Trinity Consultants
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May 7, 2025

Kentucky Division for Air Quality
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601

RE: Permit Revision Application for State-Origin Permit No. S-23-061
Amazon Data Services, Inc. (AI 178765)

Dear Permit Review Branch:

Amazon Data Services, Inc. ("Amazon") hereby submits the following Permit Revision Application for the facility located in Florence, KY (CVG200/300). The facility currently operates under State-Origin Permit No. S-23-061 issued by the Kentucky Division of Air Quality (KDAQ) on August 25, 2023, which authorized the installation and operation of seven (7) 2.5 MW diesel-fired emergency generators. With this permit application, Amazon is reconciling the original installation to include an eighth generator (on-site but not installed) and proposing to install seven (7) additional 2.5 MW diesel-fired emergency generator for a total of 15 units.

As described in this letter, potential emissions from the existing and proposed generators will result in facility-wide potential emissions that exceeds the Title V major source threshold of 100 tons per year (tpy) for nitrogen oxides (NO_X). As such, the facility is requesting a federally enforceable facility-wide limitation of 90 tpy of NOx emissions in order to avoid Title V permitting. The remainder of this letter provides all information for an administratively complete Conditional Major Construction and Operating permit application including a facility and process description and permitting and regulatory review. Required permit application forms are provided in Attachment 1. Potential emission calculations are provided in Attachment 2. Manufacturer technical specifications and the Certificate of Conformity for the generators are provided in Attachment 3.

PROJECT AND PROCESS DESCRIPTION

The facility is located at 4805 Aero Parkway, Florence, Boone County, Kentucky, 41042. The facility assembles and tests server racks for distribution to data centers and is classified under NAICS Category 334111 for Electronic Computer Manufacturing. After installation, the facility will operate fifteen (15) 2.5 MW diesel-fired emergency generators. All 15 generator engines have a maximum power output of 3,634 hp. Table 1 summarizes the technical specifications of the proposed emergency generator. Manufacturer technical specifications for the generators are provided in Attachment 3.

Table 1. Technical Specifications for Existing and Proposed Emergency Generators

Parameter	Emergency Engine 1-15
Generator Model	3516C
Generator Manufacturer	Caterpillar
Maximum Rated Engine Capacity	3,634 hp
Fuel Type	Diesel
Engine Speed	1,800 rpm
Displacement	78 L
Number of Cylinders	16

POTENTIAL EMISSIONS CALCULATIONS

Potential emission calculations for the 15 emergency generators were calculated to determine permitting and regulatory applicability. Detailed emission calculations are provided in Attachment 2 of this letter to represent the reconciliation of the original 8 units installed and the proposed new additional 7 units. Emission factors used to calculate potential emissions are from the following sources:

- Manufacturer's technical data sheets using the Potential Site Variation emissions values
- US EPA AP-42: Section 3.4, Large Stationary Diesel and All Stationary Dual-fuel Engines (2025)
- EPA's Mandatory Reporting Rule for Greenhouse Gases, 40 CFR Part 98, Subpart C

Consistent with EPA guidance, the annual potential emissions for emergency engines are based on 500 hours of operation per year.[1] Table 2 summarizes the potential emissions at CVG200/300. Emissions of GHGs and other natural gas combustion byproducts are detailed in Attachment 2.

Table 2. Summary of Potential Emissions

Pollutant	Single Engine Potential to Emit tpy	Facility-Wide Potential to Emit for all 15 Units tpy
$PM/PM_{10}/PM_{2.5}$	0.10	1.50
NO_x	12.78	**191.68**
CO	1.52	22.83
VOC	0.28	4.21
SO_2	8.89E-03	0.13
Total HAP	9.23E-03	0.14

[1] Memorandum from John S. Seitz, Director Office of Air Quality Planning and Standards to Regional Air Division Directors, Calculating Potential to Emit (PTE) for Emergency Generators, September 6, 1995.

REGULATORY AND AIR PERMIT REQUIREMENTS

The following sections outline the federal air regulations that are potentially applicable to the proposed project. Specifically, the applicability of regulations under the federal major NSR permitting program, Title V of the Clean Air Act Amendments, New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAP).

New Source Review

CVG200/300 is located in Boone County, which has been designated by U.S. EPA as in attainment for all criteria pollutants.[2] As such, the potentially applicable New Source Review (NSR) program is Prevention of Significant Deterioration (PSD).

For all NSR-regulated pollutants, Prevention of Significant Deterioration (PSD) requirements could potentially apply to the facility. The PSD regulations specifically define 28 industrial source categories for which the "major" source threshold of any regulated NSR pollutant is 100 tpy. Because computer electronic manufacturing facilities are not on the 28 listed categories of stationary sources, the major stationary source threshold for regulated NSR pollutants under the PSD program for this facility is 250 tpy. In accordance with US EPA guidance on project aggregation, Amazon aggregated the total 15 generators into a single project for PSD applicability. As shown in Table 2, potential emissions from all 15 emergency generators are less than the 250 tpy threshold for all PSD-regulated pollutants. As such, PSD is not triggered for the proposed project. The facility will remain a minor source with respect to PSD after the installation of all units is complete.

Title V Permitting

40 CFR Part 70 establishes the federal Title V operating permit program. Kentucky has incorporated the provisions of this federal program in its Title V operating program in 401 KAR 52:020. As specified in 401 KAR 52:001, Section 1(46), the major source thresholds under the Title V permitting program are potential emissions exceeding 100 tpy of any regulated pollutant, 10 tpy of any single hazardous air pollutant (HAP), and/or 25 tpy of all combined HAPs. As shown in Table 2, facility-wide potential emissions at CVG200/300 will exceed the 100 tpy major source threshold for NOx emissions. To avoid Title V permitting, the facility is requesting a 90 tpy voluntary limit of NOx emissions. Amazon requests the proposed facility-wide limit be incorporated into the Conditional Major Construction and Operating permit.

National Emissions Standards for Hazardous Air Pollutants (NESHAP)

NESHAP, promulgated in 40 CFR 63, regulates emissions of HAPs from specific source categories. A facility that has potential emissions exceeding 10 tpy for any individual HAP and/or emissions exceeding 25 tpy for the sum of all HAPs is classified as a major source of HAP emissions. Potential emissions of both single and combined total HAPs do not exceed the NESHAP major source thresholds; as such, the facility is considered an area source of HAP. The following NESHAP standards are either generally applicable or potentially applicable to the Amazon Florence facility:

[2] 401 KAR 51:010, Attainment Status Designations.

40 CFR 63 Subpart A – General Provisions.

This subpart provides generally applicable requirements for testing, monitoring, notifications, and recordkeeping. Any source that is subject to another subpart under 40 CFR 63 is also subject to Subpart A, unless otherwise stated in the specific subpart.

40 CFR 63 Subpart ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion Engines.

NESHAP Subpart ZZZZ regulates HAPs emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. Affected sources under NESHAP Subpart ZZZZ are classified as either existing stationary RICE or new stationary RICE. The CVG200/300 facility is an area source HAPs and thus subject to the requirements of NESHAP Subpart ZZZZ.

Each of the proposed emergency engines are considered a "new stationary RICE" under 40 CFR 63.6590(a)(2)(iii) since they are located at an area source of HAP emissions and were constructed after June 12, 2006. However, according to 40 CFR 62.6590(c)(1), since these engines are new stationary RICEs located at an area source of HAP emissions, they meet the requirements of NESHAP Subpart ZZZZ by meeting the requirements of NSPS Subpart IIII for compression ignition engines. No further requirements of Subpart ZZZZ apply to the proposed engines.

New Source Performance Standards (NSPS)

NSPS, promulgated in 40 CFR 60, provide emissions standards for criteria pollutant emissions from new, modified, and reconstructed sources. The NSPS are incorporated by reference in 401 KAR 60:005.

NSPS Subpart A – General Provisions

All affected sources are subject to the general provisions of NSPS Subpart A unless specifically excluded by the source specific NSPS. Subpart A requires initial notification and performance testing, recordkeeping, and monitoring and provides reference methods and mandates general control device requirements for all other subparts as applicable.

NSPS Subpart IIII – Stationary Compression Ignition Internal Combustion Engines

NSPS Subpart IIII, Stationary Compression Ignition Internal Combustion Engines (CI ICE), was finalized on July 11, 2006. This rule applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are manufactured after April 1, 2006, and are not fire pump engines.

Pursuant to 40 CFR 60.4205(b) referencing 40 CFR 60.4202(b)(2), all 15 emergency engines shall comply with the emissions standards for new nonroad CI engines as set forth in Appendix I to Part 1039, Table 2, Tier II Emission Standards for engines rated as greater than 560 kW, summarized in Table 3 below. According to the Certificates of Conformity provided in Attachment 3, the emergency engines are certified to the required emission standard.

Table 3. Tier II Emission Standards for kW > 560

Pollutant	Emission Limit g/kW-hr
NO_x + NMHC	6.4
CO	3.5
PM	0.2

Kentucky Regulatory Applicability

In addition to the federal air regulations, KDAQ establishes regulations for the control and abatement of air pollution applicable at the emission unit and facility levels. Potentially applicable state regulations are discussed in this section.

401 KAR 52:030 Federally-enforceable Permits for Nonmajor Sources

Pursuant to 401 KAR 52:030, a federally-enforceable permit is required for sources that accept permit conditions that are legally and practically enforceable to limit their Potential to Emit (PTE) below the major source thresholds that would make them subject to 401 KAR 52:020, Title V Permits. Amazon is requesting a federally enforceable facility-wide emissions limit of 90 tpy NOx in order to remain below the Title V major source thresholds of 100 tpy of any non-hazardous regulated air pollutant, 10 tpy of any single HAP, and 25 tpy of a combination of HAPs. Therefore, the facility is submitting this application for a Conditional Major Construction and Operating Permit to reconcile the original installation to represent the eight (8) units installed and authorize the installation of the additional seven (7) emergency generators.

CERTIFICATION STATEMENT

The required certification statement is affirmed by the responsible official via the signature on the DEP7007AI in Attachment 1. Through this letter and application, Amazon requests use of these procedures in accordance with Section 22 of 401 KAR 52:030.

If you have any questions or comments about the information presented in this letter, please do not hesitate to call me at 301.325.3084.

Sincerely,

Brad Keller
Environmental Operations Manager

Attachments

cc: Elisabeth Martin, P.E., Trinity Consultants

ATTACHMENT 1
DEP7007 Forms (AI, EE, N, and V)

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007AI

Administrative Information

___ Section AI.1: Source Information

___ Section AI.2: Applicant Information

___ Section AI.3: Owner Information

___ Section AI.4: Type of Application

___ Section AI.5: Other Required Information

___ Section AI.6: Signature Block

___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

None

___ Additional Documentation attached

Source Name: Amazon Data Services, Inc.

KY EIS (AFS) #: 21- 015-00271

Permit #: S-23-061

Agency Interest (AI) ID: 178765

Date: May 2025

Section AI.1: Source Information

Physical Location Address:	**Street:**	4805 Aero Parkway					
	City:	Florence	**County:**	Boone	**Zip Code:**	41042	
Mailing Address:	**Street or P.O. Box:**	PO Box 80711					
	City:	Seattle	**State:**	WA	**Zip Code:**	98108	

Standard Coordinates for Source Physical Location

Longitude: -84.6730972 (decimal degrees) **Latitude:** 39.01755278 (decimal degrees)

Primary (NAICS) Category: Electronic Computer Manufacturing **Primary NAICS #:** 334111

Classification (SIC) Category: Electronic Computers **Primary SIC #:** 3571

Briefly discuss the type of business conducted at this site: The Florence facility assembles and tests server racks for distribution to data centers.

Description of Area Surrounding Source: ☐ Rural Area ☑ Industrial Park ☑ Residential Area ☐ Urban Area ☐ Industrial Area ☐ Commercial Area

Is any part of the source located on federal land? ☐ Yes ☑ No

Number of Employees: 500

Approximate distance to nearest residence or commercial property: ~400 ft **Property Area:** 59 acres **Is this source portable?** ☐ Yes ☑ No

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:	☐ Currently Hold	☐ Need	☑ N/A
Solid Waste:	☐ Currently Hold	☐ Need	☑ N/A
RCRA:	☐ Currently Hold	☐ Need	☑ N/A
UST:	☐ Currently Hold	☐ Need	☑ N/A

Type of Regulated Waste Activity:

☐ Mixed Waste Generator ☐ Generator ☐ Recycler ☐ Other: _____

☐ U.S. Importer of Hazardous Waste ☐ Transporter ☐ Treatment/Storage/Disposal Facility ☑ N/A

Section AI.2: Applicant Information

Applicant Name: Amazon Data Services, Inc.

Title: (if individual)

Mailing Address:
Street or P.O. Box: PO Box 80711
City: Seattle **State:** WA **Zip Code:** 98108

Email: (if individual)

Phone: (206) 435-2754

Technical Contact

Name: Brad Keller

Title: Environmental Operations Manager

Mailing Address:
Street or P.O. Box: 4805 Aero Parkway
City: Florence **State:** KY **Zip Code:** 41042

Email: bdkeller@amazon.com

Phone: (301) 325-3084

Air Permit Contact for Source

Name: Same as technical contact

Title:

Mailing Address:
Street or P.O. Box:
City: **State:** **Zip Code:**

Email:

Phone:

Section AI.3: Owner Information

☑ **Owner same as applicant**

Name:

Title:

Mailing Address: **Street or P.O. Box:**

City: **State:** **Zip Code:**

Email:

Phone:

List names of owners and officers of the company who have an interest in the company of 5% or more.

Name	Position

Section AI.4: Type of Application

Current Status: ☐ Title V ☐ Conditional Major ☑ State-Origin ☐ General Permit ☐ Registration ☐ None

Requested Action: *(check all that apply)*

☐ Name Change	☐ Initial Registration	☐ Significant Revision	☐ Administrative Permit Amendment
☐ Renewal Permit	☐ Revised Registration	☐ Minor Revision	☐ Initial Source-wide OperatingPermit
☐ 502(b)(10)Change	☐ Extension Request	☐ Addition of New Facility	☐ Portable Plant Relocation Notice
☑ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submittal	☐ Modification of Existing Facilities
☐ Ownership Change	☐ Closure		

Requested Status: ☐ Title V ☑ Conditional Major ☐ State-Origin ☐ PSD ☐ NSR ☐ Other: _____

Is the source requesting a limitation of potential emissions? ☑ Yes ☐ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter		☐ Single HAP	
☐ Volatile Organic Compounds (VOC)		☐ Combined HAPs	
☐ Carbon Monoxide		☐ Air Toxics (40 CFR 68, Subpart F)	
☑ Nitrogen Oxides	90 tpy	☐ Carbon Dioxide	
☐ Sulfur Dioxide		☐ Greenhouse Gases (GHG)	
☐ Lead		☐ Other	

For New Construction:

Proposed Start Date of Construction: *(MM/YYYY)* After draft permit issuance

Proposed Operation Start-Up Date: *(MM/YYYY)* After final permit issuance

For Modifications:

Proposed Start Date of Modification: *(MM/YYYY)* N/A

Proposed Operation Start-Up Date: *(MM/YYYY)* N/A

Applicant is seeking coverage under a permit shield. ☐ **Yes** ☑ **No**

Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.

Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- ☐ DEP7007A Indirect Heat Exchangers and Turbines
- ☐ DEP7007B Manufacturing or Processing Operations
- ☐ DEP7007C Incinerators and Waste Burners
- ☐ DEP7007F Episode Standby Plan
- ☐ DEP7007J Volatile Liquid Storage
- ☐ DEP7007K Surface Coating or Printing Operations
- ☐ DEP7007L Mineral Processes
- ☐ DEP7007M Metal Cleaning Degreasers
- ☑ DEP7007N Source Emissions Profile
- ☐ DEP7007P Perchloroethylene Dry Cleaning Systems
- ☐ DEP7007R Emission Offset Credit
- ☐ DEP7007S Service Stations
- ☐ DEP7007T Metal Plating and Surface Treatment Operations
- ☑ DEP7007V Applicable Requirements and Compliance Activities
- ☐ DEP7007Y Good Engineering Practice and Stack Height Determination
- ☐ DEP7007AA Compliance Schedule for Non-complying Emission Units
- ☐ DEP7007BB Certified Progress Report
- ☐ DEP7007CC Compliance Certification
- ☐ DEP7007DD Insignificant Activities
- ☑ DEP7007EE Internal Combustion Engines
- ☐ DEP7007FF Secondary Aluminum Processing
- ☐ DEP7007GG Control Equipment
- ☐ DEP7007HH Haul Roads
- ☐ Confidentiality Claim
- ☐ Ownership Change Form
- ☐ Secretary of State Certificate
- ☐ Flowcharts or diagrams depicting process
- ☐ Digital Line Graphs (DLG) files of buldings, roads, etc.
- ☐ Site Map
- ☐ Map or drawing depicting location of facility
- ☐ Safety Data Sheet (SDS)
- ☐ Emergency Response Plan
- ☐ Other: _____

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.

Authorized Signature	Date
	5/22/25

Type or Printed Name of Signatory	Title of Signatory
Matt Cain	Director, Amazon Data Services, Inc.

*Responsible official as defined by 401 KAR 52:001.

Section AI.7: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007EE

Internal Combustion Engines

___ Section EE.1: General Information
___ Section EE.2: Operating Information
___ Section EE.3: Design Information
___ Section EE.4: Fuel Information
___ Section EE.5: Emission Factor Information
___ Section EE.6: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG

___ Attach EPA certification of the engine

Source Name: Amazon Data Services, Inc.
KY EIS (AFS) #: 21- 015-00271
Permit #: S-23-061
Agency Interest (AI) ID: 178765
Date: May 2025

Section EE.1: General Information

Emission Unit #	Emission Unit Name	Control Device ID	Stack ID	Manufacturer	Model Number	Model Year	Date of Manufacture	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Date Reconstructed/ Modified	List Applicable Regulations
EU01	Emergency Engine 1	N/A	S1	Caterpillar	3516C	2022	7/2022	Q2 2023	N/A	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII
EU02	Emergency Engine 2	N/A	S2	Caterpillar	3516C	2022	7/2022	Q2 2023	N/A	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII
EU03	Emergency Engine 3	N/A	S3	Caterpillar	3516C	2022	7/2022	Q2 2023	N/A	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII

Emission Unit #	Emission Unit Name	Control Device ID	Stack ID	Manufacturer	Model Number	Model Year	Date of Manufacture	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Date Reconstructed/ Modified	List Applicable Regulations
EU04	Emergency Engine 4	N/A	S4	Caterpillar	3516C	2022	10/2022	Q2 2023	N/A	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII
EU05	Emergency Engine 5	N/A	S5	Caterpillar	3516C	2023	9/2023	Q1 2024	N/A	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII
EU06	Emergency Engine 6	N/A	S6	Caterpillar	3516C	2023	9/2023	Q1 2024	N/A	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII
EU07	Emergency Engine 7	N/A	S7	Caterpillar	3516C	2022	10/2022	Q3 2023	N/A	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII
EU08	Emergency Engine 8	N/A	S8	Caterpillar	3516C	2022	10/2022	Q3 2023	N/A	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII
EU09-15	Emergency Engines 9-15	N/A	S9-15	Caterpillar	3516C	2024	2024	After draft permit issuance	N/A	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII

Section EE.2: Operating Information

Emission Unit #	Engine Purpose (Identify if Non-Emergency, Emergency,Fire/Water Pump, Black-start engine for combustion turbine, Engine Testing)	Hours Operated	Is this engine a rental? *(Yes/No)*	Rental Time Period *(hrs)*	Alternate Operating Scenarios (Describe any operating scenarios in which the engine may be used in a different configuration)
EU01-08	Emergency	500	No	N/A	N/A
EU09-15	Emergency	500	No	N/A	N/A

Section EE.3: Design Information

Emission Unit #	Engine Type (Identify all that apply: Commercial, Institutional, Stationary, Non-Road)	Ignition Type (Identify if either Compression or Spark Ignition)	Engine Family (Identify all that apply: 2-stroke, 4-stroke, Rich Burn, Lean Burn)	Maximum Engine Power *(bhp)*	Maximum Engine Speed *(rpm)*	Total Displacement *(L)*	Number of Cylinders
EU01-08	Stationary	Compression Ignition	4-stroke	3,634	1,800	78	16
EU09-15	Stationary	Compression Ignition	4-Stroke	3,634	1800	78	16

Section EE.4: Fuel Information

Emission Unit #	Identify if Primary, Secondary, or Tertiary Fuel	Fuel Type (Identify if Diesel, Gasoline, Natural Gas, Liquefied Petroleum Gas (LPG), Landfill/Digester Gas, or Other)	Fuel Grade	Percent Time Used *(%)*	Maximum Fuel Consumption	Heat Content	Sulfur Content *(%)*	SCC Code	SCC Units
EU01-08	Primary	Diesel	#2	100%	0.17 Mgal/hr	137,000 Btu/gal	0.15%	20200102	1000 Gallons Diesel Burned
EU09-15	Primary	Diesel	#2	100%	0.17 Mgal/hr	137,000 Btu/gal	0.15%	20200102	1000 Gallons Diesel Burned

Section EE.5: Emission Factor Information

Emission factors expressed here are based on the potential to emit.

Emission Unit #	Fuel	Pollutant	Emission Factor	Emission Factor Units	Source of Emission Factor
EU01-08	Diesel	PM/PM10/PM2.5	2.34	lb/Mgal	Potential Site Variation Emissions Data
EU01-08	Diesel	NOx	298.39	lb/Mgal	Potential Site Variation Emissions Data
EU01-08	Diesel	CO	35.54	lb/Mgal	Potential Site Variation Emissions Data
EU01-08	Diesel	VOC	6.55	lb/Mgal	Potential Site Variation Emissions Data
EU01-08	Diesel	SO2	0.21	lb/Mgal	AP-42 Table 3.4-1, 4/2025
EU01-08	Diesel	CO2	22,338	lb/Mgal	40 CFR 98, Subpart C, Table C-1
EU01-08	Diesel	N2O	0.18	lb/Mgal	40 CFR 98, Subpart C, Table C-2
EU01-08	Diesel	CH4	0.91	lb/Mgal	40 CFR 98, Subpart C, Table C-2
EU01-08	Diesel	Benzene	0.11	lb/Mgal	AP-42 Table 4.3-3
EU01-08	Diesel	Toluene	0.038	lb/Mgal	AP-42 Table 4.3-3
EU01-08	Diesel	Xylene	0.026	lb/Mgal	AP-42 Table 4.3-3

Emission Unit #	Fuel	Pollutant	Emission Factor	Emission Factor Units	Source of Emission Factor
EU09-15	Diesel	PM/PM10/PM2.5	2.34	lb/Mgal	Potential Site Variation Emissions Data
EU09-15	Diesel	NOX	298.39	lb/Mgal	Potential Site Variation Emissions Data
EU09-15	Diesel	CO	35.54	lb/Mgal	Potential Site Variation Emissions Data
EU09-15	Diesel	VOC	6.55	lb/Mgal	Potential Site Variation Emissions Data
EU09-15	Diesel	SO2	0.21	lb/Mgal	AP-42 Table 3.4-1, 4/2025
EU09-15	Diesel	CO2	22,338	lb/Mgal	40 CFR 98, Subpart C, Table C-1
EU09-15	Diesel	CH4	0.91	lb/Mgal	40 CFR 98, Subpart C, Table C-2
EU09-15	Diesel	N2O	0.18	lb/Mgal	40 CFR 98, Subpart C, Table C-2
EU09-15	Diesel	Benzene	0.11	lb/Mgal	AP-42 Table 4.3-3
EU09-15	Diesel	Toluene	0.038	lb/Mgal	AP-42 Table 4.3-3
EU09-15	Diesel	Xylenes	0.026	lb/Mgal	AP-42 Table 4.3-3

Section EE.6: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007N

Source Emissions Profile

__ Section N.1: Emission Summary

__ Section N.2: Stack Information

__ Section N.3: Fugitive Informatio

__ Section N.4: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI

Source Name: Amazon Data Services, Inc.

KY EIS (AFS) #: 21- 015-00271

Permit #: S-23-061

Agency Interest (AI) ID: 178765

Date: May 2025

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	PM/PM10/ PM2.5	2.34	Potential Site Variation Emissions Data	N/A	N/A	0.40	N/A	0.10	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	NOx	298.39	Potential Site Variation Emissions Data	N/A	N/A	51.11	N/A	12.78	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	CO	35.54	Potential Site Variation Emissions Data	N/A	N/A	6.09	N/A	1.52	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	VOC	6.55	Potential Site Variation Emissions Data	N/A	N/A	1.12	N/A	0.28	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	SO2	0.21	AP-42 Table 3.4-1, 4/2025	N/A	N/A	0.036	N/A	8.89E-03	N/A

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	CO2	22,338	40 CFR 98, Subpart C, Table C-1	N/A	N/A	3,827	N/A	956.6	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	CH4	0.91	40 CFR 98, Subpart C, Table C-2	N/A	N/A	0.16	N/A	0.039	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	N2O	0.18	40 CFR 98, Subpart C, Table C-2	N/A	N/A	0.031	N/A	7.76E-03	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	CO2e	22,412	40 CFR 98, Subpart C	N/A	N/A	3,839	N/A	959.8	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	Benzene	0.11	AP-42 Table 4.3-3	N/A	N/A	0.018	N/A	4.55E-03	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	Toluene	0.038	AP-42 Table 4.3-3	N/A	N/A	6.59E-03	N/A	1.65E-03	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	Xylene	0.026	AP-42 Table 4.3-3	N/A	N/A	4.53E-03	N/A	1.13E-03	N/A
EU01-08	Emergency Engines 1-8	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	Total HAP	0.22	Sum of HAPs	N/A	N/A	0.037	N/A	9.23E-03	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S9-15	0.1713	PM/PM10/ PM2.5	2.34	Potential Site Variation Emissions Data	N/A	N/A	0.40	N/A	0.10	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	NOX	298.39	Potential Site Variation Emissions Data	N/A	N/A	51.11	N/A	12.78	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	CO	35.54	Potential Site Variation Emissions Data	N/A	N/A	6.09	N/A	1.52	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	VOC	6.55	Potential Site Variation Emissions Data	N/A	N/A	1.12	N/A	0.28	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	SO2	0.21	AP-42 Table 3.4-1, 4/2025	N/A	N/A	0.036	N/A	8.89E-03	N/A

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	CO2	22,338	40 CFR 98, Subpart C, Table C-1	N/A	N/A	3,827	N/A	956.6	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	CH4	0.91	40 CFR 98, Subpart C, Table C-2	N/A	N/A	0.16	N/A	0.039	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	N2O	0.18	40 CFR 98, Subpart C, Table C-2	N/A	N/A	0.031	N/A	7.76E-03	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	CO2e	22,412	40 CFR 98, Subpart C	N/A	N/A	3,839	N/A	959.8	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	Benzene	0.11	AP-42 Table 4.3-3	N/A	N/A	0.018	N/A	4.55E-03	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	Toluene	0.038	AP-42 Table 4.3-3	N/A	N/A	6.59E-03	N/A	1.65E-03	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	Xylenes	0.026	AP-42 Table 4.3-3	N/A	N/A	4.53E-03	N/A	1.13E-03	N/A
EU09-15	Emergency Engines 9-15	1	Diesel Combustion	N/A	N/A	S1-8	0.1713	Total HAP	0.22	Sum of HAPs	N/A	N/A	0.037	N/A	9.23E-03	N/A

Section N.2: Stack Information

UTM Zone: 16

Stack ID	Identify all Emission Units (with Process ID) and Control Devices that Feed to Stack	Stack Physical Data			Stack UTM Coordinates		Stack Gas Stream Data		
		Equivalent Diameter *(ft)*	Height *(ft)*	Base Elevation *(ft)*	Northing *(m)*	Easting *(m)*	Flowrate *(acfm)*	Temperature *(° F)*	Exit Velocity *(ft/sec)*
EU01	Emergency Engine 1	1.00	11.33	886	4,321,173	701,341	18,497	853.10	18.10
EU02	Emergency Engine 2	1.00	11.33	886	4,321,173	701,349	18,497	853.10	18.10
EU03	Emergency Engine 3	1.00	11.33	886	4,321,177	701,378	18,497	853.10	18.10
EU04	Emergency Engine 4	1.00	11.33	886	4,321,182	701,385	18,497	853.10	18.10
EU05	Emergency Engine 5	1.00	11.33	886	4,321,410	701,588	18,497	853.10	18.10
EU06	Emergency Engine 6	1.00	11.33	886	4,321,411	701,596	18,497	853.10	18.10
EU07	Emergency Engine 7	1.00	11.33	886	4,321,413	701,604	18,497	853.10	18.10
EU08	Emergency Engine 8	1.00	11.33	886	4,321,415	701,610	18,497	853.10	18.10
EU09-15	Emergency Engines 9-15	1.00	11.33	886	TBD	TBD	18,497	853.10	18.10

Section N.3: Fugitive Information

UTM Zone:

Emission Unit #	Emission Unit Name	Process ID	Area Physical Data		Area UTM Coordinates		Area Release Data	
			Length of the X Side *(ft)*	Length of the Y Side *(ft)*	Northing *(m)*	Easting *(m)*	Release Temperature *(°F)*	Release Height *(ft)*
Not applicable								

Section N.4: Notes, Comments, and Explanations

The N.1 form calculates the hourly and annual emissions for each generator in a group individually

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007V

Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)

___ Section V.2: Monitoring Requirements

___ Section V.3: Recordkeeping Requirements

___ Section V.4: Reporting Requirements

___ Section V.5: Testing Requirements

___ Section V.6: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI

Source Name: Amazon Data Services, Inc.

KY EIS (AFS) #: 21- 015-00271

Permit #: S-23-061

Agency Interest (AI) ID: 178765

Date: May 2025

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU01-15	Emergency Engines 1-15	40 CFR 60.4207(b)	N/A	N/A	N/A	The permittee shall use diesel fuel that meets the requirements of 40 CFR 1090.305 for nonroad diesel fuel.	Monitoring and recordkeeping requirements
EU01-15	Emergency Engines 1-15	40 CFR 60.4211(a)	N/A	N/A	N/A	The permittee shall do all of the following, except as permitted under 40 CFR 60.4211(g): (1) Operate and maintain the engines and control devices according to the manufacturer's emission-related written instructions; (2) Change only those emission-related settings that are permitted by the manufacturer; and (3) Meet the requirements of 40 CFR part 1068, as they apply.	Monitoring and recordkeeping requirements

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU01-15	Emergency Engines 1-15	40 CFR 60.4211(f)	N/A	N/A	N/A	The permittee shall operate the engines according to the requirements in 40 CFR 60.4211(f)(1) through (3). In order for the engine to be considered an emergency engine, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year is prohibited. If the permittee does not operate the engine according to the following requirements, the engine will not be considered an emergency engine under 40 CFR 60, Subpart IIII and shall meet all requirements for non-emergency engines.	Monitoring and recordkeeping requirements
EU01-15	Emergency Engines 1-15	40 CFR 60.4211(f)(1)	N/A	N/A	N/A	There is no time limit on the use of emergency engines in emergency situations.	Monitoring and recordkeeping requirements
EU01-15	Emergency Engines 1-15	41 CFR 60.4211(f)(2) and (f)(2)(i)	N/A	N/A	N/A	The permittee may operate the emergency engines for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine for a maximum of 100 hours per calendar year. Any operation for non-emergency situations counts as part of the 100 hours per calendar year allowed. The permittee may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the permittee maintains records indicating that federal, state, or local standards require maintenance and testing of emergency engines beyond 100 hours per calendar year.	Monitoring and recordkeeping requirements
EU01-15	Emergency Engines 1-15	40 CFR 60.4211(f)(3)	N/A	N/A	N/A	Emergency engines may be operated for up to 50 hours per calendar year in non emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing. Except as provided in 40 CFR 60.4211(f)(3)(i), the 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.	Monitoring and recordkeeping requirements
EU01-15	Emergency Engines 1-15	40 CFR 63.6590(c)(1)	N/A	N/A	N/A	The permittee shall meet the requirements of 40 CFR 63, Subpart ZZZZ by meeting the requirements 40 CFR 60, Subpart IIII. No further requirements apply for this engine under 40 CFR 63, Subpart ZZZZ.	Monitoring and recordkeeping requirements
EU01-15	Emergency Engines 1-15	40 CFR 60.4205(b)	N/A	N/A	N/A	The permittee shall comply with the Tier 2 emission standards in 40 CFR 1039, Appendix I, as follows, and the smoke standards as specified in 40 CFR 1039.105 over the entire life of the engine.	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4211(c)).

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU01-15	Emergency Engines 1-15	40 CFR 60.4205(b)	NOx + NMHC	6.4 g/kW-hr	N/A	N/A	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4211(c)).
EU01-15	Emergency Engines 1-15	40 CFR 60.4205(b)	CO	3.5 g/kW-hr	N/A	N/A	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4211(c)).
EU01-15	Emergency Engines 1-15	40 CFR 60.4205(b)	PM	0.20 g/kW-hr	N/A	N/A	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4211(c)).
Facility	Facility	401 KAR 52:030	NOx	NA	90 tpy	Source-wide NOx emissions shall not exceed 90 tons/yr on a 12-month rolling basis	Calculate monthly NOx emissions on a 12-month basis

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
EU01-15	Emergency Engines 1-15	N/A	401 KAR 52:040, Section 10	Diesel usage	The permittee shall monitor the amount of diesel fuel combusted (in gallons) on a monthly basis.
EU01-15	Emergency Engines 1-15	N/A	40 CFR 60.4209(a)	Operating hours	If the engines do not meet the standards applicable to non-emergency engines, the permittee shall install a non-resettable hour meter prior to startup of the engines.

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
EU01-15	Emergency Engines 1-15	N/A	401 KAR 52:040, Section 10	Diesel usage	The permittee shall maintain records of the amount of diesel fuel combusted (in gallons) on a monthly basis.
EU01-15	Emergency Engines 1-15	N/A	40 CFR 60.4214(b)	N/A	If the engines do not meet the standards applicable to non-emergency engines, the permittee shall maintain records of the operation of the engine in emergency and nonemergency service that are recorded through the non-resettable hour meter. The permittee shall record the time of operation of the engine and the reason the engine was in operation during that time.

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
EU01-15	Emergency Engines 1-15	N/A	40 CFR 60.4214(b)	N/A	The permittee is not required to submit an initial notification.
EU01-15	Emergency Engines 1-15	N/A	40 CFR 60.4214(d)	N/A	If the engines operate for the purpose specified in 40 CFR 60.4211(f)(3)(i), the permittee shall submit an annual report according to the requirements in 40 CFR 60.4214(d)(1) through (3).

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
EU01-15	Emergency Engines 1-15	N/A	401 KAR 50:045, Section 1	N/A	Testing shall be conducted at such times as may be requested by the Cabinet.

Section V.6: Notes, Comments, and Explanations

Attachment 2
Detailed Emissions Calculations

1. Emissions Associated with Caterpillar 3516C Generator Engine (Reconciliation)

1.1 Generator Power and Fuel Consumption Data

> Pertinent data on engine power and fuel usage taken from the technical data sheet and statement of exhaust for the Caterpillar 3516C generator. Heat value of diesel taken from AP-42 Appendix A.

Mechanical Power in bhp (100% load):	3,634.0	bhp
Generator Output in kW (100% load):	2,500.0	kW
Fuel Consumption Rate in Mgal/hr (100% load):	0.1713	Mgal/hr
Annual Operating Hours:	500	hrs
Typical Heat Content of Diesel Fuel:	137,000	Btu/gal
Sulfur Content of Diesel Fuel:	15	ppm

1.2 Source Classification Code

> Emissions are tied to the SCC code for diesel fueled engines listed below.

SCC:	20200102
SCC Description:	Internal Combustion Engines, Industrial (2-02), Distillate Oil (Diesel) (2-02-001), Reciprocating (2-02-001-02)
SCC Units:	1000 Gallons Diesel Burned

1.3 Emission Calculation Methodology and Emission Factors

> Emission factors for NOX, VOC, CO and PM are based on the vendor-provided potential site variation emissions data. To take into account the lower sulfur content of the diesel fuel burned, for purposes of representing potential SO2 emissions from the engines, the factor in AP-42 Table 3.4-1 (Large Stationary Diesel Engines, 4/2025 edition) is used as shown below. This factor expresses SO2 as a function of sulfur content.

1.3.1 NOX

Emission factor for NOX:	6.38	g/bhp-hr	Potential Site Variation Emissions Data
NOX emission factor in terms of SCC units:	298.39	lb/Mgal	= 6.38 g/bhp-hr * 3,634 bhp / 0.171 Mgal/hr * 0.0022046 lb/g

1.3.2 CO

Emission factor for CO:	0.76	g/bhp-hr	Potential Site Variation Emissions Data
CO emission factor in terms of SCC units:	35.54	lb/Mgal	= 0.76 g/bhp-hr * 3,634 bhp / 0.171 Mgal/hr * 0.0022046 lb/g

1.3.3 VOC

Emission factor for VOC:	0.14	g/bhp-hr	Potential Site Variation Emissions Data
VOC emission factor in terms of SCC units:	6.55	lb/Mgal	= 0.14 g/bhp-hr * 3,634 bhp / 0.171 Mgal/hr * 0.0022046 lb/g

1.3.4 PM/PM10/PM2.5

Emission factor for PM:	0.050	g/bhp-hr	Potential Site Variation Emissions Data
PM emission factor in terms of SCC units:	2.34	lb/Mgal	= 0.050 g/bhp-hr * 3,634 bhp / 0.171 Mgal/hr * 0.0022046 lb/g

1.3.5 SO2

Emission factor for SO2:	1.01 * S	lb/MMBtu	AP-42 Table 3.4-1, 10/1996 (S is sulfur content in %)
	1.52E-03	lb/MMBtu	= 1.01 * 15 ppm * 100 / 1,000,000
SO2 emission factor in terms of SCC units:	0.21	lb/Mgal	= 1.52E-03 lb/MMBtu * 137,000 Btu/gal * 1,000 / 1,000,000

1.3.6 HAP Emission Estimates

> Emission factors for organic HAP compounds expected to be emitted are based on emission factors in AP-42 Table 3.4-3 and Table 3.4-4 (4/25 Edition). Emission factors are converted from lb/MMBtu as provided in AP-42 to lb/Mgal as applicable to the SCC designation.

	CAS #	HAP?	Emission Factor (lb/MMBtu)	Emission Factor (lb/hp-hr)	Emission Factor (lb/Mgal)	Emission Factor Basis
Benzene	71-43-2	Y	7.76E-04	5.01E-06	0.11	AP-42 Table 4.3-3
Toluene	108-88-3	Y	2.81E-04	1.81E-06	0.038	AP-42 Table 4.3-3
Xylenes	1330-20-7	Y	1.93E-04	1.25E-06	0.026	AP-42 Table 4.3-3
Naphthalene	91-20-3	Y	1.30E-04	8.40E-07	0.018	AP-42 Table 4.3-4
Formaldehyde	50-00-0	Y	7.89E-05	5.10E-07	0.011	AP-42 Table 4.3-3
Phenanthrene	85-01-8	Y	4.08E-05	2.63E-07	5.59E-03	AP-42 Table 4.3-4
Acetaldehyde	75-07-0	Y	2.52E-05	1.63E-07	3.45E-03	AP-42 Table 4.3-3
Fluorene	86-73-7	Y	1.28E-05	8.27E-08	1.75E-03	AP-42 Table 4.3-4
Acenaphthylene	208-96-8	Y	9.23E-06	5.96E-08	1.26E-03	AP-42 Table 4.3-4
Acrolein	107-02-8	Y	7.88E-06	5.09E-08	1.08E-03	AP-42 Table 4.3-3
Acenaphthene	83-32-9	Y	4.68E-06	3.02E-08	6.41E-04	AP-42 Table 4.3-4
Fluoranthene	206-44-0	Y	4.03E-06	2.60E-08	5.52E-04	AP-42 Table 4.3-4
Pyrene	129-00-0	Y	3.71E-06	2.40E-08	5.08E-04	AP-42 Table 4.3-4
Chrysene	218-01-9	Y	1.53E-06	9.88E-09	2.10E-04	AP-42 Table 4.3-4
Anthracene	120-12-7	Y	1.23E-06	7.94E-09	1.69E-04	AP-42 Table 4.3-4
Benzo(b)fluoranthene	205-99-2	Y	1.11E-06	7.17E-09	1.52E-04	AP-42 Table 4.3-4
Benzo(a)anthracene	56-55-3	Y	6.22E-07	4.02E-09	8.52E-05	AP-42 Table 4.3-4
Benzo(g,h,i)perylene	191-24-2	Y	5.56E-07	3.59E-09	7.62E-05	AP-42 Table 4.3-4
Indeno (1,2,3-cd)pyrene	193-39-5	Y	4.14E-07	2.67E-09	5.67E-05	AP-42 Table 4.3-4
Dibenz(a,h)anthracene	53-70-3	Y	3.46E-07	2.23E-09	4.74E-05	AP-42 Table 4.3-4
Benzo(a)pyrene	50-32-8	Y	2.57E-07	1.66E-09	3.52E-05	AP-42 Table 4.3-4
Benzo(k)fluoranthene	207-08-9	Y	2.18E-07	1.41E-09	2.99E-05	AP-42 Table 4.3-4
Total HAP					0.22	

1.3.7 GHG Emission Factors

> CO2, CH4 and N2O emissions for diesel fuel combustion are estimated using the Distillate Fuel Oil No. 2 emission factors published in 40 CFR 98, Subpart C, Table C-1 & 2. CO2e emissions for diesel fuel combustion are estimated using the global warming potentials published in 40 CFR 98, Subpart A, Table A-1.

Global Warming Potentials of GHGs per 40 CFR 98 Subpart A, Table A-1.

CO2	1
CH4	28
N2O	265

CO2 Emission Factor	73.96	kg CO2/MMBtu	40 CFR 98, Subpart C, Table C-1; Distillate Fuel Oil No. 2
CH4 Emission Factor	3.0E-03	kg CH4/MMBtu	40 CFR 98, Subpart C, Table C-2; Distillate Fuel Oil No. 2
N2O Emission Factor	6.0E-04	kg N2O/MMBtu	40 CFR 98, Subpart C, Table C-2; Distillate Fuel Oil No. 2

Pollutant	Emission Factor (kg/MMBtu)	Equivalent Factor (lb/Mgal)
CO2	73.96	22,338
CH4	3.00E-03	0.91
N2O	6.00E-04	0.18
CO2e	74.20	22,412

1.4 Summary of Engine Potential Emissions - Single Generator

Pollutant	Emission Factor (lb/Mgal)	Basis	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
NOX	298.39	Potential Site Variation Emissions Data	51.11	12.78
CO	35.54	Potential Site Variation Emissions Data	6.09	1.52
VOC	6.55	Potential Site Variation Emissions Data	1.12	0.28
PM/PM10/PM2.5	2.34	Potential Site Variation Emissions Data	0.40	0.10
SO2	0.21	AP-42 Table 3.4-1, 4/2025	0.036	8.89E-03
CO2	22,338	40 CFR 98, Subpart C, Table C-1	3,826.56	956.64
CH4	0.91	40 CFR 98, Subpart C, Table C-2	0.16	0.039
N2O	0.18	40 CFR 98, Subpart C, Table C-2	0.031	7.76E-03
CO2e	22,412	40 CFR 98, Subpart C	3,839.13	959.78
Max HAP - benzene	0.11	AP-42 Table 4.3-3	0.018	4.55E-03
Total HAP	0.22	Sum of HAPs	0.037	9.23E-03

1.5 Summary of Engine Potential Emissions - 8 Generators

Pollutant	Emission Factor (lb/Mgal)	Basis	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
NOX	298.39	Potential Site Variation Emissions Data	408.91	102.23
CO	35.54	Potential Site Variation Emissions Data	48.71	12.18
VOC	6.55	Potential Site Variation Emissions Data	8.97	2.24
PM/PM10/PM2.5	2.34	Potential Site Variation Emissions Data	3.20	0.80
SO2	0.21	AP-42 Table 3.4-1, 4/2025	0.28	0.071
CO2	22,338	40 CFR 98, Subpart C, Table C-1	30,612.48	7,653.12
CH4	0.91	40 CFR 98, Subpart C, Table C-2	1.24	0.31
N2O	0.18	40 CFR 98, Subpart C, Table C-2	0.25	0.062
CO2e	22,412	40 CFR 98, Subpart C	30,713	7,678
Max HAP - benzene	0.11	AP-42 Table 4.3-3	0.15	0.036
Total HAP	0.22	Sum of HAPs	0.30	0.074

1. Emissions Associated with Caterpillar 3516C Generator Engine (New)

1.1 Generator Power and Fuel Consumption Data

> Pertinent data on engine power and fuel usage taken from the technical data sheet and statement of exhaust for the Caterpillar 3516C generator. Heat value of diesel taken from AP-42 Appendix A.

Mechanical Power in bhp (100% load):	3,634.0	bhp
Generator Output in kW (100% load):	2,500.0	kW
Fuel Consumption Rate in Mgal/hr (100% load):	0.1713	Mgal/hr
Annual Operating Hours:	500	hrs
Typical Heat Content of Diesel Fuel:	137,000	Btu/gal
Sulfur Content of Diesel Fuel:	15	ppm

1.2 Source Classification Code

> Emissions are tied to the SCC code for diesel fueled engines listed below.

SCC:	20200102
SCC Description:	Internal Combustion Engines, Industrial (2-02), Distillate Oil (Diesel) (2-02-001), Reciprocating (2-02-001-02)
SCC Units:	1000 Gallons Diesel Burned

1.3 Emission Calculation Methodology and Emission Factors

> Emission factors for NOX, VOC, CO and PM are based on the vendor-provided potential site variation emissions data. To take into account the lower sulfur content of the diesel fuel burned, for purposes of representing potential SO2 emissions from the engines, the factor in AP-42 Table 3.4-1 (Large Stationary Diesel Engines, 4/2025 edition) is used as shown below. This factor expresses SO2 as a function of sulfur content.

1.3.1 NOX

Emission factor for NOX:	6.38	g/bhp-hr	Potential Site Variation Emissions Data
NOX emission factor in terms of SCC units:	298.39	lb/Mgal	= 6.38 g/bhp-hr * 3,634 bhp / 0.171 Mgal/hr * 0.0022046 lb/g

1.3.2 CO

Emission factor for CO:	0.76	g/bhp-hr	Potential Site Variation Emissions Data
CO emission factor in terms of SCC units:	35.54	lb/Mgal	= 0.76 g/bhp-hr * 3,634 bhp / 0.171 Mgal/hr * 0.0022046 lb/g

1.3.3 VOC

Emission factor for VOC:	0.14	g/bhp-hr	Potential Site Variation Emissions Data
VOC emission factor in terms of SCC units:	6.55	lb/Mgal	= 0.14 g/bhp-hr * 3,634 bhp / 0.171 Mgal/hr * 0.0022046 lb/g

1.3.4 PM/PM10/PM2.5

Emission factor for PM:	0.050	g/bhp-hr	Potential Site Variation Emissions Data
PM emission factor in terms of SCC units:	2.34	lb/Mgal	= 0.050 g/bhp-hr * 3,634 bhp / 0.171 Mgal/hr * 0.0022046 lb/g

1.3.5 SO2

Emission factor for SO2:	1.01 * S	lb/MMBtu	AP-42 Table 3.4-1, 4/2025 (S is sulfur content in %)
	1.52E-03	lb/MMBtu	= 1.01 * 15 ppm * 100 / 1,000,000
SO2 emission factor in terms of SCC units:	0.21	lb/Mgal	= 1.52E-03 lb/MMBtu * 137,000 Btu/gal * 1,000 / 1,000,000

1.3.6 HAP Emission Estimates

> Emission factors for organic HAP compounds expected to be emitted are based on emission factors in AP-42 Table 3.4-3 and Table 3.4-4 (4/25 Edition). Emission factors are converted from lb/MMBtu as provided in AP-42 to lb/Mgal as applicable to the SCC designation.

	CAS #	HAP?	Emission Factor (lb/MMBtu)	Emission Factor (lb/hp-hr)	Emission Factor (lb/Mgal)	Emission Factor Basis
Benzene	71-43-2	Y	7.76E-04	5.01E-06	0.11	AP-42 Table 4.3-3
Toluene	108-88-3	Y	2.81E-04	1.81E-06	0.038	AP-42 Table 4.3-3
Xylenes	1330-20-7	Y	1.93E-04	1.25E-06	0.026	AP-42 Table 4.3-3
Naphthalene	91-20-3	Y	1.30E-04	8.40E-07	0.018	AP-42 Table 4.3-4
Formaldehyde	50-00-0	Y	7.89E-05	5.10E-07	0.011	AP-42 Table 4.3-3
Phenanthrene	85-01-8	Y	4.08E-05	2.63E-07	5.59E-03	AP-42 Table 4.3-4
Acetaldehyde	75-07-0	Y	2.52E-05	1.63E-07	3.45E-03	AP-42 Table 4.3-3
Fluorene	86-73-7	Y	1.28E-05	8.27E-08	1.75E-03	AP-42 Table 4.3-4
Acenaphthylene	208-96-8	Y	9.23E-06	5.96E-08	1.26E-03	AP-42 Table 4.3-4
Acrolein	107-02-8	Y	7.88E-06	5.09E-08	1.08E-03	AP-42 Table 4.3-3
Acenaphthene	83-32-9	Y	4.68E-06	3.02E-08	6.41E-04	AP-42 Table 4.3-4
Fluoranthene	206-44-0	Y	4.03E-06	2.60E-08	5.52E-04	AP-42 Table 4.3-4
Pyrene	129-00-0	Y	3.71E-06	2.40E-08	5.08E-04	AP-42 Table 4.3-4
Chrysene	218-01-9	Y	1.53E-06	9.88E-09	2.10E-04	AP-42 Table 4.3-4
Anthracene	120-12-7	Y	1.23E-06	7.94E-09	1.69E-04	AP-42 Table 4.3-4
Benzo(b)fluoranthene	205-99-2	Y	1.11E-06	7.17E-09	1.52E-04	AP-42 Table 4.3-4
Benzo(a)anthracene	56-55-3	Y	6.22E-07	4.02E-09	8.52E-05	AP-42 Table 4.3-4
Benzo(g,h,i)perylene	191-24-2	Y	5.56E-07	3.59E-09	7.62E-05	AP-42 Table 4.3-4
Indeno (1,2,3-cd)pyrene	193-39-5	Y	4.14E-07	2.67E-09	5.67E-05	AP-42 Table 4.3-4
Dibenz(a,h)anthracene	53-70-3	Y	3.46E-07	2.23E-09	4.74E-05	AP-42 Table 4.3-4
Benzo(a)pyrene	50-32-8	Y	2.57E-07	1.66E-09	3.52E-05	AP-42 Table 4.3-4
Benzo(k)fluoranthene	207-08-9	Y	2.18E-07	1.41E-09	2.99E-05	AP-42 Table 4.3-4
Total HAP					0.22	

1.3.7 GHG Emission Factors

> CO2, CH4 and N2O emissions for diesel fuel combustion are estimated using the Distillate Fuel Oil No. 2 emission factors published in 40 CFR 98, Subpart C, Table C-1 & 2. CO2e emissions for diesel fuel combustion are estimated using the global warming potentials published in 40 CFR 98, Subpart A, Table A-1.

Global Warming Potentials of GHGs per 40 CFR 98 Subpart A, Table A-1.

CO2	1
CH4	28
N2O	265

CO2 Emission Factor	73.96	kg CO2/MMBtu	40 CFR 98, Subpart C, Table C-1; Distillate Fuel Oil No. 2
CH4 Emission Factor	3.0E-03	kg CH4/MMBtu	40 CFR 98, Subpart C, Table C-2; Distillate Fuel Oil No. 2
N2O Emission Factor	6.0E-04	kg N2O/MMBtu	40 CFR 98, Subpart C, Table C-2; Distillate Fuel Oil No. 2

Pollutant	Emission Factor (kg/MMBtu)	Equivalent Factor (lb/Mgal)
CO2	73.96	22,338
CH4	3.00E-03	0.91
N2O	6.00E-04	0.18
CO2e	74.20	22,412

1.4 Summary of Engine Potential Emissions - Single Generator

Pollutant	Emission Factor (lb/Mgal)	Basis	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
NOX	298.39	Potential Site Variation Emissions Data	51.11	12.78
CO	35.54	Potential Site Variation Emissions Data	6.09	1.52
VOC	6.55	Potential Site Variation Emissions Data	1.12	0.28
PM/PM10/PM2.5	2.34	Potential Site Variation Emissions Data	0.40	0.10
SO2	0.21	AP-42 Table 3.4-1, 4/2025	0.036	8.89E-03
CO2	22,338	40 CFR 98, Subpart C, Table C-1	3,826.56	956.64
CH4	0.91	40 CFR 98, Subpart C, Table C-2	0.16	0.039
N2O	0.18	40 CFR 98, Subpart C, Table C-2	0.031	7.76E-03
CO2e	22,412	40 CFR 98, Subpart C	3,839.13	959.78
Max HAP - benzene	0.11	AP-42 Table 4.3-3	0.018	4.55E-03
Total HAP	0.22	Sum of HAPs	0.037	9.23E-03

1.5 Summary of Engine Potential Emissions - 7 Generators

Pollutant	Emission Factor (lb/Mgal)	Basis	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
NOX	298.39	Potential Site Variation Emissions Data	357.79	89.45
CO	35.54	Potential Site Variation Emissions Data	42.62	10.66
VOC	6.55	Potential Site Variation Emissions Data	7.85	1.96
PM/PM10/PM2.5	2.34	Potential Site Variation Emissions Data	2.80	0.70
SO2	0.21	AP-42 Table 3.4-1, 4/2025	0.25	0.062
CO2	22,338	40 CFR 98, Subpart C, Table C-1	26,785.92	6,696.48
CH4	0.91	40 CFR 98, Subpart C, Table C-2	1.09	0.27
N2O	0.18	40 CFR 98, Subpart C, Table C-2	0.22	0.054
CO2e	22,412	40 CFR 98, Subpart C	26,874	6,718
Max HAP - benzene	0.11	AP-42 Table 4.3-3	0.13	0.032
Total HAP	0.22	Sum of HAPs	0.26	0.065

Attachment 3
Engine Specifications and Certificates of Conformity

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Caterpillar Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: PCPXL78.1NZS-009

Effective Date: 06/08/2022

Expiration Date: 12/31/2023

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 06/08/2022

Revision Date: N/A

Model Year: 2023
Manufacturer Type: Original Engine Manufacturer
Engine Family: PCPXL78.1NZS

Mobile/Stationary Indicator: Stationary
Emissions Power Category: kW>560
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2024 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Caterpillar Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: RCPXL78.1NZS-030

Effective Date: 07/26/2023

Expiration Date: 12/31/2024

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 07/26/2023

Revision Date: N/A

Model Year: 2024
Manufacturer Type: Original Engine Manufacturer
Engine Family: RCPXL78.1NZS

Mobile/Stationary Indicator: Stationary
Emissions Power Category: kW>560
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

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This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

Cat® 3516C
Diesel Generator Sets

Image shown may not reflect actual configuratio

Bore – mm (in)	170 (6.69)
Stroke – mm (in)	215 (8.46)
Displacement – L (in^3)	78 (4764.73)
Compression Ratio	14.7:1
Aspiration	TA
Fuel System	EUI
Governor Type	ADEM™ A3

Standby 60 Hz ekW (kVA)	Mission Critical 60 Hz ekW (kVA)	Prime 60 Hz ekW (kVA)	Continuous 60 Hz ekW (kVA)	Emissions Performance
2500 (3125)	2500 (3125)	2250 (2812)	2050 (2562)	U.S. EPA Stationary Emergency Use Only (Tier 2)

Standard Features

Cat® Diesel Engine
- Meets U.S. EPA Stationary Emergency Use Only (Tier 2) emission standards
- Reliable performance proven in thousands of applications worldwide

Generator Set Package
- Accepts 100% block load in one step and meets NFPA 110 loading requirements
- Conforms to ISO 8528-5 G3 load acceptance requirements
- Reliability verified through torsional vibration, fuel consumption, oil consumption, transient performance, and endurance testing

Alternators
- Superior motor starting capability minimizes need for oversizing generator
- Designed to match performance and output characteristics of Cat diesel engines

Cooling System
- Cooling systems available to operate in ambient temperatures up to 50°C (122°F)
- Tested to ensure proper generator set cooling

EMCP 4 Control Panels
- User-friendly interface and navigation
- Scalable system to meet a wide range of installation requirements
- Expansion modules and site specific programming for specific customer requirements

Warranty
- 24 months/1000-hour warranty for standby and mission critical ratings
- 12 months/unlimited hour warranty for prime and continuous ratings
- Extended service protection is available to provide extended coverage options

Worldwide Product Support
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

Financing
- Caterpillar offers an array of financial products to help you succeed through financial service excellence
- Options include loans, finance lease, operating lease, working capital, and revolving line of credit
- Contact your local Cat dealer for availability in your region

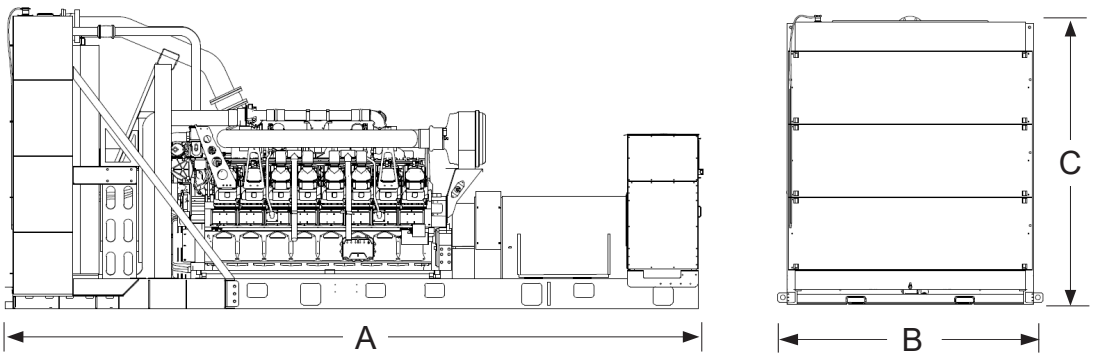
Package Performance

Performance	Standby		Mission Critical		Prime		Continuous	
Frequency	60 Hz		60 Hz		60 Hz		60 Hz	
Gen set power rating with fan	2500 ekW		2500 ekW		2250 ekW		2050 ekW	
Gen set power rating with fan @ 0.8 power factor	3125 kVA		3125 kVA		2812 kVA		2562 kVA	
Emissions	EPA ESE (TIER 2)		EPA ESE (TIER 2)		EPA ESE (TIER 2)		EPA ESE (TIER 2)	
Performance number	EM1894-01		EM1895-02		DM8447-04		DM8268-03	
Fuel Consumption								
100% load with fan – L/hr (gal/hr)	656.8	(175.3)	656.8	(175.3)	593.0	(156.6)	549.3	(145.1)
75% load with fan – L/hr (gal/hr)	510.8	(134.9)	510.8	(134.9)	467.8	(123.6)	435.6	(115.1)
50% load with fan – L/hr (gal/hr)	372.4	(98.4)	372.4	(98.4)	341.9	(90.3)	316.8	(83.7)
25% load with fan – L/hr (gal/hr)	219.3	(57.9)	219.3	(57.9)	203.0	(53.6)	188.9	(49.9)
Cooling System								
Radiator air flow restriction (system) – kPa (in. water)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)
Radiator air flow – m^3/min (cfm)	2356	(83201)	2356	(83201)	2356	(83201)	2356	(83201)
Engine coolant capacity – L (gal)	233.0	(61.6)	233.0	(61.6)	233.0	(61.6)	233.0	(61.6)
Radiator coolant capacity – L (gal)	180.0	(47.6)	180.0	(47.6)	180.0	(47.6)	180.0	(47.6)
Total coolant capacity – L (gal)	413.0	(109.2)	413.0	(109.2)	413.0	(109.2)	413.0	(109.2)
Inlet Air								
Combustion air inlet flow rate – m^3/min (cfm)	242.2	(7212.2)	242.2	(7212.2)	193.1	(6819.8)	183.8	(6491.7)
Exhaust System								
Exhaust stack gas temperature – °C (°F)	490.7	(915.2)	490.7	(915.2)	471.3	(880.4)	463.6	(866.5)
Exhaust gas flow rate – m^3/min (cfm)	554.5	(19578.8)	554.5	(19578.8)	507.9	(17935.1)	476.5	(16826.7)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)	6.7	(27.0)
Heat Rejection								
Heat rejection to jacket water – kW (Btu/min)	826	(46992)	826	(46992)	777	(44160)	739	(42021)
Heat rejection to exhaust (total) – kW (Btu/min)	2502	(142265)	2502	(142265)	2243	(127532)	2092	(118949)
Heat rejection to aftercooler – kW (Btu/min)	786	(44723)	786	(44723)	690	(39224)	619	(35176)
Heat rejection to atmosphere from engine – kW (Btu/min)	161	(9146)	161	(9146)	150	(8542)	145	(8229)
Heat rejection from alternator – kW (Btu/min)	121	(6853)	121	(6853)	99	(5607)	94	(5368)
Emissions* (Nominal)								
NOx mg/Nm^3 (g/hp-h)	2349.1	(5.32)	2349.1	(5.32)	2206.7	(4.95)	2038.1	(4.62)
CO mg/Nm^3 (g/hp-h)	195.4	(0.42)	195.4	(0.42)	141.2	(0.30)	124.8	(0.27)
HC mg/Nm^3 (g/hp-h)	42.1	(0.10)	42.1	(0.10)	44.4	(0.11)	49.2	(0.12)
PM mg/Nm^3 (g/hp-h)	14.1	(0.04)	14.1	(0.04)	10.9	(0.03)	11.0	(0.03)
Emissions* (Potential Site Variation)								
NOx mg/Nm^3 (g/hp-h)	2818.9	(6.38)	2818.9	(6.38)	2648.0	(5.94)	2445.8	(5.55)
CO mg/Nm^3 (g/hp-h)	351.8	(0.76)	351.8	(0.76)	254.2	(0.55)	224.6	(0.49)
HC mg/Nm^3 (g/hp-h)	55.9	(0.14)	55.9	(0.14)	59.1	(0.15)	65.5	(0.16)
PM mg/Nm^3 (g/hp-h)	19.7	(0.05)	19.7	(0.05)	15.2	(0.04)	15.3	(0.04)

**mg/Nm^3 levels are corrected to 5% O_2. Contact your local Cat dealer for further information.*

3516C Diesel Generator Sets
Electric Power

Weights and Dimensions



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
6800 (267.7)	2339 (92.1)	2997 (118.0)	17 590 (38,780)

Note: *For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.*

Ratings Definitions

Standby
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Mission Critical
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical power rating. Typical peak demand up to 100% of rated power for up to 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Prime
Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated ekW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Continuous
Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous power rating. Typical peak demand is 100% of continuous rated kW for 100% of the operating hours.

Applicable Codes and Standards
AS 1359, CSA C22.2 No. 100-04, UL 142, UL 489, UL 869, UL 2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC, IEC 60034-1, ISO 3046, ISO 8528, NEMA MG1-22, NEMA MG1-33, 2014/35/EU, 2006/42/EC, 2014/30/EU.

Note: Codes may not be available in all model configurations. Please consult your local Cat deale for availability.

Data Center Applications
- ISO 8528-1 Data Center Power (DCP) compliant per DCP application of Cat diesel generator set prime power rating.
- All ratings Tier III/Tier IV compliant per Uptime Institute requirements.
- All ratings ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centers.

Fuel Rates
Fuel rates are based on fuel oil of 35º API [16°C (60ºF)] gravity having an LHV of 42,780 kJ/kg (18,390 Btu/lb) when used at 29ºC (85ºF) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.)

www.cat.com/electricpower

3516 PGFL
LEHE1377-04 (03/20)

PERFORMANCE DATA [LYM03212]

AUGUST 16, 2024

(LYM03212)-ENGINE (G7G06696)-GENERATOR

For Help Desk Phone Numbers Click here

Perf No: EM1895 **Change Level:** 06

General | Heat Rejection | Sound | Emissions | Regulatory | Altitude Derate | Cross Reference | Supplementary Data | Perf Param Ref

View PDF

SALES MODEL:	3516C	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	1,800
MACHINE SALES MODEL:		**HERTZ:**	60
ENGINE POWER (BHP):	3,634	**FAN POWER (HP):**	130.1
GEN POWER WITH FAN (EKW):	2,500.0	**ASPIRATION:**	TA
COMPRESSION RATIO:	14.7	**AFTERCOOLER TYPE:**	ATAAC
RATING LEVEL:	MISSION CRITICAL STANDBY	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
PUMP QUANTITY:	1	**INLET MANIFOLD AIR TEMP (F):**	122
FUEL TYPE:	DIESEL	**JACKET WATER TEMP (F):**	219.2
MANIFOLD TYPE:	DRY	**TURBO CONFIGURATION:**	PARALLEL
GOVERNOR TYPE:	ADEM3	**TURBO QUANTITY:**	4
ELECTRONICS TYPE:	ADEM3	**TURBOCHARGER MODEL:**	GT6041BN-48T-1.10
CAMSHAFT TYPE:	STANDARD	**CERTIFICATION YEAR:**	2006
IGNITION TYPE:	CI	**CRANKCASE BLOWBY RATE (FT3/HR):**	3,619.4
INJECTOR TYPE:	EUI	**FUEL RATE (RATED RPM) NO LOAD (GAL/HR):**	16.0
FUEL INJECTOR:	3920221	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,539.4
UNIT INJECTOR TIMING (IN):	64.34		
REF EXH STACK DIAMETER (IN):	12		
MAX OPERATING ALTITUDE (FT):	2,953		

INDUSTRY	SUB INDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET
OIL AND GAS	LAND PRODUCTION	PACKAGED GENSET

General Performance Data Top

Note(s)

THIS STANDBY RATING IS FOR A STANDBY ONLY ENGINE ARRANGEMENT. RERATING THE ENGINE TO A PRIME OR CONTINUOUS RATING IS NOT PERMITTED.
THE INLET MANIFOLD AIR TEMP LISTED IN THE HEADER, AND IN THE GENERAL PERFORMANCE DATA, IS THE AVERAGE INLET MANIFOLD TEMP FRONT TO REAR ON THE ENGINE.

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	ISO BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	ISO VOL FUEL CONSUMPTN (VFC)	ELEC SPEC FUEL CONSUMPTN (ESFC)	ISO ELEC SPEC FUEL CONSUMPTN (ESFC)
EKW	%	BHP	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR	LB/EKW-HR	LB/EKW-HR
2,500.0	100	3,633	336	0.334	0.328	171.3	168.0	0.486	0.477
2,250.0	90	3,283	303	0.335	0.329	155.1	152.1	0.489	0.480
2,000.0	80	2,935	271	0.339	0.333	140.4	137.7	0.498	0.489
1,875.0	75	2,760	255	0.342	0.336	133.2	130.7	0.504	0.494
1,750.0	70	2,586	239	0.346	0.339	126.0	123.6	0.511	0.501
1,500.0	60	2,237	207	0.354	0.347	111.5	109.4	0.527	0.517
1,250.0	50	1,889	174	0.365	0.358	97.1	95.2	0.551	0.540
1,000.0	40	1,547	143	0.373	0.366	81.4	79.8	0.577	0.566
750.0	30	1,203	111	0.385	0.378	65.3	64.1	0.618	0.606
625.0	25	1,029	95	0.394	0.386	57.2	56.1	0.649	0.637
500.0	20	854	79	0.403	0.396	48.6	47.6	0.689	0.676
250.0	10	497	46	0.441	0.433	30.9	30.3	0.877	0.860

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
EKW	%	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
2,500.0	100	3,633	78.1	121.9	1,235.7	67.6	853.1	85	466.7
2,250.0	90	3,283	71.3	119.4	1,190.0	61.3	824.5	78	443.1
2,000.0	80	2,935	64.3	116.9	1,158.9	55.3	810.7	70	417.8
1,875.0	75	2,760	60.7	115.8	1,145.6	52.3	804.8	66	404.7
1,750.0	70	2,586	57.1	114.7	1,133.3	49.3	798.9	63	391.3
1,500.0	60	2,237	49.5	112.7	1,112.4	43.2	787.1	55	363.6

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
1,250.0	50	1,889	41.3	111.0	1,091.8	36.8	775.1	46	334.7
1,000.0	40	1,547	31.4	109.4	1,061.5	29.3	770.6	36	297.5
750.0	30	1,203	21.7	107.9	1,010.3	22.1	752.8	25	249.8
625.0	25	1,029	17.2	107.2	968.3	18.7	731.8	21	223.4
500.0	20	854	12.7	106.4	902.0	15.5	695.6	16	197.2
250.0	10	497	4.8	104.1	700.7	9.8	562.6	7	152.3

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2,500.0	100	3,633	7,133.1	18,497.4	31,696.1	32,910.2	6,927.7	6,289.9
2,250.0	90	3,283	6,756.8	17,036.6	29,886.4	30,985.9	6,522.8	5,944.9
2,000.0	80	2,935	6,350.9	15,740.8	28,028.8	29,019.5	6,092.1	5,568.4
1,875.0	75	2,760	6,132.5	15,125.9	27,059.2	27,998.2	5,881.4	5,382.5
1,750.0	70	2,586	5,902.5	14,507.6	26,056.9	26,945.9	5,667.5	5,192.6
1,500.0	60	2,237	5,408.9	13,196.0	23,934.4	24,726.5	5,204.1	4,777.6
1,250.0	50	1,889	4,844.0	11,701.1	21,447.3	22,136.3	4,659.1	4,284.7
1,000.0	40	1,547	4,122.0	9,918.3	18,264.4	18,842.5	3,963.7	3,647.8
750.0	30	1,203	3,423.6	8,121.4	15,177.8	15,642.9	3,293.2	3,036.5
625.0	25	1,029	3,105.0	7,237.8	13,766.9	14,173.7	2,986.8	2,759.5
500.0	20	854	2,791.1	6,276.7	12,375.6	12,721.7	2,671.3	2,475.8
250.0	10	497	2,236.2	4,428.4	9,910.4	10,129.4	2,129.9	1,997.8

Heat Rejection Data Top

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
2,500.0	100	3,633	46,992	9,146	142,265	70,115	19,835	44,723	154,077	372,403	396,702
2,250.0	90	3,283	44,242	8,557	127,929	62,041	17,960	39,380	139,243	337,204	359,207
2,000.0	80	2,935	41,477	8,162	116,879	56,282	16,262	34,167	124,444	305,311	325,233
1,875.0	75	2,760	40,076	8,007	111,588	53,551	15,425	31,612	117,053	289,608	308,505
1,750.0	70	2,586	38,657	7,874	106,293	50,817	14,588	29,085	109,651	273,881	291,752
1,500.0	60	2,237	35,755	7,684	95,729	45,311	12,915	24,201	94,874	242,485	258,307
1,250.0	50	1,889	32,626	7,527	85,184	39,388	11,245	19,401	80,109	211,118	224,893
1,000.0	40	1,547	29,235	7,262	72,693	33,148	9,427	13,873	65,583	176,995	188,544
750.0	30	1,203	25,476	6,784	59,425	26,293	7,565	8,706	51,005	142,037	151,305
625.0	25	1,029	23,394	6,435	52,542	22,520	6,621	6,496	43,653	124,317	132,429
500.0	20	854	21,006	5,995	44,739	18,221	5,624	4,534	36,223	105,594	112,484
250.0	10	497	15,737	5,026	27,795	8,787	3,578	1,916	21,071	67,181	71,564

Sound Data Top

Note(s)

SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN PERFORMANCE NUMBER - DM8779.

Emissions Data Top

Units Filter All Units

DIESEL

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN		EKW	2,500.0	1,875.0	1,250.0	625.0	250.0
ENGINE POWER		BHP	3,633	2,760	1,889	1,029	497
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	19,123	11,751	5,837	2,974	2,654
TOTAL CO		G/HR	1,515	725	607	831	1,165
TOTAL HC		G/HR	376	375	408	307	329
TOTAL CO2		KG/HR	1,740	1,340	966	559	296
PART MATTER		G/HR	132.5	88.4	94.3	99.6	100.7
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,349.1	1,857.9	1,286.9	1,127.3	1,858.5

GENSET POWER WITH FAN ENGINE POWER		EKW BHP	2,500.0 3,633	1,875.0 2,760	1,250.0 1,889	625.0 1,029	250.0 497
PERCENT LOAD		**%**	**100**	**75**	**50**	**25**	**10**
TOTAL CO	(CORR 5% O2)	MG/NM3	195.4	118.8	140.1	330.3	862.6
TOTAL HC	(CORR 5% O2)	MG/NM3	42.1	54.8	81.8	105.8	212.3
PART MATTER	(CORR 5% O2)	MG/NM3	14.1	11.8	18.4	34.7	63.0
TOTAL NOX (AS NO2)	(CORR 15% O2)	MG/NM3	871.7	689.4	477.5	418.3	689.6
TOTAL CO	(CORR 15% O2)	MG/NM3	72.5	44.1	52.0	122.6	320.1
TOTAL HC	(CORR 15% O2)	MG/NM3	15.6	20.3	30.4	39.3	78.8
PART MATTER	(CORR 15% O2)	MG/NM3	5.2	4.4	6.8	12.9	23.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,144	905	627	549	905
TOTAL CO	(CORR 5% O2)	PPM	156	95	112	264	690
TOTAL HC	(CORR 5% O2)	PPM	79	102	153	197	396
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	425	336	233	204	336
TOTAL CO	(CORR 15% O2)	PPM	58	35	42	98	256
TOTAL HC	(CORR 15% O2)	PPM	29	38	57	73	147
TOTAL NOX (AS NO2)		G/HP-HR	5.32	4.30	3.12	2.92	5.39
TOTAL CO		G/HP-HR	0.42	0.26	0.32	0.82	2.37
TOTAL HC		G/HP-HR	0.10	0.14	0.22	0.30	0.67
PART MATTER		G/HP-HR	0.04	0.03	0.05	0.10	0.20
TOTAL NOX (AS NO2)		G/KW-HR	7.23	5.84	4.24	3.96	7.33
TOTAL CO		G/KW-HR	0.57	0.36	0.44	1.11	3.22
TOTAL HC		G/KW-HR	0.14	0.19	0.30	0.41	0.91
PART MATTER		G/KW-HR	0.05	0.04	0.07	0.13	0.28
TOTAL NOX (AS NO2)		LB/HR	42.16	25.91	12.87	6.56	5.85
TOTAL CO		LB/HR	3.34	1.60	1.34	1.83	2.57
TOTAL HC		LB/HR	0.83	0.83	0.90	0.68	0.72
TOTAL CO2		LB/HR	3,836	2,955	2,130	1,233	654
PART MATTER		LB/HR	0.29	0.19	0.21	0.22	0.22
OXYGEN IN EXH		%	9.4	10.4	11.3	12.2	14.4
DRY SMOKE OPACITY		%	1.7	1.4	1.9	2.6	4.0
BOSCH SMOKE NUMBER			0.83	0.80	0.85	0.97	1.13

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN ENGINE POWER		EKW BHP	2,500.0 3,633	1,875.0 2,760	1,250.0 1,889	625.0 1,029	250.0 497
PERCENT LOAD		**%**	**100**	**75**	**50**	**25**	**10**
TOTAL NOX (AS NO2)		G/HR	22,948	14,101	7,004	3,568	3,185
TOTAL CO		G/HR	2,726	1,304	1,092	1,496	2,098
TOTAL HC		G/HR	500	499	543	408	437
PART MATTER		G/HR	185.5	123.7	132.1	139.5	141.0
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,818.9	2,229.5	1,544.3	1,352.7	2,230.2
TOTAL CO	(CORR 5% O2)	MG/NM3	351.8	213.9	252.3	594.6	1,552.7
TOTAL HC	(CORR 5% O2)	MG/NM3	55.9	72.8	108.8	140.7	282.4
PART MATTER	(CORR 5% O2)	MG/NM3	19.7	16.5	25.8	48.5	88.2
TOTAL NOX (AS NO2)	(CORR 15% O2)	MG/NM3	1,046.0	827.3	573.0	502.0	827.6
TOTAL CO	(CORR 15% O2)	MG/NM3	130.5	79.4	93.6	220.6	576.2
TOTAL HC	(CORR 15% O2)	MG/NM3	20.8	27.0	40.4	52.2	104.8
PART MATTER	(CORR 15% O2)	MG/NM3	7.3	6.1	9.6	18.0	32.7
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,373	1,086	752	659	1,086
TOTAL CO	(CORR 5% O2)	PPM	281	171	202	476	1,242
TOTAL HC	(CORR 5% O2)	PPM	104	136	203	263	527
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	510	403	279	244	403
TOTAL CO	(CORR 15% O2)	PPM	104	63	75	177	461
TOTAL HC	(CORR 15% O2)	PPM	39	50	75	97	196
TOTAL NOX (AS NO2)		G/HP-HR	6.38	5.15	3.74	3.50	6.47
TOTAL CO		G/HP-HR	0.76	0.48	0.58	1.47	4.26
TOTAL HC		G/HP-HR	0.14	0.18	0.29	0.40	0.89
PART MATTER		G/HP-HR	0.05	0.05	0.07	0.14	0.29
TOTAL NOX (AS NO2)		G/KW-HR	8.67	7.01	5.09	4.76	8.79
TOTAL CO		G/KW-HR	1.03	0.65	0.79	2.00	5.79
TOTAL HC		G/KW-HR	0.19	0.25	0.39	0.54	1.21
PART MATTER		G/KW-HR	0.07	0.06	0.10	0.19	0.39
TOTAL NOX (AS NO2)		LB/HR	50.59	31.09	15.44	7.87	7.02
TOTAL CO		LB/HR	6.01	2.88	2.41	3.30	4.62
TOTAL HC		LB/HR	1.10	1.10	1.20	0.90	0.96
PART MATTER		LB/HR	0.41	0.27	0.29	0.31	0.31

Regulatory Information Top

EPA EMERGENCY STATIONARY **2011 - ----**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data Top

STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	NORMAL
ALTITUDE (FT)											
0	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634
1,000	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,561	3,634
2,000	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,604	3,541	3,480	3,634
3,000	3,628	3,628	3,628	3,628	3,628	3,603	3,537	3,474	3,413	3,354	3,628
4,000	3,504	3,504	3,504	3,504	3,504	3,471	3,408	3,347	3,289	3,232	3,504
5,000	3,384	3,384	3,384	3,384	3,384	3,344	3,283	3,225	3,168	3,113	3,384
6,000	3,269	3,269	3,269	3,269	3,269	3,221	3,162	3,105	3,051	2,998	3,269
7,000	3,159	3,159	3,159	3,159	3,159	3,101	3,044	2,990	2,937	2,887	3,159
8,000	3,052	3,052	3,052	3,052	3,041	2,985	2,930	2,878	2,827	2,779	3,052
9,000	2,950	2,950	2,950	2,950	2,926	2,872	2,820	2,769	2,721	2,674	2,950
10,000	2,851	2,851	2,851	2,851	2,815	2,763	2,713	2,664	2,617	2,544	2,851

Cross Reference Top

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
4577176	LL1858	5084280	GS336	-	SBK02000	
4581567	LL6760	5157721	PG243	-	LYM00001	

Supplementary Data Top

Type	Classification	Performance Number
SOUND	SOUND PRESSURE	DM8779

Performance Parameter Reference Top

Parameters Reference: DM9600 - 15

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION: Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS: Power +/- 3% Torque +/- 3% Exhaust stack temperature +/- 8% Inlet airflow +/- 5% Intake manifold pressure-gage +/- 10% Exhaust flow +/- 6% Specific fuel consumption +/- 3% Specific fuel consumption (C7-C18) +/- 4% Fuel rate +/- 5% Specific DEF consumption +/- 3% DEF rate +/- 5% Heat rejection +/- 5% Heat rejection exhaust only +/- 10% Heat rejection CEM only +/- 10%
Heat Rejection values based on using treated water.
Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.
On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.
On 3500 and C175 engines, at speeds below Peak Torque these values are provided for reference only, and may not meet the tolerance listed.
These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS: Heat rejection +/- 10% Heat rejection to Atmosphere +/- 50% Heat rejection to Lube Oil +/- 20% Heat rejection to Aftercooler +/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS: Torque +/- 0.5% Speed +/- 0.2% Fuel flow +/- 1.0% Temperature +/- 2.0 C degrees Intake manifold pressure +/- 0.1 kPa
OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR FOR 3500 ENGINES AND SMALLER SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.
FOR 3600 ENGINES Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL DIESEL Reference fuel is #2 distillate diesel with a 35API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 15 deg C (59 deg F), where the density is 850 G/Liter (7.0936 Lbs/Gal).
GAS Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU

FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set.
Standard temperature values versus altitude could be seen on TM2001.
When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.
Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.
Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSION CYCLE LIMITS: Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.

WET & DRY EXHAUST/EMISSIONS DESCRIPTION: Wet - Total exhaust flow or concentration of total exhaust flow Dry - Total exhaust flow minus water vapor or concentration of exhaust flow with water vapor excluded

EMISSIONS DEFINITIONS: Emissions : DM1176

EMISSION CYCLE DEFINITIONS
1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS: Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS: 3500: EM1500

RATING DEFINITIONS: Agriculture : TM6008
Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040
Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038

SOUND DEFINITIONS: Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 03/12/24