86
2018/1/7	229	15:00-16:00	3614	2.38	6.30	1.303	184.3	98.6	22.3	88
2018/1/7	230	16:00-17:00	3612	4.58	12.11	1.913	187.1	95.3	22.5	94
2018/1/7	231	17:00-18:00	3615	6.83	18.04	2.749	192.4	94.8	21.5	93
2018/1/7	232	18:00-19:00	3614	9.24	24.41	3.121	198.1	95.8	22.3	89
2018/1/7	233	19:00-20:00	3614	2.31	6.10	1.328	185.2	97.4	23.1	87
2018/1/7	234	20:00-21:00	3614	4.54	12.00	1.901	189.1	95.0	23.2	80
2018/1/7	235	21:00-22:00	3615	6.92	18.27	2.721	194.8	98.1	21.9	75
2018/1/7	236	22:00-23:00	3615	9.27	24.49	3.116	197.4	98.1	23.4	79
2018/1/7	237	23:00-00:00	3617	2.29	6.04	1.319	186.4	98.3	21.7	88
2018/1/8	238	00:00-01:00	3613	4.53	11.96	1.925	188.1	95.9	22.8	86
2018/1/8	239	01:00-02:00	3613	6.81	17.99	2.711	192.9	96.1	23.1	87
2018/1/8	240	02:00-03:00	3618	9.25	24.41	3.014	200.7	97.4	23.5	90
2018/1/8	/	03:00-04:00	Changing oil, checking valve clearance and bolts, cleaning air filter and spark plug fouling							

Test Record

2018/1/8	241	04:00-05:00	3618	2.31	6.09	1.301	184.3	98.5	23.3	87
2018/1/8	242	05:00-06:00	3617	4.56	12.05	1.916	186.1	95.1	22.5	90
2018/1/8	243	06:00-07:00	3616	6.84	18.07	2.746	192.7	94.8	21.7	87
2018/1/8	244	08:00-09:00	3611	9.26	24.49	3.130	198.3	95.9	23.2	91
2018/1/8	245	09:00-10:00	3613	2.42	6.39	1.325	186.4	97.4	22.5	86
2018/1/8	246	10:00-11:00	3612	4.63	12.24	1.904	189.9	95.0	24.4	77
2018/1/8	247	11:00-12:00	3618	6.84	18.06	2.726	194.5	98.1	22.4	77
2018/1/8	248	12:00-13:00	3614	9.27	24.49	3.117	195.8	98.2	23.3	80
2018/1/8	249	13:00-14:00	3611	2.31	6.11	1.319	186.6	98.3	21.7	89
2018/1/8	250	14:00-15:00	3613	4.56	12.06	1.922	190.5	95.7	21.8	87

Huang Wan/Manager

REVISION (S)

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