

# A Report on Industry Visit to POWERICA Limited, Bangalore for the Inspection of 500 kVA Diesel Generator (D.G.) Set

**Date of Inspection:** 19<sup>th</sup> September 2024

**Location:** POWERICA LIMITED, Bangalore

**Inspected by:**

- **Dr. A.V. Pavan Kumar, HOD/EEE**
- **Mr. Ramesh Kumar R, Asst. Prof (Dept. of EEE)**
- **Mr. Sudhakar N, Asst. Manager Maintenance (Generator Maintenance)**
- **Mr K N Naidu, Electrical Consultant**

## Purpose of Inspection:

The primary objective of this inspection was to evaluate the performance and condition of the 500 kVA Diesel Generator (D.G.) set at POWERICA LIMITED, Bangalore. The inspection aimed to ensure compliance with technical specifications, safety standards, and overall reliability.



Site	Device	Parameter	Value	Units
AutoConnect	AutoConne...	Genset L1-L2 RMS Voltage	416	V
AutoConnect	AutoConne...	Genset L2-L3 RMS Voltage	414	V
AutoConnect	AutoConne...	Genset L3-L1 RMS Voltage	415	V
AutoConnect	AutoConne...	Genset L1 RMS Current	599.97	A
AutoConnect	AutoConne...	Genset L2 RMS Current	631.42	A
AutoConnect	AutoConne...	Genset L3 RMS Current	605.81	A
AutoConnect	AutoConne...	Genset Total kVA	440.4	kVA
AutoConnect	AutoConne...	Genset Total kW	439.4	kW
AutoConnect	AutoConne...	Genset Total Exported kWh	271.7	kWh
AutoConnect	AutoConne...	Average Genset Frequency	50.02	Hz
AutoConnect	AutoConne...	Average Engine Speed	1498	r/min (rpm)
AutoConnect	AutoConne...	Oil Pressure	268.2	kPa
AutoConnect	AutoConne...	Coolant Temperature	89	degC
AutoConnect	AutoConne...	Oil Temperature	107.125	degC
AutoConnect	AutoConne...	Battery Voltage	28.2	V
AutoConnect	AutoConne...	Genset Average Power Factor	1.00	
AutoConnect	AutoConne...	Genset Total kW Percent	110	%
AutoConnect	AutoConne...	Engine Running Time	1.70	h
AutoConnect	AutoConne...	Intake Manifold Temperature	52.0	degC
AutoConnect	AutoConne...	AT DEF Tank Level	50.0	%
AutoConnect	AutoConne...	Fuel Rate	98.90	L



Diesel Generator Inspection and Load Test Images



D.G. Control Panel



Circuit Breaker - Electrical Output



Plant Visit Images

### Key Equipment Details:

- **Generator Rating:** 500 kVA
- **Type:** Diesel Generator
- **Manufacturer:** POWERICA LIMITED
- **Fuel Type:** Diesel

### Scope of Inspection:

The inspection covered the following areas:

- **Physical and Structural Integrity**
- **Electrical and Mechanical Performance**
- **Fuel System**
- **Exhaust System**
- **Control Panel Operation**

## **Observations:**

### **a. Physical and Structural Condition**

- The generator set was found to be structurally sound.

### **b. Electrical and Mechanical Performance**

- Voltage and frequency output was stable and within the rated parameters (415V, 50Hz).
- Load test was conducted for about 40 Minutes with 25%, 50%, and 75%, 100% and 110% loading conditions.
- No significant fluctuations were observed during testing.

### **c. Fuel System**

- The fuel consumption rate at varying loads was found to be within acceptable limits.

### **d. Exhaust System**

- The exhaust system was functioning efficiently, with emissions within permissible environmental standards.

### **e. Control Panel Operation**

- The control panel displayed all relevant parameters, including voltage, current, frequency, and fuel levels, accurately.

## **Conclusion**

The 500 kVA Diesel Generator set at POWERICA LIMITED, Bangalore, was found to be in good operational condition, with all systems functioning as per manufacturer specifications. No issues were identified during the inspection.

## **Submitted by:**

1. Dr. A.V. Pavan Kumar (HOD/EEE)
2. Mr. Ramesh Kumar R (Asst. Prof., Dept. of EEE)
3. Mr. Sudhakar N, Asst. Manager Maintenance (Generator Maintenance)

**Note:** The following is the Joint Inspection reports and Minutes of meeting held at POWERIC Ltd.





A PROMISE FOR POWER

JOINT INSPECTION REPORT CUM MINUTES OF MEETING HELD AT POWERICA –  
NELAMANGALA, BANGALORE

September 19, 2024

PERSONS PRESENT :

FOR M/S. MADANAPALLE INSTITUTE OF : Dr. A.V. Pavan Kumar – HOD EEE  
TECHONOLOGY AND SCIENCE : Mr. R Ramesh Kumar – Asst. Prof. Dept EEE  
FOR CONSULTANT : Mr. K N Naidu  
FOR M/S. POWERICA LIMITED : Mr.P R Raviraj

SUB : Inspection of 500 KVA D.G. Set  
REF : PO No. 735/2024 dated 23.08.2024

The subject Genset was offered for inspection. Following are the details.


	ENGINE (CUMMINS MAKE)		ALTERNATOR (STAMFORD)	
	MODEL	SI.No.	FRAME	SI.No.
500 KVA	QSM15-G1	93844151	HCI544D1	N24I360700


Genset was tested as per agreed terms and the Parameters are as per the Load Test report attached.

Routine test certificates for Engine & alternator furnished.

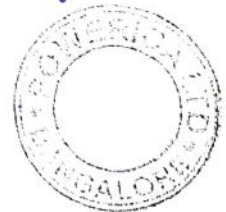
Performance of testing found satisfactory and the set is technically cleared for dispatch.

  
19/9/2024  
Dr. A V PAVAN KUMAR

  
19/9/24  
R RAMESH KUMAR

  
K N NAIDU

  
19/9/24  
P R RAVIRAJ



POWERICA LIMITED  
LOAD TEST REPORT  
LTR/FR/01



A PROMISE FOR POWER  
DATE : 19-09-2024

ALTERNATOR MAKE : STAMFORD  
ALTERNATOR MODEL : HCI544D1  
ALTERNATOR SR NO : N24I360700

ENGINE MAKE : CUMMINS  
ENGINE MODEL : QSM15-G1  
ENGINE SR NO : 93844151  
PANEL SR NO : 01/PAM1/2409105

KVA : 500

KW : 400

TIME	Genset L1-L2 RMS Voltage (V)	Genset L2-L3 RMS Voltage (V)	Genset L3-L1 RMS Voltage (V)	Genset L1 RMS Current (A)	Genset L2 RMS Current (A)	Genset L3 RMS Current (A)	Genset Total kVA (kVA)	Genset Total kW (kW)	Genset Total kWh (kWh)	Average Genset Frequency (Hz)	Average Engine Speed (r/min (rpm))	Oil Pressure (kPa)	Coolant Temperature (degC)	Oil Temperature (degC)	Battery Voltage (V)	Genset Average Power Factor	Genset Total kW Percent (%)	Fuel Rate (L)
11:20:28.781	415	415	415	0	0	0	0	0	141.8	50	1496	291.6	30	30.125	28.1	0	0	16.7
11:20:43.794	415	415	415	0	0	0	0	0	141.8	50	1499	291.6	32	31.219	28.2	0	0	15.6
11:20:58.814	415	415	415	0	0	0	0	0	141.8	50.01	1501	291.6	34	32.188	28.2	0	0	14.9
11:21:13.789	415	415	415	0	0	0	0	0	141.8	50.01	1496	288.2	36	33.937	28.2	0	0	12.3
11:21:28.788	415	415	415	0	0	0	0	0	141.8	50.01	1502	288.2	37	36.219	28.2	0	0	12.3
11:21:44.116	415	415	415	0	0	0	0	0	141.8	49.99	1496	288.2	39	37.875	28.2	0	0	12.6
11:22:00.679	415	415	415	135.01	135.31	137.35	97.7	96.3	142.1	50	1496	288.2	40	39.281	28	0.99	24	32.2
11:22:13.927	415	415	415	137.6	137.9	140.03	99.6	98.2	142.4	50.01	1506	288.2	43	41	28.2	0.99	25	35.9
11:23:15.482	415	415	415	139.8	140.28	142.36	101.2	99.7	144.2	49.99	1497	288.2	55	48.656	28.1	0.99	25	35.9
11:24:14.202	415	415	415	139.77	140.28	142.32	101.2	99.8	145.8	49.99	1497	284.1	63	56.5	28.2	0.99	25	30.6
11:25:14.173	415	415	415	139.77	140.3	142.31	101.2	99.8	147.4	49.98	1505	279.9	70	63.719	28.1	0.99	25	34
11:26:14.140	415	415	415	139.63	140.18	142.23	101.1	99.7	149.1	50	1494	279.9	76	69.813	28.2	0.99	25	33.4
11:27:14.159	415	415	415	139.7	140.25	142.29	101.1	99.7	150.8	49.97	1499	279.9	82	76.375	28.2	0.99	25	48.8
11:28:14.157	415	415	415	285.25	280.74	285.66	204.1	203.2	153	50.01	1503	275.8	84	81.188	28.2	1	51	54.9
11:29:15.725	415	415	415	284.62	280.22	285.38	203.7	202.8	156.3	50	1498	279.9	83	84.938	28.2	1	51	54.9
11:30:14.551	415	415	415	284.63	280.25	285.43	203.7	202.8	159.8	50.01	1501	279.9	83	87.969	28.2	1	51	54.1
11:31:14.275	415	415	415	284.28	279.83	284.85	203.4	202.4	163.1	50.01	1499	279.9	84	90.125	28.2	1	51	68.6
11:32:14.310	415	414	415	415.29	449.75	419.14	307.4	306.7	167.2	49.97	1488	271.7	84	92.719	28	1	77	77.9
11:33:14.328	416	414	415	414.32	448.57	418.36	306.7	305.8	172.3	49.99	1502	271.7	85	95.469	28.2	1	76	77.9
11:34:14.348	415	414	415	414.28	448.5	418.53	306.8	306	177.4	50	1502	271.7	85	97.25	28.1	1	76	77.8
11:35:14.366	415	414	415	414.2	448.47	418.38	306.7	305.8	182.5	50	1507	271.7	85	98.094	28.2	1	76	87.1
11:36:14.422	416	414	415	528.64	564.39	536.05	390.3	389.6	187.9	49.98	1500	271.7	85	98.906	28.2	1	97	89.9



TIME	Genset L1-L2 RMS Voltage (V)	Genset L2-L3 RMS Voltage (V)	Genset L3-L1 RMS Voltage (V)	Genset L1 RMS Current (A)	Genset L2 RMS Current (A)	Genset L3 RMS Current (A)	Genset Total kVA (kVA)	Genset Total kW (kW)	Genset Total kWh (kWh)	Average Genset Frequency (Hz)	Average Engine Speed (r/min (rpm))	Oil Pressure (kPa)	Coolant Temperature (degC)	Oil Temperature (degC)	Battery Voltage (V)	Genset Average Power Factor	Genset Total kW Percent (%)	Fuel Rate (L)
11:37:14.449	416	414	415	546.13	577.72	551.43	401.6	400.7	194.5	50.01	1489	275.8	86	99.906	28.2	1	100	89.9
11:38:16.023	416	414	415	545.94	577.72	551.35	401.5	400.5	201.2	50	1494	275.8	86	100.34	28.1	1	100	89.9
11:39:14.593	416	414	415	546.06	577.77	551.47	401.6	400.8	207.9	50	1494	275.8	86	101.22	28.2	1	100	102
11:40:14.601	416	414	415	545.98	577.6	551.39	401.4	401	214.5	50.01	1494	275.8	86	101.84	28.2	1	100	89.4
11:41:14.639	416	414	415	545.78	577.33	551.2	401.3	400.7	221.2	50.01	1504	275.8	86	102.34	28.2	1	100	89.2
11:42:14.669	416	414	415	545.81	577.26	551.11	401.2	400.5	227.9	49.99	1507	275.8	86	102.72	28.2	1	100	98.9
11:43:14.705	416	414	415	600.37	631.83	606.21	440.8	440.1	235.1	50	1494	268.2	87	103.53	28.2	1	110	113
11:44:14.756	416	414	415	599.98	631.52	605.91	440.5	439.8	242.4	50.02	1502	271.7	87	104.53	28.1	1	110	113
11:45:14.779	416	414	415	599.87	631.44	605.81	440.4	439.9	249.7	49.97	1498	268.2	88	105.44	28.2	1	110	113
11:46:14.822	416	414	415	600.03	631.5	605.96	440.5	439.8	257.1	49.99	1501	268.2	88	106.16	28	1	110	114
11:47:14.835	416	414	415	599.84	631.35	605.61	440.3	439.5	264.4	50	1505	268.2	89	106.78	28.2	1	110	98.9
11:48:14.856	416	414	415	599.97	631.42	605.81	440.4	439.4	271.7	50.02	1498	268.2	89	107.13	28.2	1	110	98.9
11:49:14.899	416	414	415	600.09	631.58	605.91	440.4	439.4	279	50.01	1500	268.2	89	107.5	28.2	1	110	98.9
11:50:16.671	417	415	416	548.64	580.35	554.17	404.3	398.3	286.6	50.86	1524	271.7	89	107.84	28.2	0.99	108	96.9
11:51:15.234	414	414	414	31.37	31.04	31.25	22.4	15.9	288	50	1503	275.8	82	104.75	27.8	0.71	4	12.1
11:52:15.159	414	415	414	0	0	0	0	0	288.2	50.01	1499	275.8	83	100.91	28	0	0	14.5
11:53:55.533	414	415	414	0	0	0	0	0	288.2	49.99	1497	275.8	82	97.906	28.2	0	0	16.9
11:54:12.238	414	414	414	0	0	0	0	0	288.2	49.99	1500	275.8	82	97.25	28.2	0	0	16.7
11:54:17.166	414	414	414	0	0	0	0	0	288.2	49.99	1498	275.8	82	97.094	28.2	0	0	14.8
11:54:22.156	414	414	414	0	0	0	0	0	288.2	49.99	1500	275.8	82	97	28.2	0	0	14.8

*Jay*

TESTED BY : TOOMY



*Conductor*

1) *Tanuj*  
17/9/2024  
CUSTOMER REPRESENTATIVE SIGNATURE  
(Dr. A. V. Pavan Kumar)

2) *R. Ramesh Kumar*  
19/9/24



# Cummins India Limited

Registered Office : Kothrud , Pune 411 038 ( India )

## Engine Test Certificate

*This Is to Certify that Engine Model QSM-15-G1  
serial Number 93844151 has been tested using  
diesel as per ISO-3046 standard. Corrected Full Load  
B.H.P. to N.T.P. conditions as per the test standard is  
594 B.H.P. @ 1500 R.P.M*

*Date : 23/08/2024*

*Executive  
Product Conformance*



# Test Certificate

FOR

SALIENT POLE, SELF EXCITED / PMG EXCITED AND SELF REGULATED AC GENERATOR

Machine No. **N24I360700** 

Type Test has been conducted on similar design machine  
 STANDARDS: Generator generally conforms to BS 5000 : Part 3,  
 Tested in accordance with BS EN 60034-1/IS/IEC 60034-1  
 Rotor dynamically balanced to BS ISO 1940 - 1

## ROUTINE TEST CERTIFICATE FOR BRUSHLESS AC GENERATOR:

FRAME: HCI544D1	AVR: AS440	AVR NO: 240900021210	ENCLOSURE: IP23
RATED KVA: 500	RATED VOLTS: 415	RATED AMPS: 695.6	FREQUENCY: 50
POWER FACTOR: 0.8	STR CONN: Series Star	STR WINDING: 311	DUTY: Base Continuous
EXC. VOLTS: 48	EXC.AMPS: 2.3	AMB TEMP: 40	PHASE: 3 WIRE: 4-Wire

FOR 3 PHASE SEQUENCE LOOKING FROM DRIVE END FOR CLOCKWISE ROTATION :U-V-W

WINDING	COLD RESISTANCE IN Ohm(+/- 10 %) AT 22°C (MAX VALUES)	INSULATION RESISTANCE (M- Ohm)	HV TEST 1.83 KV FOR 1 MIN	INSULATION CLASS
STATOR (Phase to Phase)	0.01212	2+	OK	H
ROTOR	1.904	2+	OK	H

## REGULATION TEST

FREQ.	VOLTS	AMPS	KVA	PF	KW	EXC.VOLT	EXC.AMP	% LOAD
52	416.4	0.00	0.00	0.00	0.00	10	0.55	0.00
50	415	695.6	500	0.8	400	48	2.3	100.00

REGULATION = (N.L.VOLTAGE-F.L.VOLTAGE / RATED VOLTAGE)\*100 = 0.34 %

Item Description: AC Generator.HC5.4.D.1.311.,1,,14,,AS440.Onan Green  
 Remarks:

Date: 04-SEP-24	 Job No: 7072653-004	AUTHORISED BY <b>Ashok S Bachkar</b> Quality Assurance
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## Certificate Of Conformity

Quality System Certification  
 ISO 9001:2015

Frame Size : **HCI544D1**

Serial Number : **N24I360700**

KVA: **500**

Manufactured Date : 04-SEP-24



Scan QR code or visit on [www.Stamford-avk.com](http://www.Stamford-avk.com) for downloading owner manuals

Authorized By Quality Assurance: **Ashok S Bachkar**

This document is electronically generated, hence signature not required.

Print Date: 04-SEP-24