11200 West Silver Spring Road
Milwaukee, WI 53225
Phone: 414/461-9100
Fax: 414/615-2101

DATE: **January 24, 2011** **Quote No. DPO110001-00**

COMPANY: **Oak Creek Water and Sewer Utility**
ATTN:

REF: **Oak Creek WTP & Low Lift Pump Station**
Caterpillar Natural Gas Generator Sets Rated 1040 KW Standby

FABCO Power Systems is pleased to provide the following proposal:

SPECIFICATIONS:	Per Clark Dietz Project No. O0130014 Generator Equipment Purchase Package Dated 12/17/10 and Addendums No. 1 & 2
QUANTITY:	Two (2) CATERPILLAR Generator Sets
MODEL:	G3516 – Natural Gas Fired – U.S. EPA NSPS Compliant
RATING:	1040 KW Standby Power Rating
VOLTAGE:	277/480 VAC (Low Lift Pump Station) 2400/1328 VAC (WTP) 3-Phase, 60 Hz, 1800 RPM
INSTALLATION:	Mechanical and Electrical By Others
DELIVERY:	FOB JOBSITE – OFFLOADING BY OTHERS

WATER TREATMENT PLANT:

I. ONE (1) CATERPILLAR MODEL G3516 GENERATOR SET RATED 1040 KW AT 2400 VAC, INCLUDING RELATED ACCESSORIES AND SERVICES – DELIVERED TO OAK CREEK, WI JOBSITE

LOW LIFT PUMP STATION:

II. ONE (1) CATERPILLAR MODEL G3516 GENERATOR SET RATED 1040 KW AT 480 VAC, INCLUDING RELATED ACCESSORIES AND SERVICES – DELIVERED TO OAK CREEK, WI JOBSITE

BILL OF MATERIALS:

AIR INLET SYSTEM
Air Cleaner – regular with service indicator

CIRCUIT BREAKER
Package mounted
1600A, UL-100%, LSIG trip functions (Low Lift Pump Station genset only)
Power termination box for 5kV cables (WTP genset only)

CONTROL PANELS
EMCP II+ control panel including:
24 VDC control
Auto start/stop control switch
Panel lights
Voltage adjustment potentiometer
Digital AC meter - 3 phase, True RMS
Digital indication for:
Operating hours
Oil pressure
Coolant temperature
DC volts
RPM
L-L volts, L-N volts, phase amps, Hz, ekW, kVA, kVAR, kWhr, %kW, PF
Shutdowns with indicating lights for:
Low oil pressure
High coolant temperature
Overspeed
Emergency stop
Failure to start (overcrank)
Low coolant level
High oil temperature
3 spare indicator LEDs (programmable)
4 spare alarm/shutdown inputs

Additional items included (per genset):
One (1) local annunciator, NFPA 110, 8-light
One (1) remote annunciator, NFPA 110, 2-light (shipped loose)
Communications module, PL1000E

CONTROL SYSTEM
Governor, Woodward 2301A (installed in EMCP II+ panel)
EG3P actuator

COOLING SYSTEM

Combined jacket water and oil cooler circuit
- Water pump, gear driven, centrifugal, non-self-priming
- Thermostats and housing, full open temperature 98 C (208 F)

Separate aftercooler circuit
- Single stage aftercooler
- Water pump, gear driven, centrifugal, non-self-priming
- Thermostats and housing

Remote mounted plate & frame heat exchangers (city water) for AC & JW circuits, with expansion tanks – includes flexible utility connectors

50/50 Propylene Glycol coolant for jacket water circuit

DOCUMENTATION

One (1) operation & maintenance manual
One (1) factory test report
One (1) test report at 0.8 PF

EXHAUST SYSTEM

Wet manifold, with the following items (all shipped loose):
- Residential grade silencer
- Stainless flex
- Mounting bands
- Raincap
- Roof thimble
- Elbow, 90 degree, flanged on one end
- Nuts, bolts and gaskets
- ANSI flange

FLYWHEELS & FLYWHEEL HOUSINGS

Flywheel, SAE No. 00
Flywheel housing, SAE No. 00
SAE standard rotation

FUEL SYSTEM

Gas pressure regulator
Requires 1.5 – 5 psi gas
Natural gas carburetor
- Dual rear inlet connections

Air/fuel ratio controller

GENERAL

Paint – Caterpillar Yellow
Crankshaft vibration damper and guard
Lifting eyes

GENERATORS AND GENERATOR ATTACHMENTS

Brushless SR4B generator with space heater
Self-excited, random wound, includes VR6 voltage regulator

IGNITION SYSTEM

Caterpillar Electronic ignition system (E. I. S.)
(includes detonation sensitive timing)

LUBE SYSTEM

Crankcase breather, top mounted
Oil cooler
Oil filter, RH
Shallow oil pan
Electric prelube pump

MOUNTING SYSTEM

Rails, engine generator mounting, 13 inch industrial type
Spring isolators (shipped loose)

PROTECTION SYSTEM

Shutoff solenoid, 24 volt, energized to run (one at each fuel inlet)
Detonation shutdown

SPARE PARTS

Two (2) each replacement air and oil filters

STARTING/CHARGING SYSTEM

24-Volt starting motors, dual, heavy duty
Oversize battery set, 24V, 1300 CCA
60 amp charging alternator
Battery rack w/cables
Battery charger, 20A, dual rate, NFPA 110
Jacket water heater, 240-480 volt, 1-phase, dual 6 kW

FIELD TEST AND PRODUCT SUPPORT:

Ten (10) days of field start-up and technical assistance per genset by FABCO technician, to include:

- General installation & wiring overview with installing contractor
- Check and fill fluids
- Program EMCP II+ control panels
- Four-hour onsite load bank test, w/portable load bank
- Simulate power failure after completion of load bank test & cooldown – observe for two (2) hours
- Coordinate with annunciators & owner provided transfer switches
- Install & calibrate air/fuel ratio controllers
- Provide third party agency to verify 2009 NSPS emissions compliance
- Eight (8) hours of programming assistance to Owner on SCADA interface for remote monitoring & control of generator sets
- Eight (8) hours of onsite owner instruction

One-Year Customer Service Agreement (CSA) – two (2) visits

NOTES & QUALIFICATIONS:

1. Please note that the proposed generator sets are U.S. EPA NSPS compliant only from the factory. These products are not factory certified, but can be made field compliant through use of the proposed air/fuel ratio controllers and on-site emissions testing by a third party agency. FABCO will provide the third party testing agency to confirm compliance with EPA 2009 NSPS for Spark Ignited Engines, and upon completion of this testing, a test certificate will be provided for the Owner to keep on file.

2. The proposed generator sets will properly fit in their designated locations at each site (WTP and Low Lift Pump Station) with proper clearances.

3. FABCO Power Systems limits the scope of supply for this project to the equipment and services listed within this quotation. Our proposal is based upon equipment and services as specified by Clark Dietz Project No. O0130014 Generator Equipment Purchase Package, along with Addendums No. 1 & 2. Specific exceptions and/or qualifications are noted below. Others will provide equipment, which is not listed.

4. All electrical and mechanical installation, unless otherwise noted in this proposal, will be provided by others, to included aftercooler & jacket water cooler circuit piping and associated installation.

5. All applicable licensing/permits and fees (Federal, State, Local) are the sole responsibility of the purchasing contractor or Owner.

6. A Natural Gas fuel filter is required but not provided with either genset. The installing contractor shall be responsible for sizing, sourcing and installing these components.

7. Twenty (20) total man-days of field technician labor have been included in this proposal. If additional days beyond the allocated number of man-days are required, due to conditions outside of FABCO's control, a technician will be provided on a per diem basis, plus travel, if necessary. Please contact FABCO for the prevailing labor and travel rates in place at time of need.

8. All labor included for on-site start up and commissioning services for the offered equipment is based upon a normal work week (Mon – Fri) and work hours (7:00am - 3:30 pm). If commissioning or services are required outside of normal work week or hours (2nd Shift, Weekend or Holidays, etc.), please contact FABCO for a revised proposal, which will reflect corresponding rates.

   Note field service technician availability is based upon FABCO service operations workload and scheduling. Please allow 2-3 weeks within your project/construction schedule for technician availability from point of notice to FABCO in coordinating services.

9. Others will provide any required relay coordination or short-circuit studies.

10. 26 32 13 – 3, 1.8.A – No special tools are required for preventative maintenance of these generator sets and none are included in this proposal.

11. 26 32 13 – 4, 2.2.H – The proposed 6 kW dual jacket water heater operates on 240-480 Vac, 1-phase. It may be operated at 208 Vac with a slight de-rating.

12. 26 32 13 – 6, 2.7.B – Witness testing must be declared at time of order to ensure an available spot in Caterpillar's production schedule. Also, witness testing may be an additional charge, depending upon the specific tests which are selected by the engineer and end user.

TERMS:	NET 10 DAYS WITH APPROVED CREDIT – PRICES ARE VALID FOR THIRTY DAYS
DELIVERY:	G3516 GENSET – DELIVERY TO LOCAL OFF-SITE STORAGE OR JOBSITE BY AUGUST 31, 2011
	FOB JOBSITE – OFFLOADING INCLUDED
TAXES:	PRICES QUOTED WITHIN THIS PROPOSAL DO NOT INCLUDE APPLICABLE FEDERAL, STATE OR LOCAL TAXES. TAXES WILL BE ADDED TO PRICES QUOTED HEREIN WHERE APPLICABLE
WARRANTY:	GENERATOR SETS – **FIVE YEARS** FROM START-UP/COMMISSIONING FOR STANDBY USE (December 31, 2011 to December 31, 2016) Caterpillar Extended Service Contract (ESC) – Platinum Level Coverage

Thank you for the opportunity to quote our products and services. Please call me with any questions or if you need additional information.

Sincerely,

David P. Owsichek

David P. Owsichek
Electric Power Generation Account Manager
FABCO Power Systems
414-461-9113, ext. 1275 direct
414-750-6273 cell
414-615-2101 fax

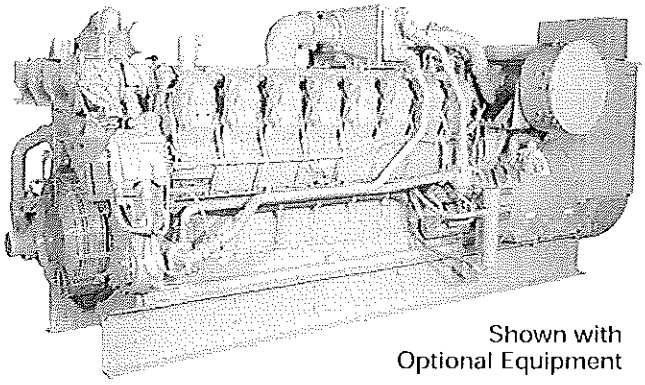
CATERPILLAR®

Gas Generator Set

G3516

1800 rpm
1040 ekW 60 Hz

Standby Power



Shown with Optional Equipment

CATERPILLAR® ENGINE SPECIFICATIONS

V-16, 4-Stroke-Cycle Spark-Ignited
Bore — in (mm) 6.7 (170)
Stroke — in (mm) 7.5 (190)
Displacement — cu in (L) 4210 (67.4)
Aspiration ..... Turbocharged-Aftercooled
Compression ratio 11:1

CATERPILLAR ENGINE FACILITIES ISO 9001 CERTIFIED

FEATURES

- **CATERPILLAR® FACTORY PACKAGE**
  Factory designed, assembled, and tested. Supported by Caterpillar parts and labor warranty through your local Caterpillar dealer.
- **DIESEL STRENGTH BUILT IN**
  Blocks, crankshafts, liners, and connecting rods are common with higher loaded Cat® diesel engines. Robust design provides prolonged life at lower gas engine loads.
- **ELECTRONIC IGNITION SYSTEM WITH DETONATION SENSITIVE TIMING**
  The Caterpillar Electronic Ignition System (EIS) provides optimized spark timing for all operating conditions. Timing is automatically controlled to maintain continuous detonation protection.
- **LOW EXHAUST EMISSIONS**
  2.0 gram/bhp-hr NO_x. Lower emissions are achievable for selected applications; consult your Caterpillar dealer.

CATERPILLAR® SR4B GENERATOR

Type ..... Static regulator, brushless excited
Construction ..... Single bearing, close coupled
Three phase ..... Wye connected
Insulation ..... Class H
Enclosure ..... Drip proof IP/22, guarded
Alignment ..... Caterpillar pilot shaft
Overspeed capability 150%
Waveform ..... Less than 5% deviation
Voltage regulator ..... 3-phase sensing with Volts-per-Hertz response
Voltage regulation ..... Less than ± 1%
Voltage gain ..... Adjustable to compensate for engine speed droop and line loss
TIF ..... Less than 50
THF ..... Less than 5%

CATERPILLAR CONTROL PANEL

24 Volt DC Control
Terminal box mounted
Vibration isolated
NEMA 1/IP 22 enclosure
Electrically dead front
Lockable door
Generator instruments meet ANSI C-39-1

Voltages Available
60 Hz
240, 480

(Adjustable a minimum of ±10%)
Other voltages available – consult your Caterpillar dealer.
Some voltages require derating.

STANDARD EQUIPMENT

Engine
Air cleaner with service indicator
Breather, crankcase
Cooler, lubricating oil
EMCP II, generator control, engine start/stop logic
Filter, lubricating oil, RH
Flywheel housing, SAE No. 0
Governor, Woodward 2301A
Ignition system, Caterpillar EIS
Instrument panel, RH intake manifold pressure, intake manifold temperature, oil pressure differential, exhaust pyrometer, and thermocouples
Jacket water heater
Lifting eyes
Manifold, exhaust, watercooled
Paint, Caterpillar yellow
Protection devices
Pumps, aftercooler water, lubricating oil, jacket water, gear driven
Rails, mounting, 13 inch
SAE standard rotation
Thermostats and housing
Torsional vibration damper
Valve, 24V gas shutoff

Generator
All metal components are plated or painted
Optimum winding pitch for minimum total harmonic distortion
Self excitation (300% short circuit current)
Standards: meets or exceeds the requirements of IEC 34-1, NEMA MG1-22, BS4999, VDE0530, UTE5100, CSA 22.2, ISO 8528-3
Three-phase sensing automatic voltage regulator
VR3 voltage regulator
Wet layer wound rotors individually tested to 125% overspeed; prototypes to 150% @ 338° F (170° C)
Windings coated with a fungus-resistant varnish

OPTIONAL EQUIPMENT

Engine
Battery chargers
Battery, rack, and cables
Air inlet adapters
Customer Communications Module (CCM)
Exhaust fittings
Muffler
Power takeoffs
Prelube pump
Lube oil

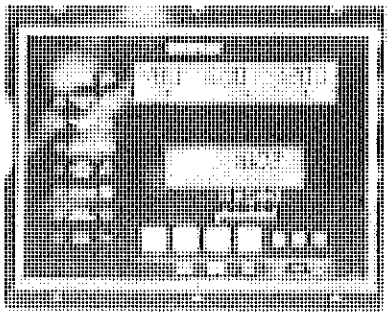
Generator
DVR – Digital Voltage Regulator, adjustable volts/H_3 regulation for large block loads. Diode monitor, under- and over-voltage protection
Extra dips and bakes of insulating resins
Manual voltage control
RFI filter – 82/499/EEC, VDE 875/10.84 A2 Level N, BS800 standards, and MIL-STD-461B (conducted, radiated, and susceptibility
VR3F for enhanced transient response and block loading
Permanent magnet excitation

ENGINE AND GENERATOR CONTROLS

The EMCP II comes complete with many control features competitive manufacturers only offer as options.

Standard Features
Adjustable purge cycle from 0-20 seconds (factory set at 5 seconds)
Auto start-stop engine control with programmable safety shutdowns
Cooldown timer, adjustable from 0 to 30 minutes
Cycle cranking, with adjustable crank/rest periods of 1 to 60 seconds
Delayed ignition (magneto) "kill" after gas valve is closed. Five second delay
Emergency stop button
Flashing LED indicators for protection and diagnostics, including: low oil pressure, high coolant temperature, low coolant level (when optional coolant sensor is installed), overspeed, overcrank, emergency stop, fault shutdown, spare fault alarm
Generator voltage adjust potentiometer
Indicator/display test switch
LCD digital readout for: engine oil pressure, coolant temperature, engine rpm, system DC volts, generator AC volts and amps, and generator frequency
NEMA 1/IP 22 enclosure
Programmable for energize to shutoff or energize to run
Spare alarm and fault inputs for customer use

Optional Features
Alarm modules and remote annunciators to meet NFPA 99 or NFPA 110 codes
Auxiliary relay
Coolant loss sensor
Customer interface module
Dustproof enclosure
Frequency adjust potentiometer
Panel lights
Reverse power relay
Synchronizing modules



G3516 GAS GENERATOR SET

CATERPILLAR®

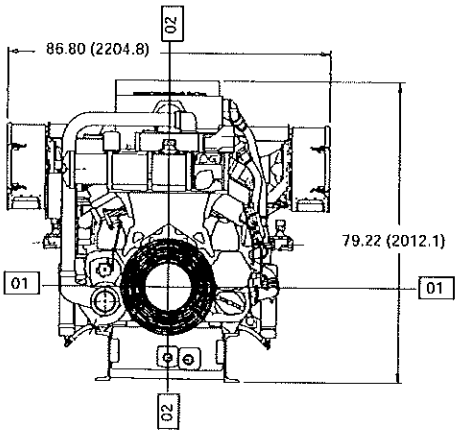
TECHNICAL DATA

G3516 LE Standby Power Gas Generator Sets — 1800 rpm		
Power Rating @ 0.8 PF without Fan	ekW kV•A	1040 1300
Generator Frame Size		693
Engine Lubricating Oil Capacity	gal	106
System Backpressure (Max Allowable)	in water	27
Exhaust Flange Size — (Internal Diameter)	in	7.1
Length	in	187.9
Width	in	86.8
Height	in	79.2
Shipping Weight	lbs	20 560
Engine Coolant Capacity with Radiator	gal	
100% Load Fuel Consumption (100% load) with Fan per ISO3046/1: +5%, -0% tolerance	BTU/bhp-hr	7899
Motor Starting (35% voltage dip)	SkVA (volt)	2626 (480)
Combustion Air Inlet Flow Rate	ft^3/min	3435
Exhaust Gas Flow Rate (at stack temp)	ft^3/min	8583
Heat Rejection to Aftercooler	BTU/min	9746
Heat Rejection to Exhaust (total)	BTU/min	54 853
Heat Rejection to Jacket Water (total)	BTU/min	58 557
Heat Rejection to Atmosphere from Engine	BTU/min	7155
Heat Rejection to Atmosphere from Generator	BTU/min	2821
Exhaust Gas Stack Temperature	Deg F	1603
Deration for Engine Altitude – 3.5% per 500 feet above 2% per 10° F above	 ft Deg F	 4000 77
* Note: For permitting see TMI data.		

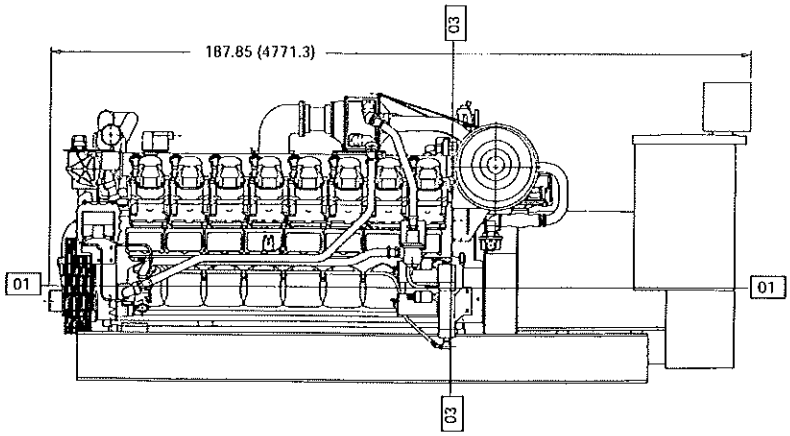
CATERPILLAR®

G3516 GAS GENERATOR SET

FRONT VIEW



SIDE VIEW



01 Centerline of Crankshaft

02 Centerline of Engine

03 Rear Face of Cylinder Block

See general dimension drawing 127-8351 for additional information.

Dimensions are in in (mm).

Note: General configuration not to be used for installation.

RATINGS DEFINITIONS AND CONDITIONS

Ratings are based on SAE J1349 standard conditions of 29.61 in Hg (100 kPa) and 77° F (25° C). These ratings also apply at ISO3046/1, DIN6271, and BS5514 standard conditions of 29.61 in Hg (100 kPa) and 81° F (27° C); and API 7B-11C standard conditions of 29.38 in Hg (99 kPa) and 85° F (29° C) also apply.

Ratings are based on dry natural gas having a low heat value of 905 btu/ft³ (35.22 MJ/m³). Variations in altitude, temperature, and gas composition from standard conditions may require a reduction in engine horsepower.

Turbocharged-aftercooled ratings apply to 4000 ft (1525 m) and 77° F (25° C). For applications which exceed these limits consult your Caterpillar dealer.

Standby — Output available with varying load for the duration of the interruption of the normal source power. Fuel stop power in accordance with ISO3046/1, AS2789, DIN6271, and BS5514.

Additional ratings may be available for specific customer requirements. Consult your Caterpillar representative for details.

G3516 LE GAS ENGINE TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED:	1800	FUEL:	NAT GAS
COMPRESSION RATIO:	11.0:1	FUEL SYSTEM:	LPG IMPCO
AFTERCOOLER (°F)	130		
JACKET WATER (°F)	210	MIN. FUEL PRESS. (PSIG):	1.5
COOLING SYSTEM:	COMBINED	MIN. METHANE NUMBER:	80
IGNITION SYSTEM:	EIS	RATED ALTITUDE (FT):	3500
EXHAUST MANIFOLD:	ASWC	AT AMBIENT TEMP (°F):	77
COMBUSTION:	LEAN BURN	NOx EMISSION LEVEL:	2 g/bhp-hr
		PRICE LIST SETTING:	LA-1231

RATING AND EFFICIENCY	NOTES	LOAD	100%	75%	50%
LHV OF FUEL		BTU/SCF	920	920	920
ENGINE POWER		BHP	1462	1096	731
ENGINE EFFICIENCY	(1)	%	32.7	31.8	30.0
THERMAL EFFICIENCY	(6)	%	48.7	50.8	55.1
TOTAL EFFICIENCY	(7)	%	81.4	82.6	85.1

ENGINE DATA					
FUEL CONSUMPTION	(1)	BTU/bhp-hr	7784	8018	8480
AIR FLOW (77 °F, 14.7 psi)	(WET)	SCFM	3042	2263	1417
AIR FLOW	(WET)	lb/hr	13489	10035	6285
COMPRESSOR OUT PRESS.		in. HG (abs)	70.1	60.5	45.1
COMPRESSOR OUT TEMP.		°F	306	268	197
INLET MAN. PRESS.		in. HG (abs)	63.5	49.4	35.3
INLET MAN. TEMP.	(11)	°F	138	134	130
TIMING	(12)	°BTDC	18	18	18
EXHAUST STACK TEMP.		°F	886	881	917
EXHAUST GAS FLOW (@ stack temp.)	(WET)	CFM, 14.5 psi	8318	6175	3992
EXHAUST MASS	(WET)	lb/hr	14054	10470	6590

EMISSIONS DATA					
NOx (as NO2)	(10)	g/bhp-hr	2	2.5	5.2
CO	(10)	g/bhp-hr	2.1	1.9	1.8
THC	(10)	g/bhp-hr	2.3	2.3	2.2
NMHC	(10)	g/bhp-hr	0.35	0.35	0.33
EXHAUST O2	(10)	%	7.4	7.1	6.0
LAMBDA			1.60	1.55	1.40

HEAT BALANCE DATA					
LHV INPUT	(1)	BTU/min	189623	146491	103287
HEAT REJ. TO JACKET	(2) (8)	BTU/min	50479	42611	34433
HEAT REJ. TO ATMOSPHERE	(4)	BTU/min	6831	5693	4555
HEAT REJ. TO LUBE OIL	(5)	BTU/min	7972	6729	5438
HEAT REJ. TO EXH. (LHV to 77°F)	(2)	BTU/min	52498	38999	25868
HEAT REJ. TO EXH. (LHV to 350°F)	(2)	BTU/min	33937	25105	17050
HEAT REJ. TO A/C	(3) (9)	BTU/min	9826	5946	1984

CONDITIONS AND DEFINITIONS

ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1 (STD. REF. CONDITIONS OF 25°C, 100 KPA). NO OVERLOAD PERMITTED AT RATING SHOWN. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE.

NOTES

1) FUEL CONSUMPTION TOLERANCE ACCORDING TO ISO 3046/1. TOLERANCE IS + 5% OF FULL LOAD DATA.
2) HEAT REJECTION TO JACKET AND EXHAUST TOLERANCE IS ± 10% OF FULL LOAD DATA.
3) HEAT REJECTION TO A/C TOLERANCE IS ± 5% OF FULL LOAD DATA.
4) HEAT REJECTION TO ATMOSPHERE TOLERANCE IS ± 50% OF FULL LOAD DATA.
5) HEAT REJECTION TO LUBE OIL TOLERANCE IS ± 20% OF FULL LOAD DATA.
6) THERMAL EFFICIENCY: JACKET HEAT + LUBE OIL HEAT + EXH. HEAT TO 350°F.
7) TOTAL EFFICIENCY: ENGINE EFF. + THERMAL EFF. TOLERANCE IS ± 10% OF FULL LOAD DATA.
8) TOTAL JW HEAT: COMBINED = JACKET HEAT + OIL COOLER HEAT (heat rate based on treated water)
   2-CIRCUIT AND 3 CIRCUIT = JACKET HEAT (heat rate based on treated water)
9) TOTAL A/C HEAT: COMBINED AND 3-CIRCUIT = A/C HEAT x A/C HEAT REJ. FACTOR (heat rate based on treated water)
   2-CIRCUIT = A/C HEAT x A/C HEAT REJ. FACTOR + O/C HEAT

10) EMISSION DATA SHOWN ARE DRY AND NOT TO EXCEED VALUES.
    PUBLISHED PART LOAD DATA MAY REQUIRE ENGINE ADJUSTMENT.
11) MEASURED IN THE INTAKE MANIFOLD PLENUM.
12) TIMING INDICATED IS FOR USE WITH THE MINIMUM FUEL METHANE NUMBER SPECIFIED. CONSULT THE APPROPRIATE FUEL USAGE GUIDE FOR TIMING AT OTHER METHANE NUMBERS.

FUEL USAGE GUIDE

DERATE FACTOR/ENGINE TIMING vs METHANE NUMBER

<30	30	35	40	45	50	55	60	65	70	75	75	83 to 100
0/--	0/--	0/--	0/--	0/--	0/--	0/--	0/--	0/--	1.0/15	1.0/16	1.0/17	1.0/18

* Denotes Air Fuel Ratio Control Required for Maximum Rating Shown.

ALTITUDE DERATION FACTORS

A	130	1.00	1.00	0.96	0.93	0.89	0.86	0.83	0.80	0.77	0.74	0.71	0.68	0.66
M	120	1.00	1.00	0.98	0.94	0.91	0.88	0.84	0.81	0.78	0.75	0.72	0.70	0.67
B	110	1.00	1.00	1.00	0.96	0.92	0.89	0.86	0.83	0.80	0.77	0.74	0.71	0.68
I	100	1.00	1.00	1.00	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.75	0.72	0.69
E	90	1.00	1.00	1.00	0.99	0.96	0.92	0.89	0.86	0.82	0.79	0.76	0.73	0.71
N	80	1.00	1.00	1.00	1.00	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.75	0.72
T	70	1.00	1.00	1.00	1.00	0.99	0.96	0.92	0.89	0.86	0.82	0.79	0.76	0.73
	60	1.00	1.00	1.00	1.00	1.00	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.75
(°F)	50	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.92	0.89	0.86	0.82	0.79	0.76
		0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000

ALTITUDE (FEET ABOVE SEA LEVEL)

AFTERCOOLER HEAT REJECTION FACTORS

A	130	1.33	1.39	1.46	1.52	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56
M	120	1.25	1.31	1.37	1.44	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
B	110	1.17	1.23	1.29	1.36	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39
I	100	1.09	1.15	1.21	1.27	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
E	90	1.01	1.07	1.13	1.19	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
N	80	1.00	1.00	1.05	1.11	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
T	70	1.00	1.00	1.00	1.03	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
	60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
(°F)	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000

ALTITUDE (FEET ABOVE SEA LEVEL)

FUEL USAGE GUIDE:

This table shows the derate factor required for a given fuel and what engine timing to use. Note that deration occurs as the methane number decreases. Methane number is a scale to measure ignition and burning characteristics of various fuels. Representative values are shown below.

Methane	100
Ethane	44
Propane	34
n-Butane	10
Hydrogen	0

Most dry pipeline natural gas has a methane number of 67 or above. The gas quality should be analyzed to determine the percentage of each constituent and then determine the methane number. Consult the dealer or factory for assistance.

ALTITUDE DERATION FACTORS:

This table shows the deration required for various ambient temperatures and altitudes. Use this information to help determine actual engine power for your site.

ACTUAL ENGINE RATING:

It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative, i.e., they are not to be added together. The same is true for the Low Energy Fuel deration (reference the Caterpillar Methane Number Program) and the Fuel Usage Guide deration. However, the Altitude/Temperature deration and Low Energy Fuel deration are cumulative; and they must be added together in the method shown below. To determine the actual power available, take the lowest rating between 1) and 2).

1) (Altitude/Temperature Deration) + (Low Energy Fuel Deration)
2) Fuel Usage Guide Deration

Note: For NA's always add the Low Energy Fuel deration to the Altitude/Temperature deration. For TA engines only add the Low Energy Fuel deration to the Altitude/Temperature deration whenever the Altitude/Temperature deration is less than 1.0 (100%). This will give the actual rating for the engine at the conditions specified.

AFTERCOOLER HEAT REJECTION FACTORS:

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant inlet air manifold temperature, as the ambient air temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shut down or fail.

EMCP II+

ELECTRONIC MODULAR CONTROL PANEL

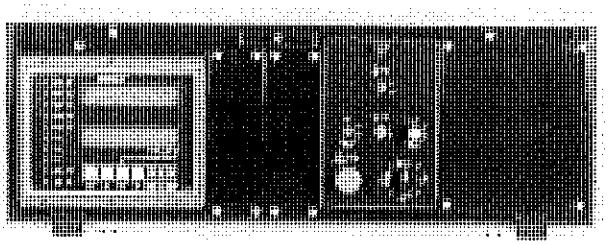


Image shown may not reflect actual package

The Caterpillar® Electronic Modular Control Panel II+ (EMCP II+) places full-featured power metering, protective relaying, simultaneous engine and generator parameter viewing, and expanded AC metering at your fingertips. Engine and generator control, diagnostics, and operating information is accessible via the control panel keypads or a remote, personal computer. The advanced microprocessor-based EMCP II+ combined with the Caterpillar Customer Communication Module (CCM) and Relay Driver Module (RDM) give you the flexibility to remotely manage the specific needs of your total system.

FEATURES

UL

- UL Recognized

RELIABLE, DURABLE, AND ACCURATE

- Environmentally sealed, die-cast aluminum housing isolates and protects electrical components against failure caused by moisture and dirt contamination.
- Rigorous vibration testing ensures panel dependability.
- Maintains metering accuracy from –40° C (–40° F) to 70° C (158° F)
- Electrical noise immunity of 100 volts/meter
- True Remote Monitoring System (RMS) sensing ensures AC metering accuracy is 0.5% for AC volts and amps.
- The digital, 32 bit microprocessor-based system eliminates the need for a number of switches, meters, transducers, relays, and sending units. That means less wiring and fewer opportunities for mechanical failures.

ADVANCED FEATURES THAT SUPPORT YOUR BUSINESS NEEDS

- Full-featured power metering, accessible with one keypad touch, allows you to view generator set kW, kVA, kVAR, kW hours, kVAR hours, percent rated power, and power factor.
- Customer programmable protective relaying, available as alarm and shutdown, protects against undervoltage, overvoltage, underfrequency, overfrequency, overcurrent, and reverse power.
- Load demand relay opens and closes based on generator kW output, programmable to activate at an adjustable setpoint.
- Simultaneous viewing of engine and generator parameters with toggle between auto parameter scrolling and individual parameter display.
- Simultaneous viewing of all AC L-L voltages, all AC L-N voltages, or all AC line currents.
- Expanded remote customer communication module supported by an open RS-232C architecture — easily interfaces with existing plant systems and equipment.

KEYPAD PROGRAMMABILITY

- User-friendly, convenient, customer programmability directs the customer to logical parameter groups — AC metering, protective relaying, engine monitoring — for quick keypad access.
- Programmable, spare control relay with remote control capability provides additional flexibility for customer control function.
- 10 LED alarms, three programmable for customer inputs, provide more information at a glance.

REGULATORY APPROVALS

- U.S. sourced control panels meet CSA requirements.
- Larne sourced control panels meet CE requirements.

STANDARD/OPTIONAL FEATURES

EMCP II+	
STANDARD FEATURES	
Digital (LCD) Indication	AC voltage — 3 phase (L-L & L-N) AC amps (3 phase & total) kW (total & per phase) kVA (total) kVAR (total) kWhr (total) kVARhr (total) PF (average total & per phase) Percent of rated (total) Frequency DC voltage Coolant temperature Oil pressure rpm Hours run System diagnostic L/R exhaust manifold temperature (3500 only) Oil temperature (except 3300/3406)
Controls	Auto start/stop Purge cycle (gas packages only) Staged shutdown (gas packages only) Emergency stop Lamp test Cycle crank Voltage control Cooldown timer Phase selector switch Load demand relay Spare relay — programmable
Enclosure	NEMA 12, IP44 Vandal door (Not available on 3406, 3456)
Indicating Lights with Shutdown	Low oil pressure High coolant temperature Overspeed Overcrank Emergency stop High inlet air temp (gas TA engines only) Detonation sensitive timing (gas LE engines only) Fault shutdown Fault alarms 3 spare lights/4 spare inputs, customer programmable (shutdown or alarm) to spare alarm or fault LEDs
Protective Relaying	Programmable relays: Over/undervoltage Reverse power relay Over/underfrequency Overcurrent
OPTIONAL FEATURES	
Protective Devices	Low coolant level (standard on some packages)
Miscellaneous Controls	Electronic governor: Isochronous speed control Load share Alarm modules — local (with horn and silence switch) Frequency control Common alarm/shutdown volt free contact Generator running volt free contact Ether starting aid (not available on gas packages) Remote annunciator modules Computer communications data link Panel lights

PROTECTIVE RELAYING

Setpoint programming provides the flexibility to custom configure protective relays in a manner which best suits a customer's application. The customer determines the response type and timing of protective relay functions:

- Alarm enable/disable
- Alarm threshold level
- Alarm time delay
- Shutdown enable/disable
- Shutdown threshold level
- Shutdown time delay

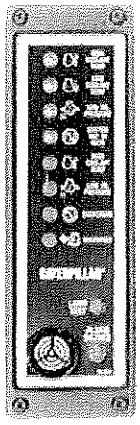
Setpoints are factory set for optimum performance and generator protection. Setpoint values may be viewed with the engine running or stopped.

EXPANDED SYSTEM FLEXIBILITY

ALARMS AND ANNUNCIATORS

EMCP II+ control panel includes two slots for optional alarm or synchronizing modules. Each alarm module contains a block of eight LEDs. Customers select from the following:

- NFPA99/110 alarm modules
- Custom alarm module
- Manual synchronizing module

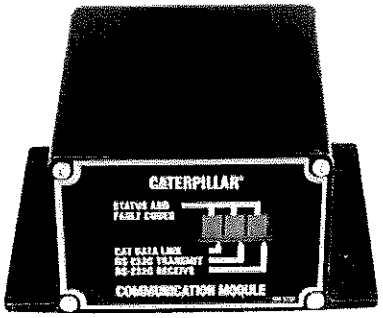


CUSTOMER INTERFACE MODULE

The Customer Interface Module (CIM) is a relay board that provides nine contacts for custom remote annunciation.

REMOTE COMMUNICATION

The Caterpillar Customer Communication Module (CCM) provides a means to remotely monitor and control single or multiple packaged generator sets at a common site. By accessing the CCM from a personal computer or other RS-232C device, each unit can be remotely started and stopped, and all engine and generator parameters can be monitored on a "real time" basis. Published, open architecture enables you to connect the CCM to an existing plant information system.



The combined power of the EMCP II+ and CCM now enable you to control the packaged generator set and ancillary equipment. Text editable software enables you to control the EMCP II+ spare relay.

SYSTEM SOFTWARE

CCM PC is a user-friendly, IBM compatible, windows-based program.

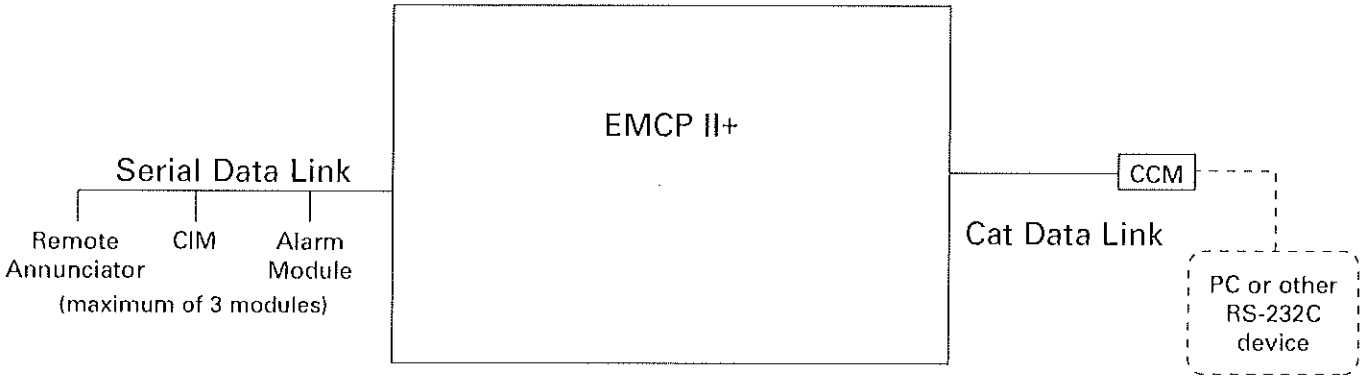
CCM PC interfaces with the CCM and EMCP II+. Remote control ability, parameter status display, diagnostic viewing/clearing options, and parameter logging are among its standard tools. An on-line help system provides fingertip access to software questions and instructions. Integrated file management facility allows you to copy, move, delete, view, print, and rename documents and files from within CCM PC.

CATERPILLAR®

EMCP II+ SPECIFICATIONS

EMI Immunity
IEC 801-2, IEC 801-3, IEC 801-4, EN 5082-2
Enclosure
NEMA 12, IP44
Humidity
0 to 100% relative humidity
Impervious to:
salt spray, fuel, oil and oil additives, coolant, spray cleaners, chlorinated solvents, hydrogen sulfide and methane gas, and dust
Input and output protection
all inputs and outputs are protected against short circuits to (+/-) battery
Input voltage range (24 VDC nominal)
14 to 45 VDC
Power requirements
10 watts (with generator set in standby mode — no alarms)
Reverse polarity protected
Shock, withstands 20 g
Temperature range
Operating: –40° C to 70° C (–40° F to 158° F)
Storage: –55° C to 85° C (–67° F to 185° F)
Vibration
withstands 2.0 g @ 18 to 500 Hz

EMCP II+ SYSTEM HIERARCHY DRAWING

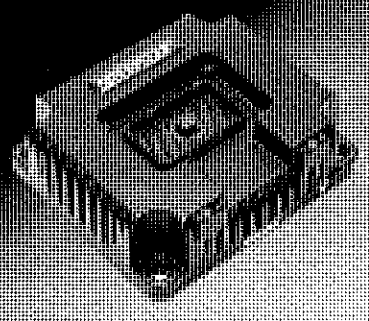


U.S./European sourced
LEHX9590-03 (10-08)
www.cat-electricpower.com

CAT Electronics

PROVEN RELIABLE in the real world

PL1000E Communication Module

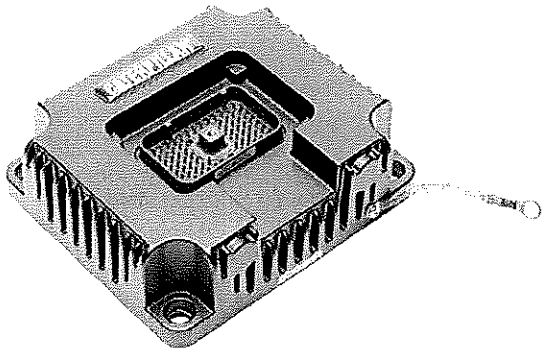


PRODUCT INFORMATION

PL1000E Communication Module

CAT Electronics

Proven Reliable in the Real World



The PL1000E ECU has the processing power, memory, communications interfaces, and software to integrate many mobile and industrial applications. The ECU has flexible communications capabilities and replaces many of today's purpose built products.

- "Rugged design
- 12 / 24 Volt Battery Powered
- Sealed

Operating Characteristics/Specifications

Processing and Memory:	
MPC555 Microprocessor	40 MHz
Flash ROM	4 MB Max.
SRAM	4 MB Max.
BBRAM	2 MB Max.
EEPROM	32 kB
Real-Time Clock	1
Inputs:	
Switch to Battery w/ wake up input	1
Key Switch (+Bat)	1
Software Functionality:	
Cat Data Link to Modbus Translation	Yes
J1939 to Modbus Translation	Yes
User Configurable Parameter Translation	Yes
Web Server: Status and Configuration Pages	Yes
CDL Boost	Yes
Embedded Communications Adapter	Yes
Communication:	
Cat Data Link	1
CAN 2.0 Data Link	2
RS-232 Serial ports	3
RS-485/422	1
Ethernet	1

Environmental Specifications

Operating Temperature Range (ambient)	-40°C to +85°C
Radiated Immunity	15.0KHZ to 1.0 GHZ @ 55 V/M
Storage Temperature Range (Normal)	-50°C to +120°C
Output Shortage Tolerance	75% to 133% (NSV) Nominal System Voltage
Input Shortage Tolerance	Between Input and Batt+ / Batt-
Humidity Tolerance	115% NSV, 90% relative humidity over operating temperature range
Salt Spray Tolerance	115% NSV with 5% salt spray for 48 hours at 35C
Chemical Splash Immunity	Diesel fuel, engine/machine oil, & SAE J1455 chemical agents
Vibration (shock isolated components tolerance)	9.80 Grms random vibration from 24-2000 Hz in three orthogonal planes
Moisture leakage (Sealant pressure tolerance)	+/- 35 kPa against water and water vapor
Electrostatic environment	Zero damage during exposure to electrostatic painting process

Cat Electronics
Building AC 6130
P.O. Box 610
Mossville, IL 61552-0610
(888) 598-8186
fax: (309) 578-8534
www.catelectronics.com

Ameridex Plate Exchangers - Design Specifications

Power Source Midwest	Mike DeMauro		1/21/2011
Quotation No: MO-067-208R		Project: Oak Creek WTP	

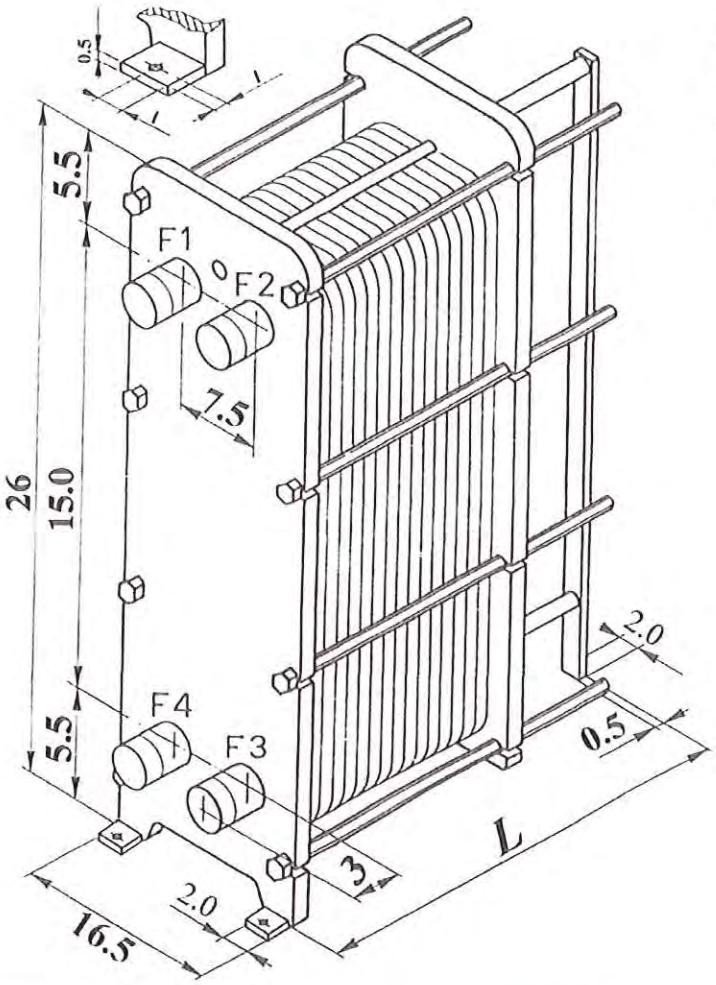
PHE-Type	X-18-33	Hot Side	Cold Side
Flowrate	(g.p.m.)	110.00	40.00
Inlet temperature	(°F)	145.88	75.00
Outlet temperature	(°F)	130.00	113.88
Pressure drop	(PSI)	3.91	0.58
Heat Transfer	(Btu/h)	761220	
Thermodynamic Properties:		EG-50	Water
Density	(Lb/Ft^3)	66.57	62.04
Specific heat	(Btu/Lb*F)	0.82	1.00
Thermal conductivity	(Btu/h*Ft*F)	0.23	0.36
Mean viscosity	(cP)	1.73	0.74
Wall viscosity	(cP)	3.04	0.50
Fouling factors	(Ft^2*h*F/kBtu)	0.01	0.01
Excess Capacity	%	7.20	
Connection locations - Inlet		F1	F3
Connection locations - Outlet		F4	F2

Design of Frame / Plates:		
Plate arrangement (passes*channel)		1 x 16 + 0 x 0
Plate arrangement (passes*channel)		1 x 16 + 0 x 0
Number of plates		33
Effective Surface Area	(Ft^2)	34.28
Overall K-value Duty/Clean	(Btu/Ft^2*h*F)	524.44 562.20
Plate material		0.0157 inch AISI 304
Gasket material / Max. temp.		Nitrile HT - AmeriClip (H) / 280
Max. Design temperature	(°F)	225.00
Max. Design/Test Pressure	(PSI)	100.00 130.00
Max. Differential pressure	(PSI)	100.00
Hold-up volume	(Ft^3)	0.34
Frame length	(Ft)	Isometric
Net weight	(Lb)	300
Frame style		INDUSTRIAL

Connections Size - Hot : 3.0 INCH Studded ports ANSI B16.5 #150
Connections Size - Cold: 2.0 INCH Studded ports ANSI B16.5 #150

AC Exchanger
Aluminum Plate Pack Shroud

Ameridex Plate Exchangers P.O. Box 237 Bryant, Alabama 35958
Tel: 256-597-3360 Fax: 256-597-3358



CONNECTION TYPES

X Studded Ports - 150#
_ C.S. Nozzles / C.S. Flanges
_ MPT - 316 SS
_Victaulic

CONNECTION CODES

F1 = AC Inlet (145.88
F2 = H2O Outlet (113.88)
F3 = H2O Inlet (75.00)
F4 = AC Outlet (130.00)

X-18

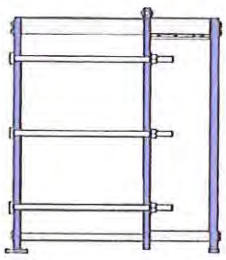
Frame	Plate Capacity	L
1	40	14<----
2	90	26
3	140	38

Dimensions Are In Inches

Design Pressure	**100**	**P.S.I.G.**
Test Pressure	**130**	**P.S.I.G.**
Design Temp.	**225**	**Degrees F**
Dry Weight	**300**	**Lbs.**
Wet Weight	**330**	**Lbs.**

Finish: Ameridex Blue
Tightening Rods / Nuts: ZN / CA Plated
Carrying / Guide Bars: Stainless Steel
Aluminum Plate Pack Shroud

Project: Oak Creek WTP
Quotation #: MO-067-208
Unit #: X-18-33
Date: January 21, 2011
AC Exchanger



Ameridex Plate Exchangers
P.O. Box 237
Bryant, Alabama 35958
Tel: (256) 597-3360
Fax: (256) 597-3358

Ameridex Plate Exchangers - Design Specifications

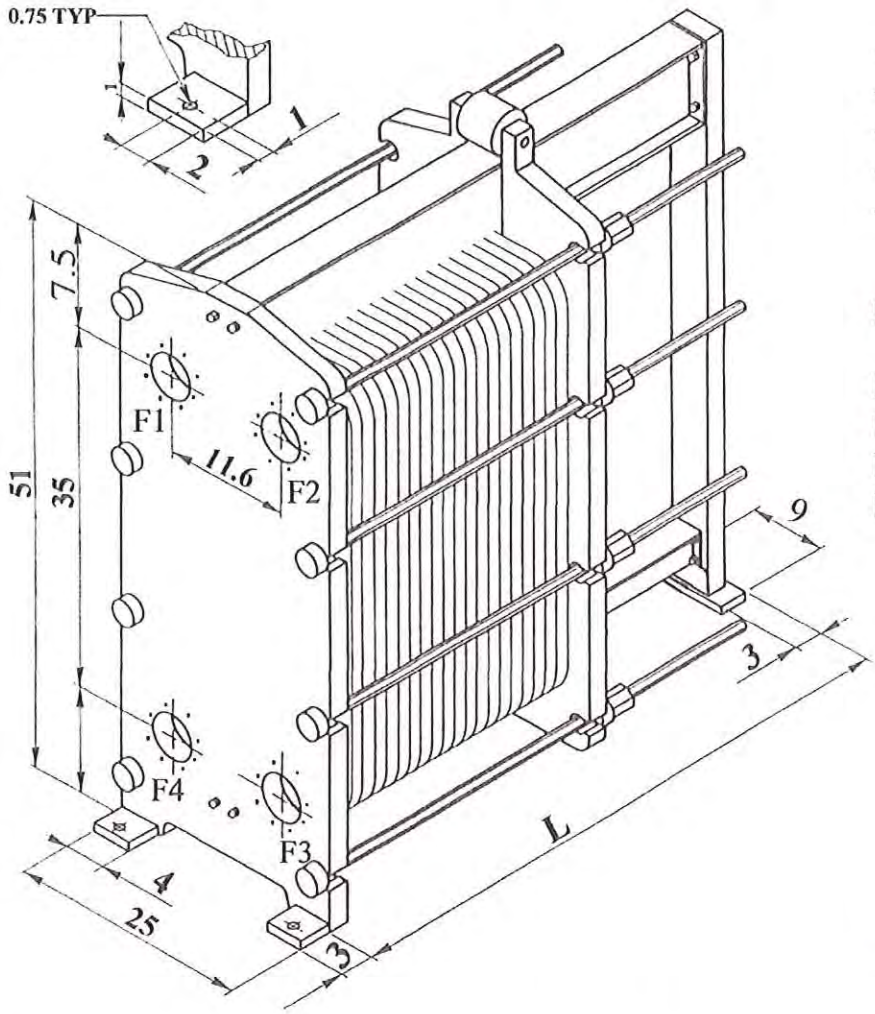
Power Source Midwest	Mike DeMauro		1/21/2011
Quotation No: MO-067-208R		Projeot: Oak Creek WTP	

PHE-Type	X-60-30	Hot Side	Cold Side
Flowrate	(g.p.m.)	396.00	200.00
Inlet temperature	(°F)	210.00	75.00
Outlet temperature	(°F)	187.63	114.02
Pressure drop	(PSI)	3.94	1.35
Heat Transfer	(Btu/h)	3905640	
Thermodynamic Properties:		EG-50	Water
Density	(Lb/Ft^3)	65.55	62.04
Specific heat	(Btu/Lb*F)	0.84	1.00
Thermal conductivity	(Btu/h*Ft*F)	0.23	0.36
Mean viscosity	(cP)	0.74	0.75
Wall viscosity	(cP)	3.06	0.33
Fouling factors	(Ft^2*h*F/kBtu)	0.98	0.98
Excess Capacity	%	110.30	
Connection locations - Inlet		F1	F3
Connection locations - Outlet		F4	F2

Design of Frame / Plates:		
Plate arrangement (passes*channel)		1 x 15 + 0 x 0
Plate arrangement (passes*channel)		1 x 14 + 0 x 0
Number of plates		30
Effective Surface Area	(Ft^2)	138.64
Overall K-value Duty/Clean	(Btu/Ft^2*h*F)	271.22 570.38
Plate material		0.0157 inch AISI 304
Gasket material / Max. temp.		Nitrile HT -AmeriSnap (S) / 280
Max. Design temperature	(°F)	225.00
Max. Design/Test Pressure	(PSI)	100.00 130.00
Max. Differential pressure	(PSI)	100.00
Hold-up volume	(Ft^3)	1.64
Frame length	(Ft)	Isometric
Net weight	(Lb)	1190
Frame style		INDUSTRIAL
Connections Size - Hot :	6 INCH Studded ports	ANSI B16.5 #150
Connections Size - Cold:	4 INCH Studded ports	ANSI B16.5 #150

JW Exchanger
Aluminum Plate Pack Shroud

Ameridex Plate Exchangers P.O. Box 237 Bryant, Alabama 35958
Tel: 256-597-3360 Fax: 256-597-3358



CONNECTION TYPES

__X Studded Ports - 150#
___ C.S. Nozzles / C.S. Flanges
___ MPT
___Victaulic

CONNECTION CODES

F1 = JW Inlet (396.00)
F2 = H2O Outlet (114.02)
F3 = H2O Inlet (70.00)
F4 = JW Outlet (187.63)

X-60

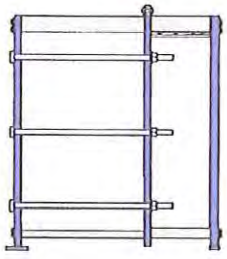
Frame	Plate Capacity	L
1	40	26<----
2	80	38
3	120	50
4	160	62
5	200	74

Dimensions Are In Inches

Design Pressure	100	P.S.I.G.
Test Pressure	130	P.S.I.G.
Design Temp.	225	Degrees F
Dry Weight	1190	Lbs.
Wet Weight	1300	Lbs.

Finish: Ameridex Blue
Tightening Rods / Nuts: ZN / CA Plated
Aluminum Plate Pack Shroud

Project: Oak creek WTP
Quotation #: MO-067-208R
Unit #: X-60-30
Date: January 21. 2011
JW Exchanger

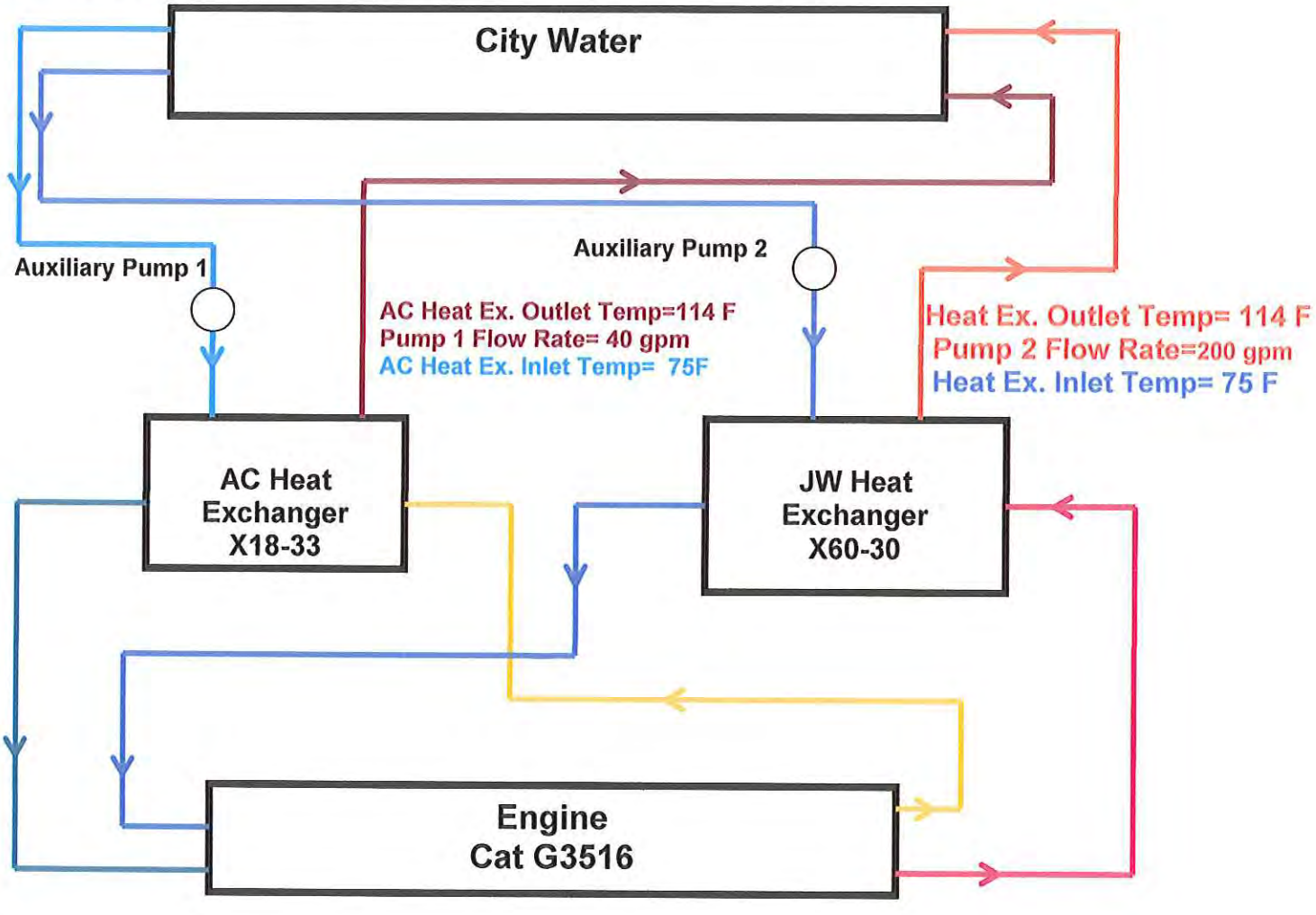


Ameridex Plate Exchangers
P.O. Box 237
Bryant, Alabama 35958
Tel: (256) 597-3360
Fax: (256) 597-3358

POWER SOURCE MIDWEST, INC.
18 HAWK RIDGE BLVD., SUITE 120* LAKE ST. LOUIS, MO 63367-1829
Phone 636-625-4771 * Fax 636-625-4773 * E-mail sales@powersourcemidwest.com

Dual Liquid Circuit With Plate & Frames

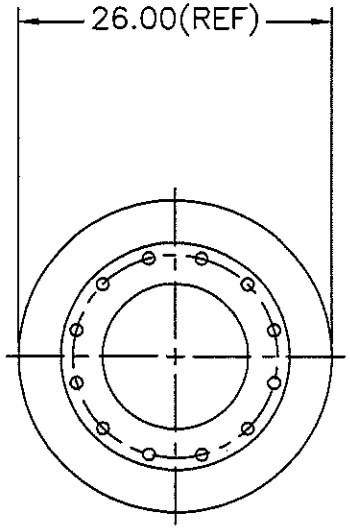
Application: Engine JW and AC flow through separate circuits. Cooling through the plate and frames is by city water with a maximum temperature of 75 deg F.



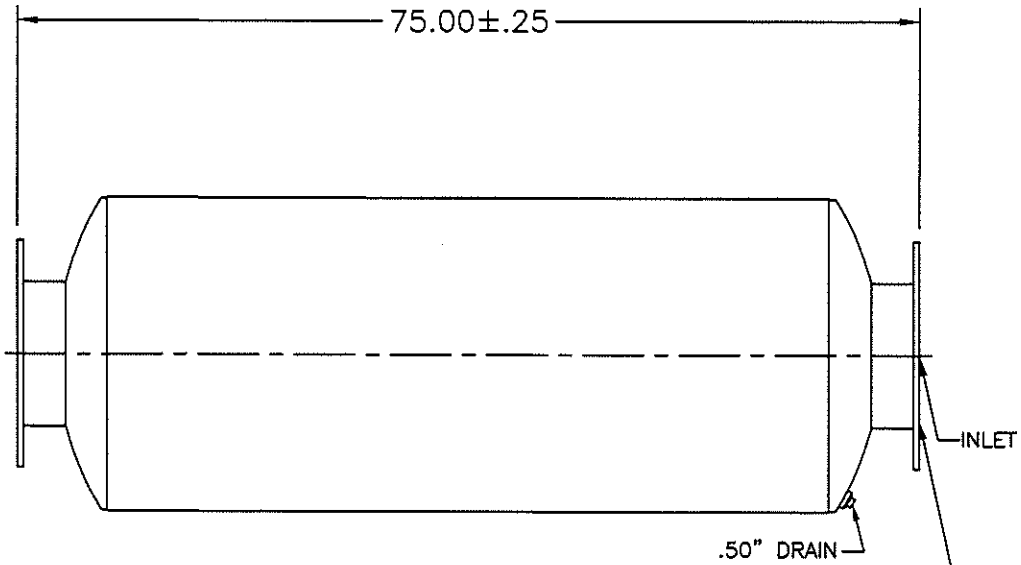
Notes:

Auxiliary pumps are not included in this system, But do represent required flows.

JW Inlet Temp= 210 F
JW Flow Rate= 396 gpm
JW Outlet Temp= 187.6 F
JW Heat Load= 3905640 BTU/Hr
AC Inlet Temp= 145.9 F
AC Flow Rate= 110 gpm
AC Outlet Temp= 130 F
AC Heat Load= 761220 BTU/Hr

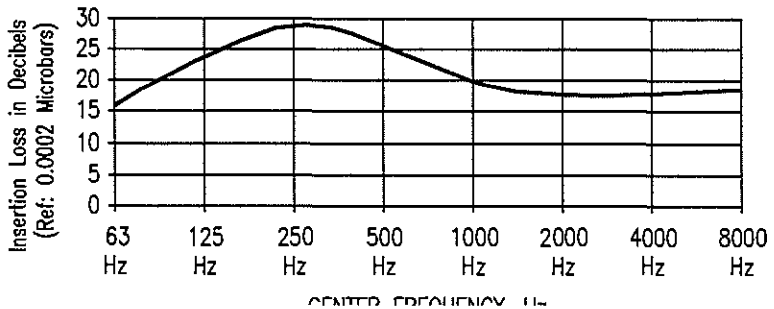


OUTLET END VIEW



SIDE VIEW

Nominal Attenuation Curve for 201-4108 to 201-4112
OCTAVE BAND (Consult Factory for Specific Applications)



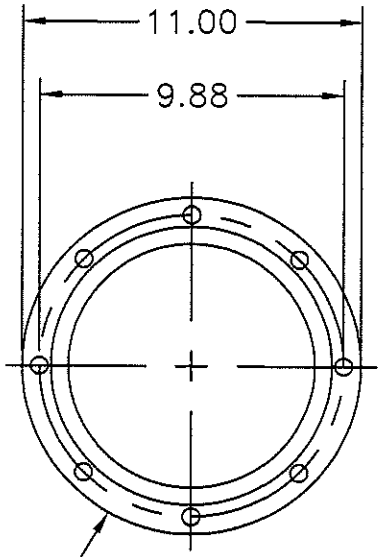
FINISH HIGH HEAT BLACK
APPROX. WT. 330 LBS
NOTE: ALL DIMENSIONS ARE IN INCHES.

TOLERANCES (EXCEPT AS NOTED)	REVISIONS NO.	DESCRIPTION	DATE	BY
DECIMAL: .12"				
FRACTIONAL: 1/8"				
ANGULAR: ?°				

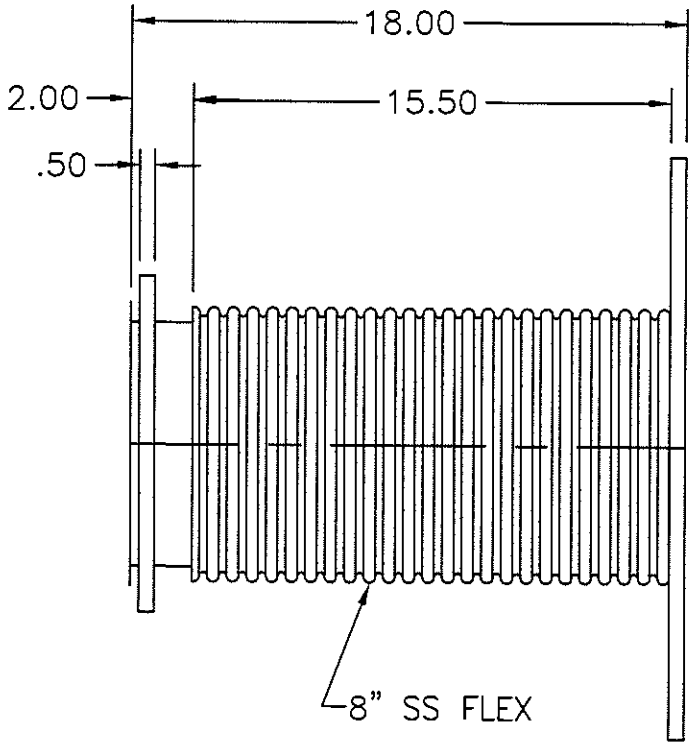
GT EXHAUST SYSTEMS, INC

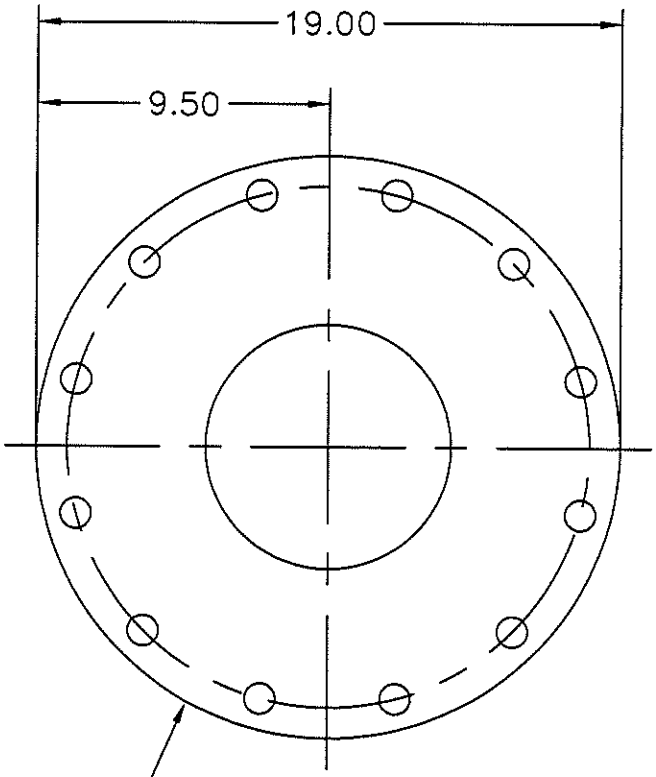
201-4112-1: 12" RESIDENTIAL GRADE SILENCER

DRAWN BY: DRK	SCALE: NONE	MATERIAL: HRS
APP'D BY:	DATE: 11/10/99	DWG. NO. 15722
CUSTOMER:		



8" CATERPILLAR FLANGE
PATTERN .50" DIA., 8 HOLES
ON 9.88 DIA. B.C. (FLOATING
FLANGE)

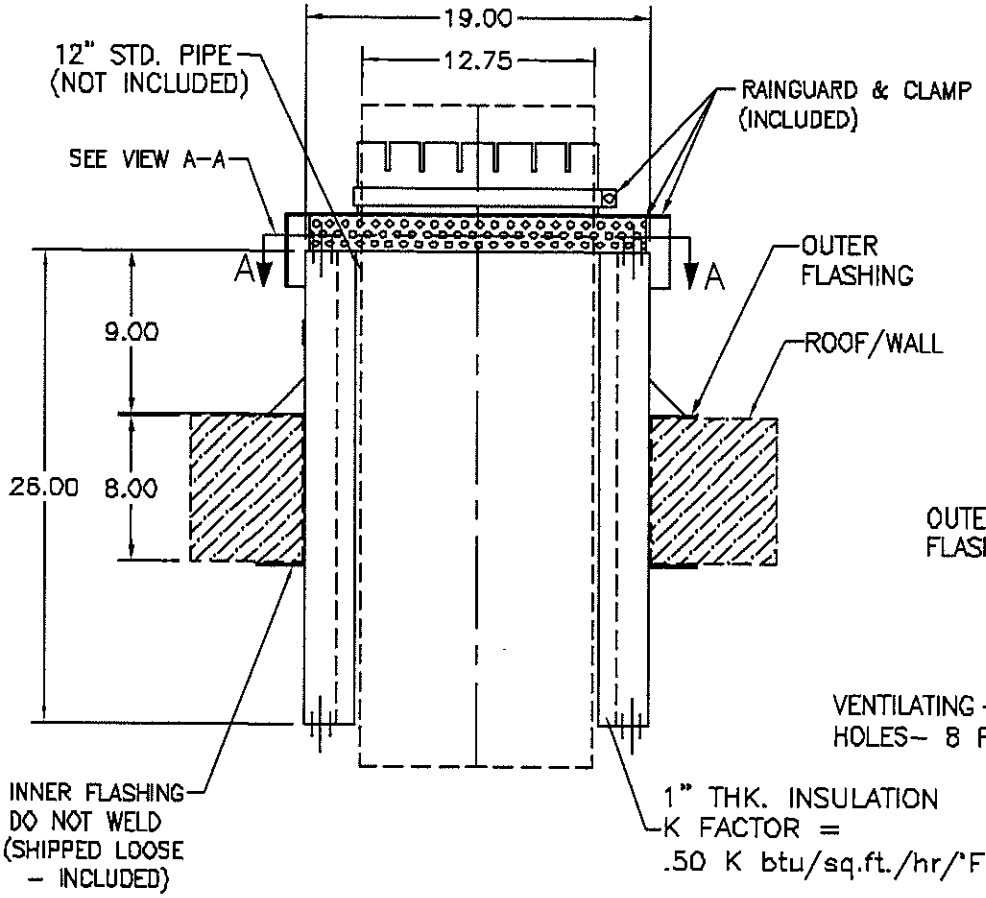


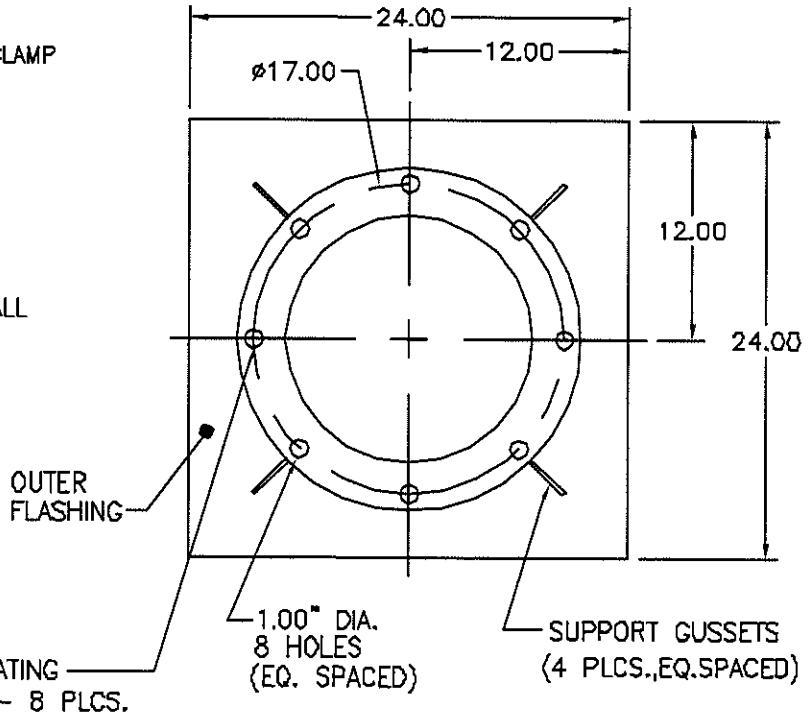


12" x 8"–REDUCING FLANGE
PATTERN 1.00 DIA., 12 HOLES
ON 17.00 DIA. B.C. (BOLT
HOLES STRADDLE CENTERLINE)

FINISH: HIGH HEAT BLACK
APPROX. WT.
NOTE: ALL DIMENSIONS ARE IN INCHES.

TOLERANCES (EXCEPT AS NOTED)	REVISIONS NO.	DATE	BY	GT EXHAUST SYSTEMS, INC		
DECIMAL: .12"				10–11F–818–21824 : 8" CAT / 12" ANSI		
FRACTIONAL: 1/8"				DRAWN BY: MAM	SCALE: NONE	MATERIAL: HRS/SS
ANGULAR: 2				APP'D BY:	DATE: 5/27/02	DWG. NO. 21824
				CUSTOMER:		





VIEW A -A

TOP VIEW OF ROOF/WALL THIMBLE
(VIEW WITHOUT RAINGUARD)

GT PART NUMBER	A	B	ROOF TYPE	ROOF THK.
20-B-1275	12.75 OD	19.00	FLAT / NO PITCH	8.00

CUSTOMER : _____

P.O. NO. #: _____

JOB NO./TAG#: _____

GT REF NO.#: _____

APPROVED BY : _____

DATED APPROVED: _____

FINISH: GRAY
APPROX. WT: 121 LBS.
NOTE: ALL DIMENSIONS ARE IN INCHES.

TOLERANCES (EXCEPT AS NOTED)	REVISIONS			
	NO.	DESCRIPTION	DATE	BY
DECIMAL: .12"	A	CHANGE MATERIAL TO AZ	7/25/02	MAN
FRACTIONAL: 1/8"				
ANGULAR: 3				

GT EXHAUST SYSTEMS, INC

20-B-1275: 12.75" ROOF/WALL THIMBLE STD

DRAWN BY: MAR	SCALE: NONE	MATERIAL: AZ/HRS
APP'D BY:	DATE: 11/14/95	DWG. NO. 8515
CUSTOMER:		

CATERPILLAR

APPLICATION SUPPORT CENTER: Inquiry Print

Inquiry Number:: 500201466
Description:: Sizing Confirmation #2
Created At:: 2011/01/19

Type:: Sizing
Status:: Closed
Priority:: Very high

CUSTOMER INFORMATION

Contact Person:: David Owsichek
Telephone Number::
Email Address:: dpo@fabco.com

Dealer:: FABCO EQUIPMENT, IN
Fax Number::

ASSIGNMENT DETAILS

Workgroup Responsible:: Elec Power - Lafayette - G
Engineer Responsible:: Brendan Morreale

PRODUCTION INFORMATION

Category:: URL
Market:: General EPG
Model:: G3516
Product Descriptor:: EPG

System:: Transient Analysis
Facility:: Lafayette, IN
Project:: OAK CREEK WTP & LOW LIFT PUMP

QUOTATION DETAILS

Quote Number::
Main Quote::
Proposal Number::
Quote Class::
Quote Unit::

Sub Quote::
Complexity::
Updated Quote::
Quote Type::

ADDITIONAL INFORMATION

Requested Completion Date:: 1/20/2011
Estimated Completion Date::

ECD Comments::

INTERNAL NOTES

Re-open Date:: Re-opened By::

Re-opened Reason::

INQUIRY DETAILS

Subject:: Sizing Confirmation #2

Reassignment Log:

****
Inquiry claimed : Brendan Morreale
Claimed On : TH 01/20/2011 09:58 CST

Resolution Log:

*** Brendan Morreale : FR 01/21/2011 12:13 CST ***
David,
Both sites will work on a G3516 1040ekW standby genset. Please see theattached estimated transient analysis repc
Keep in mind, thesegensets require a dealer provided air/fuel ratio control to meet NSPSemissions.

Let me know if you have any questions.

Regards,
Brendan Morreale

*** Brendan Morreale : TH 01/20/2011 09:58 CST ****** David Owsichek:2011-01-19 ***
Attached you will find updated SpecSizer files for two (2) sites:

- WTP genset (2400Y/1328 volts genset output) - loads explained belowdue to voltage not selectable in SpecSizer.

Step 1 600A load for 500 kVA, 480Y/277 volt transformer
Step 2 250 HP pump on single speed, full voltage, 2300 volt controller
Step 3 250 HP pump on single speed, fullvoltage, 2300 volt controller
Step 3 250 HP pump on single speed, full voltage, 2300 volt controller

- Pump Station (480Y/277)volts) - loads are self explanatory.

The consultant issued an addendum, which changed the altitude.
For reference, your original transient analyses were provided underInquiry # 500200601.

I need help with the following:

1. Confirm a G3516 PGL rated 1040 kW standby will still work for eachscenario.

2. Provide updated transient analyses for each site based upon theattached files.

3. For the Pump Station, please make sure to include a transientanalysis sheet for Step 1 for a total of 5 analyses sh

Please contact me as soon as possible with any questions. This is amunicipal sealed bid, which requires sizing documentation tobe submittedwith the bid form.

Thanks,

Dave
414-750-6273 mobile

END OF INQUIRY DETAILS

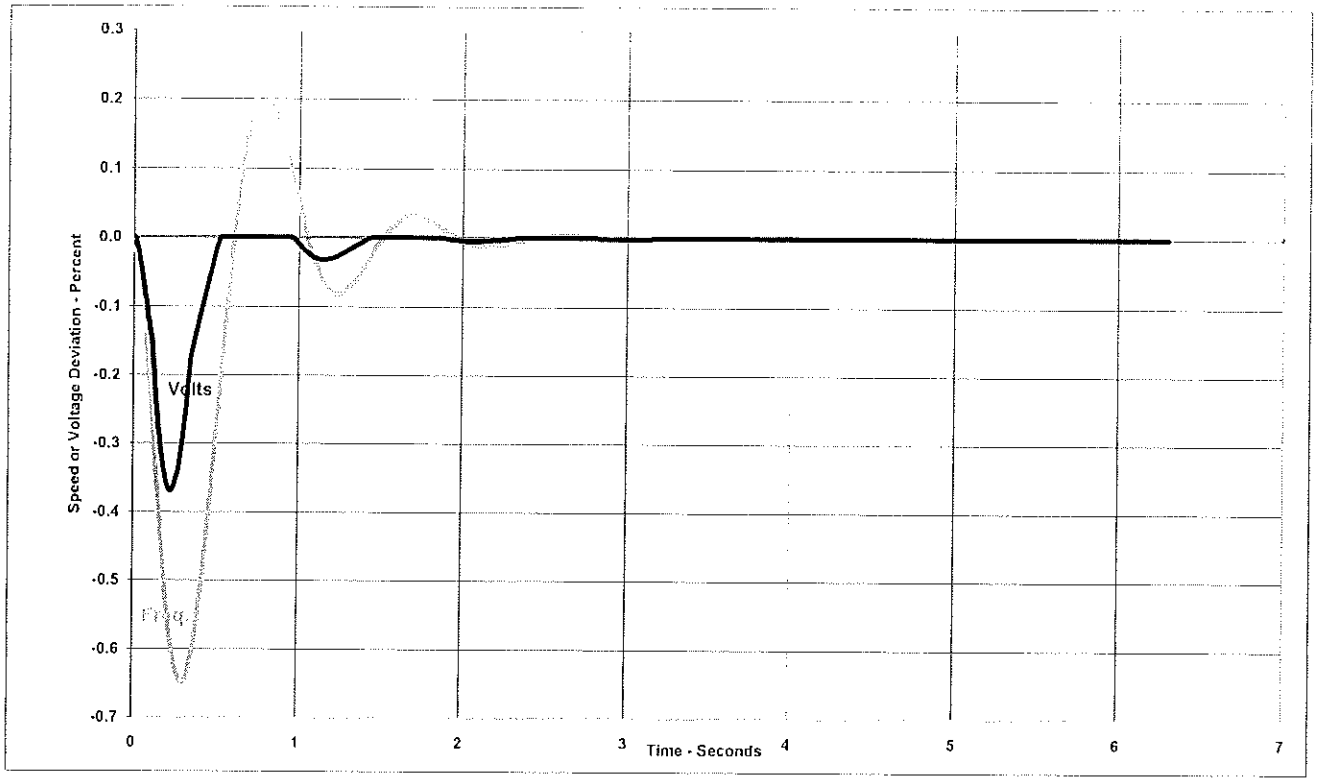
Oak Creek Low Lift Pump - G3516 Genset

Estimated Transient Response - TRAN Program

3516SITAH-G Engine, 2301 Gov, 695 4 pole Gen, DVR Reg, 60Hz, 1800rpm, 1040kW, 0.80pf

Start% 0.0 End% 9.6

Note: This information is representative of a typical Caterpillar GenSet, but is not guaranteed
This estimate has tolerances, and there are also GenSet-to-GenSet variations.



Engine Model.....	3516SITAH-G
Fuel Type.....	Gas
Est. Fan Power - kw.....	0
Cold Start?.....	No
Air Impingement?.....	Yes
Governor type.....	2301
Governor Droop - %.....	0
Fuel Air Ratio Control?...	No
Generator Frame Size.....	695 4 pole
Est. Rated Gen. Eff.- %....	94.9
Extra Inert @ Gen- NM2.	0
Volt. Regulator Type.....	DVR
Knee Frequency - hz.....	2
DVR Slope 1.....	1
DVR Slope 2.....	1
DVR Min Volts %.....	50
Engine/Gen Spd rpm.....	1800
Genset Rating - EKW.....	1040
Engine Overload - %.....	0
Power Factor.....	0.8
Altitude - Feet.....	1000
Ambient Temp - deg F....	105
Max Speed change %.....	-0.6
Max Voltage change %...	-0.4
Full Load Bmep-psi.....	153

Type of Load.....	RAMP
Initial Load - kw.....	0
Final Load - kw.....	100

STEP OR RAMP LOADS		
Load Step	Pct Load	Time-Sec
1	0	0
2	9.6	0.0001
3		
4		
5		
6		
7		
8		

Motor HP.....	n/a
Motor Speed - rpm.....	n/a
Motor inertia-lb ft sqd...	n/a
Motor Design Class.....	n/a
Mtr Starter = Motor Starter -	n/a
Motor Load Hp.....	n/a
Mtr Load inert-lb ft sqd.	n/a
Pct NEMA max inert.....	n/a
n/a	
Date Printed.....	21-Jan-11

Transient Analysis Valid to Date: 22-Jul-11

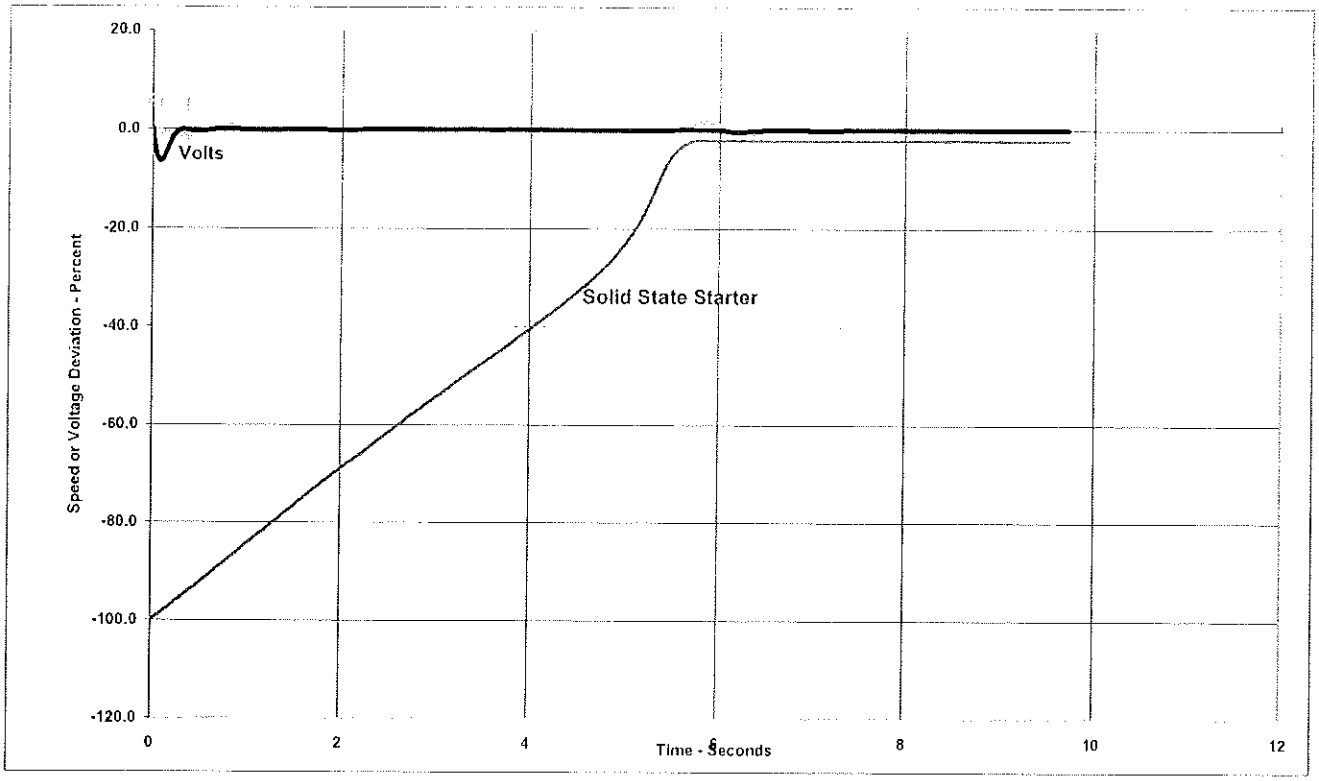
Oak Creek Low Lift Pump - G3516 Genset

Estimated Transient Response (Preload=100kw) (Motor Started=300hp) - TRAN Program

3516SITAH-G Engine, 2301 Gov, 695 4 pole Gen, DVR Reg, 60Hz, 1800rpm, 1040kW, 0.80pf

MtrSpd

Note: This information is representative of a typical Caterpillar GenSet, but is not guaranteed
This estimate has tolerances, and there are also GenSet-to-GenSet variations.



Engine Model.....	3516SITAH-G
Fuel Type.....	Gas
Est. Fan Power - kw.....	0
Cold Start?.....	No
Air Impingement?.....	Yes
Governor type.....	2301
Governor Droop - %.....	0
Fuel Air Ratio Control?...	No
Generator Frame Size.....	695 4 pole
Est. Rated Gen. Eff.- %....	94.9
Extra Inert @ Gen- NM2.	0
Volt. Regulator Type.....	DVR
Knee Frequency - hz.....	2
DVR Slope 1.....	1
DVR Slope 2.....	1
DVR Min Volts %.....	50
Engine/Gen Spd rpm.....	1800
Genset Rating - EKW.....	1040
Engine Overload - %.....	0
Power Factor.....	0.8
Altitude - Feet.....	1000
Ambient Temp - deg F....	105
Max Speed change %.....	-1.5
Max Voltage change %...	-6.3
Full Load Bmep-psi.....	153

Type of Load.....	MOTOR
Initial Load - kw.....	100
Final Load - kw.....	n/a

STEP OR RAMP LOADS		
Load Step	Pct Load	Time-Sec
1	9.6	0
2		0.0001
3		
4		
5		
6		
7		
8		

Motor HP.....	300
Motor Speed - rpm.....	1800
Motor inertia-lb ft sqd...	94.9
Motor Design Class.....	B
Mtr Starter = 250% Current Limit	
Motor Load Hp.....	270
Mtr Load inert-lb ft sqd.	299.3
Pct NEMA max inert.....	25%
Torque Exp. = 2 (Centrifugal Load)	
Date Printed.....	21-Jan-11

Transient Analysis Valid to Date: 22-Jul-11

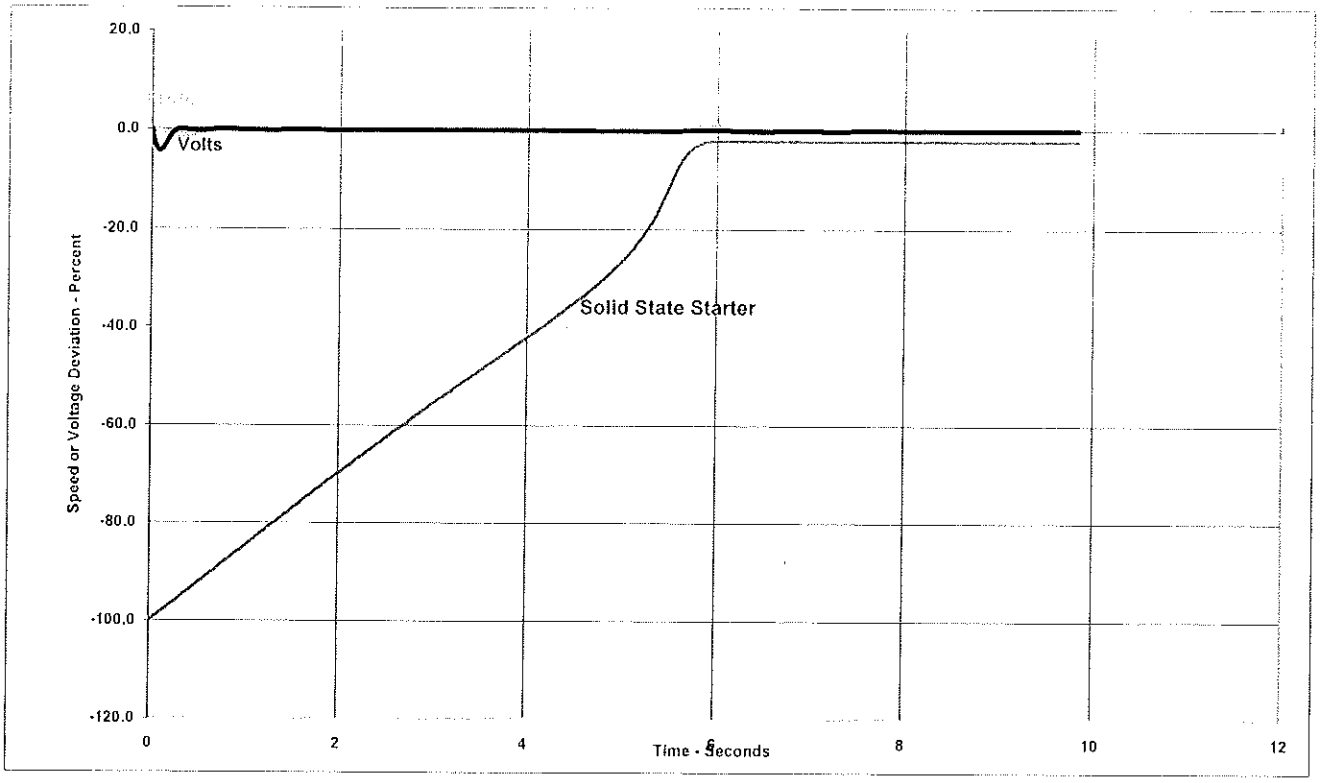
Oak Creek Low Lift Pump - G3516 Genset

Estimated Transient Response (Preload=348kw) (Motor Started=200hp) - TRAN Program

3516SITAH-G Engine, 2301 Gov, 695 4 pole Gen, DVR Reg, 60Hz, 1800rpm, 1040kW, 0.80pf

MtrSpd

Note: This information is representative of a typical Caterpillar GenSet, but is not guaranteed
This estimate has tolerances, and there are also GenSet-to-GenSet variations.



Engine Model.....	3516SITAH-G
Fuel Type.....	Gas
Est. Fan Power - kw.....	0
Cold Start?.....	No
Air Impingement?.....	Yes
Governor type.....	2301
Governor Droop - %.....	0
Fuel Air Ratio Control?...	No
Generator Frame Size.....	695 4 pole
Est. Rated Gen. Eff.- %....	94.9
Extra Inert @ Gen- NM2.	0
Volt. Regulator Type.....	DVR
Knee Frequency - hz.....	2
DVR Slope 1.....	1
DVR Slope 2.....	1
DVR Min Volts %.....	50
Engine/Gen Spd rpm.....	1800
Genset Rating - EKW.....	1040
Engine Overload - %.....	0
Power Factor.....	0.8
Altitude - Feet.....	1000
Ambient Temp - deg F....	105
Max Speed change %.....	-1.0
Max Voltage change %....	-4.2
Full Load Bmep-psi.....	153

Type of Load.....	MOTOR
Initial Load - kw.....	348
Final Load - kw.....	n/a

STEP OR RAMP LOADS		
Load Step	Pct Load	Time-Sec
1	33.5	0
2		0.0001
3		
4		
5		
6		
7		
8		

Motor HP.....	200
Motor Speed - rpm.....	1800
Motor inertia-lb ft sqd...	63.3
Motor Design Class.....	B
Mtr Starter = 250% Current Limit	
Motor Load Hp.....	180
Mtr Load inert-lb ft sqd.	207.8
Pct NEMA max inert.....	25%
Torque Exp. = 2 (Centrifugal Load)	
Date Printed.....	21-Jan-11

Transient Analysis Valid to Date: 22-Jul-11

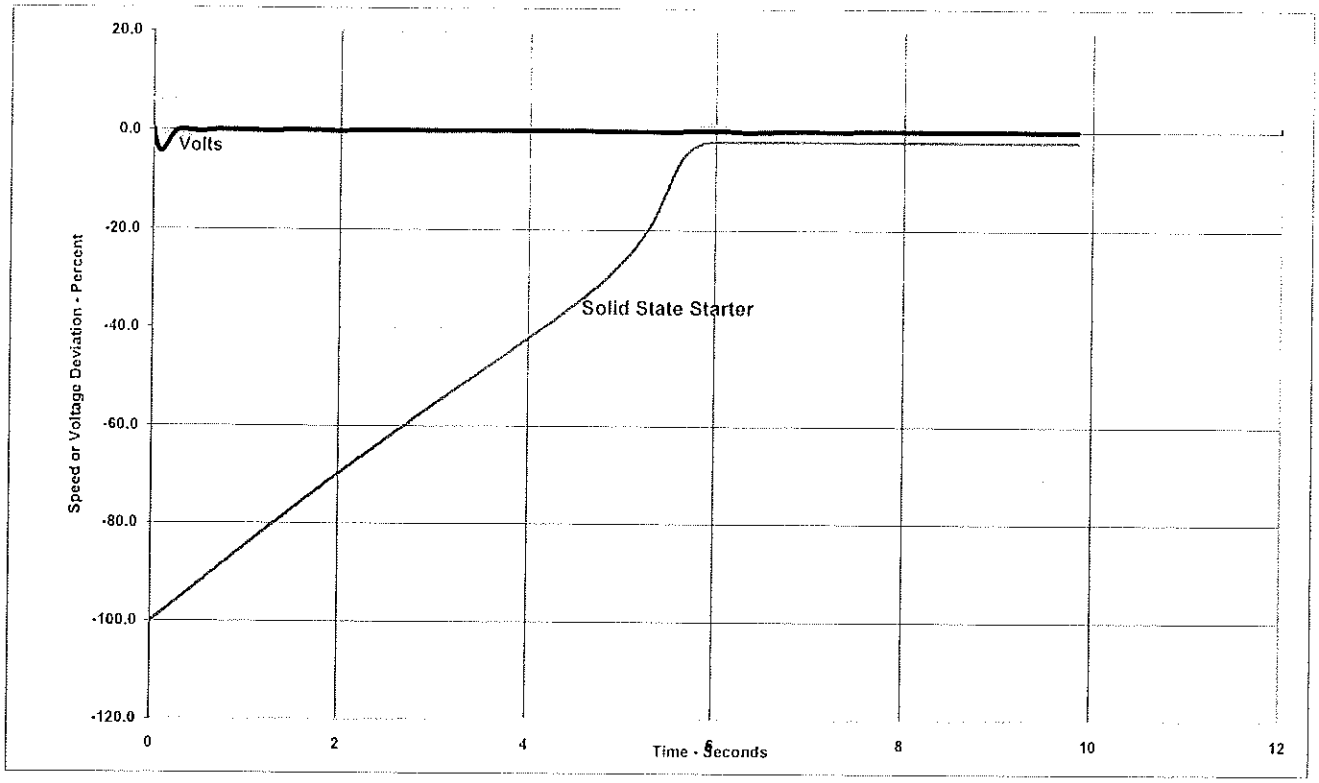
Oak Creek Low Lift Pump - G3516 Genset

Estimated Transient Response (Preload=515kw) (Motor Started=200hp) - TRAN Program

3516SITAH-G Engine, 2301 Gov, 695 4 pole Gen, DVR Reg, 60Hz, 1800rpm, 1040kW, 0.80pf

MtrSpd

Note: This information is representative of a typical Caterpillar GenSet, but is not guaranteed
This estimate has tolerances, and there are also GenSet-to-GenSet variations.



Engine Model.....	3516SITAH-G
Fuel Type.....	Gas
Est. Fan Power - kw.....	0
Cold Start?.....	No
Air Impingement?.....	Yes
Governor type.....	2301
Governor Droop - %.....	0
Fuel Air Ratio Control?...	No
Generator Frame Size.....	695 4 pole
Est. Rated Gen. Eff.- %....	94.9
Extra Inert @ Gen- NM2.	0
Volt. Regulator Type.....	DVR
Knee Frequency - hz.....	2
DVR Slope 1.....	1
DVR Slope 2.....	1
DVR Min Volts %.....	50
Engine/Gen Spd rpm.....	1800
Genset Rating - EKW.....	1040
Engine Overload - %.....	0
Power Factor.....	0.8
Altitude - Feet.....	1000
Ambient Temp - deg F....	105
Max Speed change %.....	-0.9
Max Voltage change %....	-4.2
Full Load Bmep-psi.....	153

Type of Load.....	MOTOR
Initial Load - kw.....	515
Final Load - kw.....	n/a

STEP OR RAMP LOADS		
Load Step	Pct Load	Time-Sec
1	49.5	0
2		0.0001
3		
4		
5		
6		
7		
8		

Motor HP.....	200
Motor Speed - rpm.....	1800
Motor inertia-lb ft sqd...	63.3
Motor Design Class.....	B
Mtr Starter = 250% Current Limit	
Motor Load Hp.....	180
Mtr Load inert-lb ft sqd.	207.8
Pct NEMA max inert.....	25%
Torque Exp. = 2 (Centrifugal Load)	
Date Printed.....	21-Jan-11

Transient Analysis Valid to Date: 22-Jul-11

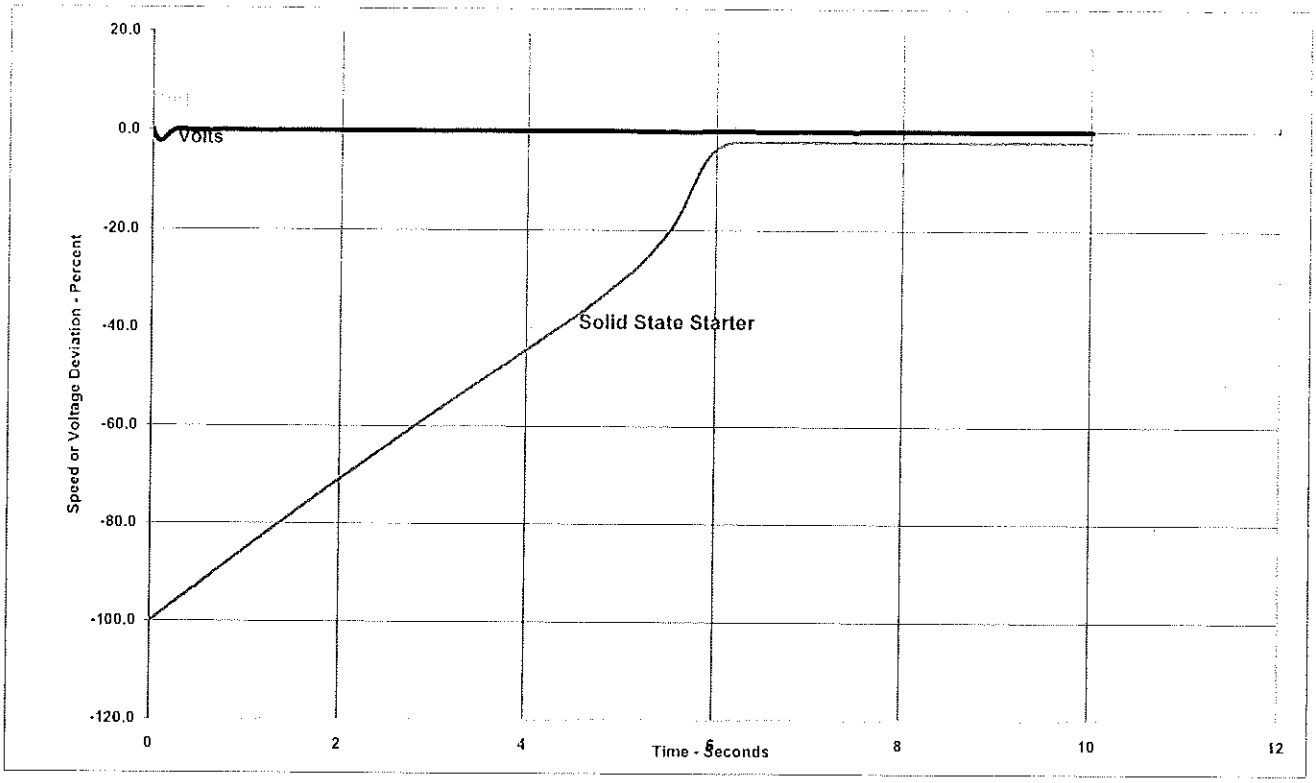
Oak Creek Low Lift Pump - G3516 Genset

Estimated Transient Response (Preload=680kw) (Motor Started=100hp) - TRAN Program

3516SITAH-G Engine, 2301 Gov, 695 4 pole Gen, DVR Reg, 60Hz, 1800rpm, 1040kW, 0.80pf

MtrSpd

Note: This information is representative of a typical Caterpillar GenSet, but is not guaranteed
This estimate has tolerances, and there are also GenSet-to-GenSet variations.



Engine Model.....	3516SITAH-G
Fuel Type.....	Gas
Est. Fan Power - kw.....	0
Cold Start?.....	No
Air Impingement?.....	Yes
Governor type.....	2301
Governor Droop - %.....	0
Fuel Air Ratio Control?...	No
Generator Frame Size.....	695 4 pole
Est. Rated Gen. Eff.- %....	94.9
Extra Inert @ Gen- NM2.	0
Volt. Regulator Type.....	DVR
Knee Frequency - hz.....	2
DVR Slope 1.....	1
DVR Slope 2.....	1
DVR Min Volts %.....	50
Engine/Gen Spd rpm.....	1800
Genset Rating - EKW.....	1040
Engine Overload - %.....	0
Power Factor.....	0.8
Altitude - Feet.....	1000
Ambient Temp - deg F....	105
Max Speed change %.....	-0.5
Max Voltage change %...	-2.2
Full Load Bmep-psi.....	153

Type of Load.....	MOTOR
Initial Load - kw.....	680
Final Load - kw.....	n/a

STEP OR RAMP LOADS		
Load Step	Pct Load	Time-Sec
1	65.4	0
2		0.0001
3		
4		
5		
6		
7		
8		

Motor HP.....	100
Motor Speed - rpm.....	1800
Motor inertia-lb ft sqd...	31.6
Motor Design Class.....	B
Mtr Starter = 250% Current Limit	
Motor Load Hp.....	90
Mtr Load inert-lb ft sqd.	110.3
Pct NEMA max inert.....	25%
Torque Exp. = 2 (Centrifugal Load)	
Date Printed.....	21-Jan-11

Transient Analysis Valid to Date: 22-Jul-11

ref: none

TRAN 4.5

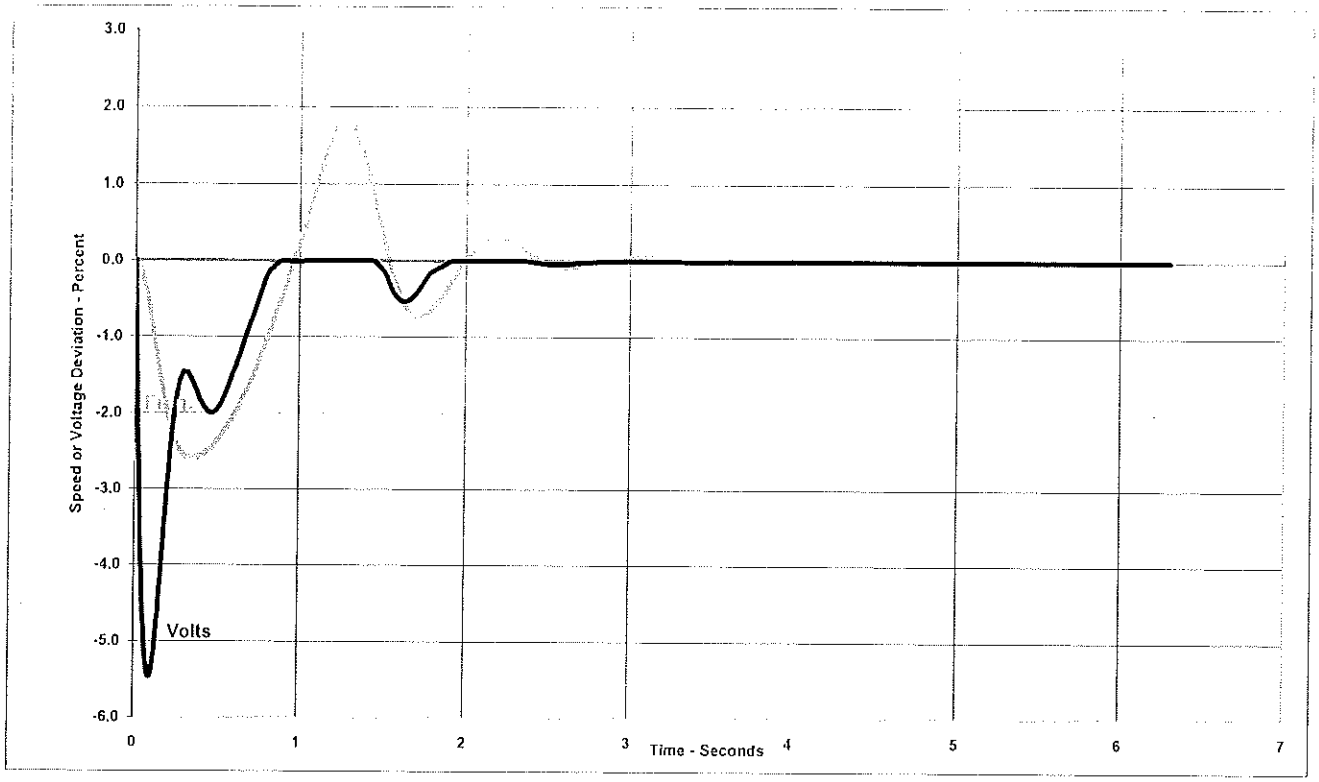
Oak Creek Water Treatment - G3516 Genset

Estimated Transient Response - TRAN Program

3516SITAH-G Engine, 2301 Gov, 695 4 pole Gen, DVR Reg, 60Hz, 1800rpm, 1040kW, 0.80pf

Start% 0.0 End% 38.5

Note: This information is representative of a typical Caterpillar GenSet, but is not guaranteed
This estimate has tolerances, and there are also GenSet-to-GenSet variations.



Engine Model.....	3516SITAH-G
Fuel Type.....	Gas
Est. Fan Power - kw.....	0
Cold Start?.....	No
Air Impingement?.....	Yes
Governor type.....	2301
Governor Droop - %.....	0
Fuel Air Ratio Control?...	No
Generator Frame Size.....	695 4 pole
Est. Rated Gen. Eff.- %...	94.9
Extra Inert @ Gen- NM2.	0
Volt. Regulator Type.....	DVR
Knee Frequency - hz.....	2
DVR Slope 1.....	1
DVR Slope 2.....	1
DVR Min Volts %.....	50
Engine/Gen Spd rpm.....	1800
Genset Rating - EKW.....	1040
Engine Overload - %.....	0
Power Factor.....	0.8
Altitude - Feet.....	1000
Ambient Temp - deg F....	105
Max Speed change %.....	-2.6
Max Voltage change %....	-5.5
Full Load Bmep-psi.....	153

Type of Load.....	RAMP
Initial Load - kw.....	0
Final Load - kw.....	400

STEP OR RAMP LOADS		
Load Step	Pct Load	Time-Sec
1	0	0
2	38.5	0.0001
3		
4		
5		
6		
7		
8		

Motor HP.....	n/a
Motor Speed - rpm.....	n/a
Motor inertia-lb ft sqd...	n/a
Motor Design Class.....	n/a
Mtr Starter = Motor Starter -	n/a
Motor Load Hp.....	n/a
Mtr Load inert-lb ft sqd.	n/a
Pct NEMA max inert.....	n/a
n/a	
Date Printed.....	21-Jan-11

Transient Analysis Valid to Date: 22-Jul-11

ref. none

TRANSYS

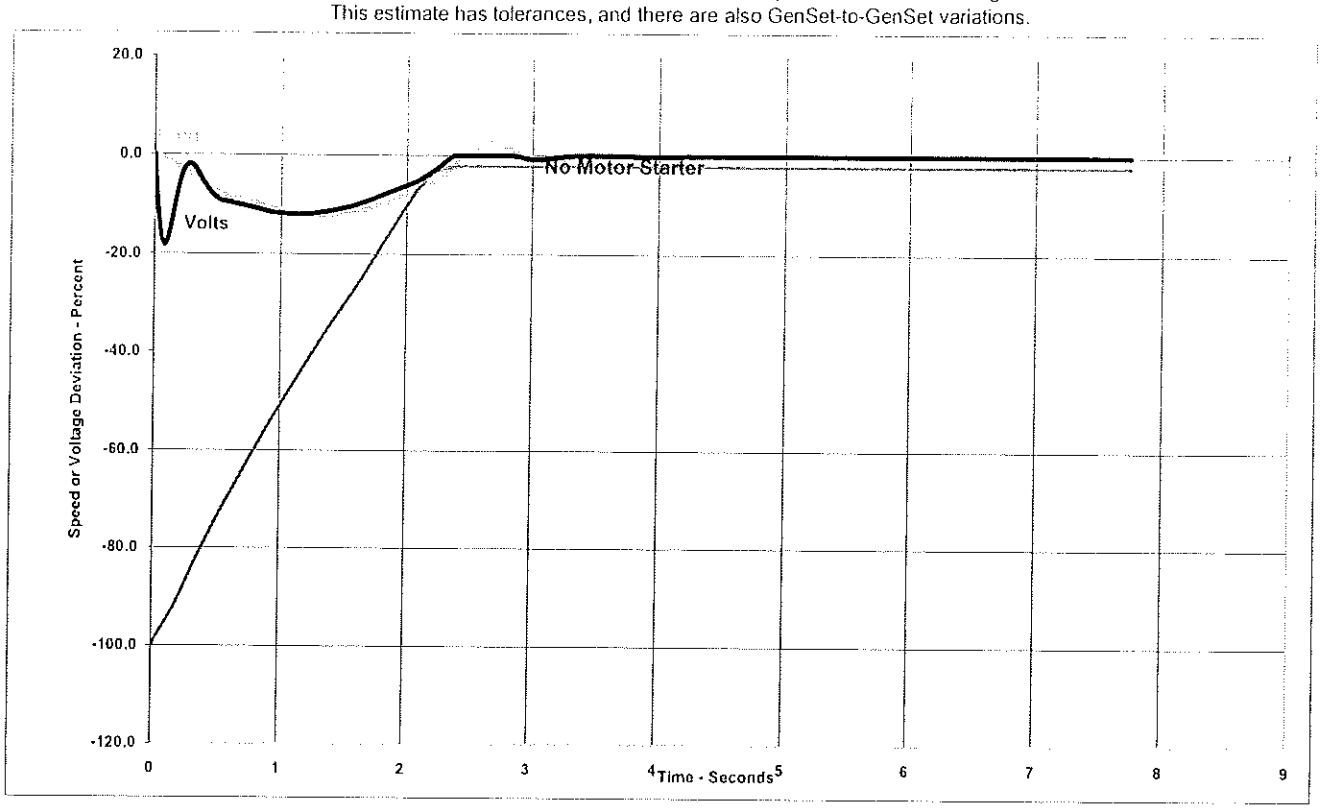
Oak Creek Water Treatment - G3516 Genset

Estimated Transient Response (Preload=400kw) (Motor Started=250hp) - TRAN Program

3516SITAH-G Engine, 2301 Gov, 695 4 pole Gen, DVR Reg, 60Hz, 1800rpm, 1040kW, 0.80pf

MtrSpd

Note: This information is representative of a typical Caterpillar GenSet, but is not guaranteed
This estimate has tolerances, and there are also GenSet-to-GenSet variations.



Engine Model.....	3516SITAH-G
Fuel Type.....	Gas
Est. Fan Power - kw.....	0
Cold Start?.....	No
Air Impingement?.....	Yes
Governor type.....	2301
Governor Droop - %.....	0
Fuel Air Ratio Control?...	No
Generator Frame Size.....	695 4 pole
Est. Rated Gen. Eff.- %....	94.9
Extra Inert @ Gen- NM2.	0
Volt. Regulator Type.....	DVR
Knee Frequency - hz.....	2
DVR Slope 1.....	1
DVR Slope 2.....	1
DVR Min Volts %.....	50
Engine/Gen Spd rpm.....	1800
Genset Rating - EKW.....	1040
Engine Overload - %.....	0
Power Factor.....	0.8
Altitude - Feet.....	1000
Ambient Temp - deg F....	105
Max Speed change %.....	-12.2
Max Voltage change %....	-18.0
Full Load Bmep-psi.....	153

Type of Load.....	MOTOR
Initial Load - kw.....	400
Final Load - kw.....	n/a

STEP OR RAMP LOADS		
Load Step	Pct Load	Time-Sec
1	38.5	0
2		0.0001
3		
4		
5		
6		
7		
8		

Motor HP.....	250
Motor Speed - rpm.....	1800
Motor inertia-lb ft sqd...	79.1
Motor Design Class.....	B
Mtr Starter = Across the Line	
Motor Load Hp.....	225
Mtr Load inert-lb ft sqd.	254.2
Pct NEMA max inert.....	25%
Torque Exp. = 2 (Centrifugal Load)	
Date Printed.....	21-Jan-11

Transient Analysis Valid to Date: 22-Jul-11

ref: none

TRAN.VLS

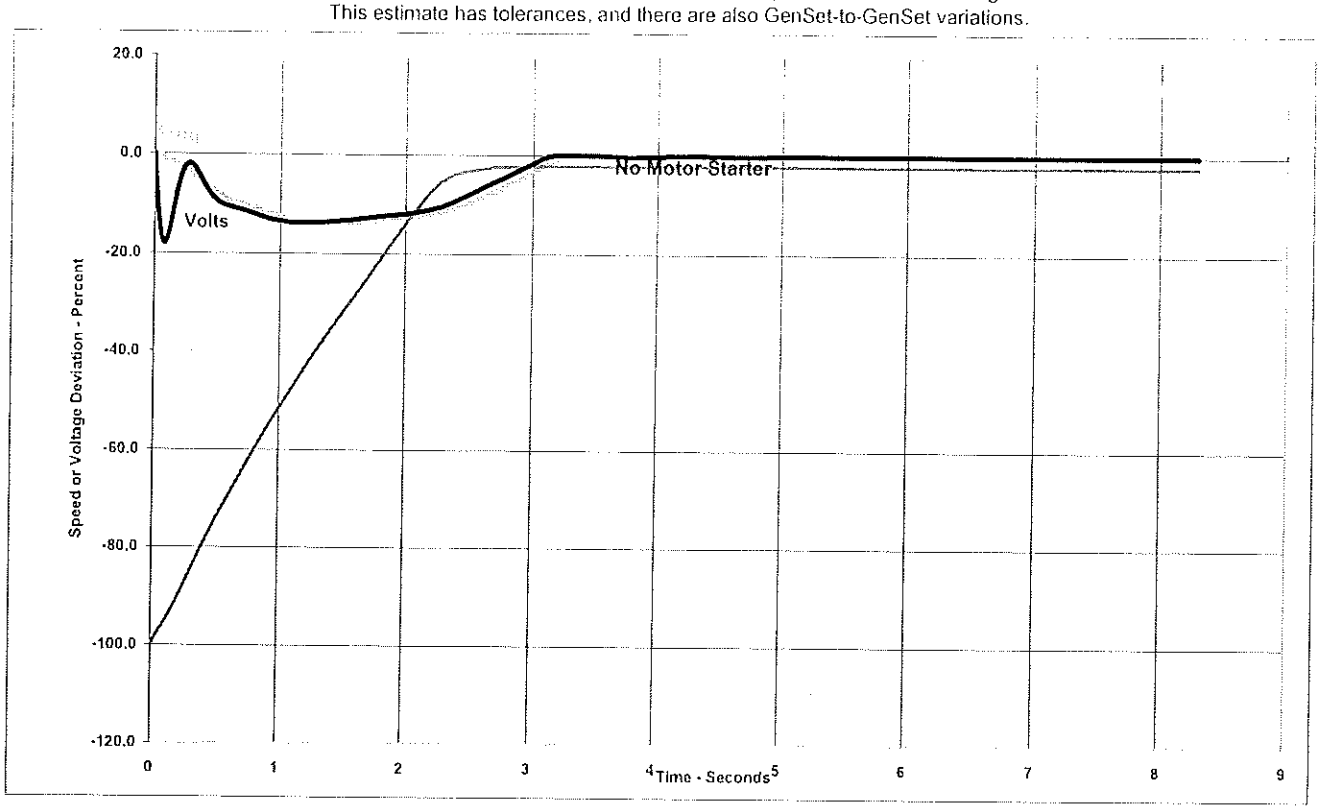
Oak Creek Water Treatment - G3516 Genset

Estimated Transient Response (Preload=607kw) (Motor Started=250hp) - TRAN Program

3516SITAH-G Engine, 2301 Gov, 695 4 pole Gen, DVR Reg, 60Hz, 1800rpm, 1040kW, 0.80pf

MtrSpd

Note: This information is representative of a typical Caterpillar GenSet, but is not guaranteed
This estimate has tolerances, and there are also GenSet-to-GenSet variations.



Engine Model.....	3516SITAH-G
Fuel Type.....	Gas
Est. Fan Power - kw.....	0
Cold Start?.....	No
Air Impingement?.....	Yes
Governor type.....	2301
Governor Droop - %.....	0
Fuel Air Ratio Control?...	No
Generator Frame Size.....	695 4 pole
Est. Rated Gen. Eff.- %....	94.9
Extra Inert @ Gen- NM2.	0
Volt. Regulator Type.....	DVR
Knee Frequency - hz.....	2
DVR Slope 1.....	1
DVR Slope 2.....	1
DVR Min Volts %.....	50
Engine/Gen Spd rpm.....	1800
Genset Rating - EKW.....	1040
Engine Overload - %.....	0
Power Factor.....	0.8
Altitude - Feet.....	1000
Ambient Temp - deg F....	105
Max Speed change %.....	-14.1
Max Voltage change %....	-17.9
Full Load Bmep-psi.....	153

Type of Load.....	MOTOR
Initial Load - kw.....	607
Final Load - kw.....	n/a

STEP OR RAMP LOADS		
Load Step	Pct Load	Time-Sec
1	58.4	0
2		0.0001
3		
4		
5		
6		
7		
8		

Motor HP.....	250
Motor Speed - rpm.....	1800
Motor inertia-lb ft sqd...	79.1
Motor Design Class.....	B
Mtr Starter = Across the Line	
Motor Load Hp.....	225
Mtr Load inert-lb ft sqd.	254.2
Pct NEMA max inert.....	25%
Torque Exp. = 2 (Centrifugal Load)	
Date Printed.....	21-Jan-11

Transient Analysis Valid to Date: 22-Jul-11

ref: none

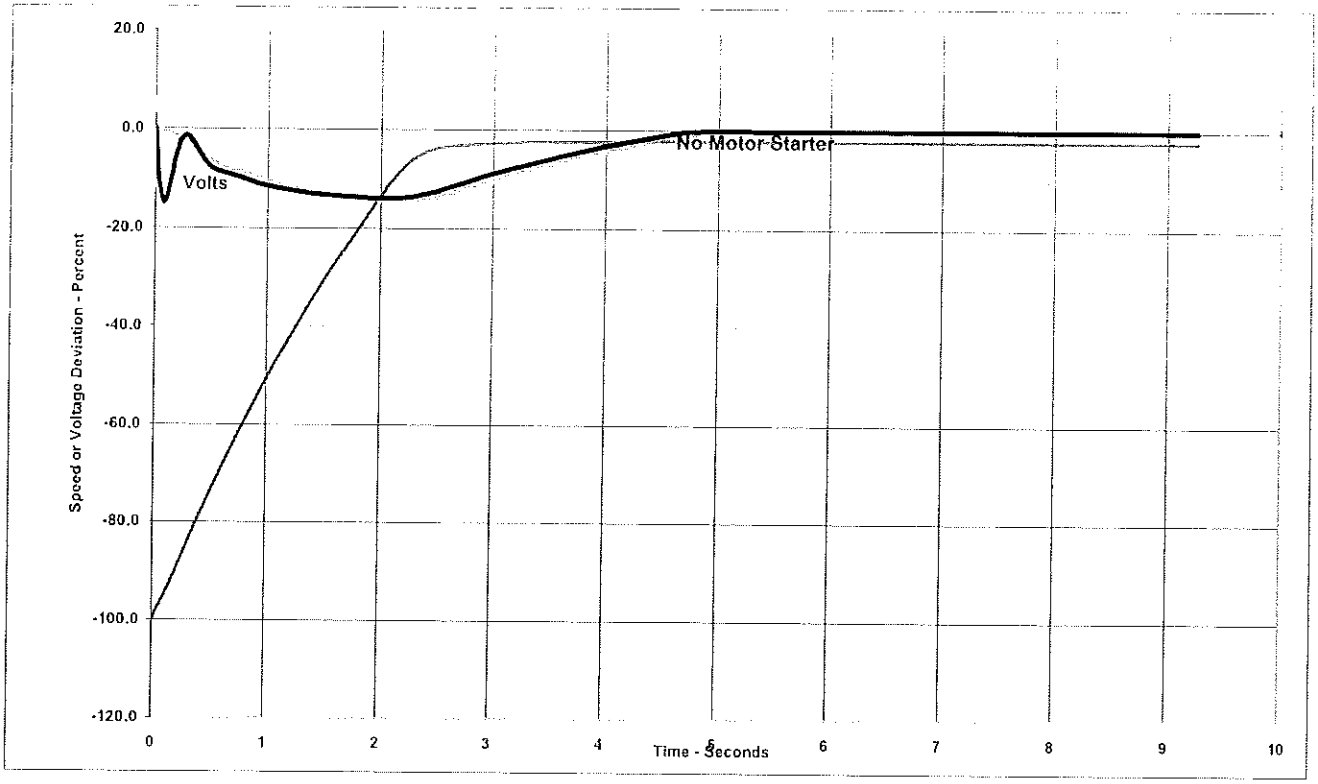
Oak Creek Water Treatment - G3516 Genset

Estimated Transient Response (Preload=814kw) (Motor Started=200hp) - TRAN Program

3516SITAH-G Engine, 2301 Gov, 695 4 pole Gen, DVR Reg, 60Hz, 1800rpm, 1040kW, 0.80pf

MtrSpd

Note: This information is representative of a typical Caterpillar GenSet, but is not guaranteed
This estimate has tolerances, and there are also GenSet-to-GenSet variations.



Engine Model.....	3516SITAH-G
Fuel Type.....	Gas
Est. Fan Power - kw.....	0
Cold Start?.....	No
Air Impingement?.....	Yes
Governor type.....	2301
Governor Droop - %.....	0
Fuel Air Ratio Control?...	No
Generator Frame Size.....	695 4 pole
Est. Rated Gen. Eff.- %....	94.9
Extra Inert @ Gen- NM2.	0
Volt. Regulator Type.....	DVR
Knee Frequency - hz.....	2
DVR Slope 1.....	1
DVR Slope 2.....	1
DVR Min Volts %.....	50
Engine/Gen Spd rpm.....	1800
Genset Rating - EKW.....	1040
Engine Overload - %.....	0
Power Factor.....	0.8
Altitude - Feet.....	1000
Ambient Temp - deg F....	105
Max Speed change %.....	-14.2
Max Voltage change %....	-14.8
Full Load Bmep-psi.....	153

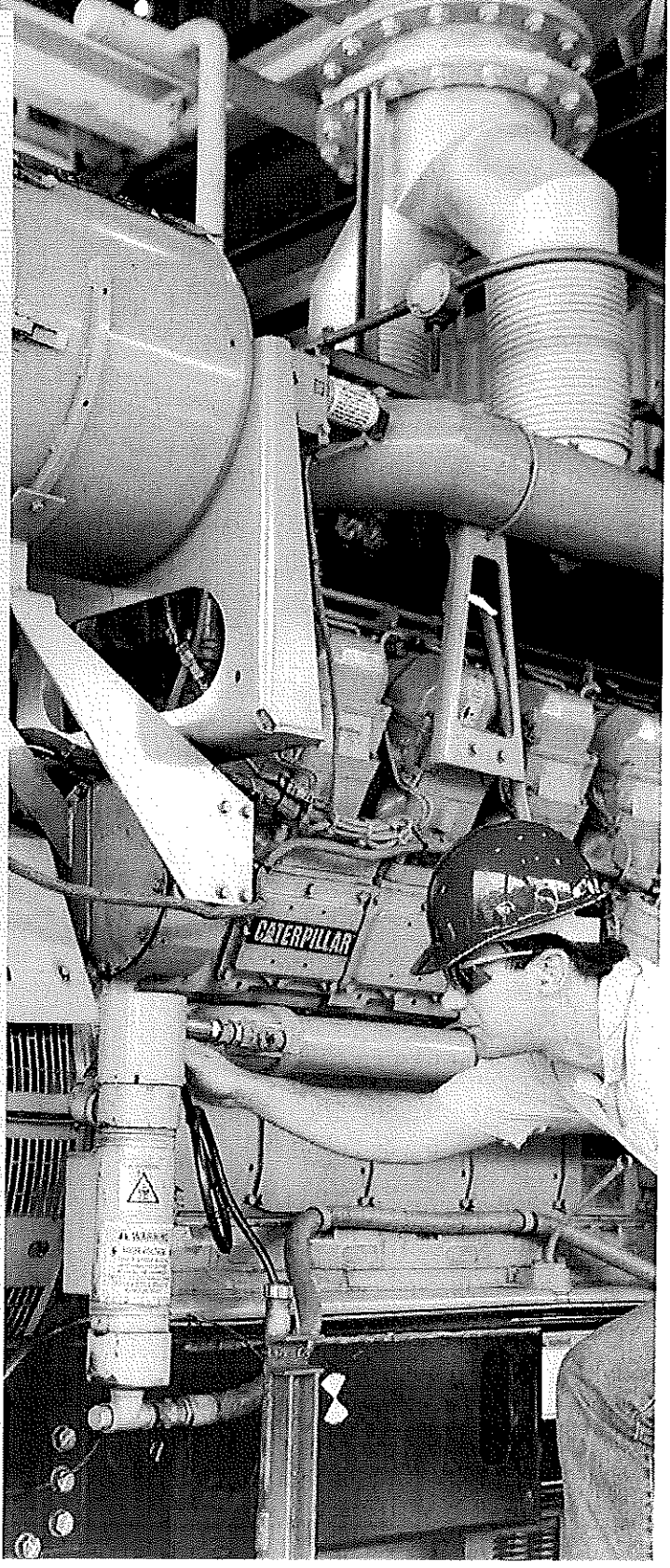
Type of Load.....	MOTOR
Initial Load - kw.....	814
Final Load - kw.....	n/a

STEP OR RAMP LOADS		
Load Step	Pct Load	Time-Sec
1	78.3	0
2		0.0001
3		
4		
5		
6		
7		
8		

Motor HP.....	200
Motor Speed - rpm.....	1800
Motor inertia-lb ft sqd...	63.3
Motor Design Class.....	B
Mtr Starter = Across the Line	
Motor Load Hp.....	180
Mtr Load inert-lb ft sqd.	207.8
Pct NEMA max inert.....	25%
Torque Exp. = 2 (Centrifugal Load)	
Date Printed.....	21-Jan-11

Transient Analysis Valid to Date: 22-Jul-11

EXTENDED SERVICE COVERAGE



Insurance Backed by the Power of Cat

Whether you need prime power or standby, you can protect your electric power solution with Extended Service Coverage (ESC) from Cat Insurance.

Your ESC provides 100 percent of usual and customary parts and labor costs for engine failures due to defect in materials and workmanship on covered components.

COVERAGE THAT IS RIGHT FOR YOU.

Prime Power Coverage

Platinum coverage - this includes all original factory equipment with Cat® part numbers, excluding consumables such as filters, hoses and belts.

Standby Power Coverage

Select the level of coverage that meets your need.

Silver coverage includes a wide range of covered components and you have confidence that ESC repairs will be done by trained professionals who use genuine Cat parts.

Gold coverage includes all the same items as silver, as well as turbochargers, fuel nozzles, injectors and water pumps.

Platinum coverage includes all original factory equipment with Cat part numbers, excluding consumables such as filters, hoses and belts.

Extended Service Coverage for electric power is available everywhere in the world. So whether your unit remains in one location or mobile around the globe, the Cat Dealer network is available to serve you.

COVERAGE AVAILABLE FOR THE LONG TERM.

An ESC from Cat Insurance can protect your electric power unit for up to 10 years. You can choose from a variety of coverage terms.

COVERAGE FOR YOUR FULLY INTEGRATED POWER SOLUTION.

You turn to Cat for a total Electric Power solution, and you can select an ESC to cover it. Automatic transfer switches and uninterruptible power supplies are eligible for additional protection. See your Cat Dealer today.

CATERPILLAR®

Platinum Level Coverage Components: All as shipped consist from the factory with Caterpillar® part numbers excluding filters, fluids, vee belts, hoses, power take-offs, paint, batteries and clutches. Also for power modules, coverage excludes containers, undercarriage, ladders, lights, wheels, axles, brakes, tires, stabilizing jacks and fire extinguishers.

Item	Silver	Gold
COOLING SYSTEM		
Thermostat Housing	Yes	Yes
Water Manifold Housing	Yes	Yes
Jacket Water Precooler	Yes	Yes
Jacket Water Pump	No	Yes
FUEL SYSTEM		
Steel Fuel Lines	Yes	Yes
Fuel Shutoff Solenoid	Yes	Yes
Fuel Injectors	No	Yes
LUBRICATION SYSTEM		
Oil Pan	Yes	Yes
Engine Oil Pump	Yes	Yes
Oil Cooler Housing & Core / Bonnet	Yes	Yes
Oil Filter Base	Yes	Yes
ELECTRONIC SYSTEM		
Electronic Control Module (ECM)	Yes	Yes
Sensors: all engine sensors	Yes	Yes
FRONT AND REAR COVERS		
Front Covers / Plate / Housing / Gears &Gaskets	Yes	Yes
Vibration Damper	Yes	Yes
Flywheel Housing & Gasket	Yes	Yes
MISCELLANEOUS		
Cat Bolts, Attaching Covered Components	Yes	Yes
GENERATOR END		
Entire Generator End	Yes	Yes
Generator Controls (EMCP, Wiring)	Yes	Yes

Item	Silver	Gold
AIR INDUCTION & EXHAUST		
Exhaust Manifolds, Studs & Gaskets	Yes	Yes
Inlet Air Heater Relay	Yes	Yes
Intake Manifold	Yes	Yes
Turbocharger (mounting hardware, lines, wastegate)	No	Yes
SHORT BLOCK		
Cylinder Block Casting	Yes	Yes
Freeze Plugs	Yes	Yes
Crankshaft	Yes	Yes
Crankshaft Rod, Main & Thrust Bearings	Yes	Yes
Connecting Rod Assembly	Yes	Yes
Piston, Wrist Pin, Retainer Clip & Piston Rings	Yes	Yes
Piston Cooling Jet Tubes	Yes	Yes
Cylinder Liner, Seals & Filler Band	Yes	Yes
Main Bearing Cap Bolts	Yes	Yes
CYLINDER HEAD		
Cylinder Head Casting, Sleeves, Bolts & Gaskets	Yes	Yes
Freeze Plug	Yes	Yes
Spacer Plate & Spacer Plate Gasket	Yes	Yes
Intake & Exhaust Valve (all related components)	Yes	Yes
Roller Follower	Yes	Yes
Valve Mechanism, Rocker Arm, Brackets, Push Tube, Bridge Dowels, Adjusting Screws, Nuts & Shaft	Yes	Yes
Valve Cover & Base	Yes	Yes
Camshaft, Camshaft Bearings, Key, Gear	Yes	Yes
Camshaft Rear Cover / Seal	Yes	Yes

Note: components not listed in the coverage matrix are not covered under Silver or Gold level coverage options.

Travel & Mileage Limitations:

For Caterpillar generator sets up to and including 7 liter displacement, for ATS models up to and including 1,200 amperes and for all Olympian products

- Up to 4 hours and 0 miles / 0 kilometers travel allowance

For all other models

- Up to 8 hours and 320 miles / 515 kilometers travel allowance

Important Notice:

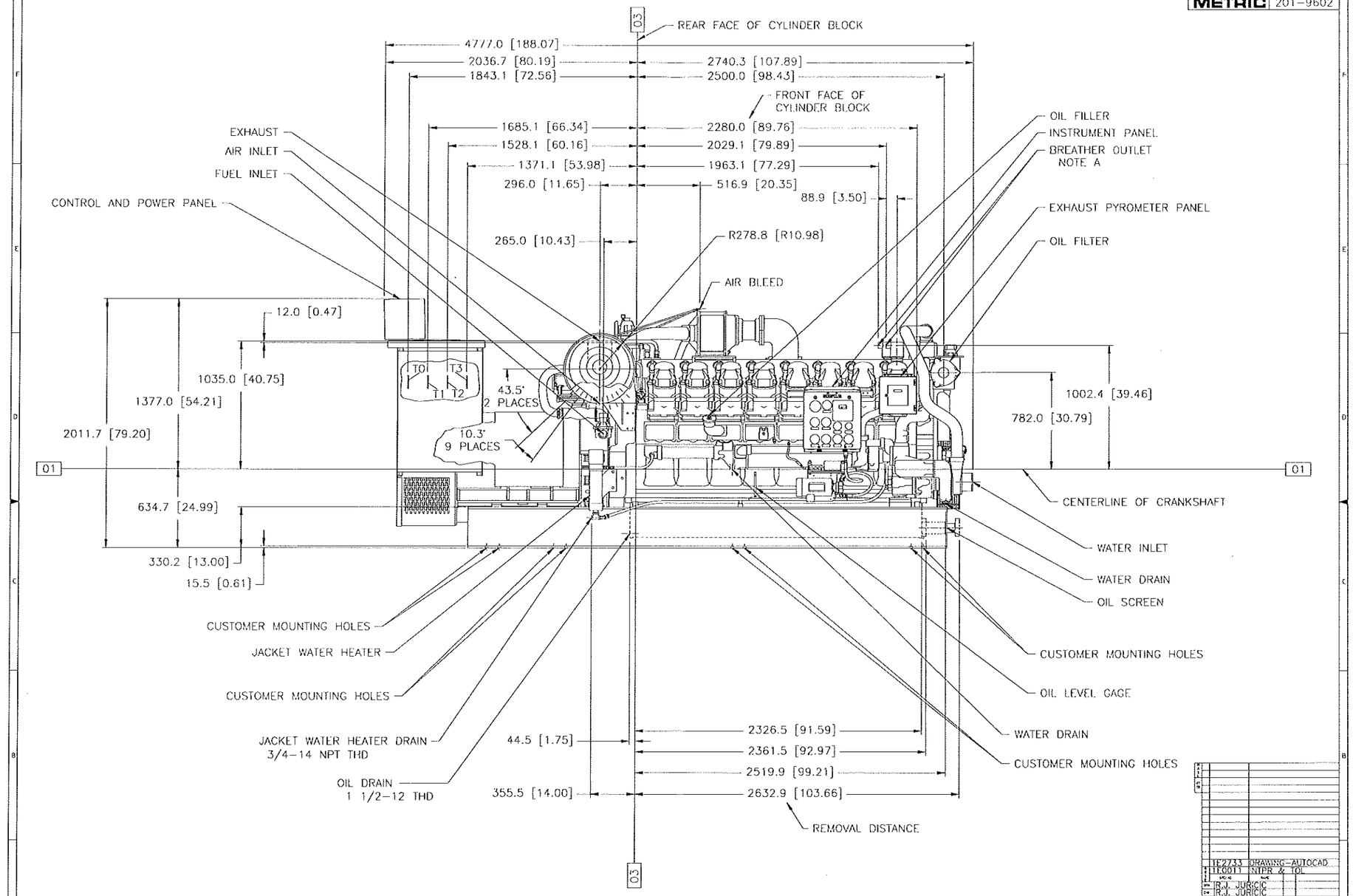
All "Covered Components" must pass inspection or be replaced at the proper intervals by an "authorized dealer" as prescribed in the manufacturer's Operation and Maintenance Manual to qualify for continued coverage under this Contract. **"Your" failure to follow the Manufacturer's Operation and Maintenance Manual will result in denial of claims.**

Additional Coverage for Cat Standby Generator Sets over 3 liter displacement with Platinum level Extended Coverage: Additional coverage is allowed if repairs can not be completed within 48 hours of the "authorized dealer" technician's initial visit for a covered "mechanical breakdown" due solely to the nature of the "mechanical breakdown" or Cat's inability to supply the required repair components. Up to $20,000 (US$) is allowed for rental genset expenses that are hereby defined as the reasonable and customary rental charge, mileage per guidelines given in the "repairer" travel & mileage limitations section of this contract and the necessary labor for connection & disconnection to your facility of the Rental GenSet from an "authorized dealer."

This is a brief description of Extended Coverage. See your Cat dealer for more information. The Extended Coverage contract will govern.

CATERPILLAR®

METRIC 201-9602



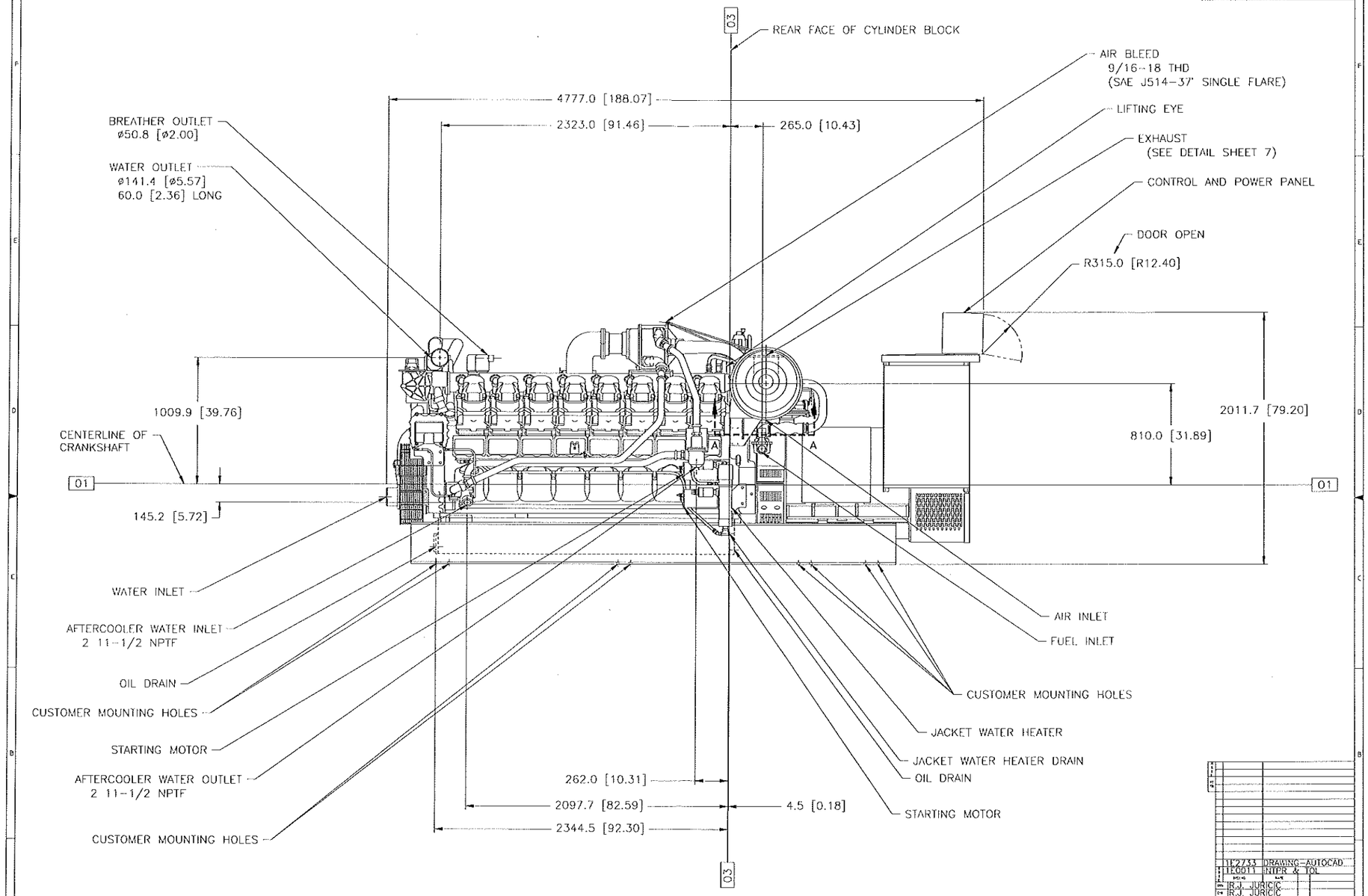
CAT G3516 PACKAGE GEN SET
DWG# 201-9602 CHG 02
METRIC [INCH]
RIGHT SIDE VIEW
LA-4939 CHG 00 SHOWN

NOTE A: MAY BE ROTATED AS REQUIRED.

MODEL	TYPE	PRICING AR
G3516 LE	I	LA-4939 CHG 00

IE2733 DRAWING-AUTOCAD
IE0011 NTPR & TOL
R.J. JURICIC
R.J. JURICIC
B.J.BROCK
02 13OCT08
CATERPILLAR INC.
INSTALLATION-ENGINE
GAS PACKAGE GEN SET
201-9602

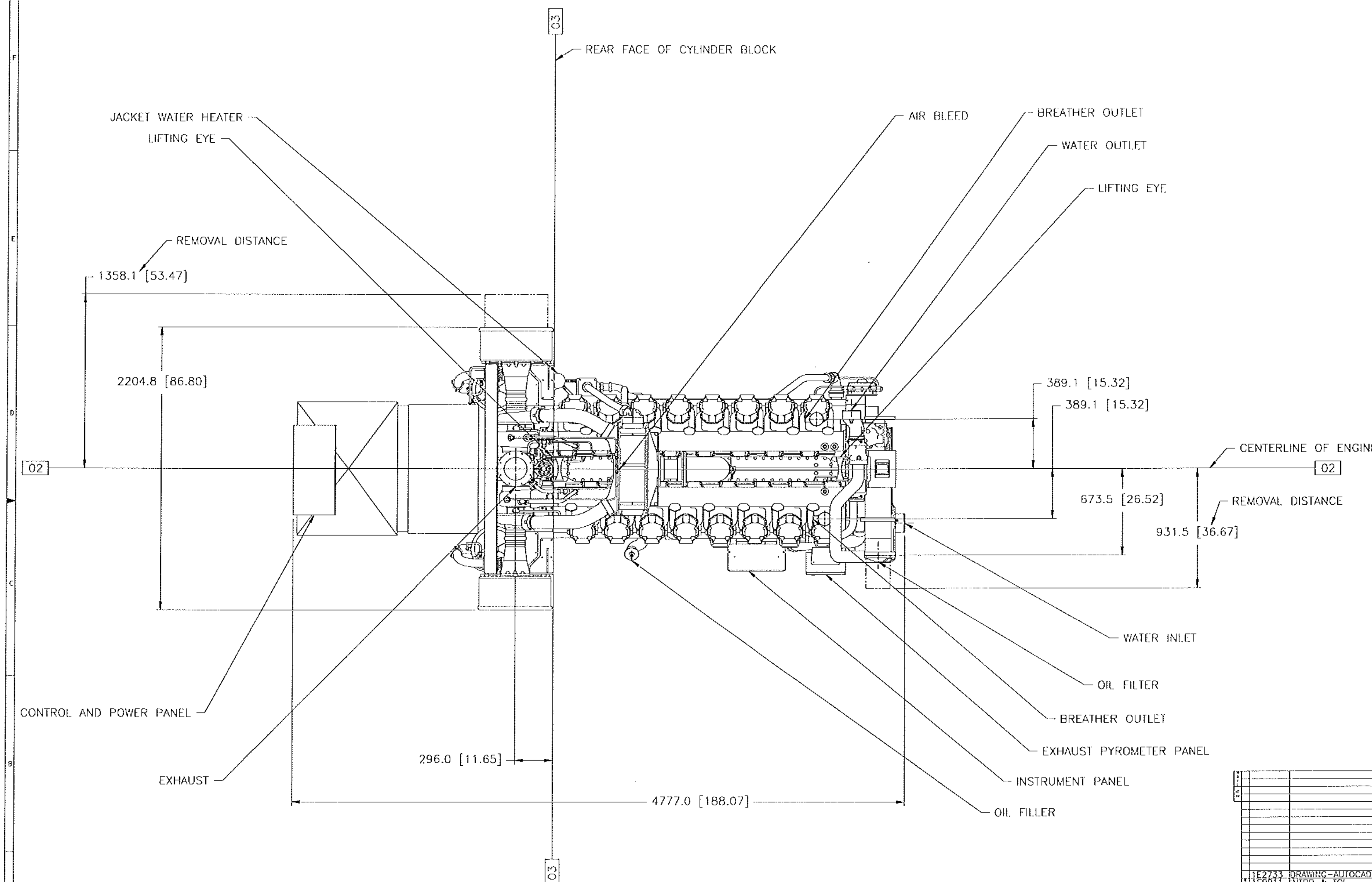
METRIC 201-9602



CAT G3516 PACKAGE GEN SET
DWG# 201-9602 CHG 02
METRIC [INCH]
LEFT SIDE VIEW
LA-4939 CHG 00 SHOWN

1E2733 DRAWING-AUTOCAD
1E6011 INTER & TOL
R.J. JURICIC
R.J. JURICIC
B.J.BROCK
02 13OCT08
CATERPILLAR INC.
INSTALLATION-ENGINE
GAS PACKAGE GEN SET
201-9602

METRIC 201-9602

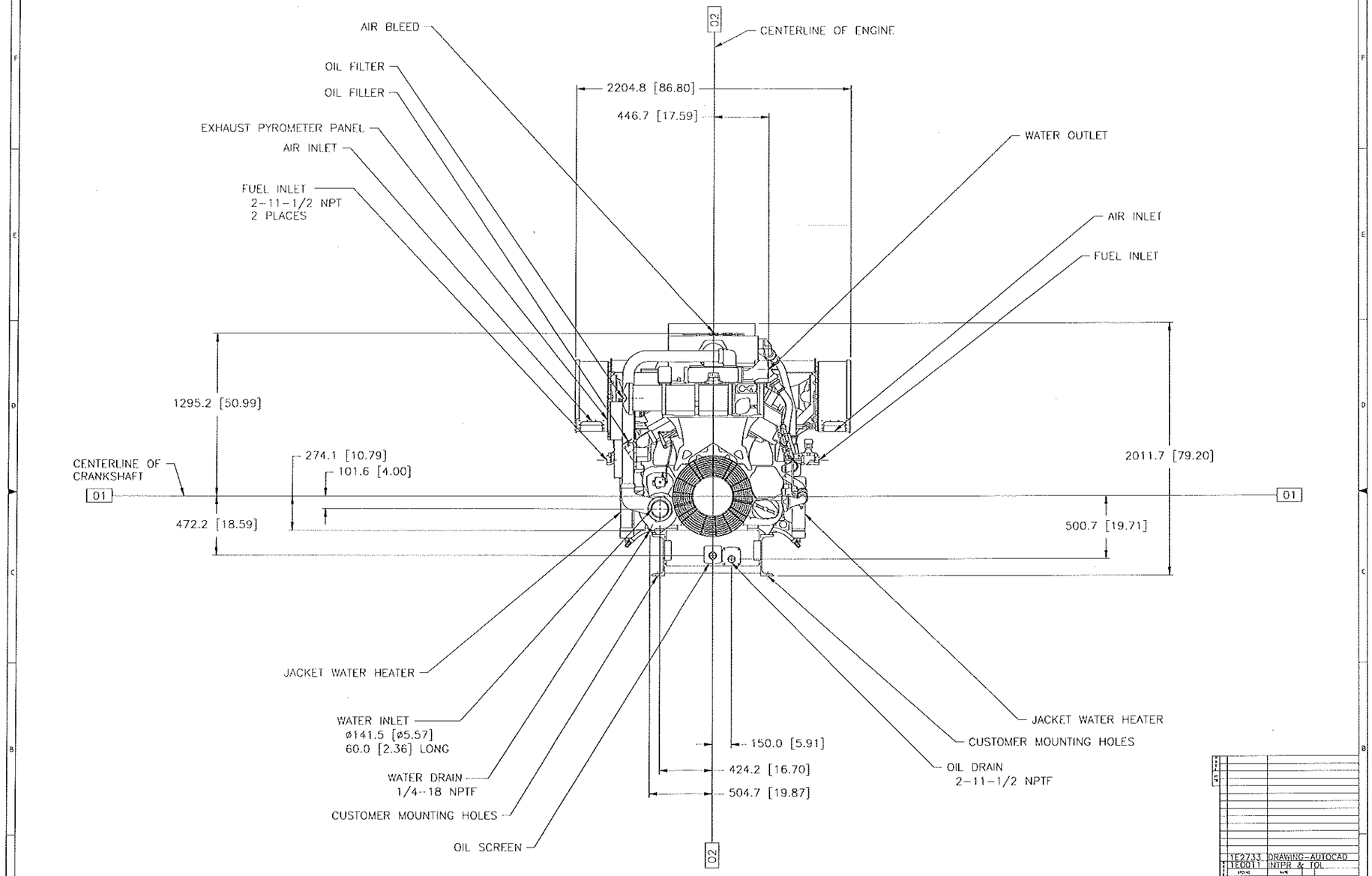


CAT G3516 PACKAGE GEN SET
DWG# 201-9602 CHG 02
METRIC [INCH]
TOP VIEW
LA-4939 CHG 00 SHOWN

1E2733	DRAWING-AUTOCAD
1E0011	NTPR & TOL
R.J. JURICIC	
R.J. JURICIC	
B.J.BROCK	
SHEET 5 OF 7	02 13OCT08

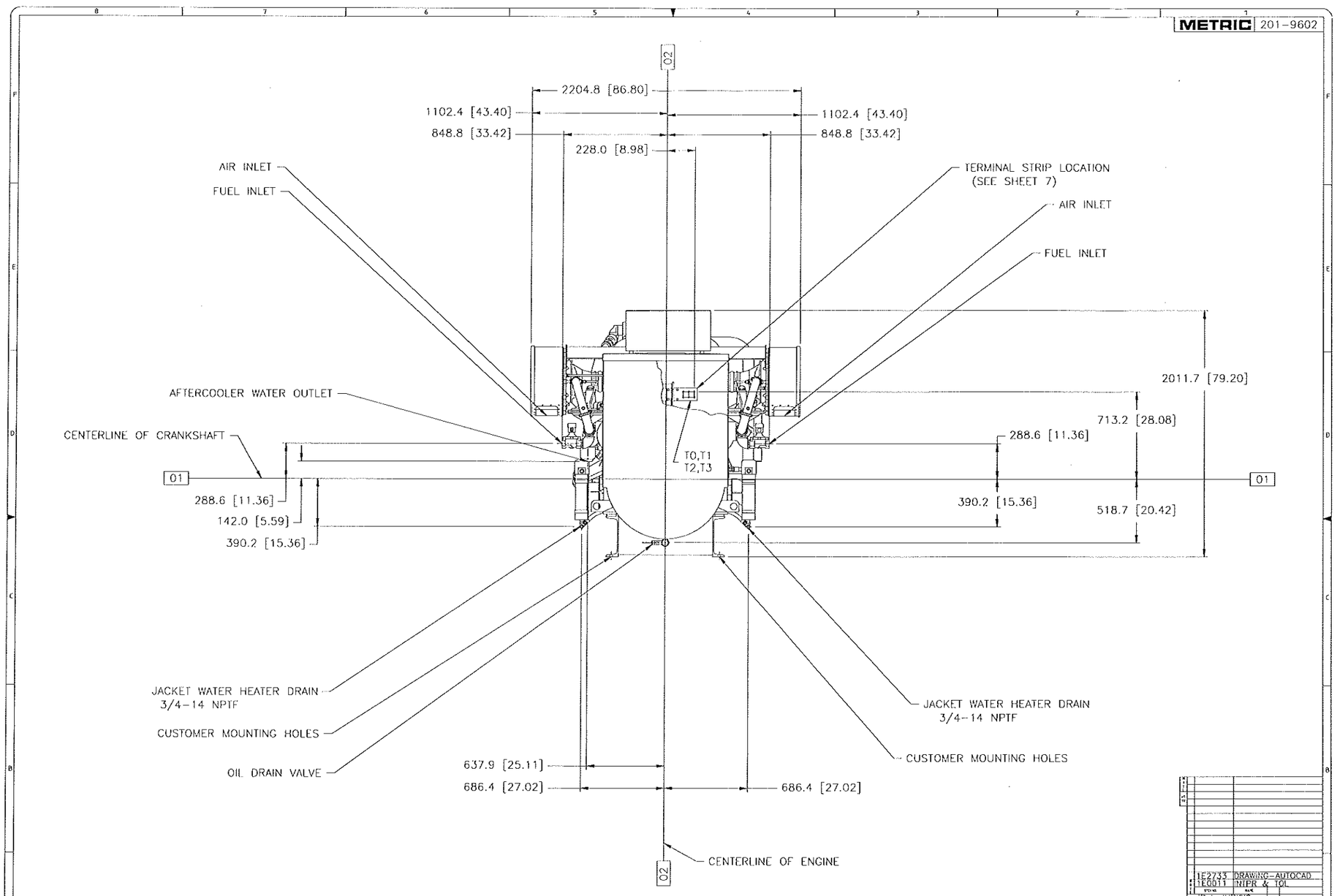
CATERPILLAR INC.

INSTALLATION-ENGINE
GAS PACKAGE GEN SET
201-9602



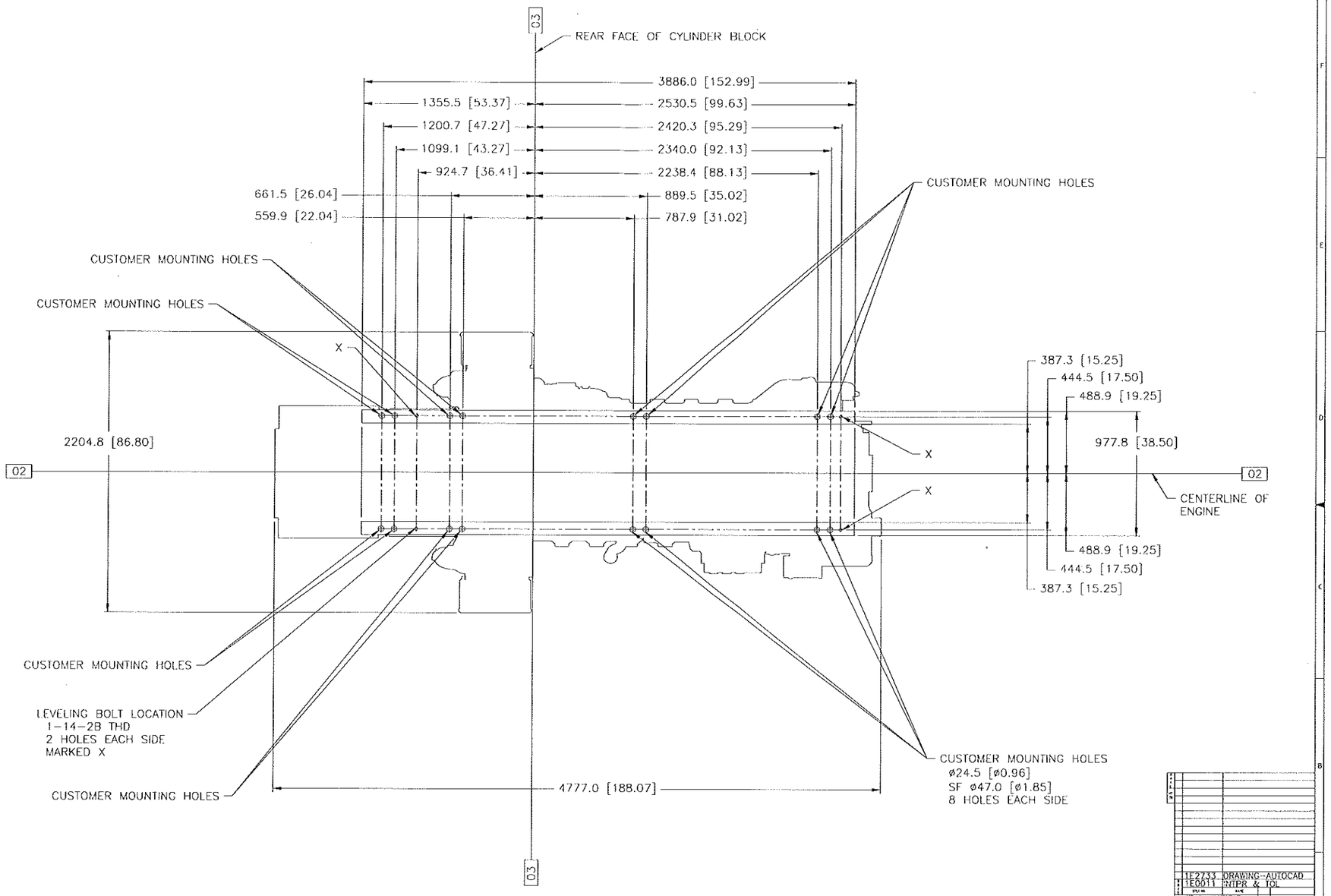
CAT G3516 PACKAGE GEN SET
DWG# 201-9602 CHG 02
METRIC [INCH]
FRONT VIEW
LA-4939 CHG 00 SHOWN

1E2733 DRAWING-AUTOCAD
1E0011 INTPR & TOL
R.J. JURICIC
R.J. JURICIC
B.J.BROCK
02 13OCT08
CATERPILLAR INC.
INSTALLATION-ENGINE
GAS PACKAGE GEN SET
201-9602 02 W855 E



CAT G3516 PACKAGE GEN SET
DWG# 201-9602 CHG 02
METRIC [INCH]
REAR VIEW
LA-4939 CHG 00 SHOWN

1E2733 DRAWING-AUTOCAD
1E0011 INTER & TOL
R.J. JURICIC
R.V. JURICIC
B.J.BROCK
02 13OCT08
CATERPILLAR INC.
INSTALLATION-ENGINE
GAS PACKAGE GEN SET
201-9602



CAT G3516 PACKAGE GEN SET
DWG# 201-9602 CHG 02
METRIC [INCH]
FOOTPRINT
LA-4939 CHG 00 SHOWN

1E2733 DRAWING-AUTOCAD
1E0011 INTPR & TOL
R.J. JURIFIC
R.J. JURIFIC
B.J.BROCK
02 13OCT08
SHT 6 OF 7
CATERPILLAR INC.
INSTALLATION-ENGINE
GAS PACKAGE GEN SET
201-9602