



अंतर्राष्ट्रीय ऑटोमोटिव प्रौद्योगिकी केन्द्र
INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY

[A Division of NATRiP Implementation Society (NATIS), Govt. of India]

C	O	T	G	0021
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Date : 06th February 2024

TYPE APPROVAL CERTIFICATE

FOR

Retro-fit Emission Control Devices (RECD) Compliance

Cert	Report	Specs	Drg	Total
06	12	129	16	163 pgs

1. Based on the verification of documents & trials conducted on RECD model "C2-CS1800-R12" (Family designation C2-R12) for below mentioned manufacturer and it is certified that the following RECD model complies with the provisions of Type Approval of CPCB System Procedure for Retro-fit Emission Control Devices (RECD) Compliance to Diesel Power Generating Set Engines Up to Gross Mechanical Power 800 kW, as per NGT Order/report "Report filed in O.A. No. 681/2018 dated 6.08.2019".

Documental Reference				RECD Manufacturer	
Current Certificate		M/s Chakr Innovation Pvt. Ltd. Survey No. 236, Hissa No. 7 and Survey No. 237 Hinjewadi, Taluka Mulshi, Pune, Maharashtra - 411057 Plant : Hinjewadi, Pune			
RECD Family Designation		Engine Manufacturer		Tested Engine Model	
C2-R12		M/s Cummins India Limited		KTA-38-G2-I	
RECD Model			Engine Cubic Capacity		Gross Engine Power
C2-CS1800-R12			38000 cm ³		664 kW @ 1500 rpm
Engine Baseline emissions	CPCB Stage -I	Class of RECD	Class II	Engine Manufacturing Date	September 2007
S. No.	Item Description	Parent RECD Type			
Annexure-II					
RECD suitable for Phase I Certified Diesel Generator engine / engine families					Annexure-III

- ## 2. Validity of the Certificate

This Type Approval Certificate is valid for Genset engine CPCB Stage -I effective from 01.07.2004 to 30.06.2014.	a.	As per System and procedure for Emission Compliance of Retro-fit Emission Control Devices(RECD) for Diesel Power Generation Set Engines up to Gross Mechanical power 800kW as per NGT Order/report "Report filed in O.A. No. 681/2018 dated 06.08.2019 or until further amendment in the MoEFCC rule, whichever is earlier.
	b.	No change in specified RECD technical specification.

3. It is certified that the above **RECD Model** (Details listed in Annexure-II) comply with the emission limits for Retro-fit Emission Control Devices (RECD) to Diesel Power Generating Set Engines having Gross Mechanical Power **499.3kW to 663.6kW**, as prescribed under the following rules, notified by **Ministry of Environment, Forest and Climate Change (MoEFCC), Govt. of India**:

Rule No.	Description	Date
CPCB-PCLS/12/2021-22	System and procedure for Emission Compliance of Retro-fit Emission Control Devices(RECD) for Diesel Power Generating Set Engines up to Gross Mechanical power 800kW as per NGT Order/report "Report filed in O.A. No. 681/2018 dated 6.08.2019	01.02.2022

4. COP : COP shall be completed by **30.06.2024** as per CPCB Procedure, for details refer **COP Annexure-I**.

AUTHORISED SIGNATORY			
 SITARAM KASHYAP DEPUTY GENERAL MANAGER		 SAURABH DALELA DIRECTOR	 Page 1 of 6

Office Address : Centre-I : Plot No.-26, Sector-3, HSIIDC, IMT-Manesar, Gurugram-122050. Haryana (India)

Centre-II : Plot No.-01, Sector-M-11, HSIIDC, IMT-Manesar, Gurugram-122051, Haryana (India)

Phone : 0124-4586111, Fax : +91-124-2290005. E-mail: team@icat.in, Website : www.icat.in

(An ISO 9001, ISO 14001 and ISO 45001 certified, scope wise NABL accredited and BIS recognised Test House)

1. ICAT issues "Type Approval Certificates" (TAC) for vehicles/ engines/gensets/ parts/ assemblies etc. based on the documents produced and/or prototype / vehicle(s) submitted by the applicant and testing thereof.
2. ICAT issues TAC in compliance to Motor Vehicle Act/ Central Motor Vehicle Rules/ Central Pollution Control Board rules and their provisions as amended from time to time or any other statutory orders under which ICAT is authorized. Other Rules/Acts are outside the purview/scope of the TAC.
3. Test(s) on prototype is/are carried out on the basis of standard procedures as notified under specific rules. Results of such tests are property of bearer of TAC. These results cannot be disclosed unless specifically ordered by Government, Court, etc.
4. The bearer of the TAC is under the obligation to ensure production strictly as per the provisions of the specific TAC.
5. ICAT is not responsible for testing each vehicles/components/parts/assemblies etc. for which TAC is issued. Further, ICAT is not responsible for ensuring manufacturing quality of the type approved vehicles/ components/ parts/ assemblies etc.
6. ICAT is no way responsible for any misuse or copying of any design/type/system in connection with entire vehicle/ components/parts and assemblies covered under the TAC.
7. Breach of any statutory provision of Indian laws or laws of other countries, will be sole responsibility of the bearer of the TAC and ICAT shall not be liable for any claims or damages. The bearer shall alone be liable for the same, and shall undertake to indemnify ICAT in this regard.
8. ICAT has the right, but not under obligation to initiate cancellation / withdrawal of the certificate issued, in case of any fraud, misrepresentation, when it surfaces and comes in the knowledge of ICAT.

SECURITY FEATURES

1. Ultraviolet (UV) printing : This certificate contains following the information printed in UV ink which can be read only under UV light:

- a) Certificate number (below the certificate number on the top left side)
- b) Signature of Director (bottom right side)
2. Pantograph (top right below the number of pages) : This box will appear only on original document
3. Watermark (diagonally in the background on full page) : The water mark consists of company name and model name
4. Micro text (horizontal line in signature boxes) : The thin hairline consists of company name and model name
5. Secure Mark (topmost right) : The QR code consists of company name, certificate number & date and model name

1 a)	CERTIFICATE PCH COMPLIANCE TO THE CENTRAL MOTOR VEHICLES RULES	Date: _____ <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Cert</td> <td style="width: 33%;">Tabl 7</td> <td style="width: 33%;">Tabl 8</td> </tr> <tr> <td style="text-align: center;">11</td> <td style="text-align: center;">11</td> <td style="text-align: center;">11</td> </tr> </table>	Cert	Tabl 7	Tabl 8	11	11	11									
Cert	Tabl 7	Tabl 8															
11	11	11															
1. In order to establish compliance to the provisions of CARB, 1989, applicable as on date, documentary verification / necessary tests was carried out on the following base model & its variants submitted by the vehicle manufacturer named below:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Vehicle Manufacturer</th> </tr> <tr> <td style="height: 20px; text-align: center;">XXXX</td> </tr> </table>	Vehicle Manufacturer	XXXX													
Vehicle Manufacturer																	
XXXX																	
2. Current certificate	Plant: _____																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">Gasoline Engine Model / Type</th> <th style="width: 33%;">Power</th> <th style="width: 33%;">Capacity (cm³)</th> </tr> <tr> <td style="height: 20px; text-align: center;">Base Model</td> <td></td> <td></td> </tr> <tr> <td style="height: 20px; text-align: center;">ABC</td> <td></td> <td></td> </tr> </table>	Gasoline Engine Model / Type	Power	Capacity (cm ³)	Base Model			ABC			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 100%;">Engine Manufacturer</th> </tr> <tr> <td style="height: 20px;"></td> </tr> <tr> <td style="height: 20px;"></td> </tr> </table>		Engine Manufacturer					
Gasoline Engine Model / Type	Power	Capacity (cm ³)															
Base Model																	
ABC																	
Engine Manufacturer																	
3. Base Model																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 40%;">Base Model</th> <th style="width: 30%;">Type & Category</th> <th style="width: 20%;">Seating Capacity (incl. driver)</th> <th style="width: 10%;">GVW (kg)</th> </tr> <tr> <td style="height: 20px; text-align: center;">ABC</td> <td></td> <td></td> <td></td> </tr> </table>			Base Model	Type & Category	Seating Capacity (incl. driver)	GVW (kg)	ABC										
Base Model	Type & Category	Seating Capacity (incl. driver)	GVW (kg)														
ABC																	
4. Brief technical specifications (XXXXXX) of the base model & its variants as supplied by the vehicle manufacturer are enclosed with this certificate. Detailed specifications (XXXXXX, XXXXXXX) of the base model & its variants are also separately stated to the vehicle manufacturer.																	
5. It is certified that the above base model & its variants comply with the provisions of the CMVR, 1989, as amended up-to-date, including following requirement(s), as detailed in ANNEXURE - I, II & III.																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">Standards</th> <th style="width: 25%;">Notification</th> <th style="width: 25%;">Date</th> <th style="width: 20%;">Effective From</th> <th style="width: 5%;">Applicable CMVR</th> </tr> <tr> <td style="height: 20px; text-align: center;">Bharat Stage - VI (including CBO - I)</td> <td></td> <td></td> <td></td> <td style="text-align: center;">115 (10) (i)</td> </tr> <tr> <td colspan="5" style="text-align: center; height: 20px;">Refer ANNEXURE - II</td> </tr> </table>			Standards	Notification	Date	Effective From	Applicable CMVR	Bharat Stage - VI (including CBO - I)				115 (10) (i)	Refer ANNEXURE - II				
Standards	Notification	Date	Effective From	Applicable CMVR													
Bharat Stage - VI (including CBO - I)				115 (10) (i)													
Refer ANNEXURE - II																	
6. This Certificate is issued as per CMVR Rules 126, to establish compliance with the Central Motor Vehicles Rules, 1989, and shall not be construed as a certificate of compliance in any rule other than those listed in ANNEXURE - I, II, III & IV. Compliance to these rules has been verified solely on the use of specific components / parts / assemblies etc. details of which are given in the detailed specifications duly endorsed by ICAT as mentioned in clause 1 above. It is the vehicle manufacturer's responsibility to ensure that the use of such components / assemblies etc. before substitution of the vehicle for registration.																	

AUTHORISED SIGNATORY		Please turn over for Disclaimers	
<u>4</u>		<u>1 b)</u>	<u>4</u>
NAME DESIGNATION		NAME DESIGNATION	Page 1 of 1



C O T G 0021

Date : 06th February 2024

COP Annexure-I

Criteria*	COP Required
RECD Manufacturer/Importer/Retrofitter	RECDs fitted on engines of all ratings shall be subjected to the verification of CoP once for every 500 units per family or once a year, whichever is earlier Wherever applicable, RECDs fitted on engines of all ratings of engines shall be subjected to the verification of PCD once every CoP-year by PCD family (ies) representative RECD(s). Such demonstration is PCD family dependent and irrespective of combined volumes produced and sold under such family (ies)

* As Applicable

Annexure-II

S No	Item Description	Parent RECD Type
		Type 1
1	Manufacturing Plant address	M/s Chakr Innovation Private Limited, Survey No. 236 & 237, Hissa No.7, Taluka - Mulshi, Rajiv Gandhi Infotech Park, Hinjewadi Phase -1, Pune, Maharashtra - 411057
2	Manufacturer's trade name or mark	Chakr Innovation Private Limited
3	RECD family designation	C2-R12
4	RECD type/model designation	C2-CS1800-R12
5	RECD Category (Domestic/Imported)	Domestic
6	Class of RECD	Class II
7	Type Identification of the RECD	Continuous
8	Location of type ID marking	Refer Specification no. CIPL/TA/C2-CS1800-R12 dtd. 25.01.2024 Clause no 1.8
9	Identifying part number(s) of the RECD	C2-CS1800-R12-V2.3
10	Engine/ Engine-Family for which the RECD is intended (application range)	KTA-38-G2-I
11	PM Reduction Efficiency of the RECD	81.06%
12	Designed for fitment to an engine meeting the emissions requirements of (Regulation and Stage):	CPCB Stage -I

ICAT Ref No. 2023-1878; IOCS No: 173095

Base Engine Type Approval Certificate number ARAI/MoEF/DGTA/CIL-F14/2004-44

Test Report Reference CT0ET 0033 dt. 27/01/2024

AUTHORISED SIGNATORY

			
SITARAM KASHYAP DEPUTY GENERAL MANAGER		SAURABH DALELA DIRECTOR	Page 2 of 6



C O T G 0021

Date : 06th February 2024

Annexure-III

List of applicable engine(s) as per GSR 371(E) dtd. 17.05.2002, GSR 520(E) dtd. 01.07.2003 and GSR 448(E) dtd. 12.07.2004 certified In -Use DG sets for corresponding RECD models of RECD Family.

S. No.	Manufacturer Name & Address	Engine Family	Engine Model	Rated Gross Mechanical Declared Power	Type Approval Certificate Number
1	AB VOLVO PENTA SE40508, GOTHENBURG, SWEDEN	F12	TWD1653GE	564 kW	ARAI/MOEF/DGTA-II/IMP/VOLVO-F12/2013-66 Dt. 13-12-2013
2			TWD1652GE	522 kW	
3		F9	TAD1642GE	504 kW	ARAI/MOEF/DGTA/IMP/VOLVO-F9/2011-16 Dt. 02-05-2011
4		F10	TWD 1643 GE	553 kW	ARAI/MOEF/DGTA/IMP/VOLVO-F10/2012-14 Dt. 13-06-2012
5	Caterpillar Inc. 100 NE Adams, Peoria, IL, USA.	F12	C18-2GP-1	540 kW	ARAI/MoEF/DGTA-II/IMP/CIUSA-F12/2013-69 Dt. 01-11-2013
6		F11	C-15-GS-1	495 kW	ARAI/MOEF/DGTA/IMP/CIUSA/F1/2010-011 Dt. 16-02-2010
7	Caterpillar India Pvt. Ltd. Mathagondapalli, TN	F4	3412 DITA-GS-2	586 kW	ARAI/MOEF/DGTA/CIPL-F4/2008-020 Dt. 21-05-2008
8			3412 DITA-GS-1	494 kW	
9			3412 DITA-GP-2	533 kW	
10		F5	3412 DITA-GS-3	696 kW	ARAI/MOEF/DGTA/CIPL-F5/2008-021 Dt. 21-05-2008
11			3412 DITA-GP-3	633 kW	
12		F6	C-18-GS-3	592 kW	ARAI/MOEF/DGTA/CIPL-F6/2008-022 Dt. 21-05-2008
13			C-18-GS-1	509 kW	
14			C-18-GP-2	498 kW	
15			C-18-GS-2	548 kW	
16			C-18-GP-3	527 kW	
17	Cummins India Ltd. Kothrud, Pune 411038	F14	KTA-38-G2-I	664 kW	ARAI/MOEF/DGTA/CIL-F14/2004-014 Dt. 26-07-2014
18		F14	KTA-38-G2-I	664 kW	ARAI/MOEF/DGTA/CIL-F14/2004-44
19		F15	VTA-28-G5-I	559.5 kW	ARAI/MOEF/DGTA/CIL-F15/2004-018 Dt. 02-06-2004
20		F15	VTA28-G5I	559.5 kW	ARAI/MOEF/DGTA/CIL-F15/2005-16 Dt. 01-06-2005
21		F33	QSK19-G7-S	618 kW	ARAI/MoEF/DGTA-II/CIPL-F33/2012-026 Dt. 05-10-2012
22			QSK19-G6-P	531 kW	
23			QSK19-G6-S	583 kW	
24			QSK19-G7-P	564 kW	
25		F33	QSK19-G7	618 kW	ARAI/MoEF/DGTA-II/CIPL-F33/2012-026-E1 Dt. 18-04-2013
26			QSK19-G6	583 kW	
27		F14	KTA-38-G2-I	663.9 kW	ARAI/MOEF/DGTACIL-F14/2007-046 Dt. 08-07-2007
28		F15	VTA28-G5I	560 kW	ARAI/MOEF/DGTA/CIL-F15/2007-055 Dt. 31-08-2007
29			VTA28-G3I	530 kW	

AUTHORISED SIGNATORY

			
SITARAM KASHYAP DEPUTY GENERAL MANAGER		SAURABH DALELA DIRECTOR	Page 3 of 6


C O T G 0021
Date : 06th February 2024
Annexure-III Cont.

S. No.	Manufacturer Name & Address	Engine Family	Engine Model	Rated Gross Mechanical Declared Power	Type Approval Certificate Number
30	Cummins India Ltd. Kothrud, Pune 411038	F26	QSK-23-G3I	656 kW	ARAI/MOEF/DGTA/CIL-F26/2007-059 Dt. 20-09-2007
31	CPIPL Hosur	F4	3412 DITA-GS-2	586 kW	ARAI/MOEF/DGTA/CPIPL-F4/2007-005 Dt. 02-12-2007
32			3412 DITA-GS-1	494 kW	
33			3412 DITA-GP-2	533 kW	
34		F5	3412 DITA-GS-3	696 kW	ARAI/MOEF/DGTA/CPIPL-F5/2007-006 Dt. 02-12-2007
35			3412 DITA-GP-3	633 kW	
36		F6	C-18-GS-3	592 kW	ARAI/MOEF/DGTA/CPIPL-F6/2007-007 Dt. 02-12-2007
37			C-18-GS-1	509 kW	
38			C-18-GP-2	498 kW	
39			C-18-GS-2	548 kW	
40			C-18-GP-3	527 kW	
41	Deutz AG Germany Ottostrasse 1, D-51149 Köln (Porz-Eil)/Germany	F10	BF8M1015CP	490 kW	ARAI/MoEF/DGTA-II/IMP/DEU-F10/2013-39 Dt. 09-05-2013
42		F10	BF8M1015CP	490 kW	ARAI/MoEF/DGTA/IMP/DEU-F10/2011-034 Dt. 27-07-2011
43	Doosan Infracore Co. Ltd., 7-11, Hwasu-dong, Dong-gu, Incheon, Korea	F2	P180LE IN02	496 kW	ARAI/MOEF/DGTA/IMP/DICL-F2/2010-079 Dt. 03-08-2010
44			P222LE IN01	532 kW	
45			P222LE IN02	574 kW	
46	Greaves Cotton Ltd. Chinchwad, Pune	F22	TBD4IV12P	488 kW	ARAI/MOEF/DGTA/GCLP-F22/2005-33 Dt. 27-10-2005
47	Greaves Cotton Ltd., (D.E.U.), Chinchwad, Pune	F22	TBD4 IV12P	488 kW	ARAI/MOEF/DGTA/GCLP-F22/2007-24 Dt. 02-07-2007
48	HPL Hosur	F4	3412DITA-GS-2	586 kW	ARAI/MOEF/DGTA/HPL-F4/2004-032 Dt. 28-07-2004
49			3412DITA-GP-2	553 kW	
50			3412DITA-GS-1	494 kW	
51		F5	3412DITA-GS-3	696 kW	ARAI/MOEF/DGTA/HPL-F5/2004-033 Dt. 28-07-2004
52			3412DITA-GP-3	633 kW	
53		F4	3412DITA-GP-1	586 kW	ARAI/MOEF/DGTA/HPL-F4/2006-018 Dt. 18-08-2006
54			3412DITA-GP-2	533 kW	
55			3412DITA-GS-2	586 kW	
56	Kirloskar Oil Engines Ltd. Khadki, Pune-411003	F9	10K18TASR1	496 kW	ARAI/MOEF/DGTA/KOEL-F9/2004-027 Dt. 02-08-2004
57			12K22TA	532 kW	
58			12K22TA SR1	574 kW	
59		F27	12K22TA-4V	569 kW	ARAI/MOEF/DGTA/KOEL-F27/2008-045 Dt. 25-08-2008
60			12K22 TA4VSRI	612 kW	
61		F23	DV12	559 kW	ARAI/MOEF/DGTA/KOEL-F23/2007-047 Dt. 24-08-2007

AUTHORISED SIGNATORY

			
SITARAM KASHYAP DEPUTY GENERAL MANAGER		SAURABH DALELA DIRECTOR	Page 4 of 6



C O T G 0021

Date : 06th February 2024

Annexure-III Cont.

S. No.	Manufacturer Name & Address	Engine Family	Engine Model	Rated Gross Mechanical Declared Power	Type Approval Certificate Number
62	Kirloskar Oil Engines Ltd. Khadki, Pune-411003	F23	DV12	532 kW	ARAI/MoEF/DGTA/KOELK-F23/2010-101-E1 Dt. 19-10-2011
63		F23	DV12	532 kW	ARAI/MoEF/DGTA/KOELK-F23/2010-101 Dt. 03-02-2011
64		F36	DV12SR1	552 kW	ARAI/MoEF/DGTA/KOELK-F36/2010-102 Dt. 17-01-2011
65	Kirloskar Electric Co. Ltd. Gokul Road, Hubli-580030, Karnataka	F24	12VKK135IBZLD2	475 kW	ARAI/MOEF/DGTA/KECL-F24/2010-008 Dt. 16-02-2010
66	MTU India Pvt. Ltd. 159/1, Tathawade, Pune-Mumbai Highway Pune 411033	F1	12V2000G23TD/3S	625 kW	ARAI/MOEF/DGTA/IMP/MTU-F1/2007-066 Dt. 18-10-2007
67			12V2000G23TD/3B	565 kW	
68			12V2000G63TD/3B	625 kW	
69			12V2000G63TD/3D	680 kW	
70		F2	12V2000G65TD/3B	695 kW	ARAI/MOEF/DGTA/IMP/MTU-F2/2008-060 Dt. 30-09-2008
71			12V2000G25TD/3B	580 kW	
72			12V2000G25-D/3D	635 kW	
73		F3	12V1600G80F	634 kW	ARAI/MoEF/IMP/DGTA/MTU-F3/2010-098-E2 Dt. 31-05-2012
74			10V1600G80F	493 kW	
75			12V1600G10F	524 kW	
76			12V1600G20F	576 kW	
77			12V1600G70F	576 kW	
78	MTU India Pvt. Ltd. 159/1, Tathawade, Pune-Mumbai Highway Pune 411033	F6	10V1600G80F	493 kW	ARAI/MoEF/DGTA-II/IMP/MTU-F6/2013-35 Dt. 30-04-2013
79		F7	12V2000G56F	665 kW	ARAI/MoEF/DGTA-II/IMP/MTU-F7/2013-36 Dt. 30-04-2013
80		F2	12V2000G25 TD/3D	635 kW	ARAI/MoEF/DGTA/IMP/MTU-F2/2008-060-E2 Dt. 30-04-2013
81			12V2000G25 TD/3B	580 kW	
82			12V2000G65 TD/3B	695 kW	
83			12V2000G25 TB/3B	580 kW	
84			12V2000G25 TB/3D	635 kW	
85			12V2000G65 TB/3B	695 kW	
86	MTU Detroit Diesel India Pvt. Ltd.	F1	12V2000G23TD13B	565 kW	ARAI/MOEF/DGTA/MTU-F1/2006-027 Dt. 18-10-2006
87			12V2000G23TD/3D	625 kW	
88			12V2000G63TD/3D	625 kW	
89			12V2000G63TD/3D	680 kW	
90	Perkins Engines Company Ltd. Tixall Road, Stafford, St16 3UB	F3	4006-23TAG2AP	658 kW	ARAI/MOEF/IMP/DGTAPECL-F3/2010-012 Dt. 19-02-2010
91	Perkins Engines Ltd. Tixall Road, Stafford, St16 3UB, UK	F13	4006D-23TAG	667 kW	ARAI/MOEF/DGTA-II/IMP/PECL-F13/2014-2 Dt. 13-01-2014

AUTHORISED SIGNATORY

			
SITARAM KASHYAP DEPUTY GENERAL MANAGER		SAURABH DALELA DIRECTOR	Page 5 of 6



C O T G 0021

Date : 06th February 2024

Annexure-III Cont.

S. No.	Manufacturer Name & Address	Engine Family	Engine Model	Rated Gross Mechanical Declared Power	Type Approval Certificate Number
92	MTU Friedrichshafen GmbH Nussdorferstrasse 88662 Überlingen Germany	F3	12V1600G80F	634 kW	ARAI/MoEF/IMP/DGTA/MTU-F3/2010-098 Dt. 10-01-2011
93			10V1600 G80F	493 kW	
94			12V1600 G10F	524 kW	
95			12V1600 G20F	576 kW	
96			12V1600 G70F	576 kW	
97	Prime Energy Pvt. Ltd. Surver No. 108/1, Village Kala, Silvassa, UT - 396 230	F5	S6R2-B1PTA-S	688 kW	ARAI/MOEF/DGTA/IMP/MHI-F5/2010-063 Dt. 30-03-2010
98	Volvo	F1	TAD1642GE(P)	485.1 kW	ARAI/MOEF/DGTA/VOLVO-F1/2005-03 Dt. 03-03-2005
99	Volvo India Pvt. Ltd., Bangalore	F6	TWD1643GE	536 kW	ARAI/MOEF/DGTA/VOLVO-F6/2007-056 Dt. 22-08-2007

Note: Engine details mentioned above are sourced from : www.cpcb.nic.in

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SITARAM KASHYAP DEPUTY GENERAL MANAGER		SAURABH DALELA DIRECTOR	Page 6 of 6