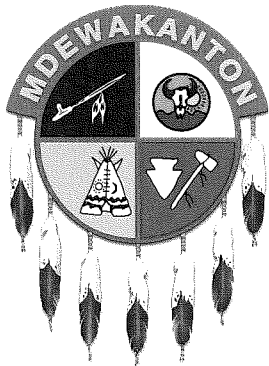


US EPA ARCHIVE DOCUMENT

OCT 27 2014



# Shakopee Mdewakanton Sioux Community

2330 SIOUX TRAIL NW • PRIOR LAKE, MINNESOTA 55372  
TRIBAL OFFICE: 952•445-8900 • FAX: 952•445-8906

## OFFICERS

Charlie Vig  
Chairman

Keith B. Anderson  
Vice-Chairman

Lori K. Watso  
Secretary/Treasurer

23 October 2014

Genevieve Damico, Chief, Air Permits Section  
U.S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd (AR-18J)  
Chicago, IL 60604

**Re: Modification of Permit Number: SYN-SM-27139R001-2013-02**

Dear Ms. Damico:

This letter requests a modification of the nitrogen oxide (NOx) emissions limits for Emission Unit 103, a diesel fired generator located at the Mystic Lake Casino Hotel. The emissions rate, calculations and proposed emissions for EU 103 in synthetic minor construction permit number MIN-SM-27139R0001-2013-2 were based on inaccurate performance specifications provided by the manufacturer. This amendment modifies emission rates and calculations using actual performance specifications for the generator engine and proposes emission limits based on the engine's actual performance specifications. The inaccurate and correct performance specifications are included with the permit application. There are no physical or operational changes proposed in this permit amendment.

The requested decrease fuel use from 109,410 gallons per year to 108,500 gallons per year, increase NOx emissions from 34.09 pounds per hour to 64.02 pounds per hour and increase annual emissions of NOx from 11.93 tons per year to 22.41 tons per year.

If you have any questions or require any additional information, please feel free to contact me.

Sincerely,

Stanley A. Ellison  
Director of Land and Natural Resources

CC: Jennifer Darrow  
Patrick Mulloy  
Richard Duncan

Enc: Proposed Modification of an Existing Source



OMB No. 2060-0336, Approval Expires 04/30/2012

Federal Operating Permit Program (40 CFR Part 71)

**CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)**

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

**A. Responsible Official**

Name: (Last) Vig (First) Charlie (MI)

Title Tribal Chairman

Street or P.O. Box 2330 Sioux Trail NW

City Prior Lake State MN ZIP 55372 -

Telephone ( 952 ) 496 - 6153 Ext.  Facsimile (  )  -

**B. Certification of Truth, Accuracy and Completeness (to be signed by the responsible official)**

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) x Charlie Vig

Name (typed) Charlie Vig Date: 10 / 22 / 2014

US EPA ARCHIVE DOCUMENT



United States Environmental Protection Agency  
Program  
Address  
Phone  
Fax  
Web address

Genevieve Damico, Chief, Air Permits Section  
U.S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd (AR-18J)  
Chicago, IL 60604  
phone: (312) 353-4761  
fax: (312) 385-5501  
email: damico.genevieve@epa.gov

## FEDERAL MINOR NEW SOURCE REVIEW PROGRAM IN INDIAN COUNTRY

### Application for New Construction (Form NEW)

Please check all that apply to show how you are using this form:

Proposed Construction of a New Source  
Proposed Construction of New Equipment at an Existing Source  
☒ Proposed Modification of an Existing Source  
Other – Please Explain

**Please submit information to:**

Genevieve Damico, Chief, Air Permits Section  
U.S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd (AR-18J)  
Chicago, IL 60604  
Phone: (312) 353-4761

#### A. GENERAL SOURCE INFORMATION

|                                                                                                                                  |                      |                                                   |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------|-----------------------------------|
| 1. (a) <b>Company Name</b><br>Shakopee Mdewakanton Sioux Community                                                               |                      | 2. <b>Source Name</b><br>Mystic Lake Casino Hotel |                                   |
| (b) <b>Operator Name</b><br>Shakopee Mdewakanton Sioux Community                                                                 |                      |                                                   |                                   |
| 3. Type of Operation Amusement and Recreation Services, Hotels and Motels, Electricity Generation                                |                      | 4. Portable Source? Yes No X                      |                                   |
|                                                                                                                                  |                      | 5. Temporary Source? Yes No X                     |                                   |
| 6. NAICS Code 713210, 721120, 221119                                                                                             |                      | 7. SIC Code 7999, 7011, 4911                      |                                   |
| 8. Physical Address (home base for portable sources) Mystic Lake Casino Hotel, 2400 Mystic Lake Boulevard, Prior Lake, MN, 55372 |                      |                                                   |                                   |
| 9. Reservation*Shakopee Mdewakanton Sioux Community                                                                              | 10. County*<br>Scott | 11a. Latitude*<br>44.730142                       | 11b. Longitude*<br>44°43'48.5112" |
| 12a. Quarter Quarter Section*<br>NW                                                                                              | 12b. Section*<br>S33 | 12c. Township*<br>T115N                           | 12d. Range*<br>R22W               |

\*Provide all proposed locations of operation for portable sources

**B. PREVIOUS PERMIT ACTIONS** (Provide information in this format for each permit that has been issued to this source. Provide as an attachment if additional space is necessary)

|                                           |                                                               |
|-------------------------------------------|---------------------------------------------------------------|
| Source Name on the Permit                 | Shakopee Mdewakanton Sioux Community Mystic Lake Casino Hotel |
| Permit Number (SYN-SM-27139R0001-2011-01) |                                                               |
| Date of the Permit Action                 | 09 April 2012                                                 |

|                                           |                                                               |
|-------------------------------------------|---------------------------------------------------------------|
| Source Name on the Permit                 | Shakopee Mdewakanton Sioux Community Mystic Lake Casino Hotel |
| Permit Number (SYN-SM-27139R0001-2013-02) |                                                               |
| Date of the Permit Action                 | 23 June 2014                                                  |

|                                      |  |
|--------------------------------------|--|
| Source Name on the Permit            |  |
| Permit Number (xx-xxx-xxxxx-xxxx.xx) |  |
| Date of the Permit Action            |  |

|                                      |  |
|--------------------------------------|--|
| Source Name on the Permit            |  |
| Permit Number (xx-xxx-xxxxx-xxxx.xx) |  |
| Date of the Permit Action            |  |

|                                      |  |
|--------------------------------------|--|
| Source Name on the Permit            |  |
| Permit Number (xx-xxx-xxxxx-xxxx.xx) |  |
| Date of the Permit Action            |  |

**C. CONTACT INFORMATION**

|                                                                                                   |  |                                    |  |
|---------------------------------------------------------------------------------------------------|--|------------------------------------|--|
| <b>Company Contact</b> Stanley Ellison                                                            |  | Title Director                     |  |
| Mailing Address Shakopee Mdewakanton Sioux Community , 2330 Sioux Trail NW, Prior Lake, MN, 55372 |  |                                    |  |
| Email Address stan.ellison@shakopeedakota.org                                                     |  |                                    |  |
| Telephone Number 952-496-6158                                                                     |  | Facsimile Number<br>(952) 445-8906 |  |
| <b>Operator Contact</b> (if different from company contact)<br><b>SAME AS COMPANY CONTACT</b>     |  | Title                              |  |
| Mailing Address                                                                                   |  |                                    |  |
| Email Address                                                                                     |  |                                    |  |
| Telephone Number                                                                                  |  | Facsimile Number                   |  |
| <b>Source Contact SAME AS COMPANY CONTACT</b>                                                     |  | Title                              |  |
| Mailing Address                                                                                   |  |                                    |  |
| Email Address                                                                                     |  |                                    |  |
| Telephone Number                                                                                  |  | Facsimile Number                   |  |
| <b>Compliance Contact</b><br><b>SAME AS COMPANY CONTACT</b>                                       |  | Title                              |  |
| Mailing Address                                                                                   |  |                                    |  |
| Email Address                                                                                     |  |                                    |  |
| Telephone Number                                                                                  |  | Facsimile Number                   |  |

**D. ATTACHMENTS**

**Include all of the following information** (see the attached instructions)

**FORM SYNMIN** - New Source Review Synthetic Minor Limit Request Form, if synthetic minor limits are being requested.

Narrative description of the proposed production processes. This description should follow the flow of the process flow diagram to be submitted with this application.

Process flow chart identifying all proposed processing, combustion, handling, storage, and emission control equipment.

A list and descriptions of all proposed emission units and air pollution-generating activities.

Type and quantity of fuels, including sulfur content of fuels, proposed to be used on a daily, annual and maximum hourly basis.

Type and quantity of raw materials used or final product produced proposed to be used on a daily, annual and maximum hourly basis.

Proposed operating schedule, including number of hours per day, number of days per week and number of weeks per year.

A list and description of all proposed emission controls, control efficiencies, emission limits, and monitoring for each emission unit and air pollution generating activity.

**Criteria Pollutant Emissions** - Estimates of Current Actual Emissions, Current Allowable Emissions, Post-Change Uncontrolled Emissions, and Post-Change Allowable Emissions for the following air pollutants: particulate matter, PM<sub>10</sub>, PM<sub>2.5</sub>, sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, fluorides (gaseous and particulate), sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>), hydrogen sulfide (H<sub>2</sub>S), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates.

These estimates are to be made for each emission unit, emission generating activity, and the project/source in total.

**Modeling – Air Quality Impact Analysis (AQIA)**

**ESA (Endangered Species Act)**

**NHPA (National Historic Preservation Act)**

## E. TABLE OF ESTIMATED EMISSIONS

The following tables provide the total emissions in tons/year for all pollutants from the calculations required in Section D of this form, as appropriate for the use specified at the top of the form.

### E(i) – Proposed New Source

| Pollutant                      | Potential Emissions<br>(tpy) | Proposed Allowable<br>Emissions<br>(tpy) |                                                                      |
|--------------------------------|------------------------------|------------------------------------------|----------------------------------------------------------------------|
| PM                             |                              |                                          | PM - Particulate Matter                                              |
| PM <sub>10</sub>               |                              |                                          | PM <sub>10</sub> - Particulate Matter less than 10 microns in size   |
| PM <sub>2.5</sub>              |                              |                                          | PM <sub>2.5</sub> - Particulate Matter less than 2.5 microns in size |
| SO <sub>x</sub>                |                              |                                          | SO <sub>x</sub> - Sulfur Oxides                                      |
| NO <sub>x</sub>                |                              |                                          | NO <sub>x</sub> - Nitrogen Oxides                                    |
| CO                             |                              |                                          | CO - Carbon Monoxide                                                 |
| VOC                            |                              |                                          | VOC - Volatile Organic Compound                                      |
| Pb                             |                              |                                          | Pb - Lead and lead compounds                                         |
|                                |                              |                                          | Fluorides - Gaseous and particulates                                 |
| Fluorides                      |                              |                                          | H <sub>2</sub> SO <sub>4</sub> - Sulfuric Acid Mist                  |
| H <sub>2</sub> SO <sub>4</sub> |                              |                                          | H <sub>2</sub> S - Hydrogen Sulfide                                  |
| H <sub>2</sub> S               |                              |                                          | TRS - Total Reduced Sulfur                                           |
| TRS                            |                              |                                          | RSC - Reduced Sulfur Compounds                                       |
| RSC                            |                              |                                          |                                                                      |

Emissions calculations must include fugitive emissions if the source is one the following listed sources, pursuant to CAA Section 302(j):

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>(a) Coal cleaning plants (with thermal dryers);</li> <li>(b) Kraft pulp mills;</li> <li>(c) Portland cement plants;</li> <li>(d) Primary zinc smelters;</li> <li>(e) Iron and steel mills;</li> <li>(f) Primary aluminum ore reduction plants;</li> <li>(g) Primary copper smelters;</li> <li>(h) Municipal incinerators capable of charging more than 250 tons of refuse per day;</li> <li>(i) Hydrofluoric, sulfuric, or nitric acid plants;</li> <li>(j) Petroleum refineries;</li> <li>(k) Lime plants;</li> <li>(l) Phosphate rock processing plants;</li> <li>(m) Coke oven batteries;</li> <li>(n) Sulfur recovery plants;</li> <li>(o) Carbon black plants (furnace process);</li> <li>(p) Primary lead smelters;</li> <li>(q) Fuel conversion plants;</li> </ul> | <ul style="list-style-type: none"> <li>(r) Sintering plants;</li> <li>(s) Secondary metal production plants;</li> <li>(t) Chemical process plants</li> <li>(u) Fossil-fuel boilers (or combination thereof) totaling more than 250 million British thermal units per hour heat input;</li> <li>(v) Petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels;</li> <li>(w) Taconite ore processing plants;</li> <li>(x) Glass fiber processing plants;</li> <li>(y) Charcoal production plants;</li> <li>(z) Fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input, and</li> <li>(aa) Any other stationary source category which, as of August 7, 1980, is being regulated under section 111 or 112 of the Act.</li> </ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**E(ii) – Proposed New Construction at an Existing Source or Modification of an Existing Source**  
**Hotel – EU 103**

| Pollutant                      | Current Actual Emissions (tpy) | Current Allowable Emissions (tpy) | Post-Change Potential Emissions (tpy) | Post-Change Allowable Emissions (tpy) |
|--------------------------------|--------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|
| PM                             | 0.00                           | 0.18                              | 2.28                                  | 0.18                                  |
| PM <sub>10</sub>               | 0.00                           | 0.18                              | 2.28                                  | 0.18                                  |
| PM <sub>2.5</sub>              | 0.00                           | 0.18                              | 2.28                                  | 0.18                                  |
| SO <sub>x</sub>                | 0.01                           | 0.22                              | 2.77                                  | 0.22                                  |
| NO <sub>x</sub>                | 0.61                           | 11.93                             | 280.41                                | 22.41                                 |
| CO                             | 0.02                           | 0.39                              | 10.07                                 | 0.81                                  |
| VOC                            | 0.01                           | 0.28                              | 6.83                                  | 0.55                                  |
| Pb                             | 0.00                           | 0.00                              | 0.00                                  | 0.00                                  |
|                                |                                |                                   |                                       |                                       |
| Fluorides                      | 0.00                           | 0.00                              | 0.00                                  | 0.00                                  |
| H <sub>2</sub> SO <sub>4</sub> | 0.00                           | 0.00                              | 0.00                                  | 0.00                                  |
| H <sub>2</sub> S               | 0.00                           | 0.00                              | 0.00                                  | 0.00                                  |
| TRS                            | 0.00                           | 0.00                              | 0.00                                  | 0.00                                  |
| RSC                            | 0.00                           | 0.00                              | 0.00                                  | 0.00                                  |

PM - Particulate Matter

PM<sub>10</sub> - Particulate Matter less than 10 microns in size PM<sub>2.5</sub> -

Particulate Matter less than 2.5 microns in size SO<sub>x</sub> - Sulfur Oxides

NO<sub>x</sub> - Nitrogen Oxides

CO - Carbon Monoxide

VOC - Volatile Organic Compound Pb -

Lead and lead compounds Fluorides -

Gaseous and particulates

H<sub>2</sub>SO<sub>4</sub> - Sulfuric Acid Mist

H<sub>2</sub>S - Hydrogen Sulfide

TRS - Total Reduced Sulfur

RSC - Reduced Sulfur Compounds

[Disclaimers] The public reporting and recordkeeping burden for this collection of information is estimated to average 20 hours per response, unless a modeling analysis is required. If a modeling analysis is required, the public reporting and recordkeeping burden for this collection of information is estimated to average 60 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

## Form New Attachments

### **FORM SYNMIN - New Source Review Synthetic Minor Limit Request Form, if synthetic minor limits are being requested.**

Attached

#### **Narrative description of the proposed production processes. This description should follow the flow of the process flow diagram to be submitted with this application.**

The emissions rate, calculations and proposed emissions for EU 103 at the Mystic Lake Casino Hotel in the synthetic minor construction permit number MIN-SM-27139R0001-2013-2 issued 23 June 2014 and effective 23 July 2014 were based on inaccurate performance specifications provided by the manufacturer (attached). This amendment modifies those emission rates and calculations using the actual performance specifications (attached) for the generator engine and proposes emission limits based on the engine's actual performance specification. There are no physical or operational changes proposed in this permit amendment.

#### **A list and descriptions of all proposed emission units and air pollution-generating activities.**

The table below summarizes information for EU 103. SMSC has also provided forms EUD1 and EMISS for this generator. The EUD 1 Form includes stack information.

| Source           | EU  | Location | Make        | Model | Serial Number | Month/Yr Mfg. | Month/Yr Installed | Primary Fuel | Rated kW | Horse Power | MMBtu /hr |
|------------------|-----|----------|-------------|-------|---------------|---------------|--------------------|--------------|----------|-------------|-----------|
| Diesel Generator | 103 | Hotel    | Caterpillar | 3516  | 1HZ02629      | Oct-03        | Jul-04             | Diesel       | 3196     | 2250        | 21.65     |

#### **Type and quantity of fuels, including sulfur content of fuels, proposed to be used on a daily, annual and maximum hourly basis.**

This generator operates on ultra low sulfur diesel with a maximum sulfur content of 0.0015%. The Material Safety Data Sheet for the fuel was provided in the original construction permit. The table below shows the maximum hourly fuel use, the proposed annual fuel limits and the actual fuel use from September 2013 through August 2014.

| EU  | (gal/hr) | Limited (gal/yr) | Actual 9/13 – 8/14 (gal/yr) |
|-----|----------|------------------|-----------------------------|
| 103 | 156.3    | 109,410          | 2,950                       |

#### **Type and quantity of raw materials used or final product produced proposed to be used on a daily, annual and maximum hourly basis.**

The relevant information is covered above, under fuels and is also provided in the attached emissions calculations.

**Proposed operating schedule, including number of hours per day, number of days per week and number of weeks per year.**

Schedule is intermittent – weekly maintenance schedule, emergency operation is a random event. Load shed typically occurs during summer and winter peak periods.

**A list and description of all proposed emission controls, control efficiencies, emission limits, and monitoring for each emission unit and air pollution generating activity.**

No change

**Criteria Pollutant Emissions - Estimates of Current Actual Emissions, Current Allowable Emissions, Post- Change Uncontrolled Emissions, and Post-Change Allowable Emissions for the following air pollutants: particulate matter, PM<sub>10</sub>, PM<sub>2.5</sub>, sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, fluorides (gaseous and particulate), sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>), hydrogen sulfide (H<sub>2</sub>S), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates.**

Individual generator emissions are provided on the attached Form EMISS and in the attached emission calculations.

| Pollutant                      | Current          |                     | Post Change            |                     |
|--------------------------------|------------------|---------------------|------------------------|---------------------|
|                                | Actual Emissions | Allowable Emissions | Uncontrolled Emissions | Allowable Emissions |
| PM                             | 0.00             | 0.18                | 2.28                   | 0.18                |
| PM <sub>10</sub>               | 0.00             | 0.18                | 2.28                   | 0.18                |
| PM <sub>2.5</sub>              | 0.00             | 0.18                | 2.28                   | 0.18                |
| SO <sub>2</sub>                | 0.01             | 0.22                | 2.77                   | 0.22                |
| NO <sub>x</sub>                | 0.61             | 11.93               | 280.41                 | 22.41               |
| CO                             | 0.02             | 0.39                | 10.07                  | 0.81                |
| VOC                            | 0.01             | 0.28                | 6.83                   | 0.55                |
| Pb                             | 0.00             | 0.00                | 0.00                   | 0.00                |
| Fl                             | 0.00             | 0.00                | 0.00                   | 0.00                |
| H <sub>2</sub> SO <sub>4</sub> | 0.00             | 0.00                | 0.00                   | 0.00                |
| H <sub>2</sub> S               | 0.00             | 0.00                | 0.00                   | 0.00                |
| TRS                            | 0.00             | 0.00                | 0.00                   | 0.00                |

## **Modeling – Air Quality Impact**

The Federal Minor New Source Review Regulations 40 CFR 49.159(d) require a modeling analysis (AQIA) of proposed emissions be performed if there is reason to be concerned that new construction would cause or contribute to a National Ambient Air Quality Standard (NAAQS) or Prevention of Significant Deterioration (PSD) increment violation.

Minnesota is currently in attainment of National Ambient Air Quality Standards for all criteria air pollutants.

This generator is designed for standby operation. It operates independently and intermittently. During routine maintenance it operates from 20 minutes to an hour per week. Emergency operation is random and sporadic. Emergency operation combined with routine maintenance is under 100 hours per year.

During peak management operation the generator operates between 2 and 10 hours and then rests with an average of 7 hours per peak management event. The contract with the utility restricts generator operation to between 500 and 600 hours of operation per year. The longer contracts restrict operations to 200 hours in the summer and 400 hours in the winter. At a maximum, operation would range from 71 to 85 days per year, spread out throughout the year. Not all generators are switched on at one time for peak load management. Typically the utility will order one part of the Mystic Casino Hotel put on load shed at a time. At least 10% of generator operation is at idle speed (during weekly testing and cool down periods after emergency and peak management events).

## **Analysis (AQIA) ESA (Endangered Species Act)**

These are existing generators built on what used to be a parking lot.

## **NHPA (National Historic Preservation Act)**

These are existing generators built on what used to be a parking lot.



United States Environmental Protection Agency  
Program

Address  
Phone  
Fax  
Web address

Genevieve Damico, Chief, Air Permits Section  
U.S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd (AR-18J)  
Chicago, IL 60604  
phone: (312) 353-4761  
fax: (312) 385-5501  
email: damico.genevieve@epa.gov

## FEDERAL MINOR NEW SOURCE REVIEW PROGRAM IN INDIAN COUNTRY

### Application For Synthetic Minor Limit (Form SYNMIN)

**Please submit information to:**

Genevieve Damico, Chief, Air Permits Section  
U.S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd (AR-18J)  
Chicago, IL 60604  
Phone: (312) 353-4761

#### A. GENERAL INFORMATION

|                                                                                                          |                                                |                                        |
|----------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------|
| <b>Company Name</b><br>Shakopee Mdewakanton Sioux Community                                              | <b>Source Name</b><br>Mystic Lake Casino Hotel |                                        |
| <b>Company Contact or Owner Name</b> Stanley Ellison                                                     |                                                | <b>Title</b> Director                  |
| <b>Mailing Address</b> Shakopee Mdewakanton Sioux Community , 2330 Sioux Trail NW, Prior Lake, MN, 55372 |                                                |                                        |
| <b>Email Address</b> stan.ellison@shakopeedakota.org                                                     |                                                |                                        |
| <b>Telephone Number</b> 952-496-6158                                                                     |                                                | <b>Facsimile Number</b> (952) 445-8906 |

#### B. ATTACHMENTS

**For each criteria air pollutant, hazardous air pollutant and for all emission units and air pollutant-generating activities to be covered by a limitation, include the following:**

- Item 1** - The proposed limitation and a description of its effect on current actual, allowable and the potential to emit.
- Item 2** - The proposed testing, monitoring, recordkeeping, and reporting requirements to be used to demonstrate and assure compliance with the proposed limitation.
- Item 3** - A description of estimated efficiency of air pollution control equipment under present or anticipated operating conditions, including documentation of the manufacturer specifications and guarantees.
- Item 4** - Estimates of the Post-Change Allowable Emissions that would result from compliance with the proposed limitation, including all calculations for the estimates.
- Item 5** - Estimates of the potential emissions of Greenhouse Gas (GHG) pollutants:

# Attachments to Form SYNMIN

## Item 1 - The proposed limitation and a description of its effect on current actual, allowable and the potential to emit.

SMSC proposes a gallon per hour fuel limit for each generator based on the manufacturer's specification and a 24 hour averaging time. SMSC also proposes an annual fuel limit for each generator based on a 12-month rolling sum.

### Proposed NOx Limits

|     | Throughput |           |                       |          | NOx                         |         |
|-----|------------|-----------|-----------------------|----------|-----------------------------|---------|
|     | Maximum    |           | Actual 9/13 –<br>4/14 | Limited  | Proposed Emission<br>Limits |         |
|     | (gal/hr)   | (gal/yr)  | (gal/yr)              | (gal/yr) | lb/hr                       | tons/yr |
| 103 | 155        | 1,357,800 | 2,950                 | 108,500  | 64.02                       | 22.41   |

Total  
NO<sub>x</sub> tpy

22.41

This generator is equipped with a fuel meters that allows determining monthly fuel use. SMSC bases the overall fuel limit for this generator on the total fuel use when operated at maximum load for 700 hours per year. The 700 hours reflect the maximum utility peak shaving contract hours (600) combined with an assumed 100 hour emergency use and weekly maintenance maximum.

| Total – September 2013 – August 2014 |                      |                      |                          |                 |
|--------------------------------------|----------------------|----------------------|--------------------------|-----------------|
|                                      | Fuel<br>Use<br>(gal) | Fuel<br>Use<br>MMBtu | Runtime<br>Hour<br>MMBtu | Percent<br>Load |
| <b>103</b>                           | 2,950                | 404.4                | 1155.2                   | 35.0%           |

Nitrogen Oxide (NO<sub>x</sub>) Limitations and Requirements:

1. EU 103
  - a. Limit NO<sub>x</sub> emissions to no greater than 64.02 pounds per hour expressed as NO<sub>2</sub>, averaged over the duration of the emission performance test.
  - b. Limit NO<sub>x</sub> emissions to no greater than 22.41 tons per year expressed as NO<sub>2</sub>, based on a 12 month rolling sum. Compliance with this limit shall be based on a rolling sum of monthly emissions during the previous 12 months.
  - c. Limit fuel usage to ultra low diesel fuel with a maximum sulfur content of 0.0015%.
  - d. Limit fuel usage to 108,500 gallons per year, based on a 12 month rolling sum. Compliance with this limit shall be based on a rolling sum of monthly fuel usage (in gallons) during the previous 12 months.

**Item 3 - A description of estimated efficiency of air pollution control equipment under present or anticipated operating conditions, including documentation of the manufacturer specifications and guarantees.**

Generator EU 103 was installed July 2004. The engine is equipped with a turbo charger and after cooler to reduce emissions. This is considered an inherent part of the process and not add-on pollution control equipment.

The manufacturer data regarding this generator and its engine is attached. The original permit was based on an inaccurate specification sheet provided by the manufacturer. This amendment is based on the appropriate specification sheet. Both performance specification sheets are attached.

**Item 4 - Estimates of the Post-Change Allowable Emissions that would result from compliance with the proposed limitation, including all calculations for the estimates.**

All calculations are attached.

**Item 5 - Estimates of the potential emissions of Greenhouse Gas (GHG) pollutants**

|                         | Current          |                     | Post Change            |                     |
|-------------------------|------------------|---------------------|------------------------|---------------------|
|                         | Actual Emissions | Allowable Emissions | Uncontrolled Emissions | Allowable Emissions |
| CO <sub>2</sub>         | 33.35            | 1,236.88            | 15,349.90              | 1,226.59            |
| CH <sub>4</sub>         | 0.02             | 0.67                | 8.37                   | 0.67                |
| N <sub>2</sub> O        | 0.00             | 0.01                | 0.12                   | 0.01                |
| Total CO <sub>2</sub> e | 33.81            | 1,254.11            | 15,563.79              | 1,243.68            |



OMB No. 2060-0336, Approval Expires 04/30/2012

Federal Operating Permit Program (40 CFR Part 71)

**EMISSION UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES (EUD-1)**

**A. General Information**

Emissions unit ID EU 103 Description Mystic Casino Hotel Generator  
SIC Code (4-digit) 4911 SCC Code 20300101

**B. Emissions Unit Description**

Primary use Backup power and potential peak load management Temporary Source Yes ☒ No  
Manufacturer Caterpillar Model No. 3516  
Serial Number 1HZ02629 Installation Date 07 / / 2004  
Boiler Type: ☐ Industrial boiler ☐ Process burner ☐ Electric utility boiler  
Other (describe) \_\_\_\_\_  
Boiler horsepower rating \_\_\_\_\_ Boiler steam flow (lb/hr) \_\_\_\_\_  
Type of Fuel-Burning Equipment (coal burning only):  
☐ Hand fired ☐ Spreader stoker ☐ Underfeed stoker ☐ Overfeed stoker  
☐ Traveling grate ☐ Shaking grate ☐ Pulverized, wet bed ☐ Pulverized, dry bed  
Actual Heat Input \_\_\_\_\_ MM BTU/hr Max. Design Heat Input 21.24 MM BTU/hr

US EPA ARCHIVE DOCUMENT

**C. Fuel Data**Primary fuel type(s) Diesel Standby fuel type(s) None

Describe each fuel you expected to use during the term of the permit.

| Fuel Type | Max. Sulfur Content (%) | Max. Ash Content (%) | BTU Value (cf, gal., or lb.) |
|-----------|-------------------------|----------------------|------------------------------|
| Diesel    | 0.0015                  | 0                    | 137,000 Btu/gal              |
|           |                         |                      |                              |
|           |                         |                      |                              |

**D. Fuel Usage Rates**

| Fuel Type | Annual Actual Usage | Maximum Usage |             |
|-----------|---------------------|---------------|-------------|
|           |                     | Hourly        | Annual      |
| Diesel    |                     | 155 gph       | 108,500 gal |
|           |                     |               |             |
|           |                     |               |             |

**E. Associated Air Pollution Control Equipment**

|                              |                                         |                        |  |
|------------------------------|-----------------------------------------|------------------------|--|
| Emissions unit ID            | <u>NA</u>                               | Device type            |  |
| Air pollutant(s) Controlled  |                                         | Manufacturer           |  |
| Model No.                    |                                         | Serial No.             |  |
| Installation date            | <u>    </u> / <u>    </u> / <u>    </u> | Control efficiency (%) |  |
| Efficiency estimation method |                                         |                        |  |

**F. Ambient Impact Assessment**

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (this is not common).

|                                     |           |                                     |          |
|-------------------------------------|-----------|-------------------------------------|----------|
| Stack height (ft) _____             | 15.5      | Inside stack diameter (ft) _____    | 0.67     |
| Stack temp(°F) _____                | 926.6     | Design stack flow rate (ACFM) _____ | 5,632.69 |
| Actual stack flow rate (ACFM) _____ | 17,396.02 | Velocity (ft/sec) _____             | 733.23   |

Federal Operating Permit Program (40 CFR Part 71)

**EMISSION CALCULATIONS (EMISS)**

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

**A. Emissions Unit ID** EU 103

**B. Identification and Quantification of Emissions**

First, list each air pollutant that is either regulated at the unit or present in major amounts, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. You may round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values.

| Air Pollutants               | Emission Rates                    |                   |                  | CAS No. |
|------------------------------|-----------------------------------|-------------------|------------------|---------|
|                              | Actual Annual Emissions (tons/yr) | Potential to Emit |                  |         |
|                              |                                   | Hourly (lb/hr)    | Annual (tons/yr) |         |
| NOx                          | 0.61                              | 64.02             | 280.41           |         |
| CO                           | 0.02                              | 2.30              | 10.07            |         |
| PM                           | 0.00                              | 0.52              | 2.28             |         |
| PM10                         | 0.00                              | 0.52              | 2.28             |         |
| PM2.5                        | 0.00                              | 0.52              | 2.28             |         |
| SO2                          | 0.01                              | 0.63              | 2.77             |         |
| VOC                          | 0.01                              | 1.56              | 6.83             |         |
| CO2e                         | 33.81                             | 3,553.38          | 15,563.79        |         |
| Highest Single HAP (Benzene) | 0.00                              | 0.02              | 0.07             |         |
| All HAPs                     | 0.00                              | 0.03              | 0.14             |         |



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## Federal Operating Permit Program (40 CFR Part 71)

## POTENTIAL TO EMIT (PTE)

For each unit with emissions that count towards applicability, list the emissions unit ID and the PTE for the air pollutants listed below and sum them up to show totals for the facility. You may find it helpful to complete form **EMISS** before completing this form. Show other pollutants not listed that are present in major amounts at the facility on attachment in a similar fashion. You may round values to the nearest tenth of a ton. Also report facility totals in section **J** of form **GIS**.

| Emissions Unit ID | Regulated Air Pollutants and Pollutants for which the Source is Major (tons/yr) |      |      |      |       |      |      |
|-------------------|---------------------------------------------------------------------------------|------|------|------|-------|------|------|
|                   | NOx                                                                             | VOC  | SO2  | PM10 | CO    | Lead | HAP  |
| EU 103            | 280.41                                                                          | 6.83 | 2.77 | 2.28 | 10.07 | 0.00 | 0.14 |
|                   |                                                                                 |      |      |      |       |      |      |
|                   |                                                                                 |      |      |      |       |      |      |
|                   |                                                                                 |      |      |      |       |      |      |
|                   |                                                                                 |      |      |      |       |      |      |
|                   |                                                                                 |      |      |      |       |      |      |
|                   |                                                                                 |      |      |      |       |      |      |
|                   |                                                                                 |      |      |      |       |      |      |
|                   |                                                                                 |      |      |      |       |      |      |
| FACILITY TOTALS   |                                                                                 |      |      |      |       |      |      |

**GEN SET PACKAGE PERFORMANCE DATA [1HZ02629]****OCTOBER 18, 2004****(1HZ02629)-ENGINE (1HN00810)-GENERATOR (FDN01393)-GENSET**

Performance Number: DM4690

Change Level:  

Sales Model: 3516BDITA

Combustion: DI

Aspr: TA

Engine Power:

2250 W/F EKW 2310 W/O F EKW 3,210 HP  
Speed: 1,800 RPM

After Cooler: SCAC

Manifold Type: DRY

Governor Type: ADEM

After Cooler Temp(F): 140

Turbo Quantity: 4

Engine App: GP

Turbo Arrangement: Parallel

Hertz: 60

Engine Rating: PGS

Strategy:

Rating Type: STANDBY

Certification: Rating not Certified

**General Performance Data**

| GEN<br>W/F<br>EKW | PERCENT<br>LOAD | ENGINE<br>POWER<br>BHP | ENGINE<br>BMEP<br>PSI | FUEL<br>RATE<br>LB/BHP-<br>HR | FUEL<br>RATE<br>GPH | INTAKE<br>MFLD<br>TEMP<br>DEG F | INTAKE<br>MFLD P<br>IN-HG | INTAKE<br>AIR<br>FLOW<br>CFM | EXH<br>MFLD<br>TEMP<br>DEG F | EXH<br>STACK<br>TEMP<br>DEG F | EXH<br>GAS<br>FLOW<br>CFM |
|-------------------|-----------------|------------------------|-----------------------|-------------------------------|---------------------|---------------------------------|---------------------------|------------------------------|------------------------------|-------------------------------|---------------------------|
| 2,250.0           | 100             | 3,196.1                | 334                   | 0.342                         | 156.3               | 187.5                           | 88.5                      | 3,224.2                      | 1,269.3                      | 927.0                         | 8,969.9                   |
| 2,025.0           | 90              | 2,878.6                | 301                   | 0.336                         | 138.1               | 181.2                           | 81.0                      | 3,072.4                      | 1,173.4                      | 852.3                         | 8,048.2                   |
| 1,800.0           | 80              | 2,563.8                | 268                   | 0.334                         | 122.3               | 175.3                           | 72.9                      | 2,888.7                      | 1,101.4                      | 804.4                         | 7,264.2                   |
| 1,687.5           | 75              | 2,407.0                | 251                   | 0.335                         | 115.1               | 172.2                           | 68.8                      | 2,786.3                      | 1,073.8                      | 788.4                         | 6,911.1                   |
| 1,575.0           | 70              | 2,250.2                | 235                   | 0.337                         | 108.3               | 169.7                           | 64.7                      | 2,687.4                      | 1,051.3                      | 775.0                         | 6,589.7                   |
| 1,350.0           | 60              | 1,938.4                | 203                   | 0.343                         | 95.0                | 165.4                           | 56.4                      | 2,468.5                      | 1,009.2                      | 756.5                         | 5,950.5                   |
| 1,125.0           | 50              | 1,627.7                | 170                   | 0.349                         | 81.2                | 160.3                           | 45.8                      | 2,175.4                      | 968.0                        | 748.2                         | 5,219.5                   |
| 900.0             | 40              | 1,323.1                | 138                   | 0.356                         | 67.4                | 155.3                           | 35.4                      | 1,885.8                      | 927.5                        | 740.1                         | 4,467.3                   |
| 675.0             | 30              | 1,013.9                | 106                   | 0.367                         | 53.2                | 151.0                           | 25.1                      | 1,589.2                      | 863.4                        | 714.7                         | 3,665.7                   |
| 562.5             | 25              | 857.7                  | 90                    | 0.376                         | 46.0                | 149.0                           | 20.0                      | 1,440.8                      | 821.5                        | 693.9                         | 3,259.5                   |
| 450.0             | 20              | 700.4                  | 73                    | 0.388                         | 38.8                | 147.4                           | 15.0                      | 1,292.5                      | 772.9                        | 667.8                         | 2,849.9                   |
| 225.0             | 10              | 382.3                  | 40                    | 0.444                         | 24.3                | 145.6                           | 7.6                       | 1,020.6                      | 624.2                        | 561.9                         | 2,034.1                   |

**Heat Rejection Data**

| GEN W/F<br>EKW | PERCENT<br>LOAD | REJ TO<br>JW<br>BTU/MN | REJ TO<br>ATMOS<br>BTU/MN | REJ TO<br>EXHAUST<br>BTU/MN | EXH<br>RCOV<br>TO 350F<br>BTU/MN | FROM<br>OIL CLR<br>BTU/MN | FROM<br>AFT CLR<br>BTU/MN | WORK<br>ENERGY<br>BTU/MN | LHV<br>ENERGY<br>BTU/MN | HHV<br>ENERGY<br>BTU/MN |
|----------------|-----------------|------------------------|---------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|--------------------------|-------------------------|-------------------------|
| 2,250.0        | 100             | 48,169                 | 9,554                     | 128,526                     | 38,046                           | 16,777                    | 34,236                    | 135,521                  | 334,224                 | 356,005                 |
| 2,025.0        | 90              | 44,131                 | 8,417                     | 111,124                     | 31,051                           | 14,843                    | 29,345                    | 122,100                  | 295,780                 | 315,059                 |
| 1,800.0        | 80              | 40,434                 | 7,677                     | 97,759                      | 26,103                           | 13,137                    | 24,909                    | 108,735                  | 262,454                 | 279,572                 |
| 1,687.5        | 75              | 38,728                 | 7,450                     | 92,129                      | 24,227                           | 12,341                    | 22,805                    | 102,081                  | 247,043                 | 263,194                 |
| 1,575.0        | 70              | 36,965                 | 7,222                     | 86,840                      | 22,520                           | 11,601                    | 20,758                    | 95,428                   | 232,086                 | 247,213                 |
| 1,350.0        | 60              | 33,553                 | 6,881                     | 76,319                      | 19,677                           | 10,180                    | 16,720                    | 82,177                   | 202,457                 | 215,651                 |
| 1,125.0        | 50              | 29,914                 | 6,483                     | 65,912                      | 16,890                           | 8,701                     | 12,853                    | 69,040                   | 172,884                 | 184,145                 |
| 900.0          | 40              | 26,160                 | 6,142                     | 55,619                      | 14,274                           | 7,222                     | 9,213                     | 56,131                   | 143,824                 | 153,207                 |
| 675.0          | 30              | 22,066                 | 5,744                     | 44,813                      | 11,146                           | 5,687                     | 5,858                     | 42,994                   | 114,024                 | 121,474                 |
| 562.5          | 25              | 19,848                 | 5,516                     | 39,240                      | 9,497                            | 4,948                     | 4,322                     | 36,397                   | 98,897                  | 105,323                 |
| 450.0          | 20              | 17,573                 | 5,289                     | 33,553                      | 7,791                            | 4,152                     | 2,843                     | 29,686                   | 83,542                  | 89,001                  |
| 225.0          | 10              | 12,568                 | 4,777                     | 21,554                      | 3,981                            | 2,616                     | 398                       | 16,208                   | 52,093                  | 55,505                  |

## EXHAUST Sound Data: 6.6 FEET

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250.0        | 100             | 118                       | 108             | 123                 | 119                 | 111                 | 109                  | 110                  | 110                  | 108                  |
| 2,025.0        | 90              | 116                       | 107             | 121                 | 117                 | 109                 | 108                  | 109                  | 109                  | 107                  |
| 1,800.0        | 80              | 115                       | 106             | 120                 | 116                 | 108                 | 107                  | 108                  | 108                  | 106                  |
| 1,687.5        | 75              | 115                       | 105             | 120                 | 116                 | 108                 | 106                  | 108                  | 107                  | 106                  |
| 1,575.0        | 70              | 114                       | 105             | 119                 | 115                 | 107                 | 106                  | 107                  | 107                  | 105                  |
| 1,350.0        | 60              | 113                       | 103             | 118                 | 114                 | 106                 | 104                  | 106                  | 106                  | 104                  |
| 1,125.0        | 50              | 112                       | 102             | 117                 | 113                 | 105                 | 103                  | 104                  | 104                  | 102                  |
| 900.0          | 40              | 110                       | 101             | 115                 | 111                 | 103                 | 102                  | 103                  | 103                  | 101                  |
| 675.0          | 30              | 109                       | 99              | 114                 | 110                 | 102                 | 100                  | 101                  | 101                  | 99                   |
| 562.5          | 25              | 108                       | 98              | 113                 | 109                 | 101                 | 99                   | 100                  | 100                  | 98                   |
| 450.0          | 20              | 107                       | 97              | 112                 | 108                 | 100                 | 98                   | 99                   | 99                   | 97                   |
| 225.0          | 10              | 104                       | 95              | 109                 | 105                 | 97                  | 96                   | 97                   | 97                   | 95                   |

## EXHAUST Sound Data: 23.0 FEET

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250.0        | 100             | 104                       | 96              | 112                 | 106                 | 98                  | 96                   | 97                   | 97                   | 94                   |
| 2,025.0        | 90              | 103                       | 94              | 111                 | 105                 | 97                  | 95                   | 96                   | 96                   | 93                   |
| 1,800.0        | 80              | 102                       | 93              | 110                 | 104                 | 96                  | 94                   | 95                   | 95                   | 92                   |
| 1,687.5        | 75              | 101                       | 93              | 109                 | 104                 | 95                  | 93                   | 94                   | 94                   | 91                   |
| 1,575.0        | 70              | 101                       | 92              | 109                 | 103                 | 94                  | 93                   | 94                   | 93                   | 91                   |
| 1,350.0        | 60              | 100                       | 91              | 108                 | 102                 | 93                  | 92                   | 92                   | 92                   | 89                   |
| 1,125.0        | 50              | 98                        | 90              | 106                 | 100                 | 92                  | 90                   | 91                   | 91                   | 88                   |
| 900.0          | 40              | 97                        | 88              | 105                 | 99                  | 90                  | 89                   | 90                   | 89                   | 87                   |
| 675.0          | 30              | 95                        | 87              | 103                 | 97                  | 89                  | 87                   | 88                   | 88                   | 85                   |
| 562.5          | 25              | 94                        | 86              | 102                 | 96                  | 88                  | 86                   | 87                   | 87                   | 84                   |
| 450.0          | 20              | 93                        | 85              | 101                 | 95                  | 87                  | 85                   | 86                   | 86                   | 83                   |
| 225.0          | 10              | 91                        | 82              | 99                  | 93                  | 84                  | 83                   | 84                   | 83                   | 81                   |

**EXHAUST Sound Data: 49.2 FEET**

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250.0        | 100             | 98                        | 89              | 106                 | 100                 | 91                  | 90                   | 90                   | 90                   | 87                   |
| 2,025.0        | 90              | 96                        | 88              | 104                 | 99                  | 90                  | 88                   | 89                   | 89                   | 86                   |
| 1,800.0        | 80              | 95                        | 87              | 103                 | 98                  | 89                  | 87                   | 88                   | 88                   | 85                   |
| 1,687.5        | 75              | 95                        | 86              | 103                 | 97                  | 88                  | 87                   | 88                   | 87                   | 85                   |
| 1,575.0        | 70              | 94                        | 86              | 102                 | 96                  | 88                  | 86                   | 87                   | 87                   | 84                   |
| 1,350.0        | 60              | 93                        | 84              | 101                 | 95                  | 87                  | 85                   | 86                   | 86                   | 83                   |
| 1,125.0        | 50              | 92                        | 83              | 100                 | 94                  | 85                  | 84                   | 84                   | 84                   | 81                   |
| 900.0          | 40              | 90                        | 82              | 98                  | 92                  | 84                  | 82                   | 83                   | 83                   | 80                   |
| 675.0          | 30              | 89                        | 80              | 97                  | 91                  | 82                  | 81                   | 81                   | 81                   | 78                   |
| 562.5          | 25              | 88                        | 79              | 96                  | 90                  | 81                  | 80                   | 80                   | 80                   | 77                   |
| 450.0          | 20              | 87                        | 78              | 95                  | 89                  | 80                  | 79                   | 79                   | 79                   | 76                   |
| 225.0          | 10              | 84                        | 76              | 92                  | 86                  | 78                  | 76                   | 77                   | 77                   | 74                   |

**MECHANICAL Sound Data: 3.3 FEET**

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250.0        | 100             | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 2,025.0        | 90              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,800.0        | 80              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,687.5        | 75              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,575.0        | 70              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,350.0        | 60              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,125.0        | 50              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 900.0          | 40              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 675.0          | 30              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 562.5          | 25              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 450.0          | 20              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 225.0          | 10              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |

**MECHANICAL Sound Data: 23.0 FEET**

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCJ<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250.0        | 100             | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 2,025.0        | 90              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,800.0        | 80              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,687.5        | 75              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,575.0        | 70              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,350.0        | 60              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,125.0        | 50              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 900.0          | 40              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 675.0          | 30              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 562.5          | 25              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 450.0          | 20              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 225.0          | 10              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |

**MECHANICAL Sound Data: 49.2 FEET**

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250.0        | 100             | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 2,025.0        | 90              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,800.0        | 80              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,687.5        | 75              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,575.0        | 70              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,350.0        | 60              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,125.0        | 50              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 900.0          | 40              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 675.0          | 30              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 562.5          | 25              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 450.0          | 20              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 225.0          | 10              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |

**EMISSIONS DATA**

**Certification:** Rating not Certified

Emissions data measurement is consistent with those described in EPA CFR 40 PART 86 SUBPART D AND ISO 8178-1 for measuring HC, CO, CO<sub>2</sub> and NOX. These procedures are very similar to the methods described in EPA CFR 40 PART 60 APPENDIX A METHOD 25A for HYDROCARBONS, METHOD 10 for CO, METHOD 7E for NOX.

Data shown is based on steady state engine operating conditions of 25 Deg C, 96Kpa and NUMBER 2 diesel fuel with 35 Deg API and LHV of 42,780 KJ/KG.

To properly apply this data you must refer to performance parameter DM1176 for additional information...

|                                                    |                  |
|----------------------------------------------------|------------------|
| EXHAUST STACK DIAMETER                             | 8 IN             |
| WET EXHAUST MASS                                   | 15,280.22 LB/HR  |
| WET EXHAUST FLOW ( 983 DEG F STACK TEMP )          | 8,977.00 CFM     |
| WET EXHAUST FLOW RATE ( 32 DEG F AND 29.98 IN HG ) | 2,972.00 STD CFM |
| DRY EXHAUST FLOW RATE ( 32 DEG F AND 29.98 IN HG ) | 2,722.41 STD CFM |
| FUEL FLOW RATE                                     | 155 GAL/MIN      |

## RATED SPEED "Not to exceed data"

| GEN<br>PWR<br>EKW | PERCENT<br>LOAD | ENGINE<br>POWER<br>BHP | TOTAL<br>NOX (AS<br>NO <sub>2</sub> )<br>LB/HR | TOTAL<br>CO<br>LB/HR | TOTAL<br>HC<br>LB/HR | PART<br>MATTER<br>LB/HR | OXYGEN<br>IN<br>EXHAUST<br>PERCENT | DRY<br>SMOKE<br>OPACITY<br>PERCENT | BOSCH<br>SMOKE<br>NUMBER |
|-------------------|-----------------|------------------------|------------------------------------------------|----------------------|----------------------|-------------------------|------------------------------------|------------------------------------|--------------------------|
| 2,250.0           | 100             | 3,196.1                | 34.09                                          | 1.11                 | 0.81                 | .520                    | 999999.88                          | 1.5                                | 1.28                     |
| 1,687.5           | 75              | 2,407.0                | 25.32                                          | 0.42                 | 0.73                 | .350                    | 1.20                               | 5.4                                | 1.71                     |
| 1,125.0           | 50              | 1,627.7                | 11.79                                          | 0.60                 | 0.49                 | .400                    | 3.30                               | 2.0                                | 1.28                     |
| 562.5             | 25              | 857.7                  | 5.67                                           | 0.72                 | 0.32                 | .430                    | 5.80                               | 2.6                                | 1.28                     |
| 225.0             | 10              | 382.3                  | 2.71                                           | 1.27                 | 0.32                 | .460                    | 9.90                               | 2.9                                | 1.29                     |

## RATED SPEED "Nominal Data"

| GEN<br>PWR<br>EKW | PERCENT<br>LOAD | ENGINE<br>POWER<br>BHP | TOTAL<br>NOX (AS<br>NO <sub>2</sub> )<br>LB/HR | TOTAL<br>CO<br>LB/HR | TOTAL<br>HC<br>LB/HR | TOTAL<br>CO <sub>2</sub><br>LB/HR | PART<br>MATTER<br>LB/HR | OXYGEN<br>IN<br>EXHAUST<br>PERCENT | DRY<br>SMOKE<br>OPACITY<br>PERCENT | BOSCH<br>SMOKE<br>NUMBER |
|-------------------|-----------------|------------------------|------------------------------------------------|----------------------|----------------------|-----------------------------------|-------------------------|------------------------------------|------------------------------------|--------------------------|
| 2,250.0           | 100             | 3,196.1                | 28.41                                          | 0.62                 | 0.61                 | 1,625.2                           | 0.370                   | 999999.88                          | 1.5                                | 1.28                     |
| 1,687.5           | 75              | 2,407.0                | 21.10                                          | 0.23                 | 0.55                 | 1,161.6                           | 0.250                   | 1.20                               | 5.4                                | 1.71                     |
| 1,125.0           | 50              | 1,627.7                | 9.82                                           | 0.33                 | 0.37                 | 816.6                             | 0.290                   | 3.30                               | 2.0                                | 1.28                     |
| 562.5             | 25              | 857.7                  | 4.73                                           | 0.40                 | 0.24                 | 464.5                             | 0.300                   | 5.80                               | 2.6                                | 1.28                     |
| 225.0             | 10              | 382.3                  | 2.26                                           | 0.70                 | 0.24                 | 241.2                             | 0.330                   | 9.90                               | 2.9                                | 1.29                     |

## Altitude Capability Data

| Ambient Operating Temp.<br>Altitude | 50 F     | 68 F     | 86 F     | 104 F    | 122 F    | NORMAL   |
|-------------------------------------|----------|----------|----------|----------|----------|----------|
| 0 F                                 | 3,210 hp | 3,210 hp | 3,210 hp | 3,210 hp | 3,210 hp | 3,210 hp |
| 984 F                               | 3,210 hp | 3,210 hp | 3,210 hp | 3,154 hp | 3,056 hp | 3,210 hp |
| 1,640 F                             | 3,210 hp | 3,210 hp | 3,181 hp | 3,079 hp | 2,984 hp | 3,210 hp |
| 3,281 F                             | 3,206 hp | 3,096 hp | 2,994 hp | 2,899 hp | 2,809 hp | 3,056 hp |
| 4,921 F                             | 3,016 hp | 2,914 hp | 2,817 hp | 2,728 hp | 2,643 hp | 2,907 hp |
| 6,562 F                             | 2,836 hp | 2,740 hp | 2,649 hp | 2,564 hp | 2,485 hp | 2,764 hp |
| 8,202 F                             | 2,665 hp | 2,573 hp | 2,489 hp | 2,408 hp | 2,335 hp | 2,626 hp |
| 9,843 F                             | 2,501 hp | 2,417 hp | 2,336 hp | 2,262 hp | 2,191 hp | 2,493 hp |
| 10,499 F                            | 2,439 hp | 2,355 hp | 2,278 hp | 2,205 hp | 2,136 hp | 2,442 hp |

## Identification Reference and Notes

|                                         |          |                                        |              |
|-----------------------------------------|----------|----------------------------------------|--------------|
| Engine Arrangement:                     | 1955874  | Lube Oil Press @ Rated Spd(PSI):       | 55.8         |
| Effective Serial No:                    | 1HZ02922 | Piston Speed @ Rated Eng SPD (FT/Min): | 2,173.2      |
| Primary Engine Test Spec:               | 0K2962   | Max Operating Altitude(FT):            | 1,640.4      |
| Performance Parm Ref:                   | TM5739   | PEEC Elect Control Module Ref          |              |
| Performance Data Ref:                   | DM4690   | PEEC Personality Cont Mod Ref          |              |
| Aux Coolant Pump Perf Ref:              | DM1286   |                                        |              |
| Cooling System Perf Ref:                | DM1299   | Turbocharger Model                     | BTV8501-1.23 |
| Certification Ref:                      |          | Fuel Injector                          | 2563663      |
| Certification Year:                     |          | Timing-Static (DEG):                   | --           |
| Compression Ratio:                      | 14.0     | Timing-Static Advance (DEG):           | --           |
| Combustion System:                      | DI       | Timing-Static (MM):                    | --           |
| Aftercooler Temperature (F):            | 140      | Unit Injector Timing (MM):             | 64.3         |
| Crankcase Blowby Rate(CFH):             | 3,210.1  | Torque Rise (percent)                  | --           |
| Fuel Rate (Rated RPM) No Load (Gal/HR): | 16.2     | Peak Torque Speed RPM                  | --           |
| Lube Oil Press @ Low Idle Spd(PSI):     | 20.0     | Peak Torque (LB/FT):                   | --           |

Reference  
Number: DM4690

EPA TIER-I 20002005A4

Parameters

Reference: TM5739

GEN SET - PACKAGED - DIESEL

TOLERANCES:

AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES.  
EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING  
TOLERANCES.

|                                 |     |     |
|---------------------------------|-----|-----|
| ENGINE POWER                    | +/- | 3%  |
| EXHAUST STACK TEMPERATURE       | +/- | 8%  |
| GENERATOR POWER                 | +/- | 5%  |
| INLET AIR FLOW                  | +/- | 5%  |
| INTAKE MANIFOLD PRESSURE - GAGE | +/- | 10% |
| EXHAUST FLOW                    | +/- | 6%  |
| SPECIFIC FUEL CONSUMPTION       | +/- | 3%  |
| FUEL RATE                       | +/- | 5%  |
| HEAT REJECTION                  | +/- | 5%  |
| HEAT REJECTION EXHAUST ONLY     | +/- | 10% |

CONDITIONS:

ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS  
OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND  
TEMPERATURE IN ACCORDANCE WITH SAE J1995. ALSO INCLUDED IS A  
CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A  
LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT  
29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002  
LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL  
APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE  
DATA IS CORRECTED TO SAE J1995, ISO 3046-2 & 8665 & 2288 & 9249 &  
1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL  
PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE  
AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE  
NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL  
AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING  
ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT  
TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON  
THE PERFORMANCE DATA SET.

GEN SET - PACKAGED - DIESEL

ALTITUDE:

ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR  
SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT  
TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT  
TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET  
DURING NORMAL ENGINE OPERATION.

NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC  
ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET  
ELECTRICAL POWER OUTPUT OF THE GENERATOR.

DEFINITIONS:

STANDBY - MAXIMUM OUTPUT AVAILABLE FOR NON PROGRAMMED POWER OUTAGES. THE EXPECTED USAGE SHOULD BE APPROXIMATELY 30 HOURS PER YEAR AND THE AVERAGE DEMAND, DURING THE OUTAGE, SHOULD NOT EXCEED THE CORRESPONDING INDUSTRIAL ENGINE CONTINUOUS RATING. STANDBY RATINGS MAY BE USED IN PEAK SHAVING AND DURING INTERRUPTIBLE UTILITY SERVICE IF THE FOLLOWING CRITERIA ARE MET.

|      |                                |
|------|--------------------------------|
| 500  | HOURS/YEAR OR LESS             |
| 60%  | MAXIMUM AVERAGE LOAD FACTOR    |
| 80%  | LOAD PEAK DEMAND               |
| 100% | LOAD USED ONLY FOR EMERGENCIES |

PRIME POWER - OUTPUT AVAILABLE FOR PEAK DEMAND OF A VARIABLE ELECTRIC LOAD INCLUDING PEAK SHAVING AND PROGRAMMED OUTAGES. THE AVERAGE DEMAND DURING ANY 24 HOUR PERIOD SHOULD NOT EXCEED THE CORRESPONDING INDUSTRIAL ENGINE CONTINUOUS RATING. ALL PRIME POWER RATINGS, EXCEPT D SERIES, HAVE 10% OVERLOAD FOR EMERGENCY USE.

CONTINUOUS - OUTPUT WHICH MAY BE UTILIZED CONTINUOUSLY WITHOUT LOAD CYCLING. ALL 3600 ENGINE CONTINUOUS RATINGS HAVE 10% OVERLOAD CAPABILITY.



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**Content Owner:** Alan Scott

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## GEN SET PACKAGE PERFORMANCE DATA

SEPTEMBER 18, 2014

[1HZ02629]

(1HZ02629)-ENGINE (1H000810)-GENERATOR (FDN01393)-  
GENSETFor Help Desk Phone Numbers [Click here](#)

Performance Number: DM4690

Change Level: 01 ▼

Sales Model: 3516BDITA Combustion: DI

Aspr: TA

Engine Power:

2250 W/F 2310 W/O F  
EKW EKW

Speed: 1,800 RPM

After Cooler: SCAC

3,210 HP

Manifold Type: DRY

Governor Type: ADEM2

After Cooler Temp (F): 140

Turbo Quantity: 4

Engine App: GP

Turbo Arrangement: Parallel

Hertz: 60

Application Type: PACKAGE-DIE Engine Rating: PGS

Strategy:

Rating Type: STANDBY Certification: N-C 1970 - 2100

## General Performance Data

| GEN<br>W/F<br>EKW | PERCENT<br>LOAD | ENGINE<br>POWER<br>BHP | ENGINE<br>BMEP<br>PSI | FUEL<br>BSFC<br>LB/BHP-<br>HR | FUEL<br>RATE<br>GPH | INTAKE<br>MFLD<br>TEMP<br>DEG F | INTAKE<br>MFLD P<br>IN-HG | INTAKE<br>AIR<br>FLOW<br>CFM | EXH<br>MFLD<br>TEMP<br>DEG F | EXH<br>STACK<br>TEMP<br>DEG F | EXH GAS<br>FLOW<br>CFM |
|-------------------|-----------------|------------------------|-----------------------|-------------------------------|---------------------|---------------------------------|---------------------------|------------------------------|------------------------------|-------------------------------|------------------------|
| 2,250             | 100             | 3196                   | 334.03                | 0.34                          | 156.31              | 187.52                          | 88.48                     | 6,452                        | 1,269.32                     | 926.96                        | 17,381.9               |
| 2,025             | 90              | 2879                   | 300.81                | 0.34                          | 138.14              | 181.22                          | 81.02                     | 6,144.76                     | 1,173.38                     | 852.26                        | 15,626.75              |
| 1,800             | 80              | 2564                   | 267.89                | 0.33                          | 122.26              | 175.28                          | 72.91                     | 5,773.95                     | 1,101.38                     | 804.38                        | 14,125.88              |
| 1,687.5           | 75              | 2407                   | 251.5                 | 0.33                          | 115.1               | 172.22                          | 68.76                     | 5,576.19                     | 1,073.84                     | 788.36                        | 13,451.37              |
| 1,575             | 70              | 2250                   | 235.11                | 0.34                          | 108.34              | 169.7                           | 64.73                     | 5,374.9                      | 1,051.34                     | 775.04                        | 12,833.36              |
| 1,350             | 60              | 1938                   | 202.62                | 0.34                          | 94.97               | 165.38                          | 56.41                     | 4,937                        | 1,009.22                     | 756.5                         | 11,597.35              |
| 1,125             | 50              | 1628                   | 170.13                | 0.35                          | 81.15               | 160.34                          | 45.84                     | 4,350.77                     | 968                          | 748.22                        | 10,184.76              |
| 900               | 40              | 1323                   | 138.22                | 0.36                          | 67.36               | 155.3                           | 35.45                     | 3,771.61                     | 927.5                        | 740.12                        | 8,719.2                |
| 675               | 30              | 1014                   | 106.02                | 0.37                          | 53.18               | 150.98                          | 25.14                     | 3,181.85                     | 863.42                       | 714.74                        | 7,165.35               |
| 562.5             | 25              | 858                    | 89.63                 | 0.38                          | 46.02               | 149                             | 20.05                     | 2,881.68                     | 821.48                       | 693.86                        | 6,377.84               |
| 450               | 20              | 700                    | 73.25                 | 0.39                          | 38.81               | 147.38                          | 15.04                     | 2,581.5                      | 772.88                       | 667.76                        | 5,586.79               |
| 225               | 10              | 382                    | 39.89                 | 0.44                          | 24.25               | 145.58                          | 7.55                      | 2,041.19                     | 624.2                        | 561.92                        | 4,001.16               |

## General Performance Data 2

| GEN<br>W/F<br>EKW | PERCENT<br>LOAD | ENGINE<br>POWER<br>BHP | COMPRESS<br>OUT<br>PRESS<br>IN-HG | COMPRESS<br>OUT<br>TEMP<br>DEG F |
|-------------------|-----------------|------------------------|-----------------------------------|----------------------------------|
| 2,250             | 100             | 3196                   | 59.52                             | 485.78                           |
| 2,025             | 90              | 2879                   | 51.91                             | 449.42                           |
| 1,800             | 80              | 2564                   | 43.74                             | 416.12                           |
| 1,687.5           | 75              | 2407                   | 39.62                             | 401.18                           |
| 1,575             | 70              | 2250                   | 35.65                             | 386.78                           |
| 1,350             | 60              | 1938                   | 27.48                             | 357.62                           |
| 1,125             | 50              | 1628                   | 16.88                             | 320.9                            |
| 900               | 40              | 1323                   | 6.51                              | 280.4                            |

|       |    |      |       |        |
|-------|----|------|-------|--------|
| 675   | 30 | 1014 | 3.67  | 234.86 |
| 562.5 | 25 | 858  | 8.65  | 211.82 |
| 450   | 20 | 700  | 13.5  | 188.78 |
| 225   | 10 | 382  | 20.94 | 148.64 |

## Engine Heat Rejection Data

| GEN<br>W/F<br>EKW | PERCENT<br>LOAD | REJ TO<br>JW<br>BTU/MH | REJ TO<br>ATMOS<br>BTU/MH | REJ TO<br>EXHAUST<br>BTU/MH | EXH<br>RCOV<br>TO 350F<br>BTU/MH | FROM<br>OIL CLR<br>BTU/MH | FROM<br>AFT CLR<br>BTU/MH | WORK<br>ENERGY<br>BTU/MH | LHV<br>ENERGY<br>BTU/MH | HHV<br>ENERGY<br>BTU/MH |
|-------------------|-----------------|------------------------|---------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|--------------------------|-------------------------|-------------------------|
| 2,250             | 100             | 48,168.8               | 9,554.1                   | 128,525.9                   | 70,575.5                         | 16,776.6                  | 34,235.7                  | 135,520.9                | 334,224.3               | 356,005.4               |
| 2,025             | 90              | 44,131.0               | 8,416.7                   | 111,123.8                   | 57,893.5                         | 14,843.0                  | 29,344.9                  | 122,099.6                | 295,780.2               | 315,059.1               |
| 1,800             | 80              | 40,434.5               | 7,677.4                   | 97,759.3                    | 48,851.2                         | 13,136.9                  | 24,909.0                  | 108,735.2                | 262,454.5               | 279,572.3               |
| 1,687.5           | 75              | 38,728.4               | 7,450.0                   | 92,129.2                    | 45,325.3                         | 12,340.8                  | 22,804.8                  | 102,081.4                | 247,042.8               | 263,193.8               |
| 1,575             | 70              | 36,965.4               | 7,222.5                   | 86,840.3                    | 42,311.2                         | 11,601.5                  | 20,757.5                  | 95,427.7                 | 232,086.0               | 247,213.4               |
| 1,350             | 60              | 33,553.2               | 6,881.3                   | 76,319.4                    | 36,965.4                         | 10,179.7                  | 16,719.7                  | 82,177.0                 | 202,456.8               | 215,650.6               |
| 1,125             | 50              | 29,913.6               | 6,483.2                   | 65,912.2                    | 31,847.1                         | 8,701.1                   | 12,852.6                  | 69,040.0                 | 172,884.4               | 184,144.7               |
| 900               | 40              | 26,160.1               | 6,142.0                   | 55,618.7                    | 26,956.3                         | 7,222.5                   | 9,212.9                   | 56,130.6                 | 143,823.9               | 153,207.5               |
| 675               | 30              | 22,065.5               | 5,743.9                   | 44,813.5                    | 21,155.6                         | 5,687.0                   | 5,857.6                   | 42,993.6                 | 114,024.1               | 121,474.1               |
| 562.5             | 25              | 19,847.6               | 5,516.4                   | 39,240.2                    | 18,027.8                         | 4,947.7                   | 4,322.1                   | 36,396.7                 | 98,896.7                | 105,323.0               |
| 450               | 20              | 17,572.8               | 5,288.9                   | 33,553.2                    | 14,843.0                         | 4,151.5                   | 2,843.5                   | 29,686.1                 | 83,541.9                | 89,001.4                |
| 225               | 10              | 12,568.2               | 4,777.1                   | 21,553.7                    | 7,677.4                          | 2,616.0                   | 398.1                     | 16,207.9                 | 52,092.8                | 55,505.0                |

## EXHAUST Sound Data: 4.92 FEET

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250          | 100             | 118                       | 108             | 123                 | 119                 | 111                 | 109                  | 110                  | 110                  | 108                  |
| 2,025          | 90              | 116                       | 107             | 121                 | 117                 | 109                 | 108                  | 109                  | 109                  | 107                  |
| 1,800          | 80              | 115                       | 106             | 120                 | 116                 | 108                 | 107                  | 108                  | 108                  | 106                  |
| 1,687.5        | 75              | 115                       | 105             | 120                 | 116                 | 108                 | 106                  | 108                  | 107                  | 106                  |
| 1,575          | 70              | 114                       | 105             | 119                 | 115                 | 107                 | 106                  | 107                  | 107                  | 105                  |
| 1,350          | 60              | 113                       | 103             | 118                 | 114                 | 106                 | 104                  | 106                  | 106                  | 104                  |
| 1,125          | 50              | 112                       | 102             | 117                 | 113                 | 105                 | 103                  | 104                  | 104                  | 102                  |
| 900            | 40              | 110                       | 101             | 115                 | 111                 | 103                 | 102                  | 103                  | 103                  | 101                  |
| 675            | 30              | 109                       | 99              | 114                 | 110                 | 102                 | 100                  | 101                  | 101                  | 99                   |
| 562.5          | 25              | 108                       | 98              | 113                 | 109                 | 101                 | 99                   | 100                  | 100                  | 98                   |
| 450            | 20              | 107                       | 97              | 112                 | 108                 | 100                 | 98                   | 99                   | 99                   | 97                   |
| 225            | 10              | 104                       | 95              | 109                 | 105                 | 97                  | 96                   | 97                   | 97                   | 95                   |

**EXHAUST Sound Data: 22.97 FEET**

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250          | 100             | 104                       | 96              | 112                 | 106                 | 98                  | 96                   | 97                   | 97                   | 94                   |
| 2,025          | 90              | 103                       | 94              | 111                 | 105                 | 97                  | 95                   | 96                   | 96                   | 93                   |
| 1,800          | 80              | 102                       | 93              | 110                 | 104                 | 96                  | 94                   | 95                   | 95                   | 92                   |
| 1,687.5        | 75              | 101                       | 93              | 109                 | 104                 | 95                  | 93                   | 94                   | 94                   | 91                   |
| 1,575          | 70              | 101                       | 92              | 109                 | 103                 | 94                  | 93                   | 94                   | 93                   | 91                   |
| 1,350          | 60              | 100                       | 91              | 108                 | 102                 | 93                  | 92                   | 92                   | 92                   | 89                   |
| 1,125          | 50              | 98                        | 90              | 106                 | 100                 | 92                  | 90                   | 91                   | 91                   | 88                   |
| 900            | 40              | 97                        | 88              | 105                 | 99                  | 90                  | 89                   | 90                   | 89                   | 87                   |
| 675            | 30              | 95                        | 87              | 103                 | 97                  | 89                  | 87                   | 88                   | 88                   | 85                   |
| 562.5          | 25              | 94                        | 86              | 102                 | 96                  | 88                  | 86                   | 87                   | 87                   | 84                   |
| 450            | 20              | 93                        | 85              | 101                 | 95                  | 87                  | 85                   | 86                   | 86                   | 83                   |
| 225            | 10              | 91                        | 82              | 99                  | 93                  | 84                  | 83                   | 84                   | 83                   | 81                   |

**EXHAUST Sound Data: 49.21 FEET**

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250          | 100             | 98                        | 89              | 106                 | 100                 | 91                  | 90                   | 90                   | 90                   | 87                   |
| 2,025          | 90              | 96                        | 88              | 104                 | 99                  | 90                  | 88                   | 89                   | 89                   | 86                   |
| 1,800          | 80              | 95                        | 87              | 103                 | 98                  | 89                  | 87                   | 88                   | 88                   | 85                   |
| 1,687.5        | 75              | 95                        | 86              | 103                 | 97                  | 88                  | 87                   | 88                   | 87                   | 85                   |
| 1,575          | 70              | 94                        | 86              | 102                 | 96                  | 88                  | 86                   | 87                   | 87                   | 84                   |
| 1,350          | 60              | 93                        | 84              | 101                 | 95                  | 87                  | 85                   | 86                   | 86                   | 83                   |
| 1,125          | 50              | 92                        | 83              | 100                 | 94                  | 85                  | 84                   | 84                   | 84                   | 81                   |
| 900            | 40              | 90                        | 82              | 98                  | 92                  | 84                  | 82                   | 83                   | 83                   | 80                   |
| 675            | 30              | 89                        | 80              | 97                  | 91                  | 82                  | 81                   | 81                   | 81                   | 78                   |
| 562.5          | 25              | 88                        | 79              | 96                  | 90                  | 81                  | 80                   | 80                   | 80                   | 77                   |
| 450            | 20              | 87                        | 78              | 95                  | 89                  | 80                  | 79                   | 79                   | 79                   | 76                   |
| 225            | 10              | 84                        | 76              | 92                  | 86                  | 78                  | 76                   | 77                   | 77                   | 74                   |

**MECHANICAL Sound Data: 3.28 FEET**

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250          | 100             | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 2,025          | 90              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,800          | 80              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,687.5        | 75              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,575          | 70              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,350          | 60              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 1,125          | 50              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 900            | 40              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 675            | 30              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 562.5          | 25              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 450            | 20              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |
| 225            | 10              | 111                       | 113             | 123                 | 114                 | 105                 | 101                  | 101                  | 99                   | 103                  |

**MECHANICAL Sound Data: 22.97 FEET**

| GEN W/F<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|----------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250          | 100             | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 2,025          | 90              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,800          | 80              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,687.5        | 75              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,575          | 70              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,350          | 60              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 1,125          | 50              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 900            | 40              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 675            | 30              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 562.5          | 25              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 450            | 20              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |
| 225            | 10              | 98                        | 100             | 109                 | 100                 | 92                  | 89                   | 90                   | 87                   | 91                   |

**MECHANICAL Sound Data: 49.21 FEET**

| GEN WF<br>EKW | PERCENT<br>LOAD | OVERALL<br>SOUND<br>DB(A) | OBCF<br>63HZ DB | OBCF<br>125HZ<br>DB | OBCF<br>250HZ<br>DB | OBCF<br>500HZ<br>DB | OBCF<br>1000HZ<br>DB | OBCF<br>2000HZ<br>DB | OBCF<br>4000HZ<br>DB | OBCF<br>8000HZ<br>DB |
|---------------|-----------------|---------------------------|-----------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 2,250         | 100             | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 2,025         | 90              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,800         | 80              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,687.5       | 75              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,575         | 70              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,350         | 60              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 1,125         | 50              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 900           | 40              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 675           | 30              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 562.5         | 25              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 450           | 20              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |
| 225           | 10              | 92                        | 94              | 103                 | 94                  | 86                  | 84                   | 84                   | 82                   | 86                   |

**EMISSIONS DATA**

N-C 1970 - 2100 \*\*\*\*\* N1  
Non-Certified: This engine rating is not emission certified by any domestic  
or foreign agency.

|                                                   |                  |
|---------------------------------------------------|------------------|
| REFERENCE EXHAUST STACK DIAMETER                  | 8 IN             |
| WET EXHAUST MASS                                  | 29,475.8 LB/HR   |
| WET EXHAUST FLOW (926.60 F STACK TEMP)            | 17,396.02 CFM    |
| WET EXHAUST FLOW RATE ( 32 DEG F AND 29.98 INHG ) | 6,148.00 STD CFM |
| DRY EXHAUST FLOW RATE ( 32 DEG F AND 29.98 INHG ) | 5,632.69 STD CFM |
| FUEL FLOW RATE                                    | 155 GAL/HR       |

**RATED SPEED "Potential site variation"**

| GEN<br>PWR<br>EKW | PERCENT<br>LOAD | ENGINE<br>POWER<br>BHP | TOTAL<br>NOX (AS<br>NO2)<br>LB/HR | TOTAL<br>CO<br>LB/HR | TOTAL<br>HC<br>LB/HR | PART<br>MATTER<br>LB/HR | OXYGEN<br>IN<br>EXHAUST<br>PERCENT | DRY<br>SMOKE<br>OPACITY<br>PERCENT | BOSCH<br>SMOKE<br>NUMBER |
|-------------------|-----------------|------------------------|-----------------------------------|----------------------|----------------------|-------------------------|------------------------------------|------------------------------------|--------------------------|
| 2,250             | 100             | 3196                   | 64.0200                           | 2.3000               | 1.5600               | .5200                   | 9.6000                             | 1.5000                             | 1.2800                   |
| 1,687.5           | 75              | 2407                   | 48.0900                           | .8600                | 1.4200               | .3500                   | 11.3000                            | 5.4000                             | 1.7100                   |
| 1,125             | 50              | 1628                   | 22.4300                           | 1.2200               | .9600                | .4000                   | 12.3000                            | 2.0000                             | 1.2800                   |
| 562.5             | 25              | 858                    | 10.8500                           | 1.4600               | .6300                | .4300                   | 13.6000                            | 2.6000                             | 1.2800                   |
| 225               | 10              | 382                    | 5.2400                            | 2.5700               | .6200                | .4600                   | 15.5000                            | 2.9000                             | 1.2900                   |

**RATED SPEED "Nominal Data"**

| GEN<br>PWR<br>EKW | PERCENT<br>LOAD | ENGINE<br>POWER<br>BHP | TOTAL<br>NOX (AS<br>NO2)<br>LB/HR | TOTAL<br>CO<br>LB/HR | TOTAL<br>HC<br>LB/HR | TOTAL<br>CO2<br>LB/HR | PART<br>MATTER<br>LB/HR | OXYGEN<br>IN<br>EXHAUST<br>PERCENT | DRY<br>SMOKE<br>OPACITY<br>PERCENT | BOSCH<br>SMOKE<br>NUMBER |
|-------------------|-----------------|------------------------|-----------------------------------|----------------------|----------------------|-----------------------|-------------------------|------------------------------------|------------------------------------|--------------------------|
| 2,250             | 100             | 3196                   | 53.3500                           | 1.2800               | 1.1700               | 3,361.8               | .3700                   | 9.6000                             | 1.5000                             | 1.2800                   |
| 1,687.5           | 75              | 2407                   | 40.0700                           | .4800                | 1.0700               | 2,389.8               | .2500                   | 11.3000                            | 5.4000                             | 1.7100                   |
| 1,125             | 50              | 1628                   | 18.6900                           | .6800                | .7200                | 1,675.1               | .2900                   | 12.3000                            | 2.0000                             | 1.2800                   |
| 562.5             | 25              | 858                    | 9.0400                            | .8100                | .4700                | 949.4                 | .3000                   | 13.6000                            | 2.6000                             | 1.2800                   |
| 225               | 10              | 382                    | 4.3700                            | 1.4300               | .4700                | 490.4                 | .3300                   | 15.5000                            | 2.9000                             | 1.2900                   |

**Altitude Capability Data(Corrected Power Altitude Capability)**

| <b>Ambient Operating Temp.</b> | <b>50 F</b> | <b>68 F</b> | <b>86 F</b> | <b>104 F</b> | <b>122 F</b> | <b>NORMAL</b> |
|--------------------------------|-------------|-------------|-------------|--------------|--------------|---------------|
| <b>Altitude</b>                |             |             |             |              |              |               |
| 0 F                            | 3,210.4 hp  | 3,210.4 hp  | 3,210.4 hp  | 3,210.4 hp   | 3,210.4 hp   | 3,210.4 hp    |
| 984.25 F                       | 3,210.4 hp  | 3,210.4 hp  | 3,210.4 hp  | 3,154.08 hp  | 3,056.18 hp  | 3,210.4 hp    |
| 1,640.42 F                     | 3,210.4 hp  | 3,210.4 hp  | 3,180.9 hp  | 3,078.98 hp  | 2,983.77 hp  | 3,210.4 hp    |
| 3,280.84 F                     | 3,206.38 hp | 3,096.42 hp | 2,994.5 hp  | 2,899.29 hp  | 2,809.44 hp  | 3,056.18 h    |
| 4,921.26 F                     | 3,015.95 hp | 2,914.04 hp | 2,817.48 hp | 2,727.63 hp  | 2,643.15 hp  | 2,907.33 h    |
| 6,561.68 F                     | 2,836.26 hp | 2,739.7 hp  | 2,648.51 hp | 2,564.03 hp  | 2,484.91 hp  | 2,763.84 h    |
| 8,202.1 F                      | 2,664.61 hp | 2,573.42 hp | 2,488.93 hp | 2,408.47 hp  | 2,334.72 hp  | 2,625.72 h    |
| 9,842.52 F                     | 2,501 hp    | 2,416.52 hp | 2,336.06 hp | 2,262.3 hp   | 2,191.23 hp  | 2,492.96 h    |
| 10,498.69 F                    | 2,439.32 hp | 2,354.83 hp | 2,278.39 hp | 2,204.64 hp  | 2,136.24 hp  | 2,442 hp      |

The powers listed above and all the Powers displayed are Corrected Powers

**Identification Reference and Notes**

|                                                |          |                                               |              |
|------------------------------------------------|----------|-----------------------------------------------|--------------|
| <b>Engine Arrangement:</b>                     | 1955874  | <b>Lube Oil Press @ Rated Spd(PSI):</b>       | 55.8         |
| <b>Effective Serial No:</b>                    | 1HZ02922 | <b>Piston Speed @ Rated Eng SPD (FT/Min):</b> | 2,173.2      |
| <b>Primary Engine Test Spec:</b>               | 0K2962   | <b>Max Operating Altitude(FT):</b>            | 1,640.4      |
| <b>Performance Parm Ref:</b>                   | TM5739   | <b>PEEC Elect Control Module Ref</b>          |              |
| <b>Performance Data Ref:</b>                   | DM4690   | <b>PEEC Personality Cont Mod Ref</b>          |              |
| <b>Aux Coolant Pump Perf Ref:</b>              | DM1286   |                                               |              |
| <b>Cooling System Perf Ref:</b>                | DM1299   | <b>Turbocharger Model</b>                     | BTV8501-1.23 |
| <b>Certification Ref:</b>                      |          | <b>Fuel Injector</b>                          | 2563663      |
| <b>Certification Year:</b>                     |          | <b>Timing-Static (DEG):</b>                   | --           |
| <b>Compression Ratio:</b>                      | 14.0     | <b>Timing-Static Advance (DEG):</b>           | --           |
| <b>Combustion System:</b>                      | DI       | <b>Timing-Static (MM):</b>                    | --           |
| <b>Aftercooler Temperature (F):</b>            | 140      | <b>Unit Injector Timing (MM):</b>             | 64.3         |
| <b>Crankcase Blowby Rate(CFH):</b>             | 3,210.1  | <b>Torque Rise (percent)</b>                  | --           |
| <b>Fuel Rate (Rated RPM) No Load (Gal/HR):</b> | 16.2     | <b>Peak Torque Speed RPM</b>                  | --           |
| <b>Lube Oil Press @ Low Idle Spd(PSI):</b>     | 20.0     | <b>Peak Torque (LB.FT):</b>                   | --           |

Reference  
Number: DM4690 N-C 19702100N1

Parameters  
Reference: TM5739

## GEN SET - PACKAGED - DIESEL

### **TOLERANCES:**

AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES.  
EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING  
TOLERANCES.

|                               |         |
|-------------------------------|---------|
| Power                         | +/- 3%  |
| Exhaust Stack Temperature     | +/- 8%  |
| Generator Power               | +/- 5%  |
| Inlet Airflow                 | +/- 5%  |
| Intake Manifold Pressure-gage | +/- 10% |
| Exhaust Flow                  | +/- 6%  |
| Specific Fuel Consumption     | +/- 3%  |
| Fuel Rate                     | +/- 5%  |
| Heat Rejection                | +/- 5%  |
| Heat Rejection - Exhaust Only | +/- 10% |

### **T4i Tolerance Exceptions**

**C15:** Power Tolerance +4% , -0%

**C27:** Power Tolerance +0% , -4%

### **CONDITIONS:**

ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS  
OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND  
TEMPERATURE IN ACCORDANCE WITH SAE J1349. ALSO INCLUDED IS A  
CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A  
LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT  
29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002  
LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL  
APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE  
DATA IS CORRECTED TO SAE J1349, ISO 3046-2 & 8665 & 2288 & 9249 &  
1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL  
PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE  
AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE  
NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL  
AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING  
ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT  
TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON

THE PERFORMANCE DATA SET.

**ALTITUDE:**

*ALTITUDE CAPABILITY* - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

*COLUMN "N" DATA* - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

*AMBIENT TEMPERATURE* - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.

*NORMAL TEMPERATURE* - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

**GENERATOR SET RATINGS***EMERGENCY STANDBY POWER (ESP)*

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

*STANDBY POWER RATING*

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. 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.

*PRIME POWER RATING*

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 KW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

*CONTINUOUS POWER RATING*

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 OPERATING HOURS.

**SOUND DEFINITIONS:**

Sound Power : DMB702

Sound Pressure : TM7080

Date Released : 03/14/12

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Caterpillar Confidential: **Green**

Content Owner: Commercial Processes Division

Web Master(s): PSG Web Based Systems Support

Current Date: Thursday, September 18, 2014 11:56:17 AM

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## Criteria Pollutant Emissions

| Fuel<br>Parameter | Pollutant                  | Type              | Emission<br>Factor<br>(lb/unit) | Max. Uncontrolled<br>Emissions [1] |           | Control<br>Efficiency<br>% | Max. Controlled<br>Emissions [2] |           | Limited<br>Emissions<br>(tons/yr) | Actual<br>Emissions<br>tons/yr |
|-------------------|----------------------------|-------------------|---------------------------------|------------------------------------|-----------|----------------------------|----------------------------------|-----------|-----------------------------------|--------------------------------|
|                   |                            |                   |                                 | lb/hr                              | tons/yr   |                            | lb/hr                            | tons/yr   |                                   |                                |
|                   | CO                         | CO                | 0.11                            | 2.30                               | 10.07     | 0%                         | 2.30                             | 10.07     | 0.81                              | 0.02                           |
|                   | NO <sub>x</sub>            | NO <sub>x</sub>   | 3.01                            | 64.02                              | 280.41    | 0%                         | 64.02                            | 280.41    | 22.41                             | 0.61                           |
|                   | PM                         | PM                | 0.02                            | 0.52                               | 2.28      | 0%                         | 0.52                             | 2.28      | 0.18                              | 0.00                           |
|                   | PM <sub>10</sub>           | PM <sub>10</sub>  | 0.02                            | 0.52                               | 2.28      | 0%                         | 0.52                             | 2.28      | 0.18                              | 0.00                           |
|                   | PM <sub>2.5</sub>          | PM <sub>2.5</sub> | 0.02                            | 0.52                               | 2.28      | 0%                         | 0.52                             | 2.28      | 0.18                              | 0.00                           |
| 0.0015<br>wt% S   | SO <sub>2</sub>            | SO <sub>2</sub>   | 0.02982                         | 0.63                               | 2.77      | 0%                         | 0.63                             | 2.77      | 0.22                              | 0.01                           |
|                   | VOC                        | VOC               | 0.07                            | 1.56                               | 6.83      | 0%                         | 1.56                             | 6.83      | 0.55                              | 0.01                           |
|                   | CO <sub>2</sub>            | CO <sub>2</sub>   | 165                             | 3,504.54                           | 15,349.90 | 0%                         | 3,504.54                         | 15,349.90 | 1,226.59                          | 33.35                          |
|                   | CH <sub>4</sub>            | CH <sub>4</sub>   | 0.09                            | 1.91                               | 8.37      | 0%                         | 1.91                             | 8.37      | 0.67                              | 0.02                           |
|                   | N <sub>2</sub> O           | N <sub>2</sub> O  | 1.32E-03                        | 0.03                               | 0.12      | 0%                         | 0.03                             | 0.12      | 0.01                              | 0.00                           |
|                   | Total<br>CO <sub>2</sub> e | CO <sub>2</sub> e |                                 | 3,553.38                           | 15,563.79 | 0%                         | 3,553.38                         | 15,563.79 | 1,243.68                          | 33.81                          |

## HAP and PAH Emissions

| Pollutant               | Type | Emission Factor<br>(lb/unit) | Max. Uncontrolled Emissions |          | Control Efficiency<br>% | Max. Controlled Emissions |          | Limited Emissions<br>(tons/yr) | Actual Emissions<br>tons/yr |
|-------------------------|------|------------------------------|-----------------------------|----------|-------------------------|---------------------------|----------|--------------------------------|-----------------------------|
|                         |      |                              | lb/hr                       | tons/yr  |                         | lb/hr                     | tons/yr  |                                |                             |
| Benzene                 | HAP  | 7.76E-04                     | 1.65E-02                    | 7.22E-02 | 0%                      | 1.65E-02                  | 7.22E-02 | 5.77E-03                       | 1.57E-04                    |
| Toluene                 | HAP  | 2.81E-04                     | 5.97E-03                    | 2.61E-02 | 0%                      | 5.97E-03                  | 2.61E-02 | 2.09E-03                       | 5.68E-05                    |
| Xlenes                  | HAP  | 1.93E-04                     | 4.10E-03                    | 1.80E-02 | 0%                      | 4.10E-03                  | 1.80E-02 | 1.43E-03                       | 3.90E-05                    |
| Formaldehyde            | HAP  | 7.89E-05                     | 1.68E-03                    | 7.34E-03 | 0%                      | 1.68E-03                  | 7.34E-03 | 5.87E-04                       | 1.59E-05                    |
| Acetaldehyde            | HAP  | 2.52E-05                     | 5.35E-04                    | 2.34E-03 | 0%                      | 5.35E-04                  | 2.34E-03 | 1.87E-04                       | 5.09E-06                    |
| Acrolein                | HAP  | 7.88E-06                     | 1.67E-04                    | 7.33E-04 | 0%                      | 1.67E-04                  | 7.33E-04 | 5.86E-05                       | 1.59E-06                    |
| Naphthalene             | HAP  | 1.30E-04                     | 2.76E-03                    | 1.21E-02 | 0%                      | 2.76E-03                  | 1.21E-02 | 9.66E-04                       | 2.63E-05                    |
| Acenaphthylene          | PAH  | 9.23E-06                     | 1.96E-04                    | 8.59E-04 | 0%                      | 1.96E-04                  | 8.59E-04 | 6.86E-05                       | 1.87E-06                    |
| Acenaphthene            | PAH  | 4.68E-06                     | 9.94E-05                    | 4.35E-04 | 0%                      | 9.94E-05                  | 4.35E-04 | 3.48E-05                       | 9.46E-07                    |
| Fluorene                | PAH  | 1.28E-05                     | 2.72E-04                    | 1.19E-03 | 0%                      | 2.72E-04                  | 1.19E-03 | 9.52E-05                       | 2.59E-06                    |
| Phenanthrene            | PAH  | 4.08E-05                     | 8.67E-04                    | 3.80E-03 | 0%                      | 8.67E-04                  | 3.80E-03 | 3.03E-04                       | 8.25E-06                    |
| Anthracene              | PAH  | 1.23E-06                     | 2.61E-05                    | 1.14E-04 | 0%                      | 2.61E-05                  | 1.14E-04 | 9.14E-06                       | 2.49E-07                    |
| Fluoranthene            | PAH  | 4.03E-06                     | 8.56E-05                    | 3.75E-04 | 0%                      | 8.56E-05                  | 3.75E-04 | 3.00E-05                       | 8.15E-07                    |
| Pyrene                  | PAH  | 3.71E-06                     | 7.88E-05                    | 3.45E-04 | 0%                      | 7.88E-05                  | 3.45E-04 | 2.76E-05                       | 7.50E-07                    |
| Benzo(a)anthracene      | PAH  | 6.22E-07                     | 1.32E-05                    | 5.79E-05 | 0%                      | 1.32E-05                  | 5.79E-05 | 4.62E-06                       | 1.26E-07                    |
| Chrysene                | PAH  | 1.53E-06                     | 3.25E-05                    | 1.42E-04 | 0%                      | 3.25E-05                  | 1.42E-04 | 1.14E-05                       | 3.09E-07                    |
| Benzo(b)fluoranthene    | PAH  | 1.11E-06                     | 2.36E-05                    | 1.03E-04 | 0%                      | 2.36E-05                  | 1.03E-04 | 8.25E-06                       | 2.24E-07                    |
| Benzo(k)fluoranthene    | PAH  | 2.18E-07                     | 4.63E-06                    | 2.03E-05 | 0%                      | 4.63E-06                  | 2.03E-05 | 1.62E-06                       | 4.41E-08                    |
| Benzo(a)pyrene          | PAH  | 2.57E-07                     | 5.46E-06                    | 2.39E-05 | 0%                      | 5.46E-06                  | 2.39E-05 | 1.91E-06                       | 5.19E-08                    |
| Indeno(1,2,3-c,d)pyrene | PAH  | 4.14E-07                     | 8.79E-06                    | 3.85E-05 | 0%                      | 8.79E-06                  | 3.85E-05 | 3.08E-06                       | 8.37E-08                    |
| Dibenzo(a,h)anthracene  | PAH  | 3.46E-07                     | 7.35E-06                    | 3.22E-05 | 0%                      | 7.35E-06                  | 3.22E-05 | 2.57E-06                       | 6.99E-08                    |
| Benzo(g,h,i)perylene    | PAH  | 5.56E-07                     | 1.18E-05                    | 5.17E-05 | 0%                      | 1.18E-05                  | 5.17E-05 | 4.13E-06                       | 1.12E-07                    |
| Total HAPS              |      | 1.49E-03                     | 3.17E-02                    | 1.39E-01 | 0%                      | 3.17E-02                  | 1.39E-01 | 1.11E-02                       | 3.02E-04                    |