



अंतर्राष्ट्रीय ऑटोमोटिव प्रौद्योगिकी केन्द्र INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY

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

C O S G 0504 V01

Date : 15th May 2023

TYPE APPROVAL CERTIFICATE

| Cert | Report | Specs | Drg | Total |
|------|--------|-------|-----|--------|
| 04 | --- | 01 | --- | 05 pgs |

FOR

Retro-fit Emission Control Devices (RECD) Compliance

1. Based on the verification of documents & trials conducted on RECD model "Chakr Shield 2.0_C2-CS1800-R10-V2" (Family designation C2-R10) 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 | | | | | |
|--|------------------|---|---|---------------------------|-----------------------------------|--------|--------------|
| COSG 0504 dtd. 10.05.2023 | | M/s.Chakr Innovation Pvt Ltd S.NO 236,Hissa No.7 & S.NO 237, Taluka Mulish, Hinjewadi, Phase 1, Pune - 411 057, Maharashtra Plant : Hinjewadi, Pune | | | | | |
| RECD Family-Designation | | Engine Manufacturer | | | RECD Model | | |
| C2-R10 | | M/s. Caterpillar Inc. | | | Chakr Shield 2.0_C2-CS1800-R10-V2 | | |
| Tested Engine Model | | Engine Cubic Capacity | | Gross Engine Power | | | |
| C15-2GP-1 | | 15200 cm ³ | | 454 kW @ 1500 rpm | | | |
| Engine Baseline emissions | CPCB Stage -II | Class of RECD | Class II | Engine Manufacturing Date | | | |
| | | | | September 2017 | | | |
| S. No. | Item Description | Parent RECD Type | RECD types within the RECD family (if applicable) | | | | |
| | | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 | Type 6 |
| RECD suitable for Phase II Certified Diesel Generator engine / engine families | | | | | | | Annexure-III |




2. Validity of the Certificate

| | | |
|--|----|---|
| This Type Approval Certificate is valid for Genset engine CPCB Stage-II effective from 01.07.2014 to 30.06.2023. | a. | As per 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 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 454 kW, 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 4 |



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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 | RECD types within the RECD family (if applicable) | | | | |
|------|---|---|---|--|--|--|--|
| | | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 | Type 6 |
| 1 | Manufacturing Plant address | M/s.Chakr Innovation Private Limited,S.NO 236,Hissa No.7 & S.NO 237, Taluka Mulish, Hinjewadi, Phase 1, Pune - 411 057, Maharashtra | | | | | |
| 2 | Manufacturer's trade name or mark | Chakr Innovation Private Limited | | | | | |
| 3 | RECD family designation | C2-R10 | | | | | |
| 4 | RECD type/model designation | Chakr Shield 2.0_C2-CS1800- R10-V2 | CHAKR SHIELD 2.0_C2-CS1800- R10-V1 | CHAKR SHIELD 2.0_C2-CS1800- R10-V1.2 | CHAKR SHIELD 2.0_C2-CS1800- R10-V2.2 | CHAKR SHIELD 2.0_C2-CS1800- R10-V3 | CHAKR SHIELD 2.0_C2-CS1800- R10-V4 |
| 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-R10 dtd. 18.04.2023 Clause no 1.8 | | | | | |
| 9 | Identifying part number(s) of the RECD | C2-CS1800-R10-V2 | | | | | |
| 10 | Engine/ Engine-Family for which the RECD is intended (application range) | C15-2GP-1 | | | | | |
| 11 | PM Reduction Efficiency of the RECD | 75.56% | | | | | |
| 12 | Designed for fitment to an engine meeting the emissions requirements of (Regulation and Stage): | CPCB Stage -II | | | | | |

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| ICAT Ref No. | 2023-168; IOCS No: 166870 |
| Base Engine Type Approval Certificate number | ARAI/MoEF/DGTA/IMP/CIUSA-F2/2014-01-E1 |
| Test Report Reference | CT0ES 0234 dt. 26/04/2023 |

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| AUTHORISED SIGNATORY | |  |  |  |
|  | SITARAM KASHYAP DEPUTY GENERAL MANAGER | | | |



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Annexure-III

List of applicable engine(s) as per 771(E) dtd. 11.12.2013 and GSR 232(E) dtd. 31.03.2014 Phase II 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 | Caterpillar India Pvt. Ltd, 7th Floor, International Tech Park , Taramani Road, Taramani, Chennai, Tamilnadu 600 113 | F2 | CAT-C15-2GP-1 | 454 kW | ARAI/MoEF/DGTA/CIPL-F2/201704-E1 dt. 07-05-2019 | |
| 2 | | F11 | CAT-C13-2GP-1 | 367 kW | ARAI/MoEF/DGTA/CIPL-F11/201906-E1 dt. 28-06-2019 | |
| 3 | FMTU power system pvt.Ltd. Gat No. 450/1/B1 & 1/B3 Part, Indospace Industrial Park, Mahalunge Chakan, Maharashtra Pune 410 501. | F6 | 10V1600G10F/3B | 407 kW | ARAI/MoEF/DGTA/FMTU-F6/2021-01 dt. 07-06-2021 | |
| 4 | | | 10V1600G20F/3B | 448 kW | | |
| 5 | | | 10V1600G70F/3D | 448 kW | | |
| 6 | Cummins India Limited, Cummins India Office Campus Tower A, 5th Floor Survey No. 21, Balewadi, Pune 411045 | F50 | QSL9 G15 | 298 kW | ARAI/MoEF/DGTA/CILP-F50/201727-E3 dt. 04-01-2019 | |
| 7 | | F31 | QSN14-G3 | 396 kW | ARAI/MoEF/DGTA/CILP-F31/201404 dt. 25-03-2014 | |
| 8 | | | QSN14-G1 | 334 kW | | |
| 9 | | | QSN14-G2 | 363 kW | | |
| 10 | | | QSN14-G4 | 319 kW | | |
| 11 | | | QSN14-G5 | 346 kW | | |
| 12 | | F43 | KTAA19-G11 | 458 kW | ARAI/MoEF/DGTA/CILP-F43/201406-E2 dt. 26-08-2016 | |
| 13 | | | KTAA19-G10 | 438 kW | | |
| 14 | | | KTAA19-RG10 | 438 kW | | |
| 15 | | Greaves Cotton Ltd. Industrial Engines Unit, Plot No.J- 2/A, MIDC Chikalthana, Aurangabad- 431210 | F321 | D3V8TAG21 | 284 kW | ARAI/MoEF/DGTA/GCLPF321/2016-13-E1 dt. 18-08-2021 |
| 16 | | | F500 | 12V14TAG23 | 444 kW | ARAI/MoEF/DGTA/GCLPF500/2014-01-E4 dt. 18-08-2021 |
| 17 | | | | 12V14TAG21 | 284 kW | |
| 18 | | | | 12V14TAG22 | 356 kW | |
| 19 | | | | 12V14TAG24 | 444 kW | |
| 20 | Kirloskar Oil Engines Ltd. Khadki, Pune | F115 | DV8TA G1 | 294.2 kW | ARAI/MoEF/DGTA/KOELF115/2014-01-E1 dt. 11-09-2019 | |
| 21 | | | DV8TA G2 | 345.6 kW | | |
| 22 | | | DV8TA G3 | 360.3 kW | | |
| 23 | | | DV10TA G1 | 447.1 kW | | |
| 24 | Mahindra Heavy Engines Pvt. Ltd., Plot # A-1/1, Chakan Industrial Area, Phase-IV, Village Nigoje, Chakan, Taluka- Khed, Pune- 410501 | F23 | mPower 63905G | 287 kW | ARAI/MoEF/DGTA/MHELF23/2017-06 dt. 27-06-2017 | |

AUTHORISED SIGNATORY

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|  SITARAM KASHYAP DEPUTY GENERAL MANAGER |  |  SAURABH DALELA DIRECTOR |  Page 3 of 4 |
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Annexure-III contd.

| S. No. | Manufacturer Name & Address | Engine Family | Engine Model | Rated Gross Mechanical Declared Power | Type Approval Certificate Number |
|--------|---|---------------|----------------------|---------------------------------------|--|
| 25 | Perkins India Private Limited, 7th Floor, International Tech Park , | F10 | Perkins-2506DE15TAG2 | 454 kW | ARAI/MoEF/DGTA/PIPL-F10/201706-E1 dt. 07-05-2019 |
| 26 | Taramani Road, Taramani, Chennai-600113 Tamil Nadu, India | F11 | Perkins-2206DE13TAG3 | 367 kW | ARAI/MoEF/DGTA/PIPL-F11/201909-E1 dt. 28-06-2019 |
| 27 | Scania Commercial Vehicles India Pvt. Ltd. Plot No.63 (part),64-66,88-97,Narsapur, KIADB Industrial Area, Achhatahahalli Village, Narsapur Hobli, Kolar Taluk, District Kolar, Karnataka, PIN-563 130 | F6 | DC13071A 364 | 364 kW | ARAI/MoEF/DGTA/IMP/SCANIAF1/2015-01-E1 dt. 25-07-2017 |
| 28 | | | DC09 071A 289 | 289 kW | |
| 29 | | | DC13 071A 325 | 325 kW | |
| 30 | | | DC16 071A 438 | 438 kW | |
| 31 | Volvo India Private Limited, Volvo Penta, Yalachahally, Tavarekere Post, Hosakote TQ, Bangalore, Karnataka- 562 122 | F11 | TAD1651GE | 441 kW | ARAI/MoEF/DGTA/IMP/VOLVOF11/2014-01-E1 dt. 30-06-2015 |
| 32 | | | TAD1650GE | 402 kW | |
| 33 | | F13 | TAD1355GE | 369 kW | ARAI/MoEF/DGTA/IMP/VOLVOF13/2014-03-E1 dt. 30-06-2015 |
| 34 | | | TAD1351GE | 286 kW | |
| 35 | | | TAD1352GE | 325 kW | |
| 36 | | | TAD1354GE | 339 kW | |
| 37 | M/s. Baudouin (Welfang) Power Co. Ltd., Add : No. 197A, Fushou East Street, High-new Technology, Industrial Development Zone,Welfang, Shandong, China. | 6M33D | 6M33D506E310 | 460 kW | ICAT/MoEF/DGTA/IMP/BWPCL-6M33D/M-1736-E01 dt. 05-06-2018 |
| 38 | | 6M21G | 6M21G500/5e3 | 410 kW | ICAT/MoEF/DGTA/IMP/BWPCL-6M21G/P-1726 dt. 30-11-2020 |
| 39 | | | 6M21G352/5e3 | 290 kW | |
| 40 | | | 6M21G440/5e3 | 365 kW | |
| 41 | | F11 | 6M19G320/5E3 | 290 kW | ICAT/MoEF/DGTA/IMP/BWPCL-F11/N-2138 dt. 16-11-2018 |
| 42 | | 8M21G | 8M21G550/5e3 | 460 kW | ICAT/MoEF/DGTA/IMP/BWPCL-8M21G/P-0401 dt. 28-02-2020 |
| 43 | | 6M16G | 6M16G4D2/5 | 290 kW | ICAT/MoEF/DGTA/IMP/BWPCL-6M16G/P-0838 dt. 06-07-2020 |
| 44 | 6M21G5 | 6M21G6D2/5 | 450 kW | C O Q G 0652 dt. 02-08-2021 | |
| 45 | | 6M21G4D2/5 | 410 kW | | |
| 46 | | 6M21G2D2/5 | 365 kW | | |
| 47 | M/s. Shandong Heavy Industry India Pvt. Ltd., Add: Survey No. 280/281, Hinjawadi Phase II, Village Mann, Taluka Mulshi, Pune - 411057, Maharashtra, India | 6M21G5 | 6M21G6D2/5 | 450 kW | C O Q G 0651 dt. 02-08-2021 |

Note Engine details mentioned above are Sourced from : cpceb.nic.in

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| AUTHORISED SIGNATORY | | | |
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| | | | |
| SITARAM KASHYAP DEPUTY GENERAL MANAGER | | SAURABH DALELA DIRECTOR | Page 4 of 4 |