



Référence: e13*2016/1628*2016/1628SRB3/P*0140*01

Annexes: - Rapport technique
- Fiche de renseignements du constructeur

Luxembourg, le 27 décembre 2019

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⁾ .../... (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 .../... ⁽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*2016/1628SRB3/P*0140*01

Motif de l'extension/du refus/du retrait ⁽¹⁾:
Reason for extension/refusal/withdrawal ⁽¹⁾:

see: List of modifications, Appendix 0 of test report
N° 87-2016/1628-2576/19-00

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, 400052,
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, 400052,
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.764H 2V80FD
NRS.764H LC2V80FD
- 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 Luxembourg GmbH
2a, Kalchesbruck
L-1852 Luxembourg
- 2. Date(s) du/des rapport(s) d'essai:**
Date(s) of the test report(s):
18.11.2019
- 3. Numéro(s) du/des rapport(s) d'essai:**
Number(s) of the test report(s):
87-2016/1628-2576/19-00

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⁾.

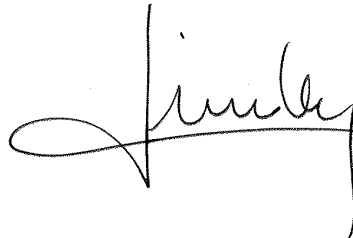
- | | | |
|----|---|---|
| 1. | <p>Le type de moteurs / la famille de moteurs ⁽¹⁾ satisfait / ne satisfait pas ⁽¹⁾ aux exigences définies dans le règlement (UE) 2016/1628.
The engine type / engine family ⁽¹⁾ meets / does not meet ⁽¹⁾ the requirements laid down in Regulation (EU) 2016/1628.</p> | meets |
| 2. | <p>La réception est accordée/étendue/refusée/retirée ⁽¹⁾.
The approval is granted/extended/refused/withdrawn ⁽¹⁾.</p> | granted/extended/refused/withdrawn ⁽¹⁾ |
| 3. | <p>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⁾.</p> | not applicable |
| 4. | <p>Restrictions de validité ⁽³⁾⁽⁶⁾:
Restrictions to validity ⁽³⁾⁽⁶⁾:</p> | not applicable |
| 5. | <p>Dérogations appliquées ⁽³⁾⁽⁶⁾:
Exemptions applied ⁽³⁾⁽⁶⁾:</p> | not applicable |
| | <p>Lieu:
Place:</p> | Luxembourg |
| | <p>Date:
Date:</p> | 27 décembre 2019 |
| | <p>Signature:
Signature:</p> | |

**Pour le Ministre de la Mobilité
et des Travaux publics**



Alain DISIVISOUR
Conseiller

Pour la SNCH




Laurent LINDEN
Directeur opérationnel



Pièces jointes:

Attachments:

- 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⁾ :
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.	Autres dispositifs de post-traitement (préciser): Other after-treatment devices (specify):	not applicable
2.11.9.	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:	2V80FD	LC2V80FD
3.1.2.	Engine type designation shown on engine mark: Yes / No ⁽¹⁾	Yes	Yes
3.1.3.	Location of the manufacturer's statutory marking:	<u>enclosure of the engine</u>	<u>enclosure of the engine</u>
3.2.1.	Declared rated speed (rpm)	3600	3600
3.2.1.2.	Declared rated net Power (kW):	18,0	18,0
3.2.2.	Maximum power speed (rpm):	3600	3600
3.2.2.2.	Maximum net power (kW):	18,0	18,0
3.2.3.	Declared maximum torque speed (rpm):	2800	2800
3.2.3.2.	Declared maximum torque (Nm):	52,0	52,0
3.6.3.	Number of Cylinders:	2	2
3.6.4.	Engine total swept volume (cm ³):	764	764
3.8.5.	Device for recycling crank-case gases: Yes / No ⁽¹⁾	Yes	Yes
3.11.3.12.	Consumable reagent: Yes / No ⁽¹⁾	No	No
3.11.3.12.1.	Type and concentration of reagent needed for catalytic action:	not applicable	not applicable
3.11.3.13.	NO _x sensor(s): Yes / No ⁽¹⁾	No	No
3.11.3.14.	Oxygen sensor: Yes / No ⁽¹⁾	No	No
3.11.4.7.	Fuel borne catalyst (FBC): Yes / No ⁽¹⁾	No	No

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

3.8.1.1.	Maximum allowable intake depression at 100 % engine speed and at 100 % load (kPa) with clean air cleaner:	1,5	1,5
3.8.3.2.	Maximum charge air cooler outlet temperature at 100 % speed and 100 % load (deg. C):	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
3.9.3.	Maximum permissible exhaust gas backpressure at 100 % engine speed and at 100 % load (kPa):	8,0	8,0
3.9.3.1.	Location of measurement:	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
3.11.1.2.1.	Test conditions for measurement:	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	409,11	---	---	5,88	---	---	G2
NRTC Final test result with DF	---	---	---	---	---	---	---

- 11.2. Résultat concernant le CO₂:**
CO₂ result: 771,72 g/kWh
- 11.3. Valeurs de référence de la surveillance en service ⁽⁹⁾:**
In service monitoring reference values ⁽⁹⁾: not applicable
- 11.3.1. Travail de référence (kWh):**
Reference work (kWh): not applicable
- 11.3.2. Masse de CO₂ de référence (g):**
Reference CO₂ mass (g): not applicable

(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.

(9) Applicable uniquement aux moteurs des sous-catégories NRE-v-5 et NRE-v-6 soumis à l'essai NRTC.

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



Référence: e13*2016/1628*2016/1628SRB3/P*0140*01

Annexes: - Rapport technique
- Fiche de renseignements du constructeur

Luxembourg, le 27 décembre 2019

INDEX DU DOSSIER DE RECEPTION INDEX TO TYPE-APPROVAL REPORT

	Numéro de réception: Approval number:	e13*2016/1628*2016/1628SRB3/P*0140*01
	Révision: Revision:	00
	Marque de fabrique: Trade name or mark:	Loncin
	FT: FT:	NRS.764H 2V80FD NRS.764H LC2V80FD
1.	Procès-verbal d'essai: Test report:	N° 87-2016/1628-2576/19-00
	- Test report:	Page(s) 1 to 11;
	- List of modifications:	Appendix 0 - Page(s) 12.
2.	Dossier du constructeur: Report of the manufacturer:	N° 2016/1628-NRS.764H-01
	- Manufacturer's information document:	Page(s) <u>1 to 18</u> ;
	- Attachments to the information document:	see: Index of attachments, page(s) <u>1</u> .
3.	Autres documents annexés: Other documents annexed:	not applicable
4.	Date de délivrance de la réception initiale: Date of issue of initial type approval:	02.07.2018
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:	27.12.2019

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

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

and

Commission Delegated Regulation
(EU) 2017/654 amended by (EU) 2018/989
(EU) 2017/655 amended by (EU) 2018/987

Commission Implementing Regulation
(EU) 2017/656 amended by (EU) 2018/988

Previously granted	
EU type – approval	: e13*2016/1628*2016/1628SRB3/P*0140*00

Structure of report:

1. General Information
2. General engine information (test engine)
3. Documentation and information Check list (primary test only)
4. Reference fuel(s) used for test (complete relevant subparagraph(s))
5. Lubricant
6. Engine Speed
7. Engine Power
8. Conditions at test
9. Information concerning the conduct of the NRSC test:
10. Information concerning the conduct of the NRTC test (if applicable):
11. Final emissions results
12. Remarks concerning tested object(s)
13. Appendices
14. Statement of conformity

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

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, 400052,
 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, 400052,
 P. R. China
 1.7 Date of test : April 18, 2018
 1.8 Test report number : 87-2016/1628-2576/19-00
 1.9 Information document reference number (if available) : 2016/1628-NRS.764H-01
 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~~ : NRS.764H 2V80FD
 2.2 Engine identification number : T2310018030092977
 2.3 Engine Category and subcategory : ~~NRE-v 1/NRE-v 2/NRE-v 3/NRE-v 4/NRE-v 5/NRE-v 6/NRE-v 7/NRE-c 1/NRE-c 2/NRE-c 3/NRE-c 4/NRE-c 5/NRE-c 6/NRE-c 7/NRG-v 1/NRG-c 1/NRSh-v 1a/NRSh-v 1b/NRS-vr 1a/NRS-vr-1b/NRS-vi 1a/NRS-vi 1b/NRS-v 2a/NRS-v 2b/NRS-v 3/IWP-v 1/IWP-v 2/IWP-v 3/IWP-v 4/IWP-e 1/IWP-e 2/IWP-e 3/IWP-e 4/IWA-v 1/IWA-v 2/IWA-v 3/IWA-v 4/IWA-e 1/IWA-e 2/IWA-e 3/IWA-e 4/RLL-v 1/RLL-C 1/RLR-v 1/RLR-C 1/SMB-v 1/ATS-v 1~~
 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 : ---

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

3. **Documentation and information Check list (primary test only)**
- 3.1. Engine mapping documentation reference : See information document No. 2016/1628-NRS.764H-01
- 3.2. Deterioration factor determination documentation reference : See information document No. 2016/1628-NRS.764H-01
- 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.764H-01
- 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 $0,93 \times$ ECU torque : ~~Yes~~/No
- 3.8.2. ECU torque correction factor in case that dynamometer torque less than $0,93 \times$ 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 : 96.1
- 4.1.4. Octane number MON : 85.9
- 4.1.5. Ethanol content (%) : 9.6
- 4.1.6. Density at 15 Deg.C (kg/m³) : 0.753
- 4.2. *Liquid fuel for compression-ignition engines* : ---
- 4.2.1. Make : ---
- 4.2.2. Type : ---
- 4.2.3. Cetane number : ---

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

4.2.4.	Fame content (%)	:	---
4.2.5.	Density at 15 Deg.C (kg/m3)	:	---
4.3.	<i>Gaseous fuel — LPG</i>	:	---
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.	<i>Gaseous fuel- Methane/biomethane</i>	:	---
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 $S\lambda$ for the resulting fuel blend	:	---
4.4.4.3.	The Methane Number (MN) of the resulting fuel blend	:	---
4.5.	<i>Dual fuel engine (in addition to relevant sections above)</i>	:	---
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	:	107 mm ² /s at 40°C 14.7 mm ² /s at 100°C
5.4.	Lubricant and fuel are mixed	:	Yes /No
5.4.1.	Percentage of oil in mixture	:	---

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

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 _{r,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:

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

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)	---	---	18.0
Total auxiliary power from table 1 ($P_{f,i}$)	---	---	---
Total auxiliary power from table 2 ($P_{r,i}$)	---	---	---
Net engine power (kW) $P_i = P_{m,i} - P_{f,i} + P_{r,i}$	---	---	18.0

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%	---	---	---	---	---	1.8
25%	---	---	---	---	---	4.5
50%	---	---	---	---	---	9.0
75%	---	---	---	---	---	13.5
100%	---	---	---	---	---	18.0

(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.

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

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	CO	HC	NO _x	HC+NO _x	PM	PN
mult/add	1.11	---	---	1.14	---	---
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	368.57	3.44	1.72	5.16	---	---
k_{ru}/k_{rd} mult/add	---	---	---	---	---	---
test result with IRAF	---	---	---	---	---	---
Final test result with DF	409.11	---	---	5.88	---	---

9.3.3. Cycle weighted CO₂ (g/kWh) : 771.729.3.4. Cycle weighted NH₃ (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 : ---

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

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

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

Table 8 Transient test cycle

NRTC	---
LSI-NRTC	---

10.2. Transient test deterioration factors : ---

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

10.2.2. DF values and the emissions results to be stated in Table 9 or in Table 10

10.3. NRTC emission results :

Table 9 DF values and the emissions results for NRTC

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

10.3.1. Hot cycle CO₂ (g/kWh) : ---

10.3.2. Cycle weighted NH₃ (ppm) : ---

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

10.3.4. Cycle CO₂ for hot start test (g) : ---

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

10.4. LSI-NRTC emission results

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	---	---	---	---	---	---
<i>k_{ru}/k_{rd}</i> mult/add	---	---	---	---	---	---
Test result with IRAF	---	---	---	---	---	---
Final test result with DF	---	---	---	---	---	---

- 10.4.1. Cycle CO₂ (g/kWh) : ---
- 10.4.2. Cycle average NH₃ (ppm) : ---
- 10.4.3. Cycle work (kWh) : ---
- 10.4.4. Cycle CO₂ (g) : ---
- 10.5. Sampling system used for the transient test : ---
- 10.5.1. Gaseous emissions : ---
- 10.5.2. PM : ---
- 10.5.3. 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 ⁽²⁾ .	409.11	---	---	5.88	---	---	G2
Final transient test result with DF ⁽³⁾	---	---	---	---	---	---	---

- 11.2 CO₂ result (g/kWh) ⁽⁴⁾ : 771.72
- 11.3. In service monitoring reference values ⁽⁵⁾
- 11.3.1. Reference work (kWh) ⁽⁶⁾ : ---
- 11.3.2. Reference CO₂ mass (g) ⁽⁷⁾ : ---

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

- (1) For NRSC indicate the cycle noted in point 9.1 (Table 4); for transient test indicate cycle noted in point 10.1 (Table 8).
- (2) Copy the “Final test result with DF” results from Table 6.
- (3) Copy “Final test result with DF” results from Table 9 or 10, as applicable.
- (4) For an engine type or engine family that is tested on both the NRSC and a transient cycle, indicate the hot cycle CO₂ emissions values from the NRTC noted in point 10.3.4 or the CO₂ emissions values from the LSI-NRTC noted in point 10.4.4. For an engine only tested on an NRSC indicate the CO₂ emissions values given in that cycle noted in point 9.3.3.
- (5) Only applicable to engines of sub-categories NRE-v-5 and NRE-v-6 tested on NRTC.
- (6) Indicate the cycle work for hot start test value from the NRTC noted in point 10.3.3.
- (7) Indicate the cycle CO₂ for hot start test value from the NRTC noted in point 10.3.4.

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

- 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.764H-01
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, November 18, 2019

Ming Shan

Ming Shan
 Expert Technical Service

Manufacturer : Loncin Motor Co., Ltd.
Engine family designation : NRS.764H
Parent engine type designation: 2V80FD

List of modifications

Appendix 0

- Correction of : the maximum no load speed: 3800±100 rpm
- Modification of : the location of the manufacturer's statutory marking to enclosure of the engine.
the method of attachment of the statutory marking to adhesive label or engraved.
the types of spark plug
regulation update.
- Addition of : DF value of HC+NOx
- Deletion of : ---

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2V80FD-02	Cylinder header	21
2V80FD-03	Cylinder	22
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2V80FD-05	Carburettor	24
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Modification

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

The undersigned (full name and position): Mr. Wan Huang / 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 (amended by (EU) 2018/989), Commission Delegated Regulation (EU) 2017/655 (amended by (EU) 2018/987) and Commission Implementing Regulation (EU) 2017/656 (amended by (EU) 2018/988) 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 (amended by (EU) 2018/989), and have been disclosed in accordance with that Annex and with Annex I to Implementing Regulation (EU) 2017/656 (amended by (EU) 2018/988).

- | | | |
|------|--|--|
| 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, 400052, P. R. China |
| 1.4. | Name and address of manufacturer's authorized representative (if any): | CMD Costruzioni Motori Diesel Spa
Nucleo Industriale Valle di Vitalba -85020-Atella (Potenza) –Italy |
| 1.6. | Engine type designation/ engine family designation / FT: | NRS.764H 2V80FD (Parent engine),
NRS.764H LC2V80FD, |

(Place) (Date) Chongqing 18.11.2019

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):



Mr. Wan Huang / Manager

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, 400052, P. R. China
- 1.4. 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. Name(s) and address(es) of ~~assembly~~/manufacture plant(s) : Loncin Motor Co., Ltd.
No.99 Hualong Road, Jiulong Industrial Park, Jiulongpo District, Chongqing, 400052, P. R. China
- 1.6. ~~Engine type designation/ engine family designation~~ /FT : NRS.764H 2V80FD (Parent engine),
NRS.764H LC2V80FD,
- 1.7. Category and sub-category of the ~~engine type~~/engine family : NRS-vr-1b
- 1.8. Emissions durability period category : Cat 3 (Professional 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	:	V
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. 2V80FD-02
2.4.3.	Number of valves per cylinder	:	2
2.5.	Range of swept volume per cylinder (cm ³)	:	382
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, fuel mixtures or emulsions suitable for use by the engine, as declared by the manufacturer in accordance with point 1.2.3 of Annex I to Delegated Regulation (EU) 2017/654 (provide reference to recognised standard or specification)	:	n.a.
2.8.4.	Lubricant added to fuel	:	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 the devices)	:	No
2.10.4.	H ₂ injection	:	No

	(if yes, provide a schematic diagram of the location and order of the devices)		
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)
						<i>type 2</i>
3.1	Engine Identification					
3.1.1.	Engine type designation			X	2V80FD	LC2V80FD
3.1.2.	Engine type designation shown on engine marking: yes/no			X	Yes	Yes
3.1.3.	Location of the statutory marking:			X	Enclosure of the engine #	Enclosure of the engine #
3.1.4.	Method of attachment of the statutory marking:			X	Engraved or adhesive label #	Engraved or adhesive label #
3.1.5.	Drawings of the location of the engine identification number (complete example with dimensions):			X	Refer to drawing No. 2V80FD-01	Refer to drawing No. 2V80FD-01
3.2.	Performance Parameters					
3.2.1.	Declared rated speed (rpm):	X			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	6900	6900
3.2.1.2.	Declared rated net power (kW):	X			18	18
3.2.2.	Maximum power speed(rpm):			X	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	6900	6900
3.2.2.2.	Maximum net power (kW):	X		X	18	18
3.2.3.	Declared maximum torque speed (rpm):	X			2800	2800
3.2.3.1.	Fuel delivery/stroke (mm ³) for diesel engine, fuel flow (g/h) for other engines, at maximum torque speed:			X	5800	5800
3.2.3.2.	Declared maximum torque (Nm):	X			52	52
3.2.4.	Declared 100% test speed:	X			3600	3600
3.2.5.	Declared Intermediate test speed:	X			n.a	n.a

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.2.6.	Idle speed (rpm)	X			1800±150	1800±150
3.2.7.	Maximum no load speed (rpm):	X			3800±100 #	3800±100 #
3.2.8.	Declared minimum torque (Nm)	X			n.a.	n.a.
3.3.	Run-in procedure					
3.3.1.	Run in time:	X			4 hours	4 hours
3.3.2.	Run-in cycle:	X			G2	G2
3.4.	Engine test					
3.4.1.	Specific fixture required: Yes/No	X			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.
3.4.2.	Exhaust mixing chamber permitted by manufacturer: Yes/No	X			No	No
3.4.2.1.	exhaust mixing chamber description, photograph and/or drawing:	X			n.a.	n.a.
3.4.3.	Manufacturers chosen NRSC: RMC/Discrete mode	X			Discrete mode	Discrete mode
3.4.4.	Additional NRSC: E2/D2/C1	X			n.a.	n.a.
3.4.5.	Number of pre-conditioning cycles prior to transient test	X			n.a.	n.a.
3.4.6.	Pre-conditioning for RMC NRSC: Steady-state operation/RMC:	X			n.a.	n.a.
3.5.	Lubrication system					
3.5.1.	Lubricant temperature					
3.5.1.1.	Minimum (deg. C):	X			22	22
3.5.1.2.	Maximum (deg. C):	X			140	140
3.6.	Combustion Cylinder					
3.6.1.	Bore(mm):			X	80	80

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.6.2.	Stroke(mm):			X	76	76
3.6.3.	Number of cylinders:			X	2	2
3.6.4.	Engine total swept volume (cm ³):			X	764	764
3.6.5.	Swept volume per cylinder as % of parent engine:			X	100	100
3.6.6.	Volumetric compression ratio:			X	8.7:1	8.7:1
3.6.7.	Combustion system description:			X	Spark ignition	Spark ignition
3.6.8.	Drawings of combustion chamber and piston crown:			X	Refer to drawing No. 2V80FD-02 Refer to drawing No. 2V80FD-03 Refer to drawing No. 2V80FD-04	Refer to drawing No. 2V80FD-02 Refer to drawing No. 2V80FD-03 Refer to drawing No. 2V80FD-04
3.6.9.	Minimum cross sectional area of inlet and outlet ports (mm ²):			X	Inlet:580mm ² Outlet: 538mm ²	Inlet:580mm ² Outlet: 538mm 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. 2V80FD-07	Refer to drawing No. 2V80FD-07
3.6.10.2.	Reference and/or setting range:			X	TDC	TDC
3.6.10.3.	Variable valve timing system: Yes/No			X	No	No
3.6.10.3.1.	Type: continuous/(on/off)			X	n.a.	n.a.
3.6.10.3.2.	Cam phase shift angle:			X	n.a.	n.a.
3.6.11.	Porting configuration				n.a.	n.a.
3.6.11.1.	Position, size and number:			X	n.a.	n.a.
3.7.	Cooling system					
3.7.1.	Liquid cooling				n.a.	n.a.
3.7.1.1.	Nature of liquid:			X	n.a.	n.a.
3.7.1.2.	Circulating pumps: Yes/No			X	No	No
3.7.1.2.1.	type(s):			X	n.a.	n.a.
3.7.1.2.2.	Drive ratio(s):			X	n.a.	n.a.

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.7.1.3.	Minimum coolant temperature at outlet (deg. C):	X			n.a.	n.a.
3.7.1.4.	Maximum coolant temperature at outlet (deg. C):	X			n.a.	n.a.
3.7.2.	Air cooling					
3.7.2.1.	fan: Yes/No			X	Yes	Yes
3.7.2.1.1.	type(s):			X	T390	T390
3.7.2.1.2.	Drive ratio(s):			X	1	1
3.7.2.2.	Maximum temperature at reference point (deg. C):			X	250	250
3.7.2.2.1.	Reference point location			X	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		1.5	1.5
3.8.1.2.	With dirty air cleaner:	X	X		1.5	1.5
3.8.1.3.	Location, of measurement:	X	X		Air inlet nearby	Air inlet nearby
3.8.2.	Pressure charger(s): Yes/No			X	No	No
3.8.2.1.	Type(s):			X	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.
3.8.3.	Charge air cooler: Yes/No	X	X		No	No
3.8.3.1.	Type: air-air/air-water/other(specify)		X		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.
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.
3.8.4.	Intake throttle valve: Yes/No			X	No	No

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.8.5.	Device for recycling crankcase gases: Yes/No			X	Yes	Yes
3.8.5.1.	If yes, description and drawings:			X	Refer to drawing No. 2V80FD-06	Refer to drawing No. 2V80FD-06
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.
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. 2V80FD-10	Refer to drawing No. 2V80FD-10
3.8.7.	Air filter			X		
3.8.7.1.	Type:			X	T231, T230	T231, T230
3.8.8.	Intake air-silencer					
3.8.1.1.	Type:			X	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. 2V80FD-09	Refer to drawing No. 2V80FD-09
3.9.2.	Maximum exhaust temperature (deg. C):	X			800	800
3.9.3.	Maximum permissible exhaust backpressure at 100% engine speed and at 100% load (kPa):	X	X		8.0	8.0
3.9.3.1.	Location of measurement:	X	X		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.
3.9.4.1.	Location and speed/load conditions:	X			n.a.	n.a.
3.9.5.	Exhaust throttle valve: Yes/No			X	No	No
3.10.	Miscellaneous devices					
3.10.1.	Exhaust gas recirculation					

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.10.1.1.	Characteristics: cooled/uncooled, high pressure/low pressure/other (specify):			X	n.a.	n.a.
3.10.2.	Water injection					
3.10.2.1.	Operation principle:			X	n.a.	n.a.
3.10.3.	H ₂ injection	X			n.a.	n.a.
3.11.	Exhaust after-treatment system				n.a.	n.a.
3.11.1.	Location		X		n.a.	n.a.
3.11.1.1.	Place(s) and maximum/minimum distance(s) from engine to first after-treatment device:		X		n.a.	n.a.
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.
3.11.1.2.1.	Test conditions for measurement:	X	X		n.a.	n.a.
3.11.1.3.	Minimum temperature at inlet to first after-treatment device (deg. C), if stated:	X	X		n.a.	n.a.
3.11.2.	Oxidation catalyst					
3.11.2.1.	Number of catalytic converters and elements:			X	n.a.	n.a.
3.11.2.2.	Dimensions and volume of the catalytic converter(s):			X	n.a.	n.a.
3.11.2.3.	Total charge of precious metals:			X	n.a.	n.a.
3.11.2.4.	Relative concentration of each compound:			X	n.a.	n.a.
3.11.2.5.	Substrate (structure and material):			X	n.a.	n.a.
3.11.2.6.	Cell density:			X	n.a.	n.a.
3.11.2.7.	Type of casing for the catalytic converter(s):			X	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.
3.11.3.2.	Number of catalytic converters and elements:			X	n.a.	n.a.

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

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.11.4.2.	Type:			X	n.a.	n.a.
3.11.4.3.	Dimensions and capacity of the particulate trap:			X	n.a.	n.a.
3.11.4.4.	Location place(s) and maximum and minimum distance(s) from engine:		X		n.a.	n.a.
3.11.4.5.	Method or system of regeneration, description and/or drawing:			X	n.a.	n.a.
3.11.4.5.1.	Infrequent regeneration: Yes/No			X	No	No
3.11.4.5.2.	Minimum exhaust gas temperature for initiating regeneration procedure (deg. C):			X	n.a.	n.a.
3.11.4.6.	Catalytic coating: Yes/No			X	No	No
3.11.4.6.1.	Type of catalytic action:			X	n.a.	n.a.
3.11.4.7.	Fuel borne catalyst (FBC): Yes/No			X	No	No
3.11.4.8.	Normal operating temperature range (deg. C):			X	n.a.	n.a.
3.11.4.9.	Normal operating pressure range (kPa)			X	n.a.	n.a.
3.11.4.10.	Storage capacity soot/ash [g]:			X	n.a.	n.a.
3.11.4.11.	Oxygen sensor(s): Yes/No			X	No	No
3.11.4.11.1.	Type:			X	n.a.	n.a.
3.11.4.11.2.	Location(s):			X	n.a.	n.a.
3.11.5.	Other systems					
3.11.5.1.	Description and operation:			X	n.a.	n.a.
3.11.6.	Infrequent Regeneration					
3.11.6.1.	Number of cycles with regeneration	X			n.a.	n.a.
3.11.6.2.	Number of cycles without regeneration	X			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.

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.12.2.	Injection system					
3.12.2.1.	Pump					
3.12.2.1.1.	Type(s):			X	n.a.	n.a.
3.12.2.1.2.	Rated pump speed (rpm):			X	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.
3.12.2.1.4.	Torque peak pump speed (rpm):			X	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.
3.12.2.1.6.	Characteristic diagram:			X	n.a.	n.a.
3.12.2.1.7.	Method used: on engine/on pump bench			X	n.a.	n.a.
3.12.2.2.	Injection timing					
3.12.2.2.1.	Injection timing curve:			X	n.a.	n.a.
3.12.2.2.2.	Static Timing:			X	n.a.	n.a.
3.12.2.3.	Injection piping					
3.12.2.3.1.	Length(s) (mm):			X	n.a.	n.a.
3.12.2.3.2.	Internal diameter (mm):			X	n.a.	n.a.
3.12.2.4.	Common rail: Yes/No			X	No	No
3.12.2.4.1.	Type:			X	n.a.	n.a.
3.12.3.	Injector(s)					
3.12.3.1.	Type(s):			X	n.a.	n.a.
3.12.3.2.	Opening pressure (kPa):			X	n.a.	n.a.
3.12.4.	Electronic control unit (ECU): Yes/No			X	No	No
3.12.4.1.	Type(s):			X	n.a.	n.a.
3.12.4.2.	Software calibration number(s):			X	n.a.	n.a.

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
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.
3.12.5.	Governor					
3.12.5.1.	Type(s):			X	n.a.	n.a.
3.12.5.2.	Speed at which cut-off starts under full load:			X	n.a.	n.a.
3.12.5.3.	Maximum no-load speed:			X	n.a.	n.a.
3.12.5.4.	Idle speed:			X	n.a.	n.a.
3.12.6.	Cold-start system: Yes/No			X	No	No
3.12.6.1.	Type(s):			X	n.a.	n.a.
3.12.6.2.	Description:			X	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.
3.12.7.2.	Maximum (deg. C):	X			n.a.	n.a.
3.13.	Fuel feed for liquid fuel spark ignition engine					
3.13.1.	Carburettor					
3.13.1.1.	Type(s):			X	T231	T231
3.13.2.	Port fuel injection:				n.a.	n.a.
3.13.2.1.	single-point / multi-point			X	n.a.	n.a.
3.13.2.2.	Type(s):			X	n.a.	n.a.
3.13.3.	Direct injection:				n.a.	n.a.
3.13.3.1.	Type(s):			X	n.a.	n.a.
3.13.4.	Fuel temperature at location specified by manufacturer					
3.13.4.1.	Location:	X			Carburettor cup	Carburettor cup
3.13.4.2.	Minimum (deg. C)	X			25	25

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.13.4.3.	Maximum (deg. C)	X			35	35
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.
3.14.2.	Pressure regulator(s)/vaporiser(s)					
3.14.2.1.	Type(s)			X	n.a.	n.a.
3.14.2.2.	Number of pressure reduction stages			X	n.a.	n.a.
3.14.2.3.	Pressure in final stage minimum and maximum. (kPa)			X	n.a.	n.a.
3.14.2.4.	Number of main adjustment points:			X	n.a.	n.a.
3.14.2.5.	Number of idle adjustment points:			X	n.a.	n.a.
3.14.3.	Fuelling system: mixing unit/gas injection/liquid injection/direct injection			X	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.
3.14.4.	Mixing unit					
3.14.4.1.	Number:			X	n.a.	n.a.
3.14.4.2.	Type(s):			X	n.a.	n.a.
3.14.4.3.	Location:			X	n.a.	n.a.
3.14.4.4.	Adjustment possibilities:			X	n.a.	n.a.
3.14.5.	Inlet manifold injection					
3.14.5.1.	Injection: single-point/multi-point			X	n.a.	n.a.
3.14.5.2.	Injection: continuous/simultaneously timed/ sequentially timed			X	n.a.	n.a.
3.14.5.3.	Injection equipment					
3.14.5.3.1.	Type(s):			X	n.a.	n.a.

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.14.5.3.2.	Adjustment possibilities:			X	n.a.	n.a.
3.14.5.4.	Supply pump					
3.14.5.4.1.	Type(s):			X	n.a.	n.a.
3.14.5.5.	Injector(s)					
3.14.5.5.1.	Type(s):			X	n.a.	n.a.
3.14.6.	Direct injection					
3.14.6.1.	Injection pump/pressure regulator			X	n.a.	n.a.
3.14.6.1.1.	Type(s):			X	n.a.	n.a.
3.14.6.1.2.	Injection timing (specify):			X	n.a.	n.a.
3.14.6.2.	Injector(s)					
3.14.6.2.1.	Type(s):			X	n.a.	n.a.
3.14.6.2.2.	Opening pressure or characteristic diagram :			X	n.a.	n.a.
3.14.7.	Electronic Control Unit (ECU)					
3.14.7.1.	Type(s):			X	n.a.	n.a.
3.14.7.2.	Adjustment possibilities:			X	n.a.	n.a.
3.14.7.3.	Software calibration number(s):			X	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	No	No
3.14.8.2.	Calibration for a specific gas composition: NG-H/NG-L/NG-HL/ LNG/Fuel specific LNG	X	X	X	n.a.	n.a.
3.14.8.3.	Transformation for a specific gas composition: NG-HT/NG-LT/NG-HLT	X	X	X	n.a.	n.a.
3.14.9.	Fuel temperature pressure regulator final stage					
3.14.9.1.	Minimum (deg. C):	X			n.a.	n.a.
3.14.9.2.	Maximum (deg. C):	X			n.a.	n.a.

Item Number	Item Description	Test	Installation	Homologation	Parent engine/ engine type	Engine types within the engine family (if applicable)
						<i>type 2</i>
3.15.	Ignition system					
3.15.1.	Ignition coil(s)					
3.15.1.1.	Type(s):			X	T231	T231
3.15.1.2.	Number:			X	1	1
3.15.2.	Spark plug(s)					
3.15.2.1.	Type(s):			X	RC12YC #	RC12YC #
3.15.2.2.	Gap setting:			X	0.7 mm-0.8 mm	0.7 mm-0.8 mm
3.15.3.	Magneto			X		
3.15.3.1.	Type(s):			X	T231	T231
3.15.4.	Ignition timing control: Yes/No			X	Yes	Yes
3.15.4.1.	Static advance with respect to top dead centre (crank angle degrees):			X	26°	26°
3.15.4.2.	Advance curve or map:			X	Refer to drawing No. 2V80FD-08	Refer to drawing No. 2V80FD-08
3.15.4.3.	Electronic control: Yes/No			X	No	No



Front view



Left view

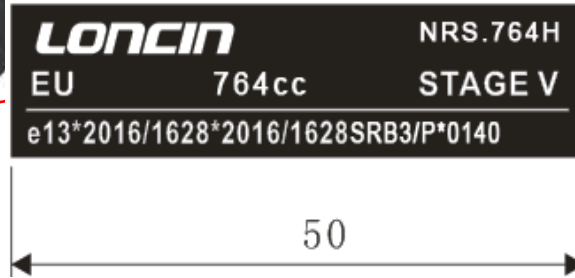
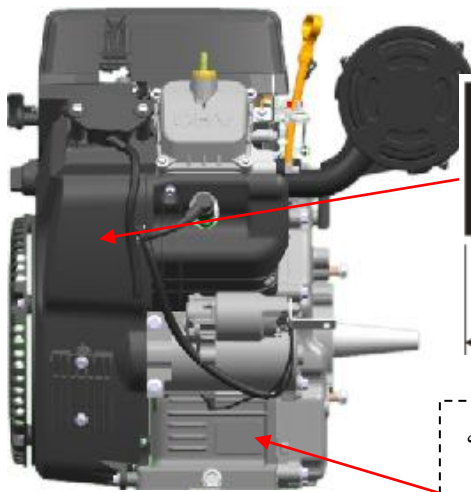


Right view



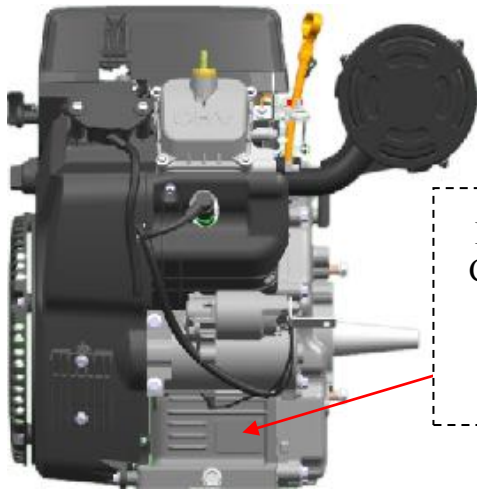
Rear view

ENGINE TYPE	2V80FD/LC2V80FD
PHOTOGRAPHS OF THE PARENT ENGINE	
PHOTOGRAPH NO.	Photo-01



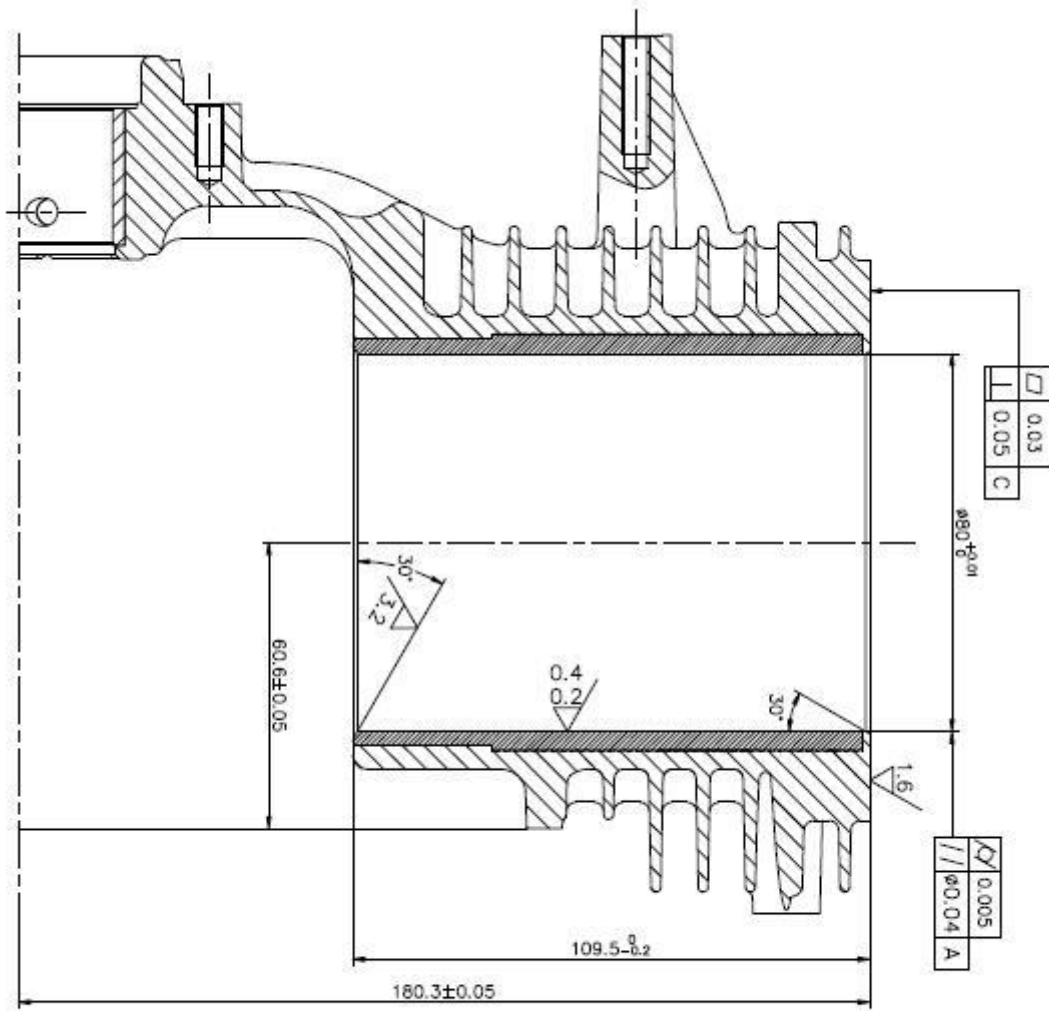
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OR

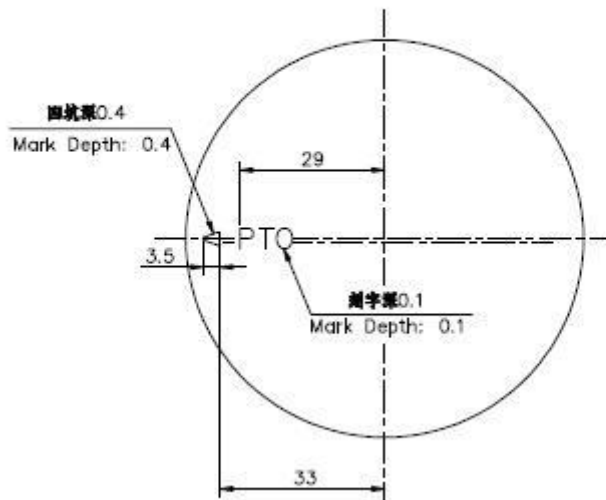
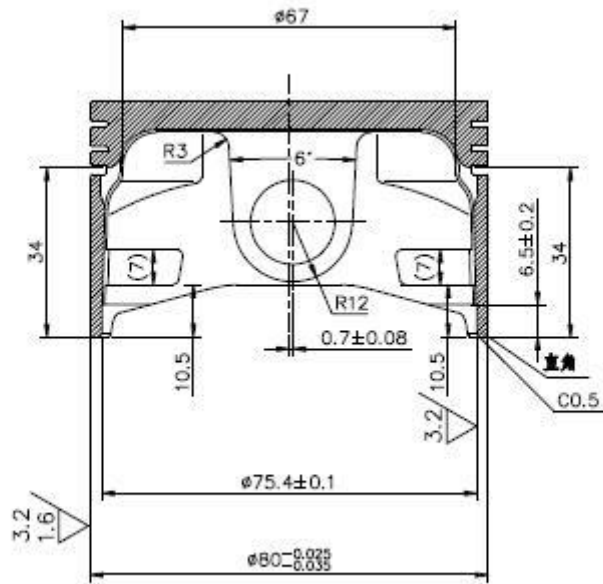


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 Note: date of manufacture, YY-year, MM-month

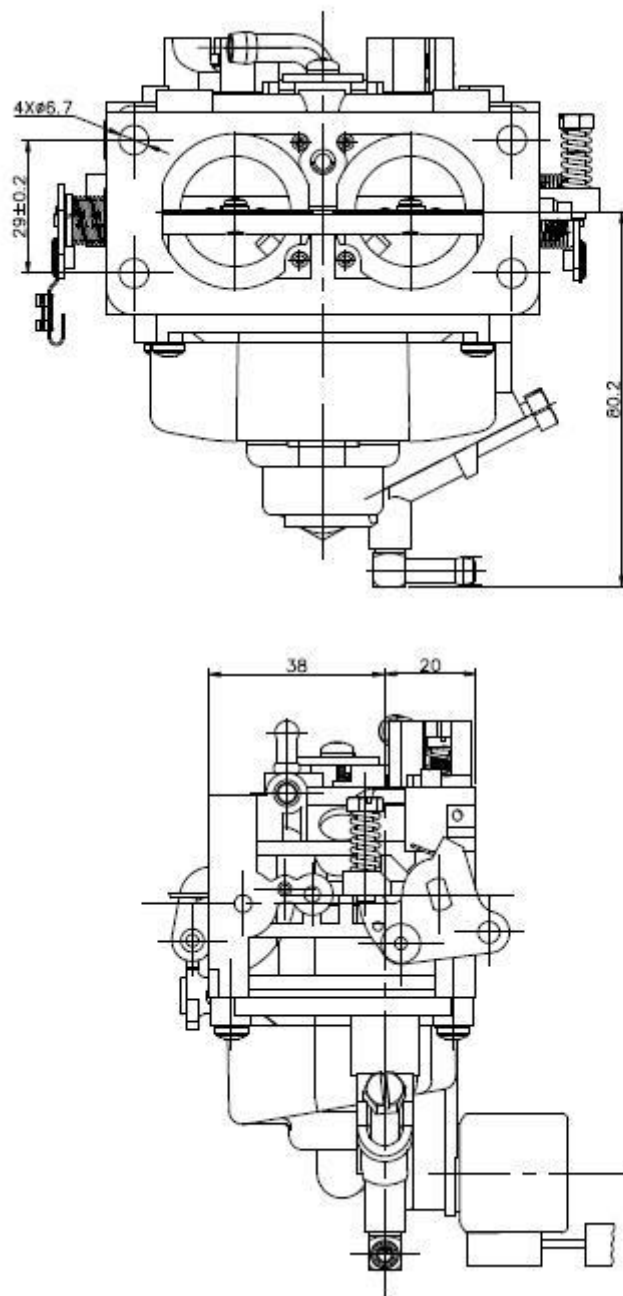
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POSITION OF ENGINE NO. AND EU APPROVAL NO.	
DRAWING NO.	2V80FD-01



ENGINE TYPE	2V80FD/LC2V80FD
CYLINDER	
DRAWING NO.	2V80FD-03



ENGINE TYPE	2V80FD/LC2V80FD
PISTON	
DRAWING NO.	2V80FD-04



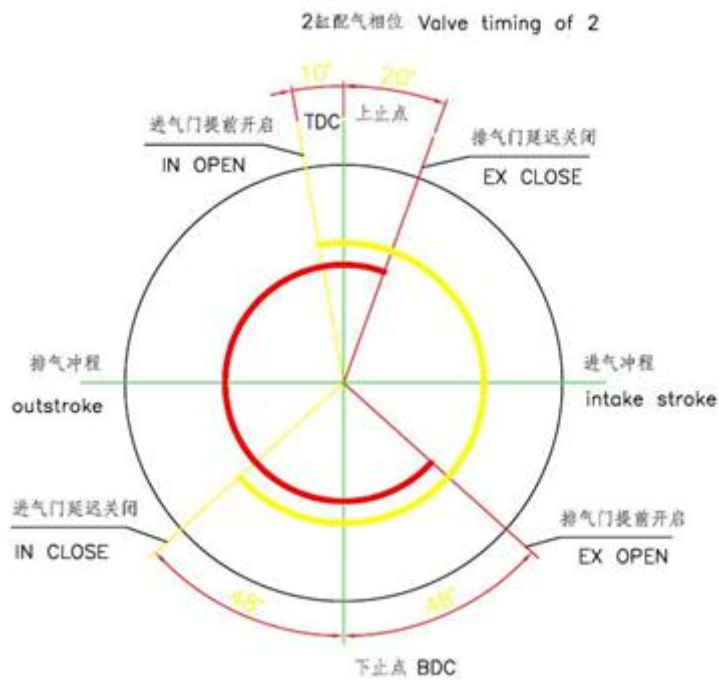
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CARBURETOR	
DRAWING NO.	2V80FD-05



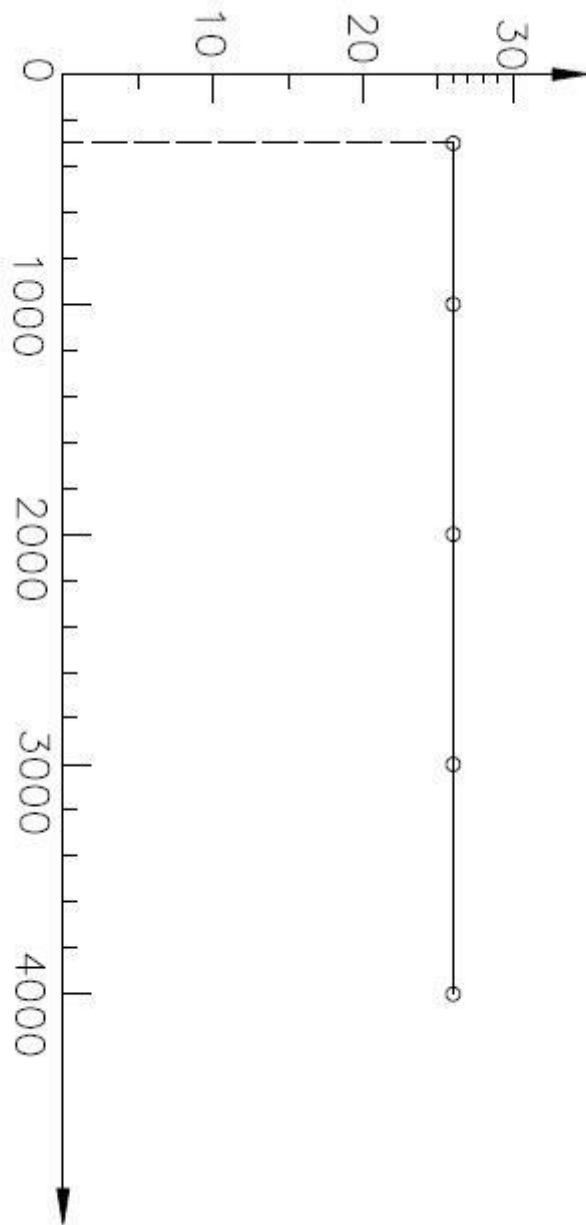
Pipe for recycling the crankcase gases

Remark: Through the pipe, the crankcase gases go into the air filter, and finally the gases burn in the combustion chamber.

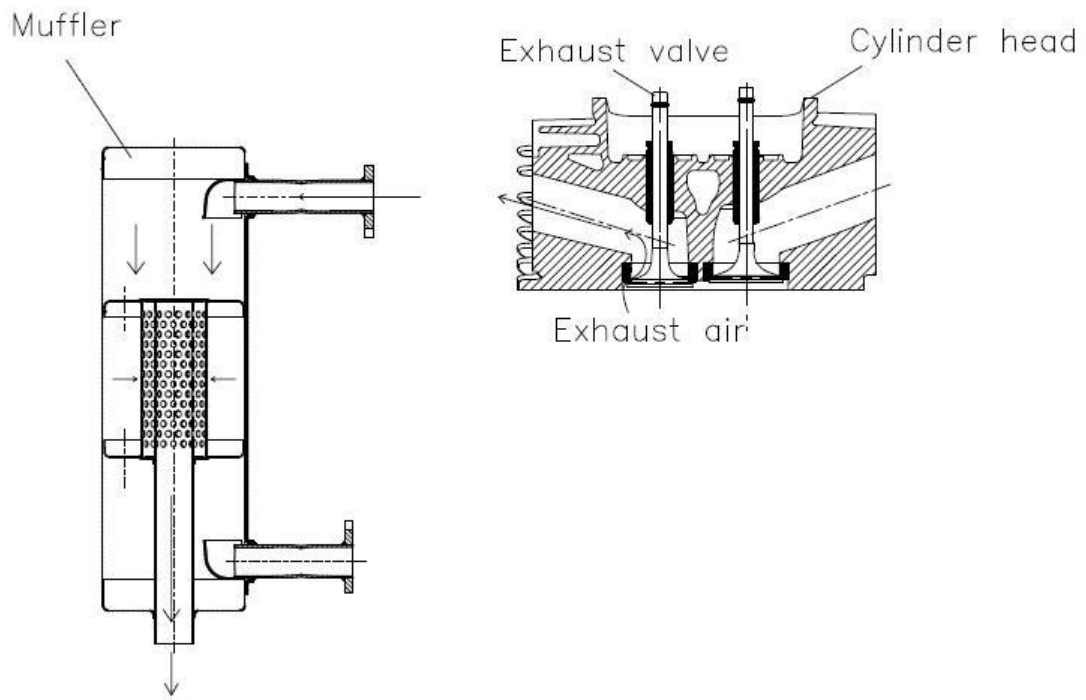
ENGINE TYPE	2V80FD/LC2V80FD
DEVICE FOR RECYCLING CRANKCASE GASES	
DRAWING NO.	2V80FD-06



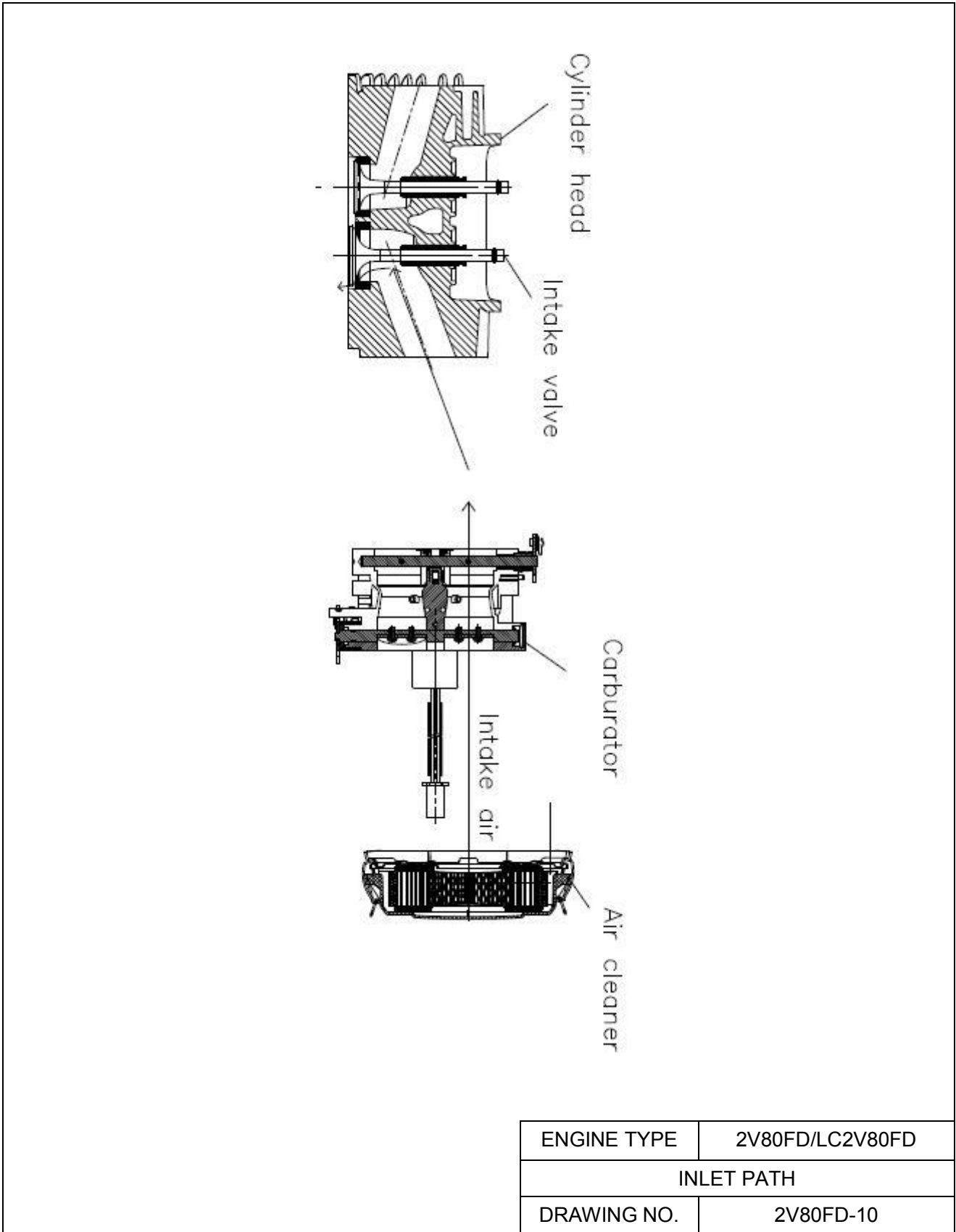
ENGINE TYPE	2V80FD/LC2V80FD
TIMING DIAGRAM	
DRAWING NO.	2V80FD-07

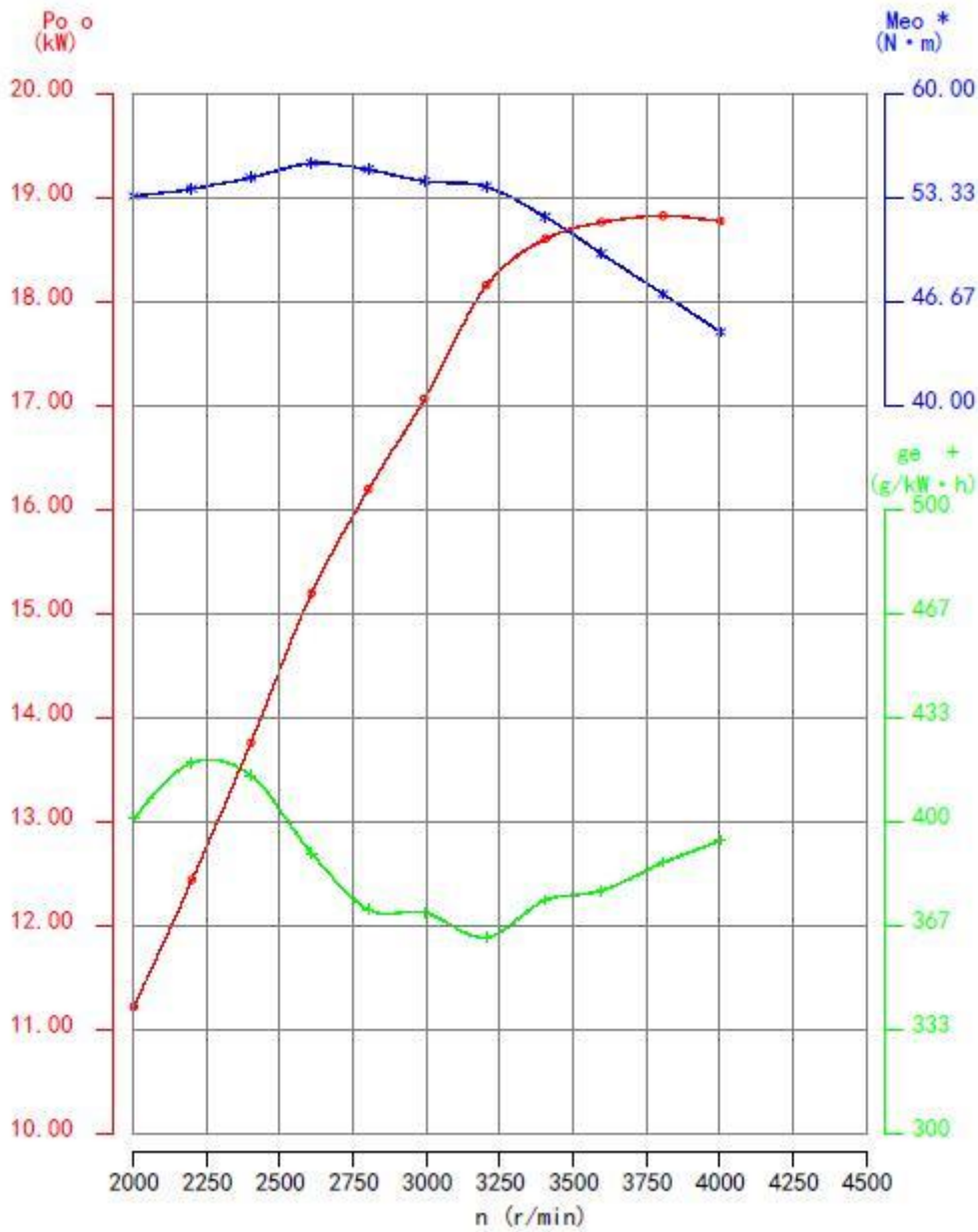


ENGINE TYPE	2V80FD/LC2V80FD
IGNITION ADVANCE CURVE	
DRAWING NO.	2V80FD-08



ENGINE TYPE	2V80FD/LC2V80FD
EXHAUST SYSTEM	
DRAWING NO.	2V80FD-09





ENGINE TYPE	2V80FD/LC2V80FD
THE STRUCTURE OF ENGINES	
DRAWING NO.	2V80FD-11



ENGINE TYPE	2V80FD/LC2V80FD
THE STRUCTURE OF ENGINES	
DRAWING NO.	2V80FD-12

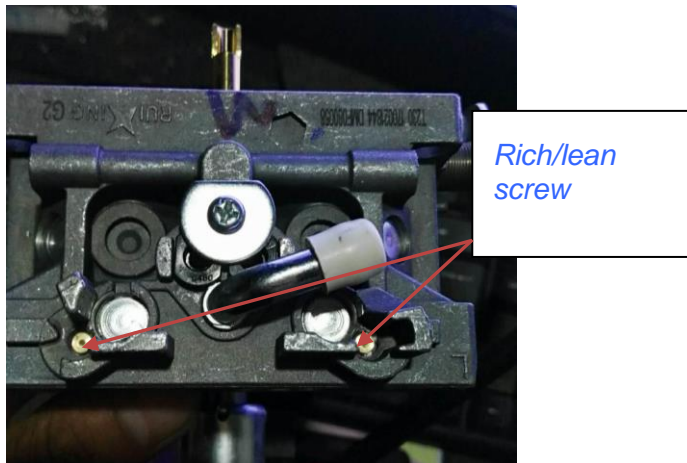
Declaration by manufacturer on prevention of tampering

The undersigned (full name and position): Mr. Wan Huang / 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 (amended by (EU) 2018/988).

- 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, 400052, P. R. China
- 1.4. Name and address of manufacturer's authorized representative (if any): CMD Costruzioni Motori Diesel Spa
Nucleo Industriale Valle di Vitalba -85020-Atella (Potenza) –Italy
- 1.6. ~~Engine type designation/ engine family designation~~/ FT: NRS.764H 2V80FD (Parent engine),
NRS.764H LC2V80FD,

Technical details: For rich/lean screw, after being adjusted, break the screw head. The screw cannot be adjusted anymore



(Place) (Date) Chongqing November 18, 2019

Signature: 
Mr. Wan Huang / Manager

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.764H.

Engine family designation	NRS.764H	
Specification of machinery to be propelled by the engine	Mower, Carrier, Compressor, Pump, Pressure Washer, Brush Cutter, Stump Beater, Tiller, Ice Auger, Non-Backpack Blower, Walk-Behind Lawnmower, Riding Mower	
EDP category (hours)	Category 3, 1000 hours	
DF (deterioration factor)	CO	1.11
	HC+NO _x	1.14 #

This statement refers exclusively to the emission durability report.

Sincerely yours



Mr. Wan Huang / Manager

Date: November 18, 2019

Make : **Loncin**
Name and address of the manufacturer : **Loncin Motor Co., Ltd.**
No.99 Hualong Road, Jiulong Industrial Park,
Jiulongpo District, Chongqing, 400052, P. R. China

EMISSION DURABILITY 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

and

Commission Delegated Regulation

(EU) 2017/654 amended by (EU) 2018/989

(EU) 2017/655 amended by (EU) 2018/987

Commission Implementing Regulation

(EU) 2017/656 amended by (EU) 2018/988

0. General information

- 0.1 Make (trade name of the manufacturer) : Loncin
- 0.2 Engine family designation : NRS.764H
Parent engine type designation : 2V80FD
- 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,
400052, P. R. China
- 0.5 Specification of machinery to be propelled by the engine : Mower, Carrier, Compressor, Pump,
Pressure Washer, Brush Cutter, Stump
Beater, Tiller, Ice Auger, Non-Backpack
Blower, Walk-Behind Lawnmower, Riding
Mower

1. Test information

- 1.1 Test object(s)
- identification number : T2310018030092977
version : --
- 1.2 Test date : 18.04.2018 –04.06.2018
- 1.3 Test site : Loncin Motor Co., Ltd.
No.99 Hualong Road, Jiulong Industrial
Park, Jiulongpo District, Chongqing,
400052, P. R. China
- 1.4 Test facilities : The test equipment used was in
compliance with the requirements of the
directive.

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	: 96.1
	Mon	: 85.9
1.5.1.2	State percentage of oil in mixture when lubricant and petrol are mixed as in the case of two stroke engines	: --
1.5.1.3	Density of petrol for four-stroke engines and petrol/ oil mixture for two-stroke engines	: 0.753 g/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	: G2
1.6	Engine performance	
1.6.1	Engine speeds	
	Idle [min ⁻¹]	: 1800±150
	Intermediate [min ⁻¹]	: ---
	Rated [min ⁻¹]	: 3600
1.6.2	Rated power [kW]	: 18.0
1.7	Emission durability test	
1.7.1	Emission durability period [h]	: 1000
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)	3.44	368.57	1.72	5.16	771.72
Emission test result (1000 hours)	---	409.11	---	5.88	---
DF value	---	1.11	---	1.14 #	---

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

Item	Time	Remark
Air cleaner	Checked every 50h Changed if necessary	
Spark plug(s)	Checked every 50h Changed if necessary	
Normal inspection	Any time	

The rule of emission durability test

Appendix 2

Mode	Load (%)	Engine speed (min ⁻¹)	Torque (N.m)	Time ratio (%)	Time (min)
1	0	1800	0.14	5	12
2	10	3600	4.8	6	16
3	25	3600	12.0	30	72
4	50	3600	24.0	29	68
5	75	3600	36.0	20	48
6	100	3600	48.0	10	24

Each emission durability cycle is 4 hours. Record every 2 hours.

Emission durability test record

Appendix 3

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
4.18	16:00	0	57.48	231.8	37.99	8.81	178	97.5	30.6	97.5	46	
	18:00	2	57.55	231.6	38.02	8.81	178.6	98.4	30.8	97.5	46	
	20:00	4	57.65	230.4	37.98	8.75	180.2	97.5	30.5	97.2	47	
	22:00	6	57.58	230.5	37.99	8.76	176.5	96.8	30	97.4	46	
4.19	0:00	8	57.65	230.1	37.94	8.73	178.6	97.1	28.9	97.5	47	
	2:00	10	57.56	230	37.98	8.74	179.5	98.2	29.1	97.6	46	
	4:00	12	57.58	231	37.94	8.76	180.2	97.8	30.1	97.6	46	
	6:00	14	57.67	231.3	37.95	8.78	183.4	97.6	30.4	97.5	47	
	8:00	16	57.59	230	37.91	8.72	181.1	98.5	30.5	97.3	47	
	10:00	18	57.62	231.2	37.92	8.77	178.7	97.1	31	97.4	47	
	12:00	20	57.57	231.3	37.94	8.78	180.5	98	31.6	97.4	48	
	14:00	0	58.16	231.40	24.86	5.75	145.5	78.2	31.6	97.2	48	
	16:00	2	57.52	23.00	37.61	0.87	179.8	80.9	32	97.2	48	
	18:00	4	57.17	231.60	55.22	12.79	188.8	97.3	30	97.6	44	
	20:00	6	59.24	231.70	24.66	5.71	165.7	86.2	30.1	97.4	48	change oil
	22:00	8	57.44	231.40	37.67	8.72	172.3	96.5	30.5	97.5	48	
4.20	0:00	10	57.11	230.10	55.74	12.83	185.5	116.2	31.2	97.5	48	
	2:00	12	56.54	227.69	77.83	17.72	212.2	122.5	31.6	97.5	48	
	4:00	14	57.80	233.30	24.66	5.75	164.4	98.6	31.2	97.5	48	
	6:00	16	57.82	230.70	55.25	12.75	198.2	103.2	30.6	97.5	46	
	8:00	18	52.28	230.30	78.20	18.01	221.2	124.5	30.8	97.5	46	
	10:00	20	60.30	230.20	0.00	0.00	144.5	71.2	30.5	97.2	47	
	12:00	22	57.49	231.60	24.72	5.73	165.7	88.4	30	97.4	46	
	14:00	24	57.59	231.60	37.67	8.72	174	98.1	28.9	97.5	47	
	16:00	26	60.57	230.7	0.00	0.00	142.3	75.5	29.1	97.6	46	
	18:00	28	59.34	235	1.42	0.33	156.8	82.2	30.1	97.6	46	
	20:00	30	58.48	226	78.07	17.64	221.4	122.6	30.4	97.5	47	
	22:00	32	57.11	227.4	55.74	12.68	198.7	115.6	30.5	97.3	47	
4.21	0:00	34	57.42	229.1	37.64	8.62	178.5	97.8	30.5	97.3	47	
	2:00	36	57.72	231.3	24.68	5.71	166.40	86.5	31	97.4	47	
	4:00	38	57.41	231.1	37.67	8.71	175.90	97.1	31.6	97.4	48	
	6:00	40	59.31	231	13.55	3.13	154.40	80.2	31.6	97.2	48	
	8:00	42	58.28	227.7	78.10	17.78	218.40	125.1	32	97.2	48	
	10:00	44	56.78	229.1	55.23	12.65	197.8	115.5	31.5	97.6	48	
	12:00	46	56.06	229.8	79.13	18.18	224.5	122.6	31.6	97.5	46	
	14:00	48	57.77	229.2	55.19	12.65	198.6	114.5	31.6	97	44	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	16:00	50	59.32	231.1	13.56	3.13	155.4	82.5	30	97.6	44	change oil and clean the air filter
	18:00	52	57.69	231.6	24.70	5.72	165.4	90.1	30.1	97.4	48	
	20:00	54	57.32	231.2	37.68	8.71	177.1	95.6	30.5	97.5	48	
	22:00	56	56.33	229.5	78.97	18.12	220.2	125.4	31.2	97.5	48	
4.22	0:00	58	57.56	232.4	24.67	5.73	164.4	92.2	31.6	97.5	48	
	2:00	60	56.53	230.6	55.22	12.73	197.1	115.5	31.2	97.5	48	
	4:00	62	59.06	231.1	13.41	3.10	152.1	84.6	30.6	97.5	46	
	6:00	64	56.6	230.7	55.15	12.72	196.3	102.2	30.8	97.5	46	
	8:00	66	56.7	232.3	37.68	8.75	176.8	97.5	30.5	97.2	47	
	10:00	68	57.57	229	24.64	5.64	165.4	90.6	30	97.4	46	
	12:00	70	57.28	230	37.60	8.65	175.8	95.6	28.9	97.5	47	
	14:00	72	56.67	232.1	55.22	12.82	194.5	105.1	29.1	97.6	46	
	16:00	74	57.88	231.9	24.67	5.72	155.6	89.1	30.1	97.6	46	
	18:00	76	58.8	229.6	13.35	3.07	142.8	80.4	30.4	97.5	47	
	20:00	78	57.91	229.3	37.59	8.62	178.5	102.6	30.5	97.3	47	
	22:00	80	56.3	231.2	55.92	12.93	200.5	114.6	31	97.4	47	
4.23	0:00	82	57.18	233.4	37.65	8.79	179.4	97.5	31.6	97.4	48	
	2:00	84	57.77	229.1	24.66	5.65	164.8	90.1	31.6	97.2	48	
	4:00	86	56.57	229.8	57.62	13.24	196.5	102.9	32	97.2	48	
	6:00	88	57.67	230.6	8.64	1.99	174.5	98.8	30	97.6	44	
	8:00	90	56.33	231.2	55.81	12.90	201.5	107.1	30.1	97.4	48	
	10:00	92	57.24	230.2	39.17	9.02	178.6	100.3	30.5	97.5	48	
	12:00	94	57.36	228.3	39.41	9.00	170.1	101.5	31.2	97.5	48	
	14:00	96	55.88	231.9	79.42	18.42	222.3	126.8	31.6	97.5	48	
	16:00	98	58.45	231.4	19.36	4.48	166.4	80.6	31.2	97.5	48	
	18:00	100	57.09	230.8	39.37	9.09	176.9	101.5	30.6	97.5	46	change oil and clean the air filter
	20:00	102	59.68	230.8	7.75	1.79	142.3	76.4	30.8	97.5	46	
	22:00	104	57.47	228.9	38.98	8.92	178.6	98.6	30.5	97.2	47	
4.24	0:00	106	59.15	230.9	8.01	1.85	145.2	84	30	97.4	46	
	2:00	108	58.03	232.1	19.60	4.55	166.8	89.5	28.9	97.5	47	
	4:00	110	59.39	228.5	79.13	18.08	219.2	119.8	29.1	97.6	46	
	6:00	112	57	232.8	39.38	9.17	179.4	97.4	30.1	97.6	46	
	8:00	114	58.02	232.1	19.56	4.54	164.1	88.4	30.4	97.5	47	
	10:00	116	56.58	228.1	60.06	13.70	217.8	115.6	30.5	97.3	47	
	12:00	118	58.01	232.2	19.52	4.53	148.9	90.1	31	97.4	47	
	14:00	120	55.83	227.9	79.07	18.02	220	120.1	31.6	97.4	48	
	16:00	122	56.81	229.8	38.95	8.95	178.9	97.6	31.6	97.2	48	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	18:00	124	56.1	226.8	79.41	18.01	218.9	121.8	32	97.2	48	
	20:00	126	57.95	231.6	19.68	4.56	166.4	80.6	30	97.6	44	
	22:00	128	57.1	231.4	39.24	9.08	180.1	98.4	30.1	97.4	48	
4.25	0:00	130	57.89	231.8	19.51	4.52	155.9	90.2	30.5	97.5	48	
	2:00	132	56.65	229.3	39.05	8.95	176.7	98.8	31.2	97.5	48	
	4:00	134	57.77	234.8	0.00	0.00	134.2	76.4	31.6	97.5	48	
	6:00	136	56.79	231.2	7.36	1.70	145.4	85.4	31.2	97.5	48	
	8:00	138	55.5	230.2	19.35	4.45	165.8	90.2	30.6	97.5	46	
	10:00	140	55.62	229.8	59.11	13.58	207.8	112.2	30.8	97.5	46	
	12:00	142	57.76	229.9	59.20	13.61	209.6	111.5	30.5	97.2	47	
	14:00	144	57.76	231.1	34.75	8.03	161.2	84.5	30	97.4	46	
	16:00	146	57.71	231.5	19.52	4.52	166.4	87.6	28.9	97.5	47	
	18:00	148	57	230.4	19.77	4.56	164.8	85.5	29.1	97.6	46	
	20:00	150	55.27	229.5	59.41	13.63	207.1	115.4	30.1	97.6	46	change oil and clean the air filter
	22:00	152	52.01	230.7	19.86	4.58	162.6	85.5	30.4	97.5	47	
4.26	0:00	154	54.91	229.8	58.99	13.56	208.9	114.6	30.5	97.3	47	
	2:00	156	58.37	230.7	7.75	1.79	146.1	82.9	31	97.4	47	
	4:00	158	55.83	231.2	39.10	9.04	175.6	102.4	31.6	97.4	48	
	6:00	160	55.15	229.7	58.97	13.55	209.5	115.9	31.6	97.2	48	
	8:00	162	57.17	232.9	19.83	4.62	164.7	89.6	32	97.2	48	
	10:00	164	60.57	230.9	0.00	0.00	139.4	69.8	30	97.6	44	
	12:00	166	56.97	233.8	19.44	4.55	164.5	96.3	30.1	97.4	48	
	14:00	168	54.63	230	59.11	13.60	219.4	104	30.5	97.5	48	
	16:00	170	54.22	229.2	78.87	18.08	223.6	122	31.2	97.5	48	
	18:00	172	54.85	229.9	58.93	13.55	214.2	119	31.6	97.5	48	
	20:00	174	59.17	230.7	7.73	1.78	157.1	84	31.2	97.5	48	
	22:00	176	57.29	231.7	19.48	4.51	154.2	97.5	30.6	97.5	46	
4.27	0:00	178	56.06	231.4	39.25	9.08	177.4	90.8	30.8	97.5	46	
	2:00	180	55.04	229.5	59.13	13.57	151.2	88.4	30.5	97.2	47	
	4:00	182	57.37	232.8	19.77	4.60	164.7	85.5	30	97.4	46	
	6:00	184	55.88	231.3	39.11	9.05	178.2	96.4	28.9	97.5	47	
	8:00	186	55.02	228.9	59.19	13.55	209.4	108.6	29.1	97.6	46	
	10:00	188	56.91	232.1	19.60	4.55	164.1	86.6	30.1	97.6	46	
	12:00	190	55.99	231.2	38.98	9.01	180.5	98.1	30.4	97.5	47	
	14:00	192	57.08	232.8	19.32	4.50	161.4	84.5	30.5	97.3	47	
	16:00	194	56.13	231.4	39.24	9.08	175.5	98.4	31	97.4	47	
	18:00	196	57.68	231.3	19.20	4.44	164.2	85.4	31.6	97.4	48	
	20:00	198	55.86	231.3	39.09	9.04	179.6	102.5	31.6	97.2	48	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
4.28	22:00	200	61.73	230.6	0.00	0.00	133.5	70.1	32	97.2	48	change oil and clean the air filter
	0:00	202	56.83	230.8	19.85	4.58	164.8	92.5	30	97.6	44	
	2:00	204	55.76	231.2	39.21	9.07	178.8	97.2	30.1	97.4	48	
	4:00	206	55.01	229.5	59.19	13.58	211.6	115.6	30.5	97.5	48	
	6:00	208	58.95	230.6	7.96	1.84	155.4	80.5	31.2	97.5	48	
	8:00	210	59.19	228.6	79.03	18.07	221.5	120.5	31.6	97.5	48	
	10:00	212	57.41	230.8	19.64	4.53	154.9	86.6	31.2	97.5	48	
	12:00	214	55.7	231.3	39.26	9.08	181.2	96.8	30.6	97.5	46	
	14:00	216	54.79	229.7	59.07	13.57	215.6	105.8	30.8	97.5	46	
	16:00	218	57.14	231.8	19.70	4.57	162.2	85.6	30.5	97.2	47	
					0.00	0.00			30	97.4	46	Stop
5.2	10:00	218	58.13	230.6	8.00	1.84	151.6	75.8	28.9	97.5	47	
	12:00	220	57.02	231.9	19.64	4.55	168.7	84.6	29.1	97.6	46	
	14:00	222	59.31	231.2	39.13	9.05	180.5	97.4	30.1	97.6	46	
	16:00	224	55.02	229.6	59.27	13.61	209.8	102.5	30.4	97.5	47	
	18:00	226	57.16	231.7	19.68	4.56	165.8	86.4	30.5	97.3	47	
	20:00	228	58.15	230.5	7.99	1.84	144.5	80.4	30.6	97.5	46	
	22:00	230	57.06	231.8	19.67	4.56	168.4	88.6	30.8	97.5	46	
	0:00	232	59.54	230.7	7.85	1.81	149.8	78.7	30.5	97.2	47	
	2:00	234	59.91	230.5	0.00	0.00	133.8	70.1	30	97.4	46	
	4:00	236	55.65	231.1	19.59	4.53	166.9	91.4	28.9	97.5	47	
6:00	238	54.76	231.3	39.29	9.09	181.5	96.4	29.1	97.6	46		
8:00	240	56.11	231.3	19.60	4.53	170.9	93.4	30.1	97.6	46		
10:00	242	53.25	228.7	59.12	13.52	212.8	105.6	30.4	97.5	47		
12:00	244	52.54	228.9	79.25	18.14	224.6	124.6	30.5	97.3	47		
14:00	246	54.05	231.3	39.11	9.05	190.8	94.6	31	97.4	47		
16:00	248	53.18	229.4	59.01	13.54	211.5	113.5	31.6	97.4	48		
18:00	250	55.22	231.5	19.48	4.51	167.8	91	31.6	97.2	48	change oil and clean the air filter	
20:00	252	54.26	231.7	78.44	18.17	181.7	104.7	32	97.2	48		
22:00	254	52.11	232.2	78.94	18.33	180.3	109.9	30	97.6	44		
5.4	0:00	256	54.07	231.4	39.03	9.03	176.2	97.2	30.1	97.4	48	
	2:00	258	52.09	232.4	60.01	13.95	178.3	102.5	30.5	97.5	48	
	4:00	260	52.27	230.6	78.67	18.14	180.6	109.8	31.2	97.5	48	
	6:00	262	55.98	231.8	19.59	4.54	140.8	91	31.6	97.5	48	
	8:00	264	52.92	233.1	59.07	13.77	149.6	99.6	31.2	97.5	48	
	10:00	266	56.36	231.4	19.34	4.48	141.2	92.5	30.6	97.5	46	
	12:00	268	58.15	230.6	7.84	1.81	140.1	81.7	30.8	97.5	46	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	14:00	270	56.68	231.3	19.50	4.51	145.9	95.3	30.5	97.2	47	
	16:00	272	54.47	231.3	39.07	9.04	179.2	94.2	30	97.4	46	
	18:00	274	58.84	231.3	78.75	18.21	178.4	109	28.9	97.5	47	
	20:00	276	58.84	229.5	78.75	18.07	187.4	109.3	29.1	97.6	46	
	22:00	278	57.24	230.3	0.00	0.00	69.8	63.9	30.1	97.6	46	
5.5	0:00	280	57.22	231.6	7.66	1.77	81	89.8	30.4	97.5	47	
	2:00	282	54.07	231.4	39.33	9.10	92.1	96.2	30.5	97.3	47	
	4:00	284	53.5	230.2	58.69	13.51	103.2	101.1	31	97.4	47	
	6:00	286	57.45	230.4	78.26	18.03	98.6	78.6	31.6	97.4	48	
	8:00	288	53.8	231.5	38.94	9.01	105.3	94.5	31.6	97.2	48	
	10:00	290	52.55	230.4	79.01	18.20	135.8	112.7	32	97.2	48	
	12:00	292	55.44	231.5	19.54	4.52	90.8	89.5	30	97.6	44	
	14:00	294	52.98	231.8	59.24	13.73	197.2	101.6	30.1	97.4	48	
	16:00	296	55.2	231.2	19.52	4.51	188.1	91.3	30.5	97.5	48	
	18:00	298	55.21	231	19.63	4.53	184.7	78.2	31.2	97.5	48	
	20:00	300	53.83	231.3	39.02	9.03	187.3	80.9	31.6	97.5	48	change oil and clean the air filter
	22:00	302	53.06	231.9	60.19	13.96	189.2	97.3	31.2	97.5	48	
5.6	0:00	304	56.33	231.6	19.54	4.53	182.5	86.2	30.6	97.5	46	
	2:00	306	52.9	228.6	58.53	13.38	195.6	92.4	30.8	97.5	46	
	4:00	308	55.63	231.4	19.70	4.56	176.2	87.7	30.5	97.2	47	
	6:00	310	53.94	231.3	39.10	9.04	165.5	96.5	30	97.4	46	
	8:00	312	52.22	231.3	79.50	18.39	217.5	116.2	28.9	97.5	47	
	10:00	314	56.41	229.8	19.56	4.49	157.2	85.2	29.1	97.6	46	
	12:00	316	53.91	231.9	39.11	9.07	166.2	94.3	30.1	97.6	46	
	14:00	318	52.21	227.2	78.60	17.86	168.4	103.2	30.4	97.5	47	
	16:00	320	52.47	229.3	78.66	18.04	172.7	102.8	30.5	97.3	47	
	18:00	322	52.19	229.6	19.71	4.53	180.7	98.9	30.6	97.5	46	
	20:00	324	53.88	231.7	39.46	9.14	178.6	91.4	30.8	97.5	46	
	22:00	326	58.3	228.3	7.68	1.75	149.3	87.4	30.5	97.2	47	
5.7	0:00	328	56.47	229.7	19.56	4.49	163.2	93.5	30	97.4	46	
	2:00	330	54.73	231.9	60.17	13.95	193.2	99.7	28.9	97.5	47	
	4:00	332	52.48	231	78.47	18.13	210.7	108.2	29.1	97.6	46	
	6:00	334	54.33	231.4	39.05	9.04	173.6	89.5	30.1	97.6	46	
	8:00	336	58.32	238.5	7.66	1.83	151.1	88.6	30.4	97.5	47	
	10:00	338	59.47	230.7	0.00	0.00	167.8	87.3	30.5	97.3	47	
	12:00	340	55.36	231.1	19.62	4.53	186.7	93.6	31	97.4	47	
	14:00	342	53.12	231.9	58.99	13.68	195.2	132.5	31.6	97.4	48	
	16:00	344	54.53	231.8	39.05	9.05	175.2	105.5	31.6	97.2	48	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	18:00	346	56.65	231.1	19.97	4.62	155.3	92.5	32	97.2	48	
	20:00	348	58.42	230.9	7.81	1.80	146.3	89.5	30	97.6	44	
	22:00	350	56.33	231.2	19.60	4.53	189.1	79.2	30.1	97.4	48	change oil and clean the air filter
5.8	0:00	352	56.77	231.3	39.03	9.03	187.1	80.9	30.5	97.5	48	
	2:00	354	56.77	231.6	19.87	4.60	182.5	86.2	31.2	97.5	48	
	4:00	356	60.33	230.2	0.00	0.00	166.2	87.1	31.6	97.5	48	
	6:00	358	58.11	231.1	19.60	4.53	187.7	93.6	31.2	97.5	48	
	8:00	360	55.47	231.9	58.99	13.68	195.2	120.1	30.6	97.5	46	
	10:00	362	58.88	231.7	39.46	9.14	183.9	111.2	30.8	97.5	46	
	12:00	364	57.43	229.7	19.56	4.49	167.2	93.1	30.5	97.2	47	
	14:00	366	53.17	228.8	59.20	13.54	197.2	140.7	30	97.4	46	
	16:00	368	54.83	230.8	39.15	9.04	179.5	123.3	28.9	97.5	47	
	18:00	370	53.39	227.9	59.60	13.58	199.2	136.7	29.1	97.6	46	
	20:00	372	56.97	228.5	8.00	1.83	163.5	92.8	30.1	97.6	46	
	22:00	374	54.02	231.6	39.26	9.09	167.8	91.8	30.4	97.5	47	
5.9	0:00	376	56.98	230.5	7.84	1.81	167.4	98.9	30.5	97.3	47	
	2:00	378	56.43	231.2	19.44	4.49	172.4	69.9	31	97.4	47	
	4:00	380	53.36	227.8	59.62	13.58	199.8	141.2	31.6	97.4	48	
	6:00	382	54.35	227.9	7.96	1.81	164.4	90.1	31.6	97.2	48	
	8:00	384	54.01	231.5	39.26	9.09	168.5	95.4	32	97.2	48	
	10:00	386	52.44	229.9	80.15	18.43	201.5	101.4	30	97.6	44	
	12:00	388	56.81	230	18.77	4.32	172.1	88.5	30.1	97.4	48	
	14:00	390	59.76	230.3	0.00	0.00	165.3	52.3	30.5	97.5	48	
	16:00	392	57.27	230.7	8.00	1.85	167.2	85.5	31.2	97.5	48	
	18:00	394	53.11	228.9	59.32	13.58	188.4	81.5	31.6	97.5	48	
	20:00	396	52.42	229.8	78.78	18.10	212.7	107.2	31.2	97.5	48	
	22:00	398	59.75	230.3	0.00	0.00	163.7	81.6	30.6	97.5	46	
5.10	0:00	400	57.31	230.6	7.96	1.84	175.3	96.3	30.8	97.5	46	change oil and clean the air filter
	2:00	402	55.91	231.7	19.71	4.57	182.9	102.8	30.5	97.2	47	
	4:00	404	59.57	230.5	0.00	0.00	141.5	70.2	30	97.4	46	
	6:00	406	56.1	231.4	39.06	9.04	191.2	101.7	28.9	97.5	47	
	8:00	408	54.63	228.8	79.31	18.15	210.3	107.6	29.1	97.6	46	
	10:00	410	56.11	230.8	39.13	9.03	186.2	89.2	30.1	97.6	46	
	12:00	412	56.22	231	39.61	9.15	183.7	81.9	30.4	97.5	47	
	14:00	414	58.38	230.5	7.99	1.84	183.1	82.5	30.5	97.3	47	
	16:00	416	55.98	231	39.25	9.07	187.7	79.7	30.6	97.5	46	
	18:00	418	54.94	229.6	59.15	13.58	183.8	85.2	30.8	97.5	46	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	20:00	420	58.74	231.4	19.60	4.54	180.2	75.2	30.5	97.2	47	
	22:00	422	56.09	230.6	39.13	9.02	185.7	78.8	30	97.4	46	
5.11	0:00	424	55.26	229.5	59.01	13.54	204.2	98.6	28.9	97.5	47	
	2:00	426	55.73	229.4	39.26	9.01	187.3	79.1	29.1	97.6	46	
	4:00	428	53.9	228.5	79.13	18.08	216.3	101.3	30.1	97.6	46	
	6:00	430	58.61	230.7	7.75	1.79	188.3	49.7	30.4	97.5	47	
	8:00	432	55.89	231.2	39.17	9.06	189.2	92.3	30.5	97.3	47	
	10:00	434	59.59	230.8	7.60	1.75	181.2	83.3	31	97.4	47	
	12:00	436	57.81	233.7	19.70	4.60	183.4	80.6	31.6	97.4	48	
	14:00	438	54.66	229.5	58.99	13.54	184.2	86	31.6	97.2	48	
	16:00	440	57.42	229.2	19.71	4.52	187.3	82.5	32	97.2	48	
	18:00	442	56.04	231	39.20	9.06	185.6	84.4	30	97.6	44	
	20:00	444	54.23	228.4	79.11	18.07	208.4	102.5	30.1	97.4	48	
	22:00	446	57.03	230.2	39.13	9.01	196.3	79.2	30.5	97.5	48	
5.12	0:00	448	58.73	231.5	19.64	4.55	187.1	75.9	31.2	97.5	48	
	2:00	450	59.12	228.8	79.22	18.13	191.2	96.2	31.6	97.5	48	change oil and clean the air filter
	4:00	452	55.18	228.7	59.52	13.61	489.2	84.5	31.2	97.5	48	
	6:00	454	59.93	230.3	0.00	0.00	112.8	78.5	30.6	97.5	46	
	8:00	456	55.82	230.8	39.09	9.02	128.6	80.1	30.8	97.5	46	
	10:00	458	59.42	230.3	0.00	0.00	116.9	80.1	30.5	97.2	47	
	12:00	460	57.33	231.8	19.89	4.61	121.2	79.2	30	97.4	46	
	14:00	462	56.95	231.09	39.28	9.08	129.6	81.6	28.9	97.5	47	
	16:00	464	54.17	228.8	79.27	18.14	160	91.9	29.1	97.6	46	
	18:00	466	57.13	231.8	19.68	4.56	121.3	78.6	30.1	97.6	46	
	20:00	468	55.79	230.8	39.09	9.02	131.8	81.6	30.4	97.5	47	
	22:00	470	56.78	230.2	19.56	4.50	121.1	77.8	30.5	97.3	47	
5.13	0:00	472	55.84	230.6	39.15	9.03	131.4	81.5	31	97.4	47	
	2:00	474	55.01	229.4	59.47	13.64	149.4	86.7	31.6	97.4	48	
	4:00	476	57.21	232.4	39.44	9.17	153.3	82.6	31.6	97.2	48	
	6:00	478	55.7	228.7	79.27	18.13	179.2	92.6	32	97.2	48	
	8:00	480	56.19	230.3	39.49	9.09	169	91	30	97.6	44	
	10:00	482	57.21	234.4	39.26	9.20	170	93	30.1	97.4	48	
	12:00	484	59.97	230	0.00	0.00	142	80	30.5	97.5	48	
	14:00	486	56.98	231	19.58	4.52	121.1	76.7	31.2	97.5	48	
	16:00	488	55.01	228.9	59.24	13.56	145.1	83.9	31.6	97.5	48	
	18:00	490	55.74	230.5	19.78	4.56	120.1	77.6	31.2	97.5	48	
	20:00	492	56.29	230.5	39.44	9.09	174.1	89.2	30.6	97.5	46	
	22:00	494	59.27	230.2	7.95	1.83			30.8	97.5	46	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
5.14	0:00	496	55.83	230.5	39.53	9.11	173.2	87.8	30.5	97.2	47	
	2:00	498	53.67	229	79.15	18.13	196.8	101.5	30	97.4	46	
	4:00	500	56.41	231.2	19.55	4.52	179.4	100.1	28.9	97.5	47	change oil and clean the air filter
	6:00	502	55.56	231.5	39.32	9.10	191.2	101.9	29.1	97.6	46	
	8:00	504	55.78	231.2	19.67	4.55	174.1	101.5	30.1	97.6	46	
	10:00	506	55.05	231.2	39.07	9.03	189.2	100.5	30.4	97.5	47	
	12:00	508	54.48	229.5	59.15	13.57	197.2	100.9	30.5	97.3	47	
	14:00	510	56.65	231.1	19.54	4.52	180.5	100.4	30.5	97.3	47	
	16:00	512	55.27	230.5	39.22	9.04	192.40	105.6	30.6	97.5	46	
	18:00	514	56.92	229.8	7.87	1.81	169.80	86.7	30.8	97.5	46	
	20:00	516	57.02	231.1	19.64	4.54	181.20	93.6	30.5	97.2	47	
	22:00	518	55.63	231.7	19.68	4.56	183.00	94.2	30	97.4	46	
5.15	0:00	520	55.58	230.3	39.42	9.08	213	102.2	28.9	97.5	47	
	2:00	522	55.5	213.2	39.22	8.36	210.8	113.3	29.1	97.6	46	
	4:00	524	56.04	230.9	7.75	1.79	184.1	96.1	30.1	97.6	46	
	6:00	526	56.4	231.2	19.43	4.49	181.5	99.3	30.4	97.5	47	
	8:00	528	54.45	229	59.40	13.60	205.2	155.3	30.5	97.3	47	
	10:00	530	57.57	231.3	7.85	1.82	166.5	82.1	31	97.4	47	
	12:00	532	55.14	231.2	39.15	9.05	181.2	111.5	31.6	97.4	48	
	14:00	534	54.54	229.3	59.05	13.54	208.3	152.6	31.6	97.2	48	
	16:00	536	55.63	231.3	19.56	4.52	168.2	83.5	32	97.2	48	
	18:00	538	54.41	231.3	39.25	9.08	188.2	121.9	30	97.6	44	
	20:00	540	58.88	230	78.83	18.13	223.2	164.7	30.1	97.4	48	
	22:00	542	55.67	231.5	19.44	4.50	193.2	126.1	30.5	97.5	48	
5.16	0:00	544	58.39	231	0.00	0.00	141.1	80.2	31.2	97.5	48	
	2:00	546	55.59	230.3	39.42	9.08	211	112	31.6	97.5	48	
	4:00	548	54.59	231.3	39.10	9.04	218.4	141.5	31.2	97.5	48	
	6:00	550	52.26	230	77.76	17.88	223.4	171.2	30.6	97.5	46	change oil and clean the air filter
	8:00	552	55.49	231.2	19.85	4.59	184.8	138.6	30.8	97.5	46	
	10:00	554	54.68	231.7	39.05	9.05	198.4	146.4	30.5	97.2	47	
	12:00	556	54.21	231.4	39.21	9.07	198.9	138.5	30	97.4	46	
	14:00	558	55.49	231.2	19.94	4.61	182.8	132.8	28.9	97.5	47	
	16:00	560	57.95	229.5	0.00	0.00	110.3	76.3	29.1	97.6	46	
	18:00	562	54.45	230.9	39.13	9.04	197.3	138.6	30.1	97.6	46	
	20:00	564	53.17	230	59.36	13.65	201.3	153.8	30.4	97.5	47	
	22:00	566	54.97	231.1	19.59	4.53	200.9	128.4	30.5	97.3	47	
5.17	0:00	568	54.21	230.9	19.51	4.50	200.7	121	31	97.4	47	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	2:00	570	59.75	230.5	0.00	0.00			31.6	97.4	48	
	4:00	572	57.06	230.9	19.55	4.51	187.2	126.8	31.6	97.2	48	
	6:00	574	56.04	230.5	39.20	9.04	195.6	145.8	32	97.2	48	
	8:00	576	53.52	230.1	77.80	17.90	199.8	170.6	30	97.6	44	
	10:00	578	56.01	230.8	39.03	9.01	194.8	140.2	30.1	97.4	48	
	12:00	580	55.03	229.5	59.17	13.58	209.9	153.5	30.5	97.5	48	
	14:00	582	57.04	230	19.67	4.52	165.3	85.5	31.2	97.5	48	
	16:00	584	55.13	229.1	59.16	13.55	209.1	136.1	31.6	97.5	48	
	18:00	586	59.62	230.8	0.00	0.00	154.6	76.8	31.2	97.5	48	
	20:00	588	56.14	229.2	19.64	4.50	186.4	125.3	30.6	97.5	46	
	22:00	590	55.42	231.4	39.93	9.24	197.2	140.5	30.8	97.5	46	
5.18	0:00	592	56.57	233.4	19.71	4.60	179.4	87.9	30.5	97.2	47	
	2:00	594	54.48	229.7	58.80	13.51	202.5	156.8	30	97.4	46	
	4:00	596	59.32	230.6	8.03	1.85	165.3	82.3	28.9	97.5	47	
	6:00	598	56.17	233.4	19.59	4.57	170.4	85.3	29.1	97.6	46	
	8:00	600	55.16	231.6	39.01	9.03	97.8	88.8	30.1	97.6	46	change oil and clean the air filter
	10:00	602	54.38	231.2	19.44	4.49	169.7	103.4	30.4	97.5	47	
	12:00	604	53.44	233.6	38.81	9.07	140	89.7	30.5	97.3	47	
	14:00	606	56.58	233.8	19.59	4.58	179.2	83.6	30.6	97.5	46	
	16:00	608	59.36	230.4	0.00	0.00	144.8	70.5	30.8	97.5	46	
	18:00	610	57.6	230.1	0.00	0.00	137.8	81.2	30.5	97.2	47	
	20:00	612	58.48	230.5	19.60	4.52	185.6	96.5	30	97.4	46	
	22:00	614	56.02	231.3	19.85	4.59	191.6	95.9	28.9	97.5	47	
5.19	0:00	616	54.12	230	59.13	13.60	215.5	120.3	29.1	97.6	46	
	2:00	618	59.79	230.7	0.00	0.00	136.8	79.2	30.1	97.6	46	
	4:00	620	55.27	231.1	39.11	9.04	190.3	102.5	30.4	97.5	47	
	6:00	622	59.21	230.5	0.00	0.00	167.2	81.2	30.5	97.3	47	
	8:00	624	55.08	231	39.26	9.07	180.2	85.5	31	97.4	47	
	10:00	626	53.48	230	58.89	13.54	191.6	119.2	31.6	97.4	48	
	12:00	628	59.21	230.6	0.00	0.00	145.5	80.5	31.6	97.2	48	
	14:00	630	55.24	231.2	39.02	9.02	193.1	113.4	32	97.2	48	
	16:00	632	55.07	230.5	53.77	12.39	221.3	130.5	30	97.6	44	
	18:00	634	55.31	230.1	19.55	0.45	195.4	97.9	30.1	97.4	48	
	20:00	636	54.23	229.9	59.21	13.61	221.5	114.6	30.5	97.5	48	
	22:00	638	55.46	230.7	20.05	4.63	188.2	101.7	31.2	97.5	48	
5.20	0:00	640	55.14	230.9	39.17	9.04	199.2	105.6	31.6	97.5	48	
	2:00	642	53.09	230.1	58.91	13.56	201.2	106.7	31.2	97.5	48	
	4:00	644	54.86	231.2	19.60	4.53	188.2	101.7	30.6	97.5	46	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	6:00	646	54.24	229.7	59.12	13.58	212.4	112.5	30.8	97.5	46	
	8:00	648	54.96	230.8	19.51	4.50	167.3	92.2	30.5	97.2	47	
	10:00	650	55.17	231.3	39.36	9.10	182.8	92.6	30	97.4	46	change oil and clean the air filter
	12:00	652	52.64	230.5	79.73	18.38	224.6	130.6	28.9	97.5	47	
	14:00	654	55.9	231.5	19.77	4.58	184.5	91.5	29.1	97.6	46	
	16:00	656	55.18	231.1	39.09	9.03	195.5	100.6	30.1	97.6	46	
	18:00	658	52.83	226.8	78.85	17.88	221.5	128.4	30.4	97.5	47	
	20:00	660	59.57	230.7	0.00	0.00	155.6	75.5	30.5	97.3	47	
	22:00	662	58.05	230.7	7.97	1.84	176.5	79.8	31	97.4	47	
5.21	0:00	664	55.29	231.4	19.52	4.52	188.4	86.6	31.6	97.4	48	
	2:00	666	54.9	231.2	39.22	9.07	197.8	95.5	31.6	97.2	48	
	4:00	668	55.43	231.4	19.77	4.57	179.5	80.6	32	97.2	48	
	6:00	670	55.17	231.2	39.07	9.03	188.6	98.8	30	97.6	44	
	8:00	672	52.82	226.9	78.82	17.88	215.6	122.2	30.1	97.4	48	
	10:00	674	59.56	230.6	0.00	0.00	155.4	75.5	30.5	97.5	48	
	12:00	676	55.05	231.1	39.10	9.04	182.8	92.6	31.2	97.5	48	
	14:00	678	57.4	230.3	7.99	1.84	166.5	82.1	31.6	97.5	48	
	16:00	680	54.24	229.8	58.79	13.51	208.3	152.6	31.2	97.5	48	
	18:00	682	58.28	230.1	8.00	1.84	178.5	93.6	30.6	97.5	46	
	20:00	684	54.95	231.3	19.39	4.48	188.4	92.5	30.8	97.5	46	
	22:00	686	53.57	230.6	59.32	13.68	210.5	112.5	30.5	97.2	47	
5.22	0:00	688	58.5	230.8	8.00	1.85	178.6	90.2	30	97.4	46	
	2:00	690	54.96	231.4	39.01	9.03	199.8	102.4	28.9	97.5	47	
	4:00	692	55.93	230.1	7.69	1.77	178.4	88.5	29.1	97.6	46	
	6:00	694	52.53	226.7	79.74	18.08	225.4	131.2	30.1	97.6	46	
	8:00	696	55.07	231.2	39.10	9.04	192.4	105	30.4	97.5	47	
	10:00	698	55.81	231.3	19.52	4.51	181.2	93.6	30.5	97.3	47	
	12:00	700	54.72	23.13	39.03	0.90	197.2	105.1	30.6	97.5	46	change oil and clean the air filter
	14:00	702	53.83	230.3	74.68	17.20	218.7	120.5	30.8	97.5	46	
	16:00	704	56.41	232	75.16	17.44	224.8	126.9	30.5	97.2	47	
	18:00	706	56.99	233.1	19.62	4.57	188.3	95.4	30	97.4	46	
	20:00	708	56.04	231.2	19.67	4.55	186.6	97.6	28.9	97.5	47	
	22:00	710	54.47	231.6	39.28	9.10	199.1	101.5	29.1	97.6	46	
5.23	0:00	712	52.25	228.9	78.40	17.95	224.6	128.4	30.1	97.6	46	
	2:00	714	55.36	230.7	19.70	4.54	176.8	89.6	30.4	97.5	47	
	4:00	716	54.48	231.1	39.20	9.06	201.5	104.1	30.5	97.3	47	
	6:00	718	59.05	230.6	0.00	0.00	155.6	75.4	31	97.4	47	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	8:00	720	53.36	231.7	59.35	13.75	215.7	118.4	31.6	97.4	48	
	10:00	722	59.21	230.1	8.00	1.84	182.6	89.6	31.6	97.2	48	
	12:00	724	55.53	231.3	19.54	4.52	194.8	95.6	32	97.2	48	
	14:00	726	52.29	231.1	79.17	18.30	224.6	126.8	30	97.6	44	
	16:00	728	56.2	231.2	19.60	4.53	182.4	87.6	30.1	97.4	48	
	18:00	730	54.51	231.2	38.98	9.01	197.4	96.1	30.5	97.5	48	
	20:00	732	58.59	230.3	0.00	0.00	158.6	75.9	31.2	97.5	48	
	22:00	734	54.96	230.9	39.21	9.05	201.2	97.8	31.6	97.5	48	
5.24	0:00	736	53.99	229.5	57.97	13.30	218.7	108.8	31.2	97.5	48	
	2:00	738	55.02	230.6	19.63	4.53	180.5	87.8	30.6	97.5	46	
	4:00	740	55.28	230.4	19.54	4.50	188.8	89.2	30.8	97.5	46	
	6:00	742	52.84	231.4	79.07	18.30	221.2	120.5	30.5	97.2	47	
	8:00	744	55.27	231.1	39.13	9.04	184.6	85.9	30	97.4	46	
	10:00	746	54.85	230.7	39.33	9.07	190.5	86.6	28.9	97.5	47	
	12:00	748	58.12	231.5	7.99	1.85	168.4	74.6	29.1	97.6	46	
	14:00	750	55.28	229.8	7.92	1.82	170.5	80.6	30.1	97.6	46	change oil and clean the air filter
	16:00	752	55.37	230.1	19.39	4.46	178.6	85.6	30.4	97.5	47	
	18:00	754	53.57	230.6	59.24	13.66	201.4	103.6	30.5	97.3	47	
	20:00	756	55.29	230.5	19.50	4.49	178.8	84.5	31	97.4	47	
	22:00	758	55.3	229.7	7.85	1.80	168.4	78.9	31.6	97.4	48	
5.25	0:00	760	53.48	230.5	59.25	13.66	198.4	96.2	31.6	97.2	48	
	2:00	762	54.62	231	39.13	9.04	175	81.4	32	97.2	48	
	4:00	764	58.12	231.6	7.99	1.85	158.3	65.5	30	97.6	44	
	6:00	766	54.17	230.7	39.60	9.14	180.2	85.5	30.1	97.4	48	
	8:00	768	53.56	230.6	59.23	13.66	202.3	105.2	30.5	97.5	48	
	10:00	770	55.28	230.5	19.51	4.50	163.5	76.6	31.2	97.5	48	
	12:00	772	56.17	230.1	19.58	4.51	172.7	78.7	31.6	97.5	48	
	14:00	774	53.34	230.5	19.50	4.49	163.5	78.9	31.2	97.5	48	
	16:00	776	54.17	230.6	39.60	9.13	189.6	85.5	30.6	97.5	46	
	18:00	778	53.56	228.1	59.05	13.47	172.8	90.4	30.8	97.5	46	
	20:00	780	56.73	230.7	19.40	4.48	175.2	89.8	30.5	97.2	47	
	22:00	782	53.58	229.7	59.16	13.59	195.6	95.4	30	97.4	46	
5.26	0:00	784	54.91	230.1	19.50	4.49	178.6	88.7	28.9	97.5	47	
	2:00	786	54.51	230.2	19.42	4.47	169.8	83	29.1	97.6	46	
	4:00	788	59.04	230.1	0.00	0.00	152.6	72	30.1	97.6	46	
	6:00	790	55.6	230.3	19.74	4.55	167.2	81.2	30.4	97.5	47	
	8:00	792	54.16	230.6	39.61	9.13	181.3	86.9	30.5	97.3	47	
	10:00	794	58.34	230.5	8.00	1.84	158.2	77.2	30.6	97.5	46	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repeust#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	12:00	796	55.94	230.4	19.72	4.54	176.8	92.8	30.8	97.5	46	
	14:00	798	53.91	229.7	59.11	13.58	176.4	92.8	30.5	97.2	47	
	16:00	800	54.91	230.1	19.50	4.49	178.6	89.8	30	97.4	46	change oil and clean the air filter
	18:00	802	55.18	230.5	39.11	9.01	158.4	86.9	28.9	97.5	47	
	20:00	804	57.75	230.9	8.00	1.85	151.2	84.6	29.1	97.6	46	
	22:00	806	53.44	232.1	59.40	13.79	201.3	102.5	30.1	97.6	46	
5.27	0:00	808	58.9	230.1	7.97	1.83	148.3	85.2	30.4	97.5	47	
	2:00	810	55.41	230.9	19.78	4.57	180.2	89.2	30.5	97.3	47	
	4:00	812	54.88	231	39.07	9.03	178.5	93.6	31	97.4	47	
	6:00	814	58.1	230.3	8.00	1.84	142.7	82.9	31.6	97.4	48	
	8:00	816	55.6	230.2	19.74	4.54	179.5	93.2	31.6	97.2	48	
	10:00	818	59.36	230.4	0.00	0.00	136.8	79.2	32	97.2	48	
	12:00	820	57.14	231.4	19.32	4.47	180.2	95.3	30	97.6	44	
	14:00	822	56.52	228.2	7.95	1.81	130.4	92.7	30.1	97.4	48	
	16:00	824	54.21	229.2	59.04	13.53	196.3	102.5	30.5	97.5	48	
	18:00	826	52.7	229.2	79.45	18.21	201.58	112.3	31.2	97.5	48	
	20:00	828	55.46	230.3	19.52	4.50	181.3	96.2	31.6	97.5	48	
	22:00	830	53.68	228	59.54	13.58	216.7	116.8	31.2	97.5	48	
5.28	0:00	832	59.34	230.5	0.00	0.00	137.8	81.2	30.6	97.5	46	
	2:00	834	57.25	231.2	19.24	4.45	181.1	94.7	30.8	97.5	46	
	4:00	836	52.5	226.9	79.19	17.97	218.7	120.3	30.5	97.2	47	
	6:00	838	53.72	228.1	59.50	13.57	217.2	118.4	30	97.4	46	
	8:00	840	58.1	230.5	7.88	1.82	184.2	98.1	28.9	97.5	47	
	10:00	842	54.84	231.8	19.63	4.55	185.6	96.5	29.1	97.6	46	
	12:00	844	55.05	231.1	19.79	4.57	186.7	96.8	30.1	97.6	46	
	14:00	846	53.86	229.4	59.25	13.59	215.5	120.3	30.4	97.5	47	
	16:00	848	55.18	230.6	39.13	9.02	190.3	102.5	30.5	97.3	47	
	18:00	850	54.91	230.6	39.25	9.05	193.5	103.5	31	97.4	47	change oil and clean the air filter
	20:00	852	56.3	230.1	7.77	1.79	183.2	92.5	31.6	97.4	48	
	22:00	854	55.1	231.2	19.83	4.58	187.6	98.2	31.6	97.2	48	
5.29	0:00	856	54.1	230.8	19.83	4.58	186.3	98.1	32	97.2	48	
	2:00	858	55.13	230.3	39.21	9.03	190.5	101.2	30	97.6	44	
	4:00	860	55.15	230.3	19.91	4.59	185.7	99.6	30.1	97.4	48	
	6:00	862	53.85	229.5	59.24	13.60	213.8	118.7	30.5	97.5	48	
	8:00	864	55.15	229.7	39.33	9.03	187.2	101.8	31.2	97.5	48	
	10:00	866	54.77	230.7	19.48	4.49	191.6	95.9	31.6	97.5	48	
	12:00	868	55.04	231.4	39.05	9.04	192.5	98.4	31.2	97.5	48	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repuest#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	14:00	870	52.85	230.2	75.80	17.45	219.6	116.1	30.6	97.5	46	
	16:00	872	55.13	231.4	39.13	9.05	179.5	89.5	30.8	97.5	46	
	18:00	874	53.28	230.7	59.40	13.70	162.3	130.5	30.5	97.2	47	
	20:00	876	54.83	231.4	19.68	4.55	185.2	92.5	30	97.4	46	
	22:00	878	57.53	230.5	8.09	1.86	200.2	91.4	28.9	97.5	47	
5.30	0:00	880	55.13	231.5	39.07	9.04	161.2	92.4	29.1	97.6	46	
	2:00	882	52.24	229.2	59.04	13.53	184.1	112.4	30.1	97.6	46	
	4:00	884	53.26	230.6	59.39	13.70	204.2	111.2	30.4	97.5	47	
	6:00	886	54.29	231.3	19.68	4.55	161.4	92.2	30.5	97.3	47	
	8:00	888	53.74	229.9	57.82	13.29	198.7	111.9	30.6	97.5	46	
	10:00	890	56.44	230.1	19.07	4.39	182.8	112.4	30.8	97.5	46	
	12:00	892	53.91	231.4	59.34	13.73	176.9	116.2	30.5	97.2	47	
	14:00	894	55.12	230.9	19.77	4.56	197.6	100.1	30	97.4	46	
	16:00	896	54.91	231.3	39.36	9.10	199.2	97.2	28.9	97.5	47	
	18:00	898	56.95	231	7.65	1.77	183.6	90.5	29.1	97.6	46	
	20:00	900	55.01	231	19.63	4.53	199.2	102.6	30.1	97.6	46	change oil and clean the air filter
	22:00	902	54.81	230.4	39.36	9.07	180.4	104.5	30.4	97.5	47	
5.31	0:00	904	54.85	231.4	38.91	9.00	163.2	104.6	30.5	97.3	47	
	2:00	906	54.6	230.4	39.40	9.08	172.9	113.4	31	97.4	47	
	4:00	908	53.15	228.5	59.21	13.53	197.3	113.9	31.6	97.4	48	
	6:00	910	55.6	231.6	19.56	4.53	188.2	97.9	31.6	97.2	48	
	8:00	912	54.43	232.4	39.18	9.11	199.7	108.6	32	97.2	48	
	10:00	914	51.8	229.8	78.79	18.11	165.3	112.1	30	97.6	44	
	12:00	916	58.46	230.9	0.00	0.00	164.5	84.2	30.1	97.4	48	
	14:00	918	55.2	231.3	39.33	9.10	187.2	104.8	30.5	97.5	48	
	16:00	920	57.31	230.5	7.99	1.84	164.3	85.2	31.2	97.5	48	
	18:00	922	54.83	231.2	19.99	4.62	167.3	96.5	31.6	97.5	48	
	20:00	924	54.89	231.5	39.09	9.05	168.2	102.1	31.2	97.5	48	
	22:00	926	54.89	231.2	39.28	9.08	198.2	102.1	30.6	97.5	46	
6.1	0:00	928	55.13	230.4	59.21	13.64	205.8	112.4	30.8	97.5	46	
	2:00	930	55.13	231.6	19.56	4.53	189.2	89.9	30.5	97.2	47	
	4:00	932	55.2	231.1	19.68	4.55	190.1	90.6	30	97.4	46	
	6:00	934	54.68	230.1	39.28	9.04	202.4	112.3	28.9	97.5	47	
	8:00	936	53.24	230.2	7.99	1.84	184.5	88.7	29.1	97.6	46	
	10:00	938	55.33	231.2	39.24	9.07	196.9	108.5	30.1	97.6	46	
	12:00	940	56.52	230.5	0.00	0.00	162.3	88.3	30.4	97.5	47	
	14:00	942	55.03	231.5	19.46	4.50	185.2	88.3	30.5	97.3	47	
	16:00	944	55.9	231.4	39.36	9.11	200.2	106.3	31	97.4	47	

Engine I.D.#	T2310018030092977			Unit I.D.#	2V80FD				Test Content	Duribility		check
Station.#	D3-102-2#			Repuest#	n/a				Test Date.h	1000h		
Date	Recording time	Total run hours	Frequency Hz	Voltage, V	Current, A	Power, kW	Cylinder head Temp, °C	Oil Temp, °C	Temperature °C	Atmospheric Pressure kPa	Relative Humidity %	Net engine oil Added
	18:00	946	59.54	230.1	0.00	0.00	161.2	80.7	31.6	97.4	48	
	20:00	948	55.02	231.5	19.46	4.50	184.4	88.2	31.6	97.2	48	
	22:00	950	54.29	229.8	59.11	13.58	204.2	104.8	32	97.2	48	change oil and clean the air filter
6.2	0:00	952	60.28	230.4	0.00	0.00	161.4	82.4	30	97.6	44	
	2:00	954	54.21	229.9	59.09	13.58	198.7	103.6	30.1	97.4	48	
	4:00	956	55.69	231.4	39.15	9.06	182.8	97.6	30.5	97.5	48	
	6:00	958	59.58	230.2	8.01	1.84	176.9	85.2	31.2	97.5	48	
	8:00	960	54.45	229.9	59.12	13.59	197.6	103.7	31.6	97.5	48	
	10:00	962	54.73	229.3	59.07	13.54	199.2	104.1	31.2	97.5	48	
	12:00	964	57.57	230.7	19.87	4.58	180.4	96.8	30.6	97.5	46	
	14:00	966	55.73	231.3	39.32	9.09	199.2	105.6	30.8	97.5	46	
	16:00	968	58	231.4	19.60	4.54	180.4	102.6	30.5	97.2	47	
	18:00	970	62.1	230.5	0.00	0.00	163.2	92.8	30	97.4	46	
	20:00	972	59.59	230.2	8.00	1.84	172.9	96.7	28.9	97.5	47	
	22:00	974	55.72	231.2	39.30	9.09	197.3	103.8	29.1	97.6	46	
6.3	0:00	976	59.93	231.4	19.48	4.51	188.2	101.7	30.1	97.6	46	
	2:00	978	58.68	230.5	39.26	9.05	199.7	105.2	30.4	97.5	47	
	4:00	980	62	231.2	0.00	0.00	165.3	90.3	30.5	97.3	47	
	6:00	982	60.66	231.5	19.67	4.55	188.3	102.2	30.5	97.5	48	
	8:00	984	59.35	245.4	39.37	9.66	187.2	103.6	31.2	97.5	48	
	10:00	986	62.81	244.9	0.00	0.00	164.3	90.2	31.6	97.5	48	
	12:00	988	59.58	231.69	19.62	4.55	167.3	92.2	31.2	97.5	48	
	14:00	990	61.68	230.5	7.71	1.78	168.2	90.3	30.6	97.5	46	
	16:00	992	59.78	226.9	79.19	17.97	183.3	102.1	30.8	97.5	46	
	18:00	994	57.37	226.7	59.21	13.42	179.2	101.7	30.5	97.2	47	
	20:00	996	59.27	231.3	19.55	4.52	169.2	98.6	30	97.4	46	
	22:00	998	59.13	230.5	39.26	9.05	171.3	93.7	28.9	97.5	47	
6.4	0:00	1000	62.7	230.7	0.00	0.00	157.8	82.9	29.1	97.6	46	



Huang Wan/Manager

Date: June 19, 2018

REVISION(S)

HISTORY

Rev. Date	Rev. No.	Description	Page No.
18.11.2019	01	Modify the location of the manufacturer's statutory marking to enclosure of the engine	6
		Modify the method of attachment of the statutory marking to adhesive label or engraved	6
		Correct the maximum no load speed to 3800±100 rpm	7
		Modify the types of spark plug	18
		Add DF value of HC+NOx	33, 37