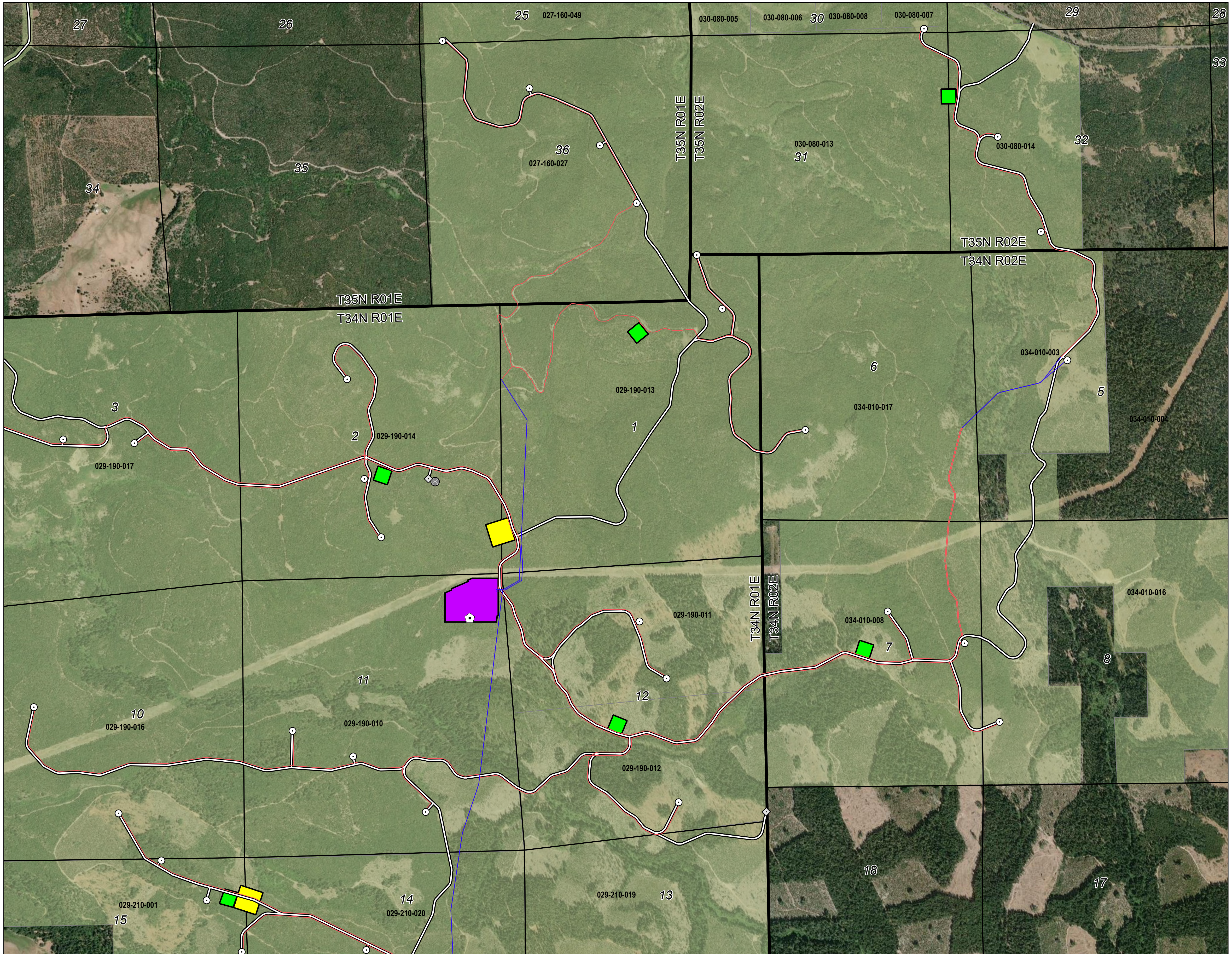
DOCKETED	
Docket Number:	23-OPT-01
Project Title:	Fountain Wind Project
TN #:	250952
Document Title:	fwp_air_permit_app_responses_part2
Description:	N/A
Filer:	Caitlin Barns
Organization:	Stantec Consulting Services, Inc.
Submitter Role:	Applicant Consultant
Submission Date:	7/5/2023 3:15:30 PM
Docketed Date:	7/5/2023



Stantec

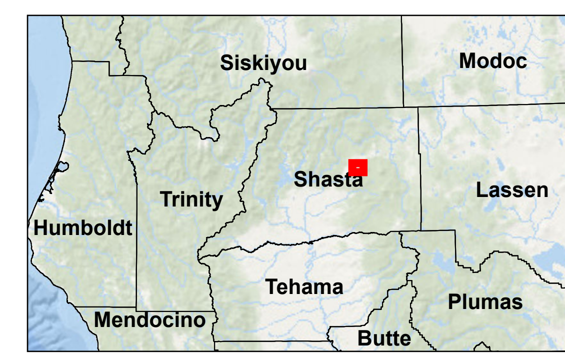
Legend
- Turbine Location
- Met Tower Location
- Microwave Tower Location
- Storage Shed Location
- Overhead Collection
- Underground Collection
- Access Road
- Batch Plant
- O&M Facility
- Staging Area
- Substation/Switchyard Site
- Lease Hold Area
- PLSS Section Boundary
- PLSS Township Range Boundary

N

0 3,000 Feet

(At original document size of 11x17)
1:24,000

Notes
1. Coordinate System: NAD 1983 UTM Zone 10N
2. Data Sources: Shasta County GIS Division
3. Background: ESRI World Imagery Base Map



Project Location
Shasta County
California

Prepared by GC on 2023-05-04
TR Review by DA on 2023-05-05
IR Review by CB on 2023-05-05

Client/Project
203723159
Fountain Wind LLC
Fountain Wind Project

Figure No.
1

Title
Project Overview
Map 2 of 3

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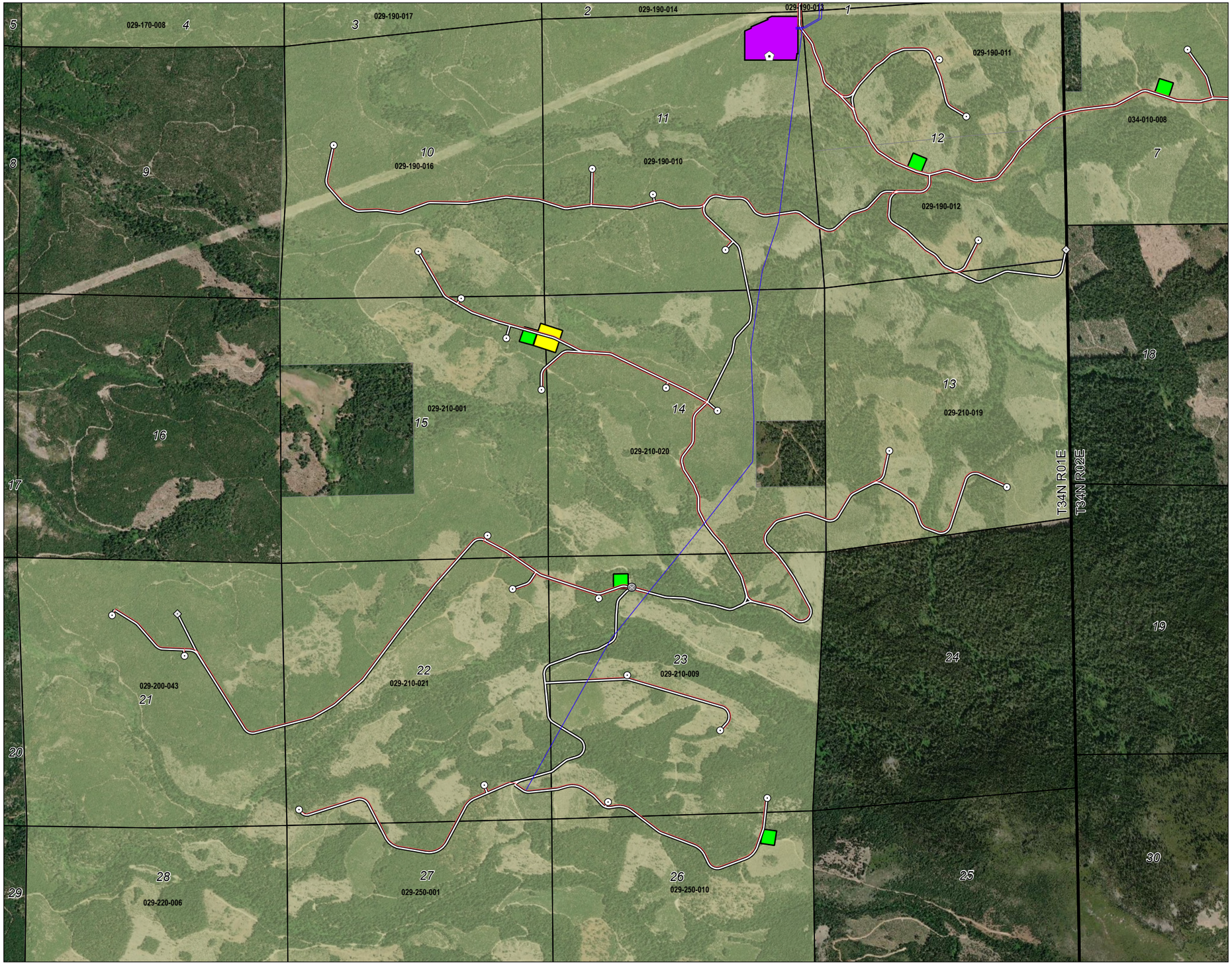

Stantec

Legend

- Turbine Location
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0 3,000 Feet

(At original document size of 11x17)
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Project Location
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California

Prepared by GC on 2023-05-04
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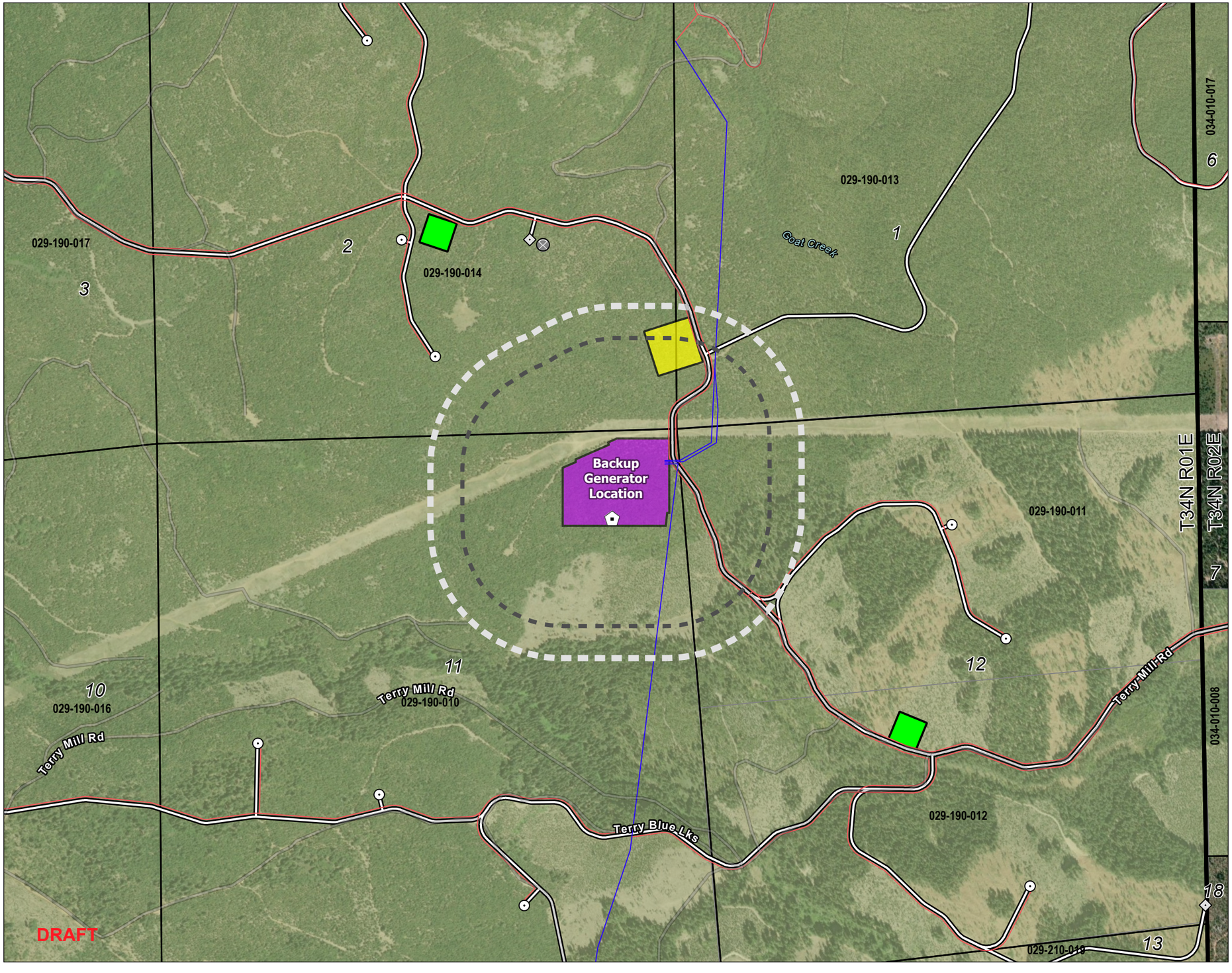
Client/Project
Fountain Wind LLC
Fountain Wind Project

203723159

Figure No.
1

Title
Project Overview
Map 3 of 3



Stantec

Legend

- Turbine Location
- Met Tower Location
- Microwave Tower Location
- Storage Shed Location
- Overhead Collection
- Underground Collection
- Access Road
- Batch Plant
- Staging Area
- Substation/Switchyard Site
- Lease Hold Area
- PLSS Section Boundary
- PLSS Township Range Boundary
- 0.25-mile buffer
- 1000-ft buffer

N

2,000 Feet

(At original document size of 11x17)
1:12,000

Notes

1. Coordinate System: NAD 1983 UTM Zone 10N
2. Data Sources: Shasta County GIS Division
3. Background: ESRI World Imagery Base Map

Project Location
Shasta County
California

Prepared by NZ on 2023-05-04
TR Review by XX on 2023-05-05
IR Review by CB on 2023-05-05

Client/Project
Fountain Wind LLC
Fountain Wind Project

203723159

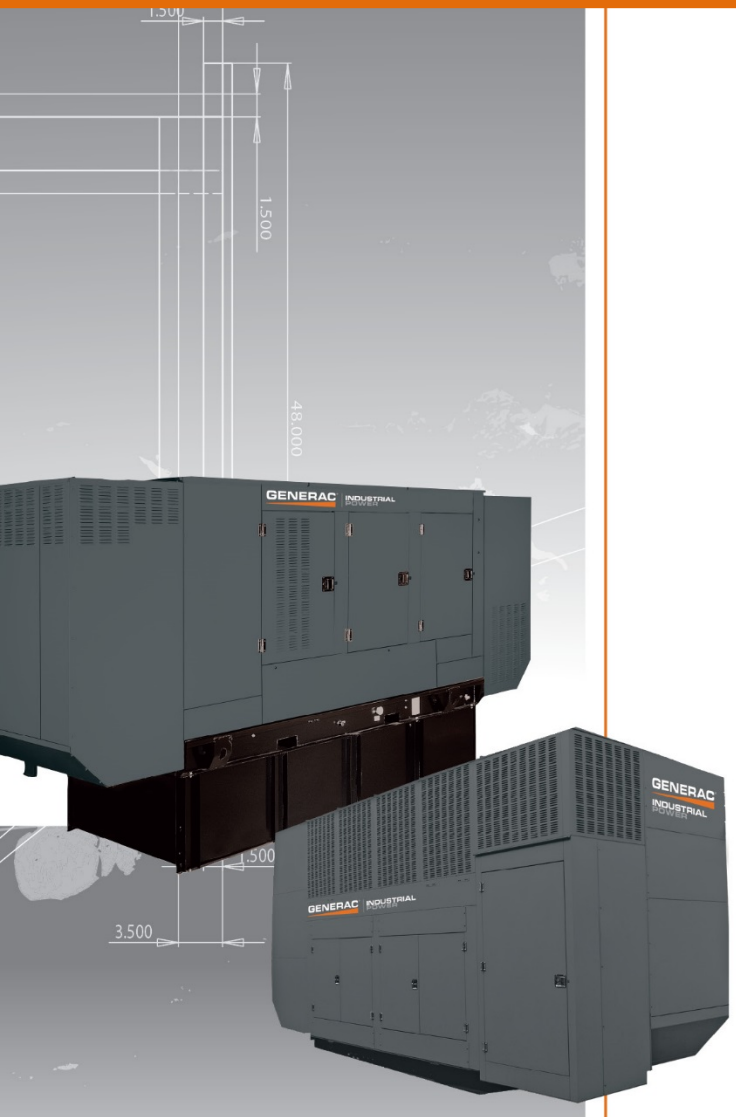
Figure No.
2

DRAFT

Title
Generator Location

GENERAC®
INDUSTRIAL POWER

Generator System Operation & Maintenance



60kW Emergency Generator Set

Prepared By: **Ben Serabian**
bserabian@espowergen.com
Energy Systems
Phone: (760) 402-1677

Date: 02-17-2022

ENERGY SYSTEMS
GENERAC INDUSTRIAL POWER

December 3, 2021

Dear Valued Customer,

We are pleased to inform you that as of December 3rd, 2021, Papé Material Handling, Inc. has signed an agreement to sell its power generation assets to West Coast Energy Systems, LLC ("Energy Systems"), a subsidiary of Generac Power Systems, Inc. ("Generac"). As part of this acquisition, the related power generation employees will become part of Energy System and will work to provide the high-quality products and services you expect.

Energy Systems is a leading distributor of power generator systems with a long-standing track record in the industry for exceptional service. Based in Stockton, California, the company serves the western United States. Energy Systems also has locations in Reno, NV and Auburn, WA to serve portions of Western Nevada, Oregon, and Northern California. An additional location in Phoenix, is currently being acquired to serve the State of Arizona.

Material handling customers of Papé Material Handling, Inc. will continue to be serviced by Papé Material Handling, Inc. for those products and services. However, as of today, for all power generation products, service, and support needs, please contact Energy Systems. Energy Systems is excited to become your partner and support your power generation needs with many of the same people and providing the equipment you have come to know and trust.

All outstanding power generation quotes, RFQs, or bids that have not been fulfilled by Papé Material Handling, will be supported by Energy Systems going forward. Any outstanding invoices from Papé, should be paid to Papé. For ongoing business, your contacts remain the same, all emails will automatically be forwarded to their new email addresses. Otherwise, you can utilize the emails listed below for the appropriate department or feel free to call 800-845-8519.

Parts: ESSouthparts@espowergen.com
Service: ESSouthservice@espowergen.com
Rental: ESSouthrentals@espowergen.com
Equipment Sales: ESSouthSales@espowergen.com
Accounts Receivable: AR@espowergen.com

We hope you are as excited as we are about this transition. We look forward to becoming a trusted partner to you and your business and promise to work every day to provide exceptional products, services, and support.

Sincerely,

Tony Coleman
General Manager
West Coast Energy Systems

West Coast Energy Systems
7100 S. Longe Street, Suite 300
Stockton, CA 95206
209-870-1900
www.ESPowerGen.com

GENERAC®
INDUSTRIAL POWER

Table of Contents

PAPÉ POWER SYSTEMS

GENERAC®

INDUSTRIAL POWER

Content Overview

PAPÉ

POWER SYSTEMS

Ben Serabian / bserabian@papemh.com

Phone (760) 402-1677 / FAX (760) 480-4333

POWER SYSTEMS

Los Angeles County

2615 Pellissier Place
City of Industry, CA
91749
Phone (562) 463-8000
FAX (562) 463-8093

26007 Huntington Ln # 3
Valencia, CA 91355
Phone (661) 257-9634
Fax (661) 257-7934

Inland Empire

8089 Cherry Ave.
Fontana, CA 92336
Phone (909) 428-3400
FAX (909) 428-9620

San Diego County

2870 Executive Ave.
Escondido, CA 92029
Phone (760) 402-1677
FAX (760) 480-4333

Orange County

15591 Computer Lane
Huntington Beach, CA
92705
Phone (714) 901-6290
FAX (714) 901-6291

Hawaii

DBA
Hawaiian Lift Truck, Inc.
1724 Kahai Street
Honolulu, HI 96819
Phone (808) 847-0624
FAX (808) 841-3706

BILL OF MATERIAL

Quantity 1 - Generac Commercial Gas Series generator set

- 60kW engine-driven standby generator:
- UL2200 listed
- digital control system including isochronous governor system and V/F voltage regulation
- selectable low-speed weekly exercise function
- 4.5 liter liquid-cooled naturally aspirated engine with an operating speed of 3600 RPM
- alternator configured for 120/240 vac single phase 3-wire 60 Hz output
- Propane vapor fuel system with customer connection fitting external to the genset base frame
- sound attenuating corrosion resistant aluminum enclosure with electrostatically-applied and baked powder coat finish
- Battery

Quantity 1 - 500 gallon propane vapor tank installed w/ regulators

NOTE: All trenching and concrete work by others

NOTE: ATS to be supplied by housing manufacturer per Swinerton direction. ATS must be a 2-wire start system. This can be included by Pape Power Systems upon request at additional cost.

Quantity 1 - Standard factory freight from Generac to jobsite (unloading by others)

Quantity 1 - Standard start-up & transfer test of above specified equipment (loadbank testing of generator can be performed upon request at an additional cost unless otherwise noted. Testing of any existing on-site equipment by others)

Quantity 1 – Training of basic operation & maintenance

GENERAC®

INDUSTRIAL POWER

Product Certifications

PAPÉ

POWER SYSTEMS

Certification of Quality

Generac Power Systems certifies that the products we manufacture have been built and tested in accordance with strict internal and external standards for quality. Our quality management system has been registered with the internationally recognized ISO 9001:2008 standard and our products comply with external standards that include, but are not limited to, CSA, NEMA, EGSA, ISO, and UL.

The Generac Quality Management System (GQMS) ensures the highest standards of quality at every level of production, from raw materials to the finished product. This includes receiving inspection, in-process checks, product and process audits, testing, final inspections, and shipping standards.

Tests of our products are performed in accordance with our internal procedures and controlled through the GQMS to ensure accuracy and effectiveness. The testing process and product designs comply with external standards which may include, but are not limited to: ISO 8528-5, ISO 3046, NFPA 99, NFPA 110, BS 5514, SAE J1349, and DIN 6271.

Generac Power Systems has over one million square feet of manufacturing space and over 2000 employees dedicated to designing and manufacturing power generation equipment in our multiple State of Wisconsin, USA factories. All of our installed and mobile generators are built with pride by our skilled American workforce to ensure our customers receive the quality that they expect from Generac.

We are committed to producing quality products for both our internal and external customers. We will continuously improve our processes and diligently measure all aspects of our business.

Daniel Waschow

Vice President of Quality
Generac Power Systems, Inc.
Waukesha, Wisconsin USA

Part No. 0184520SSD
Rev. B 03/01/12

CERTIFICATE

This is to certify that

Generac Power Systems, Inc.

S45 W29290 Hwy. 59
Waukesha, WI 53189
United States of America

with the organizational units/sites as listed in the annex

has implemented and maintains a **Quality Management System**.

Scope:
Design, Manufacturing, and Distribution of Generators and Power Products.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 9001 : 2015

Certificate registration no.	10012920 QM15
Date of original certification	2013-12-09
Date of certification	2018-07-16
Valid until	2021-07-15

DQS Inc.

Brad McGuire
Managing Director

Annex to certificate
Registration No. 10012920 QM15

Generac Power Systems, Inc.

S45 W29290 Hwy. 59
Waukesha, WI 53189
United States of America

Location	Scope
10012920 **Generac Power Systems, Inc.** **S45 W29290 Hwy. 59** **Waukesha, WI 53189** **United States of America**	Design, Manufacturing of Generator Components and Distribution of Service Parts.
10012922 **Generac Power Systems, Inc.** **211 Murphy Dr.** **Eagle, WI 53119** **United States of America**	Manufacturing and Distribution of Generators.
10012923 **Generac Power Systems, Inc.** **757 N. Newcomb St.** **Whitewater, WI 53190** **United States of America**	Manufacturing and Distribution of Generators and Manufacture of Generator components.
10012924 **Generac Power Systems, Inc.** **900 N. Parkway** **Jefferson, WI 53549** **United States of America**	Manufacturing of Generators and Power Products.
10013528 **Generac Power Systems** **3815 Oregon St.** **Oshkosh, WI 54902** **United States of America**	Manufacturing of Generators.

Remote Location	Scope
10014175 **Generac Power Systems, Inc.** **351 Collins Road** **Jefferson, WI 53549** **United States of America**	The remote location at Jefferson, WI performs the following primary functions: Parts and Components Receiving, Inventory, and Distribution to Generac Locations.

This annex (edition: 2018-07-16) is only valid in connection with the above-mentioned certificate.

GENERAC®

INDUSTRIAL POWER

Generator Assembly

PAPÉ

POWER SYSTEMS

GAS SUPPLY CHECK LIST

- **Gas Service Meter and Serving Utility**
  - Available on site and reliable
  - Rated for the combined loading of the facility and the generator (total BTU)
  - Maintains generator minimum pressure requirements while under maximum loading
- **Step Down Pressure Regulators**
  - Selected for the pressure and flow needs of the generator
  - Direct acting type with good dynamic response (no significant time lags in regulation)
  - Selected for minimum no-load to full load pressure droop (< 1-2" w.c desired)
  - Located near the generator (allows the long piping runs to be at higher pressure)
  - Located at least 10' away from generator connection (avoids regulator oscillations)
  - Dedicated to a single generator (increases system reliability)
- **Piping**
  - Sized large enough to minimize pressure drops to acceptable levels under full gas flow
  - Minimize the number of elbows to avoid unwanted pressure drops
  - Ensure entire gas supply system maintains acceptable generator pressure under full gas flow conditions
  - Should be connected to generator with a flexible connection
  - Should include a drip leg (sediment trap)
- **LP**
  - LP tank's boil off rate (BTU capacity) needs to support rated BTU at minimum ambient
  - LP liquid withdrawal systems should be considered: cold ambients, small tanks, large generators
  - LP liquid systems require pressure rated piping and vaporization outside a building
- **Generac Design Resources**
  - "Installation Guidelines for Stationary Industrial Generators" manual 046622 (detailed information)
  - "Power Design Pro" software -- mechanical design tab (gas piping pressure drop calculator)
- **National Codes and Standards**
  - NFPA 37 "Installation and use of Stationary Combustion Engines"
  - NFPA 54 "National Fuel Gas Code"
  - NFPA 58 "LP Gas Code"

Generac Power Systems, Inc. | P.O. Box 8 | Waukesha, WI 53187
P: (262) 544-4811

Part No. 10000002132
Rev. C 11/15/19

Protector® Series

PROTECTOR® SERIES
Standby Generators
Liquid-Cooled Gaseous Engine

INCLUDES:

- Two-Line LCD Multilingual Digital Evolution™ Controller (English/Spanish/French/Portuguese) with external viewing window for easy indication of generator status and breaker position.
- Capability to be installed with 18" (457mm) of a building*
- True Power™ Electrical Technology
- Isochronous Electronic Governor
- Sound Attenuated Enclosure
- Closed Coolant Recovery System
- Smart Battery Charger
- UV/Ozone Resistant Hoses
- ±1% Voltage Regulation
- Natural Gas or LP Operation
- 5 Year Limited Warranty
- UL 2200 Listed

Note: 25-45 kW units are field convertible between natural gas or liquid propane. 60 kW units are built per fuel requirement and are not convertible.

Standby Power Rating

Model RG025 (Aluminum - Bisque) - 25 kW 60 Hz
Model RG030 (Aluminum - Bisque) - 30 kW 60 Hz
Model RG036 (Aluminum - Bisque) - 36 kW 60 Hz
Model RG045 (Aluminum - Bisque) - 45 kW 60 Hz
Model RG060 (Aluminum - Bisque) - 60 kW 60 Hz

*Assembled in the USA using domestic and foreign parts

*Only if located away from doors, windows, and fresh air intakes, and unless otherwise directed by local codes. Applicable for 25kW and 30kW units only.

Meets EPA Emission Regulations
25, 30 & 45 kW CA/MA emissions compliant
36 & 60 kW not for sale in CA / MA

FEATURES

- **INNOVATIVE DESIGN & PROTOTYPE TESTING** are key components of GENERAC'S success in "IMPROVING POWER BY DESIGN." But it doesn't stop there. Total commitment to component testing, reliability testing, environmental testing, destruction and life testing, plus testing to applicable CSA, NEMA, EGSA, and other standards, allows you to choose GENERAC POWER SYSTEMS with the confidence that these systems will provide superior performance.

- **TEST CRITERIA:**
  - ✓ **PROTOTYPE TESTED**
  - ✓ **SYSTEM TORSIONAL TESTED**
  - ✓ **NEMA MG1-22 EVALUATION**
  - ✓ **MOTOR STARTING ABILITY**

- **SOLID-STATE, FREQUENCY COMPENSATED VOLTAGE REGULATION.** This state-of-the-art power maximizing regulation system is standard on all Generac models. It provides optimized FAST RESPONSE to changing load conditions and MAXIMUM MOTOR STARTING CAPABILITY by electronically torque-matching the surge loads to the engine. Digital voltage regulation at ±1%.

- **SINGLE SOURCE SERVICE RESPONSE** from Generac's extensive dealer network provides parts and service know-how for the entire unit, from the engine to the smallest electronic component.

- **GENERAC TRANSFER SWITCHES.** Long life and reliability are synonymous with GENERAC POWER SYSTEMS. One reason for this confidence is that the GENERAC product line includes its own transfer systems and controls for total system compatibility.

GENERAC®

25 • 30 • 36 • 45 • 60 kW

application & engineering data

GENERATOR SPECIFICATIONS

Type	Synchronous
Rotor Insulation Class	H
Stator Insulation Class	H
Telephone Interference Factor (TIF)	<50
Alternator Output Leads 1-Phase	4 wire
Alternator Output Leads 3-Phase	6 wire
Bearings	Sealed Ball
Coupling	Flexible Disc
Excitation System	Direct

VOLTAGE REGULATION

Type	Electronic
Sensing	Single Phase
Regulation	± 1%

GOVERNOR SPECIFICATIONS

Type	Electronic
Frequency Regulation	Isochronous
Steady State Regulation	± 0.25%

ELECTRICAL SYSTEM

Battery Charge Alternator	12 Volt 15 Amp - 25 & 30 kW 12 Volt 30 Amp - 36, 45 & 60 kW
Static Battery Charger	2 Amp
Recommended Battery (battery not included)	Group 26, 525CCA
System Voltage	12 Volts

GENERATOR FEATURES

Revolving field heavy duty generator
Directly connected to the engine
Operating temperature rise 120 °C above a 40 °C ambient
Class H insulation is NEMA rated
All models fully prototyped tested

ENCLOSURE FEATURES

Aluminum weather protective enclosure	Ensures protection against mother nature. Electrostatically applied textured epoxy paint for added durability.
Enclosed critical grade muffler	Quiet, critical grade muffler is mounted inside the unit to prevent injuries.
Small, compact, attractive	Makes for an easy, eye appealing installation.
SAE	Sound attenuated enclosure ensures quiet operation.

(All ratings in accordance with BS5514, ISO3046, ISO8528, SAE J1349 and DIN6271)

ENGINE SPECIFICATIONS: 25 & 30 kW

Make	Generac
Model	In-line
Cylinders	4
Displacement (Liters)	1.5
Bore (in/mm)	3.05/77.4
Stroke (in/mm)	3.13/79.5
Compression Ratio	11:1
Intake Air System	Naturally Aspirated
Lifter Type	Hydraulic

ENGINE SPECIFICATIONS: 36, 45 & 60 kW

Make	Generac
Model	In-line
Cylinders	4
Displacement (Liters)	2.4
Bore (in/mm)	3.41/86.5
Stroke (in/mm)	3.94/100
Compression Ratio	9.5:1
Intake Air System	Naturally Aspirated (36 & 45 kW) or Turbocharged/Aftercooled (60 kW)
Lifter Type	Hydraulic

ENGINE LUBRICATION SYSTEM

Oil Pump Type	Gear
Oil Filter Type	Full flow spin-on cartridge
Crankcase Capacity (qt/l)	4/3.8 - 25, 30, 36 & 45 kW 5.25/4.96 - 60 kW

ENGINE COOLING SYSTEM

Type	Closed
Water Pump	Belt driven
Fan Speed (rpm)	2484 - 25 & 30 kW 1865 - 36 & 45 kW 2100 - 60 kW
Fan Diameter (in/mm)	17.7/449.6 (25 & 30 kW) or 22/558.8 (36, 45 & 60 kW)
Fan Mode	Pusher (25 & 30 kW) or Puller (36, 45 & 60 kW)

FUEL SYSTEM

Fuel Type	Natural gas, propane vapor
Carburetor	Down Draft
Secondary Fuel Regulator	Standard
Fuel Shut Off Solenoid	Standard
Operating Fuel Pressure	5-14" water column/9-26 mm HG
LP Fuel Pressure	11 - 14" Water Column
NG Fuel Pressure	5 - 14" Water Column

GENERAC®

25 • 30 • 36 • 45 • 60 kW

operating data

GENERATOR OUTPUT VOLTAGE/kW - 60 Hz

		kW LPG	Amp LPG	kW Nat. Gas	Amp Nat. Gas	CB Size (Both)
RG025	120/240 V, 1Ø, 1.0 pf	25	104	25	104	125
	120/208 V, 3Ø, 0.8 pf	25	87	25	87	100
	120/240 V, 3Ø, 0.8 pf	25	75	25	75	90
RG030	120/240 V, 1Ø, 1.0 pf	30	125	30	125	150
	120/208 V, 3Ø, 0.8 pf	30	104	30	104	125
	120/240 V, 3Ø, 0.8 pf	30	90	30	90	100
RG036	120/240 V, 1Ø, 1.0 pf	36	150	36	150	175
	120/208 V, 3Ø, 0.8 pf	36	125	36	125	150
	120/240 V, 3Ø, 0.8 pf	36	108	36	108	125
	277/480 V, 3Ø, 0.8 pf	36	54	36	54	60
RG045	120/240 V, 1Ø, 1.0 pf	45	188	45	188	200
	120/208 V, 3Ø, 0.8 pf	45	156	45	156	175
	120/240 V, 3Ø, 0.8 pf	45	135	45	135	150
	277/480 V, 3Ø, 0.8 pf	45	68	45	68	80
RG060	120/240 V, 1Ø, 1.0 pf	60	250	60	250	300
	120/208 V, 3Ø, 0.8 pf	60	208	60	208	250
	120/240 V, 3Ø, 0.8 pf	60	180	60	180	200
	277/480 V, 3Ø, 0.8 pf	60	90	60	90	100

SURGE CAPACITY IN AMPS

		Voltage Dip @ < .4 pf	
		15%	30%
RG025	120/240 V, 1Ø	65	170
	120/208 V, 3Ø	80	130
	120/240 V, 3Ø	69	112
RG030	120/240 V, 1Ø	75	180
	120/208 V, 3Ø	96	155
	120/240 V, 3Ø	83	134
RG036	120/240 V, 1Ø	105	240
	120/208 V, 3Ø	44	130
	120/240 V, 3Ø	38	115
	277/480 V, 3Ø	20	60
RG045	120/240 V, 1Ø	105	240
	120/208 V, 3Ø	44	130
	120/240 V, 3Ø	38	115
	277/480 V, 3Ø	20	60
RG060	120/240 V, 1Ø	140	320
	120/208 V, 3Ø	70	210
	120/240 V, 3Ø	61	182
	277/480 V, 3Ø	30	91

ENGINE FUEL CONSUMPTION

		Natural Gas			Propane	
		(ft^3/hr)	(m^3 /hr)	(gal/hr)	(l/hr)	(ft^3/hr)
RG025	Exercise cycle	60	1.7	0.7	2.5	24
	25% of rated load	220	6.3	2.9	9.1	88
	50% of rated load	297	8.4	3.3	12.3	119
	75% of rated load	362	10.3	4	15	145
	100% of rated load	430	12.2	4.7	17.8	172
RG030	Exercise cycle	60	1.7	0.7	2.5	24
	25% of rated load	240	6.8	2.6	10	96
	50% of rated load	320	9.1	3.5	13.3	128
	75% of rated load	400	11.4	4.4	16.6	160
	100% of rated load	492	14	5.4	20.4	197
RG036	Exercise cycle	65	1.8	0.7	2.6	25
	25% of rated load	210	6	2.3	8.6	83
	50% of rated load	380	10.8	4.2	15.7	151
	75% of rated load	545	15.5	5.9	22.4	216
	100% of rated load	730	20.7	8	30.1	290
RG045	Exercise cycle	65	1.8	0.7	2.6	25
	25% of rated load	210	6	2.3	8.6	83
	50% of rated load	380	10.8	4.2	15.7	151
	75% of rated load	545	15.5	5.9	22.4	216
	100% of rated load	730	20.7	8	30.1	290
RG060	Exercise cycle	123	3.5	1.34	5.1	49.3
	25% of rated load	267	7.6	2.7	10.5	101
	50% of rated load	483	13.7	5	19	183
	75% of rated load	672	19.1	7	26.5	255
	100% of rated load	862	24.5	9	33.9	327

Note: **Fuel pipe must be sized for full load.**

For Btu content, multiply ft^3/hr x 2520 (LP) or ft^3/hr x 1000 (NG)

For megajoule content, multiply m^3/hr x 93.15 (LP) or m^3/hr x 37.26 (NG)

Refer to "Emissions Data Sheets" for maximum fuel flow for EPA and SCAQMD permitting purposes.

STANDBY RATING: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3046-1. Design and specifications are subject to change without notice.

GENERAC®

25 • 30 • 36 • 45 • 60 kW operating data

ENGINE COOLING

	25 kW	30 kW	36 kW	45 kW	60 kW
Air flow (inlet air including alternator and combustion air in cfm/cmm)	2490/70.5	2490/70.5	2725/77.2	2725/77.2	3280/92.9
System coolant capacity (gal/liters)	2/7.6	2/7.6	2.5/9.5	2.5/9.5	2.5/9.5
Heat rejection to coolant (BTU per hr/MJ per hr)	112,000/118.2	135,000/142.4	193,000/203.6	193,000/203.6	270,000/284.9
Maximum operation air temperature on radiator (°C/°F)	60/140				
Maximum ambient temperature (°C/°F)	50/122				

COMBUSTION REQUIREMENTS

Flow at rated power (cfm/cmm)	62/1.8	72/2	144/4.1	144/4.1	180/5.1

SOUND EMISSIONS

Sound output in dB(A) at 23 ft (7 m) with generator in exercise mode*	59	59	61	61	65
Sound output in dB(A) at 23 ft (7 m) with generator operating at normal load*	72	73	70	73	72

*Sound levels are taken from the front of the generator. Sound levels taken from other sides of the generator may be higher depending on installation parameters.

EXHAUST

Exhaust flow at rated output (cfm/cmm)	203/5.7	237/6.7	300/8.5	420/11.9	494/14
Exhaust temperature at muffler outlet (°C/°F)	593/1100	610/1130	579/1075	593/1100	566/1050

ENGINE PARAMETERS

Rated Synchronous rpm	3600

POWER ADJUSTMENT FOR AMBIENT CONDITIONS

Temperature Deration ..... 3% for every 10 °C above 25 °C or 1.65% for every 10 °F above 77 °F
Altitude Deration (25, 30, 36 & 45 kW) ..... 1% for every 100 m above 183 m or 3% for every 1000 ft above 600 ft
Altitude Deration (60 kW) ..... 1% for every 100 m above 915 m or 3% for every 1000 ft above 3000 ft

CONTROLLER FEATURES

Two-Line Plain Text LCD Display ..... Simple user interface for ease of operation.
Mode Switch: Auto ..... Automatic Start on Utility failure. 7 day exerciser
Off ..... Stops unit. Power is removed. Control and charger still operate.
Manual ..... Start with starter control, unit stays on. If utility fails, transfer to load takes place.
Programmable start delay between 10-30 seconds ..... 10 sec Standard
Engine Start Sequence ..... Cyclic cranking: 16 sec on, 7 rest (90 sec maximum duration)
Engine Warm-up ..... 5 sec
Engine Cool-Down ..... 1 min
Starter Lock-out ..... Starter cannot re-engage until 5 sec after engine has stopped.
Smart Battery Charger ..... Standard
Automatic Voltage Regulation with Over and Under Voltage Protection ..... Standard
Automatic Low Oil Pressure Shutdown ..... Standard
Overspeed Shutdown ..... Standard, 72 Hz
High Temperature Shutdown ..... Standard
Overcrank Protection ..... Standard
Safety Fused ..... Standard
Failure to Transfer Protection ..... Standard
Low Battery Protection ..... Standard
50 Event Run Log ..... Standard
Future Set Capable Exerciser ..... Standard
Incorrect Wiring Protection ..... Standard
Internal Fault Protection ..... Standard
Common External Fault Capability ..... Standard
Governor Failure Protection ..... Standard

ALTERNATOR DATA SHEET
A0060044N21

General Characteristics

Voltages (V)	240	Number of Leads	4
Frequency (Hz)	60	Winding Type	1 Phase
Phases	1	Air Flow (CFM)	540
Speed (RPM)	1,800	Total Harmonic Distortion (%)	Contact Factory
Excitation System	PMG/Brushless	Largest Single Harmonic Value (%)	Contact Factory
Insulation Class	H	Telephone Interference Factor (TIF)	Contact Factory
Winding Pitch	2/3	Reference Part Number	0J1377B01R, 0J1381B01R, 0L4171J01R, 0L4172J01R

Ratings at 1.0 pf Based on 40˚C Ambient

Voltage (V)	80˚C Rise		105˚C Rise		120˚C Rise		150˚C Rise	
	kW	kVA	kW	kVA	kW	kVA	kW	kVA
120/240	49	49	54	54	60	60	65	65

Base Data at 240V, 60 kVA, 1,800 RPM, 60 Hz, 1Ø

Description	Value
Stator Resistance, Line to Line, (Ω)	0.0333
Rotor Resistance (Ω)	1.205
Exciter Stator Resistance - PMG/Brushless (Ω)	5.500/6.000
Exciter Rotor Resistance - PMG/Brushless (Ω)	0.5155/0.4565
Excitation Winding Resistance -PMG/Brushless (Ω)	1.7240/0.4885
Xd, Direct Axis Synchronous Reactance (p.u.)	2.14
X2, Negative Sequence Reactance (p.u.)	0.43
X0, Zero Sequence Reactance (p.u.)	0.05
X'd, Direct Axis Transient Reactance (p.u.)	0.15
X"d, Direct Axis Subtransient Reactance (p.u.)	0.14
Xq, Quadrature Axis Synchronous Reactance (p.u.)	0.96
T'd, Direct Axis Transient Short Circuit Time Constant (s)	0.048

Description	Value
T"d, Direct Axis Subtransient Short Circuit Time Constant (s)	0.008
T'do, Direct Axis Transient Open Circuit Time Constant (s)	0.987
Ta, Short Circuit Time Constant of Armature Winding (s)	0.055
Voltage Balance, L-N (%)	2.5
Sustained 3Ø Short Circuit Current (%) - PMG Only	300
X/R	21
Short Circuit Ratio	0.51
Heat Rejection (BTU/hr) - 100% Rated Load, 480V, 0.8pf, 120ºC Temperature Rise	30,321

Reference: Mil-STD-705B
All Ratings are Nominal

Part No. A0000930094
Rev. A 7/8/20

ALTERNATOR DATA SHEET
A0060044N21

skVA

	10%	15%	20%	25%	30%	35%
240V @ 0.3PF	9	14	20	26	35	43
240V @ 0.6PF	11	17	23	31	40	49

Efficiencies

*Rated Power	240V @ 1.0 PF
20%	83.2
40%	88.1
60%	88.7
80%	88.2
100%	87.1

*Rated Power value is rating kW at 120°C Winding Temperature Rise and 1.0pf

Evolution™ Controller

GENERAC® ACCESSORIES

- Compatible with Generac RTS , RTG, pre-wired, Smart, and GenReady switches
- Two line text, LCD multilingual display
- Real-time display of genset status for both owner and service contractor
- Run log, alarm logs, maintenance logs and maintenance schedule alerts, shows last 50 events in each log
- Allows for connection of a common alarm output
- Wireless remote monitor and Mobile Link™ compatible
- Illuminated membrane button keypad for easy menu scrolling and unit activation
- Miswiring connection protection
- UL/CUL listed
- Covered USB port for field firmware updates

c UL us LISTED

DESCRIPTION

The next generation of intuitive controllers featuring a multilingual, two-line LCD text display with color coded backlit buttons. This controller allows even more system flexibility and provides a comprehensive display of alarms, maintenance alerts and real time system status.

STANDARD FEATURES

Controls
- LCD display
- Membrane button keypad
- Illuminated, color coded mode keypad

Processor
- 32 bit microcontroller
- Watertight input and output connections
- Software protected by built-in watchdog hardware

Display
- Backlit LCD
- 2 Line X 20 display
- 12 degree viewing angle
- Multilingual (English, Spanish, French, Portuguese)

Common Alarm Relay
- NO set of contacts rated 10A at 250VAC/5A at 30VDC (Note: Contact rating is for resistive load only)

Smart Battery Charger
- Built into the Evolution Controller
- Smart charge system delivers voltage depending on battery needs and ambient conditions
- Battery Sentinel watches battery performance to indicate battery health

Generator Output Voltage Regulation
- Built into processor
- +/- 1% voltage regulation

Engine Speed Governor
- Built into processor
- Isochronous operation
- +/- 1 Hz steady state regulation

Evolution™ Controller

Exercise Function
- Automatic 7-day exercise
- Low-speed, no transfer (17 & 20kW only)
- User-selected time and day of week
- Adjustable at LCD display and keypad

Displayed Parameters
- System status
- Current Time & Date
- Exercise Time & Date
- Engine Run Hours
- Hours of Protection
- Engine RPM
- Output Voltage & Frequency
- Battery Voltage, Charge Status & Condition
- Utility Input Voltage
- Software Revision

Shutdown Alarms/Displays
- Low Oil Pressure
- High Engine Temperature
- Overcrank
- Overspeed
- RPM Sensor Loss
- Underspeed
- Underfrequency
- Wiring Error
- Undervoltage
- Overvoltage
- Internal Fault
- Firmware Error
- Stepper Overcurrent
- Fuse Problem

Warning Displays
- Low Battery
- Maintenance Periods
- Exercise Error
- Battery Problem
- Charger Warning
- Charger Missing AC
- Overload Cooldown
- USB Warning
- Download Failure

User-Adjustable Settings (Unprotected)
- Exercise Time, Day
- Current Time, Day, Month, Year
- Display Language English, Spanish, French, Portuguese

Dealer-Adjustable Setting or Displayed Parameter (Password protected)
- Startup Delay (2-1500 seconds)
- Run Hours
- Utility Voltage Loss Threshold
- Utility Voltage Return Threshold
- Calibrate Current & Voltage
- Maintenance Reset
- Input & Output Debug
- Firmware Upgrade

Maintenance Alerts
- Schedule Service A
- Schedule Service B
- Schedule A Serviced
- Schedule B Serviced
- Inspect Battery
- Battery Maintained
- Next Schedule Maintenance Date/Hours

Environmental
Temperature ..... -30 to +50 deg C
Humidity ..... 0 to 95% non-condensing

Power Supply Requirements
Nominal Supply 12VDC
Transient Protection ..... Spikes clamped to 18V
Power Usage ..... 250mA maximum
Fuse on Controller ..... 7.5 Amp

Battery Charger Voltage/Freq (50-60) Parameters
Battery Charger 120-240VAC 50/60Hz

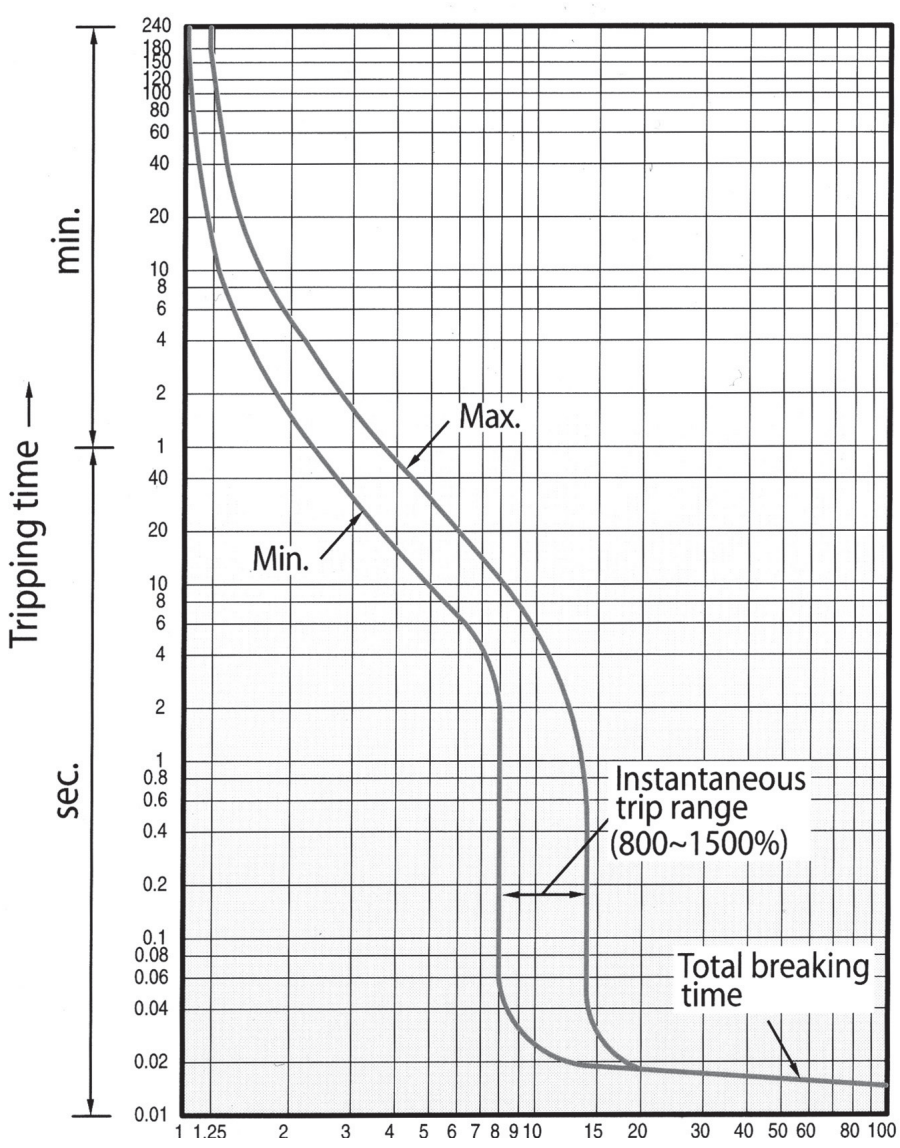
CIRCUIT BREAKER 40-600 AMP

GENERAC CIRCUIT BREAKER INFORMATION							
Circuit Breaker Amps	Generac C.B. Lug Part Number	Lug Description	Wire Size Per 310-16*	Frame	Interrupt Rating	Rating Temp.	Type
40	0F8451	Single Hole 0.656 Diameter # 6 to 300 MCM Cu/Al Single Conductor Only Mounting Bolt 70 in lbs. Wire Lug is 375 in lbs.	#8	200 Amp Frame	18,000	40 °C	Thermal Magnetic
50			#8				
60			#6				
70			#4				
80			#4				
90			#3				
100			#3				
125			#1				
150			1/0				
175			2/0				
200			3/0				
225	0A7822	(1) - 600 MCM to # 4 Cu/Al or (2) - 250 MCM to (2) - 1/0	4/0	400 Amp Frame	25,000		
250			250MCM				
300			350MCM				
350		Mounting 70 in lb. Wire Lug is 375 in lb	500MCM				
400			600MCM				
450	0F9721 Standard Lug 0F8452 Optional Lug - 450-600A	(3) - 2/0 - 400 MCM Cu/Al 480 in lb. (2) - 500-750 mcm Cu/Al Optional Lug	700MCM or 2 - 4/0	600 Amp UL Rated Frame	35,000		
500			2 - 250 MCM				
600			2 - 350MCM or 3-3/0				

All circuit breakers are CUL 489 listed for 120, 208, 240, 480 Volts. Wire size is based on Amp Ratings at 75 °C from Table 310.16, 2008 NEC. All Lugs Are Rated 75 °C.

Derate by Temperature	
Temperature °C	Rated Trip Current %
20	110
30	105
40	100
50	95

CIRCUIT BREAKER
40-600 AMP



Part No. 0172520SBY
Rev. F 11/20/19

GENERAC® | INDUSTRIAL POWER

POWER DERATION RATES

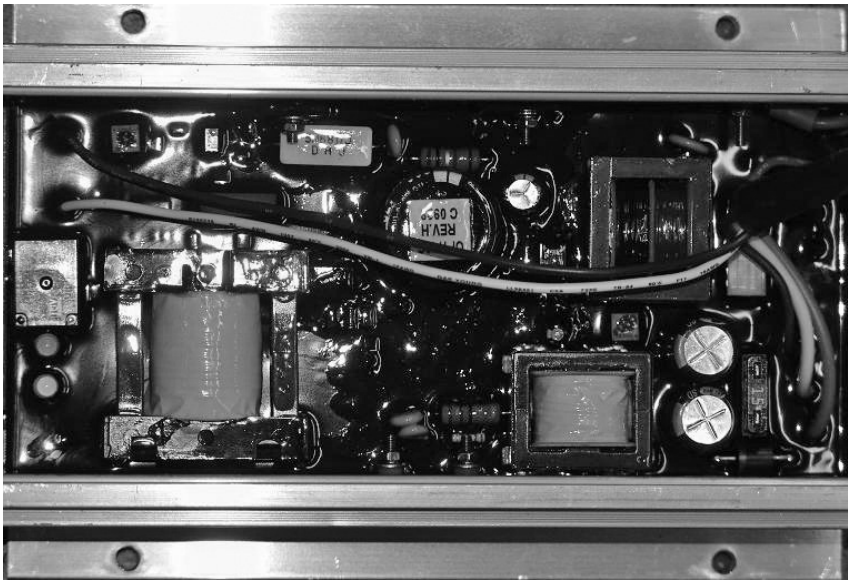
POWER DERATION
60Hz SPARK-IGNITED PRODUCT

SPARK-IGNITED ENGINE DERATE INFORMATION

Nominal Rating (kW)	Product Line	kW Propane	kW Natural gas 3Ø	kW Natural Gas 1Ø	Engine Disp (L)	Baseline	
						Temp ºF	Altitude Ft.
22	Protector	22	22	22	2.4	77	600
25	Protector	25	25	25	1.6	77	600
25	Industrial	25	25	25	2.4	104	600
27	Protector	27	25	25	2.4	77	600
30	Protector	30	27	27	1.6	77	600
35	Industrial	35	35	35	5.4	110	3500
36	Protector	36	35	35	2.4	77	3000
40	Industrial	40	40	40	5.4	110	3500
45	Protector	45	45	45	2.4	77	600
45	Industrial	45	45	45	5.4	104	1600
48	Protector	48	48	48	5.4	77	600
50	Industrial	50	50	50	5.4	104	600
50	Industrial	50	50	50	6.8	110	3500
60	Protector	60	60	60	2.4	77	3000
60	Industrial	60	60	60	6.8	104	3500
70	Protector	70	67	64	6.8	77	600
70	Industrial	70	67	64	6.8	104	600
80	Protector	80	80	77	4.6	77	600
80	Industrial	80	80	80	6.8	104	3500
80	Industrial	80	80	80	8.0	104	3500
80 *	Industrial	80 DF	80 DF	80 DF	8.0	95	3500
80	Industrial	80	80	80	9.0	104	3500
80 *	Industrial	80 DF	80 DF	80 DF	9.0	95	3500
100	Industrial	100	94	89	6.8	77	600
100	Industrial	100	100	100	9.0	77	600
100 *	Industrial	100 DF	100 DF	100 DF	9.0	77	600
130	Industrial	130	122	117	6.8	77	600
130	Industrial	130	130	130	9.0	77	600
130	Industrial	N/A	130	130	12.9	110	8000
150	Industrial	150	142	136	6.8	77	600
150	Industrial	140	150	144	9.0	77	600
150	Industrial	N/A	150	150	12.9	110	7500
175	Industrial	N/A	175	175	12.9	110	6000
200	Industrial	N/A	200	200	12.9	110	3500
230	Industrial	N/A	230	N/A	12.9	110	6000
250	Industrial	N/A	250	N/A	12.9	110	3500
275	Industrial	N/A	275	N/A	12.9	110	6000
300	Industrial	N/A	300	N/A	12.9	86	4000
350	Industrial	N/A	350	N/A	21.9	110	3500
400	Industrial	N/A	400	N/A	21.9	110	3500

Derates start at the above baseline altitudes and temperatures
*3.0% per 1000 feet for altitude and 1.65% per 10º F for temperauture (200kW & below, except for *)*
*2.1% per 1000 feet for altitude and 5.0% per 5º F for temperature (140kW LP 9.0L, 230kW, 250kW, 350kW, 400kW and *)*
2.1% per 1000 feet for altitude and 2.0% per 5º F for temperature (275 & 300kW)
2.1% per 1000 feet for altitude and 6.7% per 5º F for temperature (150kW Natural Gas 9.0L)
** Dual Fuel (DF): 2.1% per 1000 feet for altitude and 5.0% per 5º F for temperature*

BATTERY CHARGER
2.5 amp and 10 amp



Battery charger shown from inside of control panel enclosure.
Connections are made via an attached harness.

The Generac 2.5 amp 12 volt and 10 amp 12/24 volt battery chargers are designed to work with Generac Industrial Controls to provide the ultimate in automatic battery voltage maintenance.

The 2.5 amp charger is self-regulating and produces instantaneous output current adjustments to keep the battery charged to an optimum level. Battery voltage is read on the control panel digital display.

The 10 amp charger has automatic float and equalize control. It precisely monitors the battery's voltage and automatically activates the correct charging mode. The charge rate is limited and controlled to efficiently and safely maintain ideal battery levels under varying conditions.

The equalize system uses a control circuit to limit charging current to 10 amps. When battery voltage drops below a preset level, charging current increases to 5 amps and then to the 10 amp charge rate if needed. When the battery reaches maximum charge, the charger switches to float mode to supply just enough current to maintain the battery at or above 13/26 volts. Battery voltage and charging current are read at the control panel digital display.

Specifications	2.5A	10A
Nominal Input	120 VAC	120 VAC
Operating AC Line Voltage Range	108 to 132 VAC	108 to 132 VAC
Input AC Line Frequency	50/60 Hz	50/60 Hz
Battery Fuse	N/A	15 A
Nominal Charge Rate	2.5 A	10 A
Equalize Voltage	N/A	13.8/27.6 V
Float Voltage	13.4 V	13.0/26.0 V
Current @ Equalize to Float Transition	N/A	5 A
Battery Under-voltage shutdown	N/A	11/22 V
LED Indicators	No	Yes
AC Line Voltage	N/A	Green LED
Battery Connected and Charging	N/A	Yellow LED
Battery Current Drain	30 mA	30 mA
AC Line Connection	Connector Plug	Connector Plug
Battery Connection	Connector Plug	Connector Plug
Control Connection		AC Power Fail Form Relay Form C 2 A Rating
CUL Recognized	Yes	Yes
NFPA 110 Compliant	No	Yes
AGM Compatible	No	Yes
UL1236	No	Yes
CSA 22.2 No. 107	No	Yes

Generac Power Systems, Inc. | P.O. Box 8 | Waukesha, WI 53187
P: (262) 544-4811

Part No.0191900SBY
Rev. E 08/12/19

INDUSTRIAL GENSET - BATTERY INDEX

• Warranty by Exide Corp. • Exide e-mail: tbgna@exide.com • 800-782-7848 National Hot line

INDUSTRIAL SPARK-IGNITED GENSETS - AVAILABLE BATTERIES

			GENERAC PART #					
Engine	System Voltage	Battery Quantity	058208 (Group 24F)	077483 (Group 26)	058665 (Group 27F)	061119 (Group 31)	061104 (Group 8D)	BT0015A02 (Group 8D)
G2.4	12	1		X				
G4.5	12	1			X	X		
G9.0	12	1			X	X		
G14.2	24	2					X	
G21.9	24	2					X	
G25.8	24	2					X	
G33.9	24	4					X	
G49.0	24	4					X	X

INDUSTRIAL DIESEL GENSETS - AVAILABLE BATTERIES

			GENERAC PART #			
Engine	System Voltage	Battery Quantity	058665 (Group 27F)	061119 (Group 31)	061104/BT0015A00 (Group 8D)	BT0015A02 (Group 8D)
D2.2 Perkins	12	1	X	X		
D2.4 Generac	12	1	X	X		
D3.4 Generac	12	1	X	X		
D4.5 FPT	12	1		X		
D6.7 FPT 100, 130kW	12	1 or 2†		X		
D6.7 FPT 150, 175kW	12	2†		X		
D8.7 FPT	24	2		X		
D10.3 FPT	24	2		X	X	
D12.9 FPT	24	2		X	X	
D12.5 Perkins	24	2			X	
D15.2 Perkins	24	2			X	
D16.0 Volvo	24	2		X	X	
D18.1 Perkins	24	2			X	
D33.9 MHI	24	2			X	X
D37.1 MHI	24	4			X	X
D49.0 MHI	24	4			X	X
D65.4 MHI	24	4			X	X

			DIMENSIONS (in) NOMINAL		
Part Number	Group Number*	Nominal CCA @ 0° F	L	W	H
058208	24F	525	6.75	10.63	9.00
077483	26	525	6.75	8.25	7.75
058665	27F	700	6.75	12.50	9.00
061119	31	925	6.75	13.00	9.40
061104/ BT0015A00	8D	1,155	11.00	20.80	10.00
BT0015A02	8D	1,300	11.00	20.80	10.00

All batteries are 12V, 6 cell construction, lead calcium type.
For 24V systems, batteries are wired in series.

X Battery available with electrolyte and installed in genset.
† Single or dual-paralleled battery options are available on 100 and 130kW. Single-battery option not available on 150 and 175kW.
* BCI Group Size reference.

Part No. 0161970SBY
Rev. L 8/24/20

STATEMENT OF EXHAUST EMISSIONS
2021 Spark-Ignited Generators
QT and RG Series - NON-SCAQMD Certified, Stationary Emergency

	Model	Engine (L)	EPA Engine Family	Fuel	Catalyst Required	EPA Certification #	Grams/bhp-hr.				Rated RPM	BHP	Fuel Flow (lb/hr)
							THC	NMHC	NOx	CO			
Small Spark Ignited Engine (SSIE) Small Off-Road Engines (SORE)	RG022	2.4	MGNXB02.42NN	NG	No	MGNXB02.42NN-012	2.34	2.29	2.15	101.28	1,800	32	14.27
			MGNXB02.42NL	LPV		MGNXB02.42NL-013	1.54	N/A	3.76	95.37	1,800	36	15.31
	RG025	1.5	MGNXB01.52NN	NG		MGNXB01.52NN-008	2.87	0.12	1.57	133.43	3,600	47	20.36
			MGNXB01.52NL	LPV		MGNXB01.52NL-009	1.99	N/A	1.62	134.47	3,600	49	19.60
	RG027	2.4	MGNXB02.42NN	NG		MGNXB02.42NN-012	1.60	1.56	1.77	70.06	1,800	38	16.52
			MGNXB02.42NL	LPV		MGNXB02.42NL-013	1.43	N/A	4.38	86.18	1,800	43	17.59
	RG030	1.5	MGNXB01.52NN	NG		MGNXB01.52NN-008	2.87	0.12	1.57	133.43	3,600	47	20.36
			MGNXB01.52NL	LPV		MGNXB01.52NL-009	1.99	N/A	1.62	134.47	3,600	49	19.60
	RG032	2.4	MGNXB02.42NN	NG		MGNXB02.42NN-012	1.03	1.01	3.86	27.39	1,800	63	26.11
			MGNXB02.42NL	LPV		MGNXB02.42NL-013	0.75	N/A	3.02	69.69	1,800	51	19.64
	RG036	2.4	MGNXB02.42NN	NG		MGNXB02.42NN-012	1.03	1.01	3.86	27.39	1,800	63	26.11
			MGNXB02.42NL	LPV		MGNXB02.42NL-013	0.75	N/A	3.02	69.69	1,800	51	19.64
	RG038	2.4	MGNXB02.42NN	NG		MGNXB02.42NN-012	1.03	1.01	3.86	27.39	1,800	63	26.11
			MGNXB02.42NL	LPV		MGNXB02.42NL-013	0.75	N/A	3.02	69.69	1,800	51	19.64
	RG045	2.4	MGNXB02.42NN	NG		MGNXB02.42NN-012	1.56	1.53	3.94	75.70	3,600	81	34.87
			MGNXB02.42NL	LPV		MGNXB02.42NL-013	0.84	N/A	7.08	40.59	3,600	92	36.52
	RG048	4.5	MGNXB04.52NN	NG		MGNXB04.52NN-014	0.64	0.10	4.48	35.10	1,800	75	25.89
			MGNXB04.52NL	LPV		MGNXB04.52NL-016	0.84	N/A	5.27	64.25	1,800	76	29.51
	RG060, 80	4.5	MGNXB04.52NN	NG		MGNXB04.52NN-014	0.49	0.12	3.36	42.88	1,800	129	45.22
			MGNXB04.52NL	LPV		MGNXB04.52NL-016	0.47	N/A	3.27	59.64	1,800	129	48.96
	RG060	2.4	MGNXB02.42NN	NG		MGNXB02.42NN-012	0.83	0.81	3.21	69.11	3,600	107	43.84
			MGNXB02.42NL	LPV		MGNXB02.42NL-013	0.92	N/A	2.17	138.95	3,600	107	47.24

NG: Natural Gas
LPV: Liquid Propane Vapor

N/A: Non Applicable
Refer to Page 2 for Definitions and Advisory Notes

STATEMENT OF EXHAUST EMISSIONS
2021 Spark-Ignited Generators
QT and RG Series - NON-SCAQMD Certified, Stationary Emergency

2020 EPA SPARK-IGNITED EXHAUST EMISSIONS DATA

Effective since 2009, the EPA has implemented exhaust emissions regulations on stationary spark-ignited (gaseous) engine generators for emergency applications. All Generac spark-ignited gensets, including SG, MG, QTA, QT and RG series gensets that are built with engines manufactured in 2009 and later meet the requirements of 40CFR part 60 subpart JJJJ and are EPA certified. These generator sets are labeled as EPA Certified with decals affixed to the engines' valve covers.

The attached documents summarize the general information relevant to EPA certification on these generator sets. This information can be used for submittal data and for permitting purposes, if required. These documents include the following information:

EPA Engine Family
The EPA Engine Family is assigned by the Manufacturer under EPA guidelines for certification purposes and appears on the EPA certificate.

Catalyst Required
Indicates whether a three-way catalyst (TWC) and Air/Fuel Ratio control system are required on the generator set to meet EPA certification requirements. Generally, units rated 80kW and smaller do not require a TWC to meet EPA certification requirements. Please note that some units that do not require a TWC to meet EPA requirements do need one if the California SCAQMD option is selected. Please see "California SCAQMD" below for additional information on this option.

Combination Catalyst or Separate Catalyst
SG and MG series generator sets typically utilize a single combination catalyst/silencer as part of meeting EPA certification requirements. Many QT and RG series generator sets use the same engines as SG series units, but have different exhaust configurations that require the use of conventional silencers with additional separate catalysts installed.

EPA Certificate Number
Upon certification by the EPA, a Certificate Number is assigned by the EPA.

Emissions Actuals - Grams/bhp-hr
Actual exhaust emission data for Total Hydrocarbons (THC), Nitrogen Oxides (NOx) and Carbon Monoxide (CO) that were submitted to EPA and are official data of record for certification. This data can be used for permitting if necessary. Values are expressed in grams per brake horsepower-hour; to convert to grams/kW-hr, multiply by 1.341. Please see advisory notes below for further information.

California Units, SCAQMD CEP Number
A separate low-emissions option is available on many Generac gaseous-fueled generator sets to comply with the more stringent South Coast Air Quality Management District requirements that are recognized in certain areas in California. Gensets that include this option are also EPA Certified.

General Advisory Note to Dealers

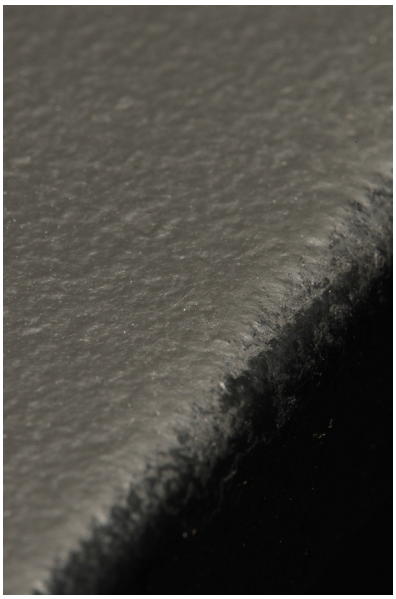
The information provided here is proprietary to Generac and its' authorized dealers. This information may only be disseminated upon request, to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Generac Power Systems, Inc..

Advisory Notes on Emissions Actuals

- The stated values are actual exhaust emission test measurements obtained from units representative of the generator types and engines described.
- Values are official data of record as submitted to the EPA and SCAQMD for certification purposes. Testing was conducted in accordance with prevailing EPA protocols, which are typically accepted by SCAQMD and other regional authorities.
- No emission values provided are to be construed as guarantees of emissions levels for any given Generac generator unit.
- Generac Power Systems, Inc. reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emissions performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and must be consulted by the permit applicant/equipment owner prior to equipment purchase or installation. The data supplied herein by Generac Power Systems, Inc. cannot be construed as a guarantee of installability of the generator set.
- The emission values provided are the result of multi-mode, weighted scale testing in accordance with EPA testing regulations, and may not be representative of any specific load point.
- The emission values provided are not to be construed as emission limits.

Part No. A0001269086
Rev. A 11/24/20

RhinoCoat™



Generac's RhinoCoat™ finish system provides superior durability as a standard for all Generac Industrial enclosures, tanks and frames.*

Testing Standards

Generac's RhinoCoat™ finished surfaces are subjected to numerous tests. These include:

- ASTM D - 1186 - 87.....2.5+ MIL Paint Thickness
- ASTM D - 3363 - 92a.....Adequate Material Hardness
- ASTM D 522 - B.....Resistant to Cracking
- ASTM D 3359 - B.....Exceptional Adhesion
- ASTM B117 D 1654.....Resistant to Salt Water Corrosion
- ASTM D1735 D 1654.....Resistant to Humidity
- ASTM 2794 93 (2004).....Exceptional Impact Resistance
- SAEJ1690 - UV Specifications.....UV Protection

In addition to the testing standards above, Generac adds the following test requirements more specific to generator applications:

- Resistant to Typical Oils
- Resistant to Typical Fuels
- Resistant to Typical Antifreeze
- Resistant to Distilled Water

Primary Codes and Standards

*RhinoCoat™ powder coat paint is durable and corrosion resistant however it is not a rust preventative. Generac pretreats all powder coated parts to assist with resistance to corrosion.

Generac Power Systems, Inc. | P.O. Box 8 | Waukesha, WI 53187
P: (262) 544-4811

Part No. 0180230SBY
Rev. F 11/16/19

GENERATOR ENCLOSURES

DESCRIPTION

GENERAC POWER SYSTEMS' generator enclosures provide year-round weather protection for your power equipment. Engineered with functionality and value in mind, the enclosure design benefits are unique in that the enclosures utilize dimensionally matched components for either a weather protective configuration or a sound attenuated/acoustic configuration. With common components used between design, modification and on-site upgrades can be accomplished with ease.

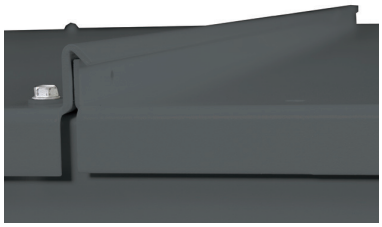
The enclosure design offers several benefits over the "standard enclosures" of other manufacturers. Generac's enclosures have been created with the goal of maximizing the customer's product performance satisfaction while maintaining the functionality of reducing exterior noise levels and discouraging product tampering.

Although others may require a "premium" for a self-enclosed exhaust system, rugged steel panel construction or protective polyethylene washers under all exterior panel fasteners, Generac includes these and several other features on every enclosure configuration. Be sure to compare. Generac Enclosures offer additional design enhancement extras that other "standard enclosures" do not.

Doc No. 0163180SBY
Rev. E 06/10/19

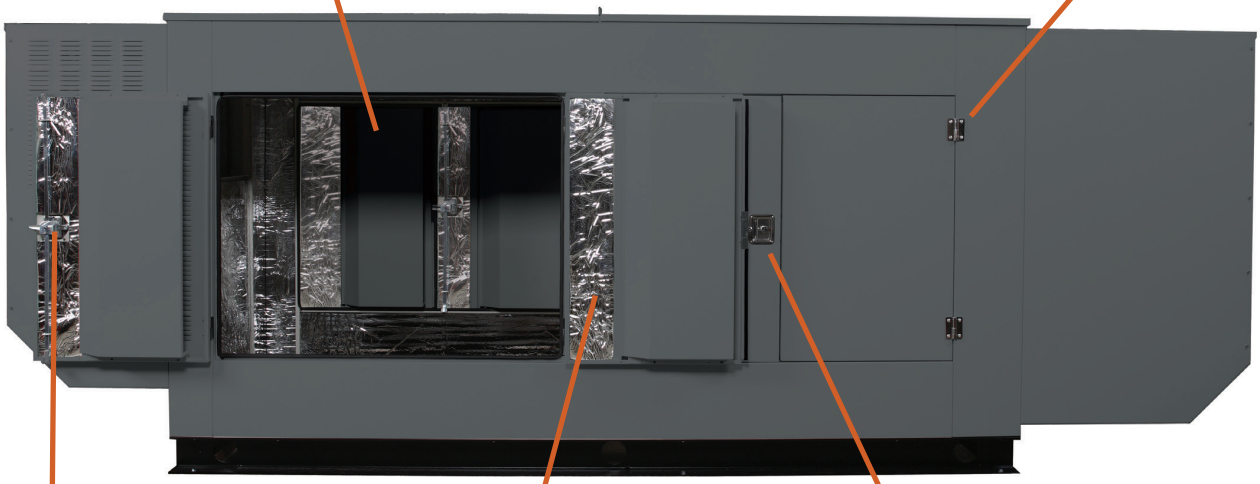
GENERATOR ENCLOSURES

Post-Free Twin Doors
Provide Large, Unobstructed Service Access



Gasket-Free, Interconnected Roof Panel Joint
Drip-Free, Maintenance-Free

Heavy Gauge, Stainless Steel, Partial Pin Hinges with Nylon Spacers
Durable, Corrosion-Free, Removable Doors



Two-Point Door Latch System
Ensures Proper Seal Preventing Water Ingress and Sound Egress

Dense, Closed-Cell Foam Insulation with Reflective Silver Mylar Layer
Improved Sound Attenuation Without Damaging Effects From Radiant Heat Exposure

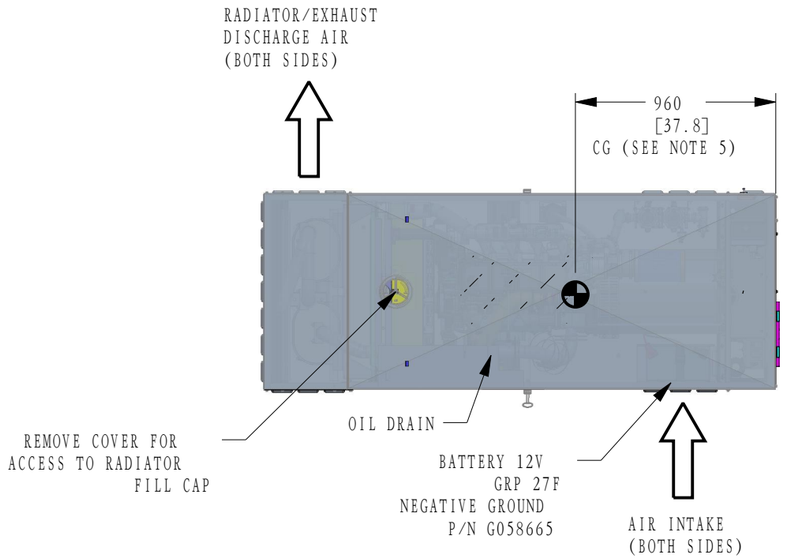
Lockable Turn and Tuck Stainless Steel Latch Handle
Corrosion-Free, Non-Protruding and Secure

Doc No. 0163180SBY
Rev. E 06/10/19

GENERATOR ENCLOSURES

FEATURES:	BENEFITS:
Dimensional matching of acoustic and non-acoustic enclosure designs	Reduces variation in fuel tank pricing, inventory; removes need to change out fuel tank or retrofit
Standardized enclosure components *	Ease of retrofit or upgrade to acoustic system; reduced parts inventory, costs
Enclosure mounted directly to unit baseframe	Simplified delivery and installation with enclosure and unit in single component design
Electrostatically painted panels	Maximum protection from weather elements
12 or 14 gauge steel based on kW rating	Maximum sound attenuation, protection and product life
Aluminum Enclosure optional	Prevents corrosion in coastal regions
Stainless steel door latch and hinge hardware	Provides extended component life; maximum protection against rusting
Stainless steel door latch strike plate	Maximum protection against enclosure paint damage from door latch pin
Door hinges utilize slip-pin design	Provides quick door removal for full-unit access
Polyethylene gasketing under door hinges	Additional protection for enclosure paint finish
Keyed door latches	Protection for equipment and personnel
Large removable access doors	Ease of maintenance
Relocation of access doors	Provides improved access to MLCB on all units
Redesigned door gasketing	Improved sealing quality from sound and weather elements
Weather resistant aluminum roof design with drip ledge	Provides optimum moisture/rain runoff from unit
Cabled and gasketed radiator access cover	Provides improved radiator access and additional protection from weather elements
Acoustic roof panels manufactured with mechanical retention pins	Increased acoustic foam retention within unit
Polyethylene washers under all panel fasteners	Additional paint finish protection from stainless steel fastener
Internally fastened enclosure panels (where possible)	Provides streamlined unit appearance
Additional roof panel stiffener	Added overall compartment rigidity and acoustic foam panel retention
Self-enclosed exhaust system	Provides safe unit operation; no enclosure hot spots; streamlined unit appearance
Discharge air duct has been designed with minimal fasteners	Ease of removal and access to exhaust system
Stainless steel exhaust band clamps	Provides extended component life; ensures proper exhaust seal
Drain holes within air ducts	Enables maximum water run-off
Rodent-proof, tamper proof enclosure design	Safety and security for personnel and equipment
Redesigned baseframe lifting lugs	Ease of unit relocation; prevents compartment damage from lifting straps
Up to 200 MPH wind kit options (Contact Factory for Availability)	Meets locally enforced wind requirements

* Consult Generac Power Systems, Inc. for installation drawings for specific configurations and dimensions.



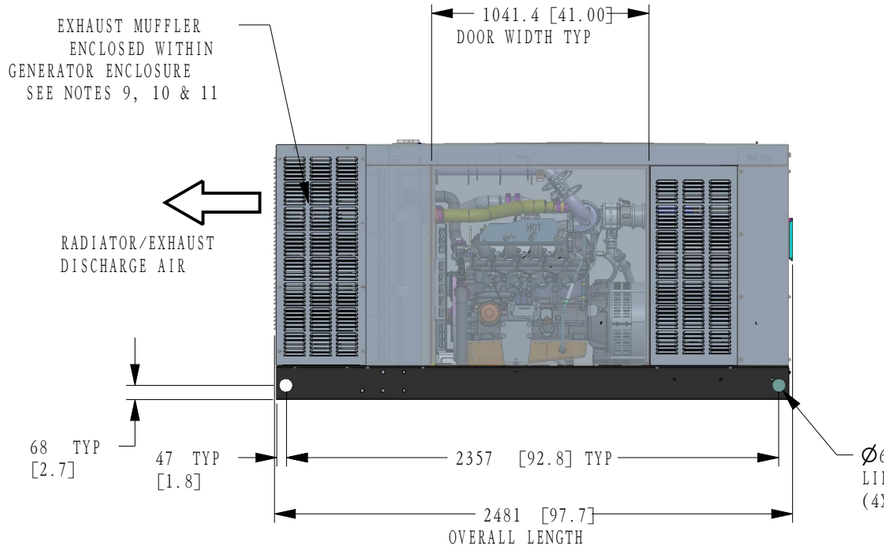
TOP VIEW

SERVICE ITEM	4.5L
OIL FILL CAP	LEFT SIDE
OIL DIP STICK	LEFT SIDE
OIL FILTER	LEFT SIDE
OIL DRAIN HOSE	LEFT SIDE
RADIATOR DRAIN HOSE	RIGHT SIDE
COOLANT RECOVERY BOTTLE	RIGHT SIDE
RADIATOR FILL CAP	ROOF TOP
AIR CLEANER ELEMENT	EITHER SIDE
SPARK PLUGS	LEFT SIDE
MUFFLER	SEE NOTE 11
FAN BELT	EITHER SIDE
BATTERY	LEFT SIDE

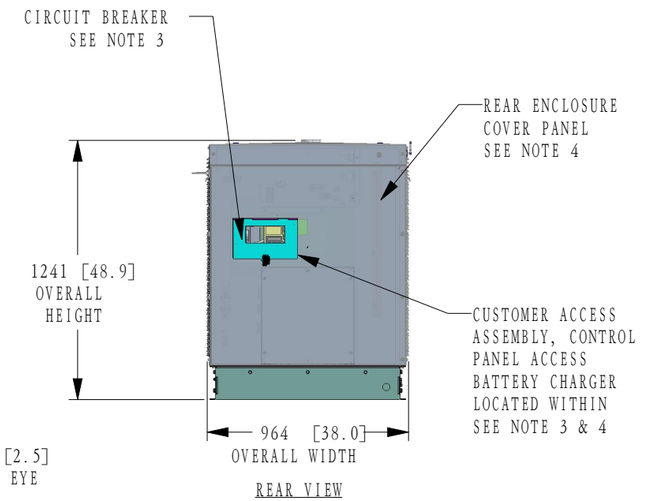
REFERENCE OWNERS MANUAL
FOR PERIODIC REPLACEMENT
PART LISTINGS.

NOTES:

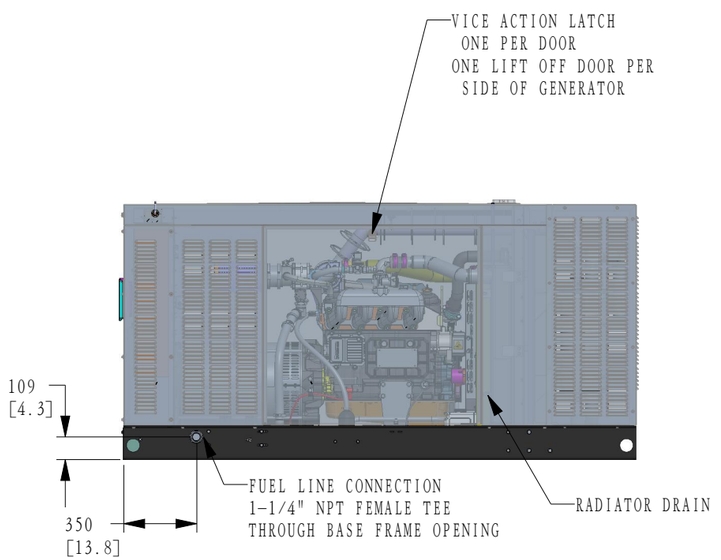
1. MINIMUM RECOMMENDED CONCRETE PAD SIZE: (6" LARGER PER SIDE THAN GENERATOR) 1269 (50") WIDE 2786 (110") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES.
2. ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
   – SEE SPECIFICATION SHEET OR OWNERS MANUAL
   – ACCESSIBLE THROUGH CUSTOMER ACCESS ASSEMBLY ON REAR OF GENERATOR.
4. INSIDE STUB–UP AREA FOR AC LOAD LEAD CONDUIT CONNECTION, NEUTRAL CONNECTION, BATTERY CHARGER 120 VOLT AC (.5 AMP MAX) CONNECTION AND ACCESS TO TRANSFER SWITCH CONTROL WIRES. REMOVE REAR COVER FOR ACCESS.
5. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
6. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
7. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
8. RECOMMENDED MOUNTING BOLTS OR STUDS TO MOUNTING SURFACE SHALL BE 1/2" DIAMETER (USE STANDARD SAE TORQUE SPECS)
9. MUST ALLOW FREE FLOW OF INTAKE AIR, DISCHARGE AIR AND EXHAUST. SEE SPEC SHEET FOR MINIMUM AIR FLOW AND MAXIMUM RESTRICTION REQUIREMENTS.
10. GENERATOR MUST BE INSTALLED SUCH THAT FRESH COOLING AIR IS AVAILABLE AND THAT DISCHARGE AIR FROM RADIATOR IS NOT RECIRCULATED.
11. REMOVE FRONT END PANEL TO ACCESS EXHAUST MUFFLER. ACCESS AVAILABLE THROUGH DOORS TO FAN BELT.



LEFT VIEW



REAR VIEW



RIGHT VIEW

WEIGHT DATA				
ENGINE/KW	ENCLOSURE MATERIAL	WEIGHT GENSET ONLY KG [LBS]	WEIGHT SHIPPING SKID KG [LBS]	SHIPPING WEIGHT KG [LBS]
4.5L/60KW	AL	857 (1890)	79 [175]	936 (2064)
4.5L/80KW	AL	903 (1990)	79 [175]	983 (2165)

DRAWING CREATED FROM PRO/ENGINEER
3D FILE. ECO MODIFICATION TO BE
APPLIED TO SOLID MODEL ONLY.

DIMENSIONS: MM [INCH]

INSTALLATION DRAWING

ELECTRONICALLY APPROVED
INSIDE WINDCHILL

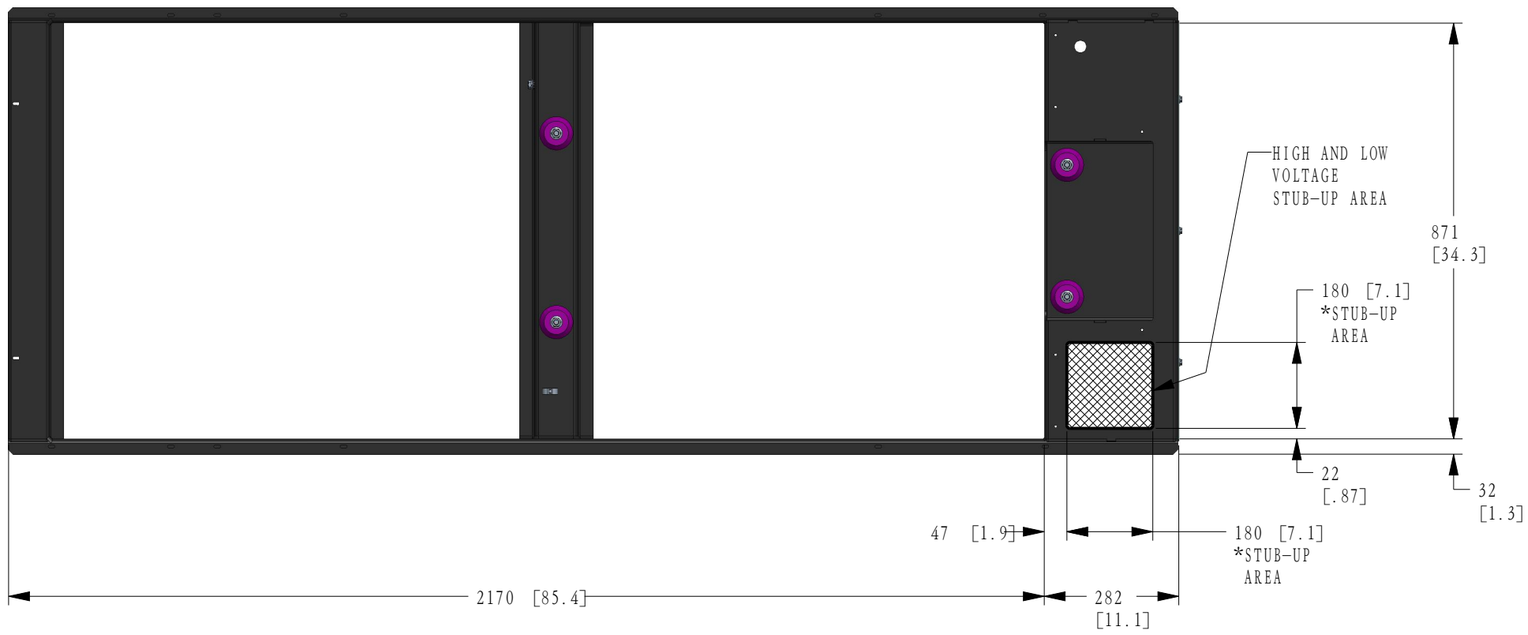
GENERAC

TITLE
INSTALL G4.5L G26 60–80KW C3

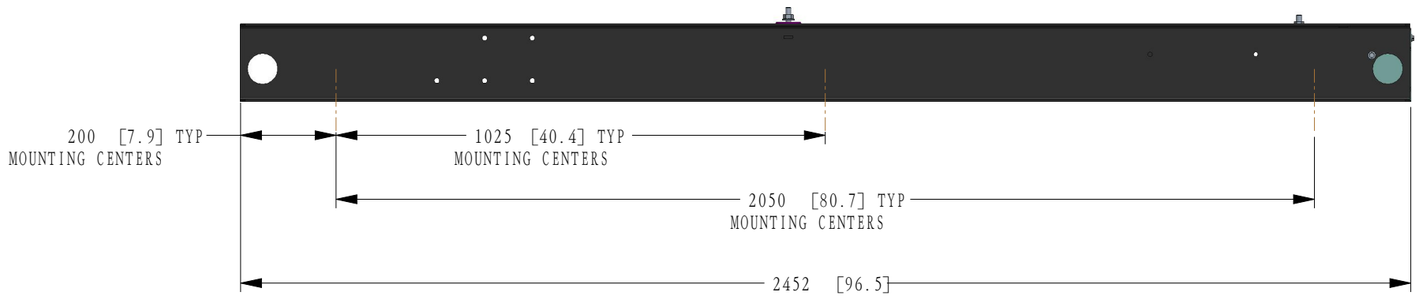
ISSUE DATE:

SIZE	CAGE NO	DWG NO	REV
B	N/A	A0000293264	C
SCALE 0.035	WT–KG	SHEET 1 of 2	

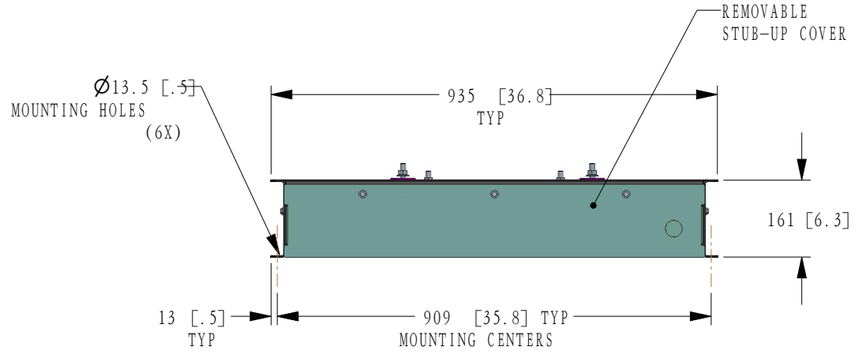
*NOTE:
STUB-UP AREA FOR HIGH AND LOW VOLTAGE CONNECTIONS, CIRCUIT BREAKER, NEUTRAL AND CUSTOMER CONNECTION OPENING.



TOP VIEW



LEFT VIEW



REAR VIEW

DRAWING CREATED FROM PRO/ENGINEER 3D FILE. ECO MODIFICATION TO BE APPLIED TO SOLID MODEL ONLY.

INSTALLATION DRAWING

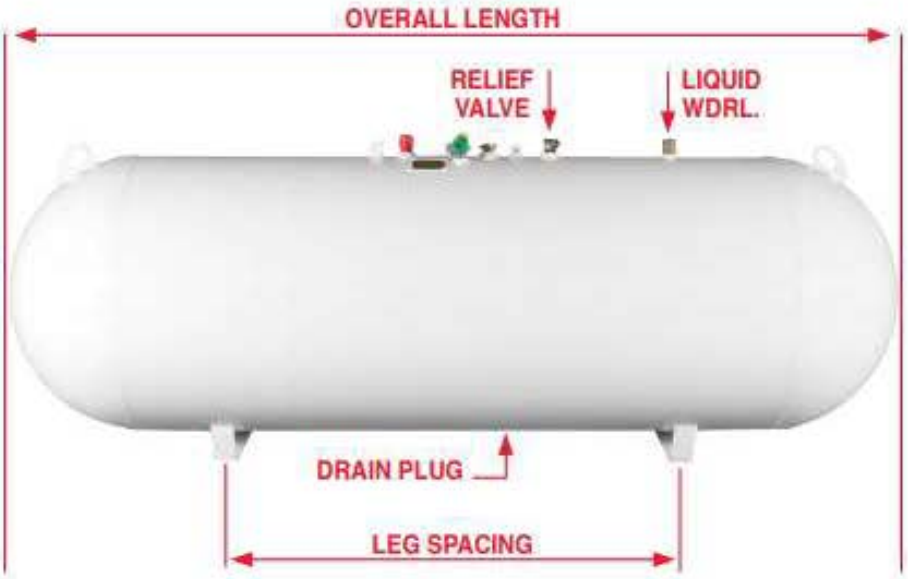
ELECTRONICALLY APPROVED
INSIDE WINDCHILL

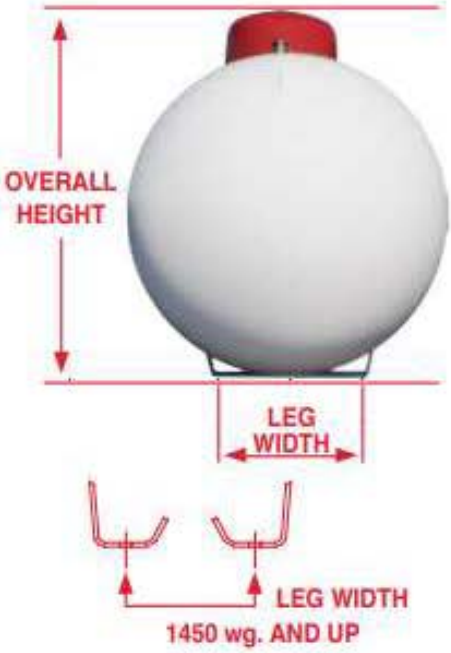
GENERAC

TITLE
INSTALL STUB-UP VIEW
G4.5L G26 60-80KW C3

ISSUE DATE:

SIZE	CAGE NO	DWG NO	REV
B	N/A	A0000293264	C
SCALE 0.080	WT-KG	SHEET 2 of 2	





APPROXIMATE ABOVEGROUND VESSEL DIMENSIONS AND SPECIFICATIONS

WATER CAPACITY	DIAMETER (OD)	HEAD TYPE	OVERALL LENGTH	OVERALL HEIGHT	LEG** WIDTH	LEG** SPACING	WEIGHT (lbs.)	***QUANTITY	
								FULL LOAD	PER STACK
*120 wg.	24"	Ellip.	5'-8"	2'-10"	1'-1 1/2"	2'-10 1/2" or 3'-11"	260	108 | 112	16 | 14
*250 wg.	30"	Hemi.	7'-10"	3'-6"	1'-5"	4'-11"	480	54	9
*320 wg.	30"	Hemi.	9'-7"	3'-6"	1'-5"	5'	620	45	9
500 wg.	37 1/2"	Hemi.	10'	4'	1'-8"	5'	950	37 | 30	8 | 6
1000 wg.	41"	Hemi.	16'	4'-3"	1'-8"	10'-1"	1,800	15	5
1450 wg.	46 1/2"	Ellip.	17'-4"	4'-9"	1'-9"	11'-7"	2,650	12	4
1990 wg.	46 1/2"	Ellip.	23'-11"	4'-9"	1'-9"	16'	3,520	8	4

Dimensions and specifications shown are approximate. Individual vessels may vary.

GENERAC®

INDUSTRIAL POWER

Factory & Field Test Reports

PAPÉ

POWER SYSTEMS

GENERAC®

INDUSTRIAL POWER

Warranty Statement

PAPÉ

POWER SYSTEMS

Generac Power Systems 5 Year (5M) Limited Warranty for Residential and Commercial Standby Generators

For the period of warranty noted below, and upon the successful start-up and/or on-line activation of the unit, Generac Power Systems, Inc. "Generac" warrants that its Generator and/or transfer switch system will be free from defects in material and workmanship for the items and period set forth below. Generac will, at its discretion, repair or replace any part(s) which, upon evaluation, inspection and testing by Generac or an Authorized Generac Service Dealer, is found to be defective. Any equipment that the purchaser/owner claims to be defective must be evaluated by the nearest Authorized Generac Service Dealer. Emissions components are excluded from coverage under this extended warranty. Emissions warranty coverage is detailed in a separate emissions warranty.

Warranty Coverage: Warranty coverage period is for Five (5) years or two-thousand (2,000) hours, whichever occurs first.

Warranty Coverage Year(s)	1-2	3	4-5
USA, USA Territories, Canada	Parts, Labor and Limited Travel	Parts Only	Major Parts Component Only
International[1]	Parts, Labor and Limited Travel	Parts Only	None

[1] *Units sold for international use are limited to 1,000 hours of use.*

Guidelines:

1. Warranty begins upon the successful start-up and/or on-line activation of the unit.
2. Unit must be registered and proof of purchase available
3. Any and all warranty repairs and/or concerns must be performed and/or addressed by an Authorized/Certified Generac Service Dealer, or branch thereof. Repairs or diagnostics performed by individuals other than Authorized/Certified Generac Service Dealers not authorized in writing by Generac will not be covered.
4. This Warranty is transferable between ownership of original install site.
5. Generac supplied engine coolant heaters (block-heaters), heater controls and circulating pumps are only covered during the first year of the warranty provision.
6. Generac may choose to repair, replace or refund a piece of equipment in its sole discretion.
7. Enclosures are warranted against rust for the first year of ownership only. Damage caused after receipt of generator is the responsibility of the owner and is not covered by this warranty. Nicks, scrapes, dents or scratches to the painted enclosure should be repaired promptly by the owner.
8. Warranty only applies to permanently wired and mounted units.
9. Damage to any covered components or consequential damages caused by the use of a non-OEM part will not be covered by the warranty.
10. Proof of performance of all required maintenance must be available.
11. Travel allowance is limited to 100 miles maximum and three (3) hours maximum (per occurrence, whichever is less) round trip from the nearest Authorized Generac Dealer. Any additional travel required will not be covered.

The following will NOT be covered by this warranty:

1. Costs of normal maintenance (i.e. tune-ups, associated part(s), adjustments, loose/leaking clamps, installation and start-up).
2. Damage/failures to the generator and/or transfer switch system caused by accidents, shipping, handling, or improper storage.
3. Damage/failures caused by operation with improper fuels, speeds, loads or installations other than what's recommended or specified by Generac Power Systems.
4. Damage to the generator and/or transfer switch due to the use of non-Generac parts and/or equipment, contaminated fuels, oils, coolants/antifreeze or lack of proper fuels, oil or coolants/antifreeze.
5. Failures due to normal wear and tear, accident, misuse, abuse, neglect, improper installation, improper sizing, or rodent, reptile, and/or insect infestation.
6. Rental equipment used while warranty repairs are being performed and/or any extraordinary equipment used for removal and/or reinstallation of generator (i.e. cranes, hoists, lifts, et. al.).
7. Planes, ferries, railroad, buses, helicopters, snowmobiles, snowcats, off-road vehicles or any other mode of transport deemed not standard by Generac.
8. Products that are modified or altered in a manor not authorized by Generac in writing.
9. Starting batteries, fuses, light bulbs, engine fluids and any related labor.
10. Steel enclosures that rust as a result of improper installation, location in a harsh or salt water environment, or are scratched where the integrity of applied paint is compromised.
11. Units sold, rated or used for "Prime Power", "Trailer Mounted" or "Rental Unit" applications as defined by Generac. Contact an Authorized Generac Service Dealer for definitions.
12. Shipping costs associated with expedited shipping.
13. Additional costs for overtime, holiday or emergency labor costs for repairs outside of normal business hours.
14. Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
15. Failures caused by any act of God or external cause including without limitation, fire, theft, freezing, war, lightning, earthquake, windstorm, hail, water, tornado, hurricane, or any other matters which are reasonably beyond the manufacturer's control.

THIS WARRANTY SUPERSEDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. SPECIFICALLY, GENERAC MAKES NO OTHER WARRANTIES AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY IMPLIED WARRANTIES WHICH ARE ALLOWED BY LAW, SHALL BE LIMITED IN DURATION TO THE TERMS OF THE EXPRESS WARRANTY PROVIDED HEREIN. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. GENERAC'S ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF GENERAC'S NEGLIGENCE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU ALSO HAVE OTHER RIGHTS FROM STATE TO STATE.

FOR AUSTRALIA ONLY: Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. For Service or other product inquiries in Australia, please contact Allpower by phone at 1800-333-428 or visit Allpower's website at www.allpower.com.au.

FOR NEW ZEALAND ONLY: Nothing in this warranty statement excludes, restricts or modifies any condition, warranty right or remedy which pursuant to the New Zealand Legislation (Commonwealth or State) including the Fair Trading Practices Act of 1986 or the Consumer Guarantees Act 1993 ("CGA") applies to this limited warranty and may not be so excluded, restricted or modified. Nothing in this statement is intended to have the effect of contracting out of the provisions of the CGA, except to the extent permitted by that Act, and these terms are to be modified to the extent necessary to give effect to that intention. If you acquire goods from Generac Power Systems or any of its authorized resellers and distributors for the purposes of a business, then pursuant to section 43(2) of the CGA, it is agreed that the provisions of the CGA do not apply. For Service or other product inquiries in New Zealand, please contact Allpower by phone at 09-269-1160 or visit Allpower's website at www.allpower.com.nz.

GENERAC POWER SYSTEMS, INC. • P.O. BOX 8 • Waukesha, WI, USA 53187
Ph: (888) GENERAC (436-3722) • Fax: (262) 544-4851

To locate the nearest Authorized Dealer and to download schematics, exploded views and parts lists
visit our website: www.generac.com

Part No. 0L0258 Revision E (9/15)

United States Environmental Protection Agency Warranty Statement (Stationary Emergency Spark-Ignited Generators)

Warranty Rights, Obligations and Coverage

The United States Environmental Protection Agency (EPA) and Generac Power Systems, Inc. (Generac) are pleased to explain the Emission Control System Warranty on your new stationary emergency engine. If during the warranty period, any emission control system or component on your engine is found defective in materials or workmanship, Generac will repair your engine at no cost to you for diagnosis, replacement parts and labor provided it be done by a Generac Authorized Warranty Service Facility. Your emission control system may include parts such as the fuel metering, ignition, and exhaust systems and other related emission related components listed below. Generac will warrant the emissions control systems on your 2009 and later model year engines provided there has been no abuse, neglect, unapproved modification, or improper maintenance of your engine. For engines less than 130 HP the warranty period is two years from the date of sale to the ultimate purchaser. For engines greater than or equal to 130 HP the warranty period is three years or 2500 hours of operation, whichever comes first, from the date of the engine being placed into service. For high-cost warranted components, the Emission Control System warranty is valid for 5 years or 3500 hours of operation, whichever comes first.

Purchaser's/Owner's Warranty Responsibilities

As the engine purchaser/owner you are responsible for the following: 1) The engine must be installed and configured in accordance to Generac's installation specifications. 2) The completion of all maintenance requirements listed in your Owner's Manual. 3) Any engine setting adjustment must be done in accordance and consistent with the instructions in the Owner's Manual. 4) Any emission control system or component must be maintained and operated appropriately in order to ensure proper operation of the engine and control system to minimize emissions at all times.

Generac may deny any/or all Emission Control System Warranty coverage or responsibility of the engine, or an emission control system or component on your engine thereof, if it has failed due to abuse, neglect, unapproved modification or improper maintenance, or the use of counterfeit and/or “gray market” parts not made, supplied or approved by Generac. Warranty service can be arranged by contacting either your selling dealer or a Generac Authorized Warranty Service dealer, 1-800-333-1322 for the dealer nearest you. The purchaser/owner shall be responsible for any expenses or other charges incurred for service calls and/or transportation of the product to/from the inspection or repair facilities. The purchaser/owner shall be responsible for any and/or all damages or losses incurred while the engine is being transported/shipped for inspection or warranty repairs. Contact Generac Power Systems Inc. for additional Emission Control System Warranty related information, Generac Power Systems, Inc., PO. Box 8, Waukesha, WI 53187, or call 1-800-333-1322 or www.generac.com.

Important Note

This warranty statement explains your rights and obligations under the Emission Control System Warranty, which is provided to you by Generac pursuant to federal law. Note that this warranty shall not apply to any incidental, consequential, or indirect damages caused by defects in materials or workmanship or any delay in repair or replacement of the defective part(s). This warranty is in place of all other warranties, expressed or implied. Specifically, Generac makes no other warranties as to the merchantability or fitness for a particular purpose. Any implied warranties which are allowed by law, shall be limited in duration to the terms of the express warranty provided herein. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Emission Related Parts Include the Following (if so equipped)

1) Fuel Metering System

1.1) Gasoline Carburetor Assembly and Internal Components
A) Fuel Filter, B) Carburetor, C) Fuel Pump

1.2) Carburetion Assembly and Its Components
A) Fuel Controller, B) Carburetor and Its Gaskets, C) Mixer and Its Gaskets, D) Primary Gas Regulator, E) Liquid Vaporizer

1.3) Fuel Regulator

2) Air Induction System Including A) Intake Pipe/Manifold, B) Air Cleaner

3) Ignition System Including A) Spark Plug, B) Ignition Module, C) Ignition Coil, D) Spark Plug Wires

4) Exhaust System
A) Catalyst Assembly*, B) Exhaust Manifold, C) Muffler, D) Exhaust Pipe, E) Muffler Gasket

5) Crankcase Breather Assembly Including
A) Breather Connection Tube, B) PCV Valve

6) Oxygen Sensor

7) Diagnostic Emission-Control System

*High-Cost Warranted Component

United States Environmental Protection Agency Compliance Requirements (Stationary Emergency Spark-Ignited Generators)

Purchaser's/Owner's Record Keeping Responsibilities

The United States Environmental Protection Agency (EPA) and Generac Power Systems, Inc. (Generac) are pleased to explain your record keeping requirements for compliance with Subpart JJJJ- Standards of Performance for Stationary Spark Ignition Internal Combustion Engines as listed in the Electronic Code of Federal Regulations Title 40 Part 60. As the engine purchaser/owner who operates and maintains their certified emergency stationary engine and emission control system according to applicable emission related guidelines as specified in this Owner's Manual, you are required to meet the following notification and record keeping requirements to demonstrate compliance: 1) Maintain documentation that the engine is certified to meet emission standards. 2) Record keeping of maintenance conducted. 3) Record keeping of the provision allowing natural gas engines to operate using propane for a maximum of 100 hours per year as an alternate fuel solely during emergency operations provided the engine is not certified to operate on propane. 4) Meet all compliance notifications submitted to the purchaser/owner and maintain all supporting documentation. 5) Record keeping of hours of operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. For emergency engines greater than or equal to 130 HP, record keeping of hours of operation begins January 1, 2011. For emergency engines less than 130 HP, record keeping of hours of operation begins January 1, 2009; engines are equipped with non-resettable hour meters to facilitate record keeping.

Specific Air Quality Management or Air Pollution Control Districts may have different and additional record keeping/reporting requirements. Your permit to construct and/or operate the engine may be contingent upon compliance with those requirements. Check with your local Air Quality Management or Air Pollution Control District for specific requirements.

Emergency stationary internal combustion engines (ICE) may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, Generac, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The purchaser/owner may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing.

The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity. For purchaser/owner of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section is prohibited.

If you operate and maintain your certified emergency stationary SI internal combustion engine and emissions control systems in accordance to the specifications and guidelines in this Owner’s Manual, EPA will not require engine performance testing. If not, your engine will be considered non-certified and you must demonstrate compliance according to Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines as listed in the Electronic Code of Federal Regulations Title 40 Part 60.

Emission-Related Installation Instructions

Your certified emergency stationary engine has pre-set emission control systems or components that require no adjustment. Inspection and replacement of an emissions related component is required to be done so in accordance with the requirements cited in the United States Environmental Protection Agency Warranty Statement or can be arranged by contacting either your selling dealer or a Generac Authorized Warranty Service dealer, 1-800-333-1322 for the dealer nearest you. Failing to follow these instructions when installing a certified engine in a piece of non-road equipment violates federal law 40 CFR 1068.105 (b), subject to fines or penalties as described in the Clean Air Act.

GENERAC®

INDUSTRIAL POWER

Operation Owners Manuals

PAPÉ

POWER SYSTEMS

Owner's Manual

For

Spark-Ignited Stationary Emergency Generators

Residential and Commercial

22 kW	**2.4L**
25 kW	**1.5L**
27 kW	**2.4L**
30 kW	**1.5L**
32 kW	**2.4L**
36 kW	**2.4L**
38 kW	**2.4L**
45 kW	**2.4L**
48 kW	**5.4L**
60 kW	**2.4L**

⚠ DANGER!

⚠ **NOT INTENDED FOR USE IN CRITICAL LIFE SUPPORT APPLICATIONS.**

⚠ **ONLY QUALIFIED ELECTRICIANS OR CONTRACTORS SHOULD ATTEMPT INSTALLATION!**

⚠ **DEADLY EXHAUST FUMES! OUTDOOR INSTALLATION ONLY!**

This manual should remain with the unit.

This manual must be used in conjunction with the appropriate installation manual.

Para español , visita: http://www.generac.com/service-support/product-support-lookup

Pour le français, visiter : http://www.generac.com/service-support/product-support-lookup

Use this page to record important information about the generator set.

For quick and easy reference, copy the information printed on the Unit Identification Label onto the sample label printed here. The Unit Identification Label is located on the base frame adjacent to the front engine mount on all models.

When contacting an Independent Authorized Service Dealer about parts and/or service, always provide the complete model number and serial number.

Operation and Maintenance: Proper maintenance and care of the generator ensures safe operation and longer service life while also keeping operating expenses to a minimum. It is the operator's responsibility to perform all safety checks, to make sure that all maintenance is performed promptly, and to have the equipment checked periodically by an Independent Authorized Service Dealer.

Normal maintenance, service and replacement of parts are the responsibility of the owner/operator, and are not considered defects in materials or workmanship within the terms of the warranty. Individual operating habits and usage may contribute to the need for additional maintenance or service.

When the generator requires servicing or repairs, contact an Independent Authorized Service Dealer for assistance. Authorized service technicians are factory-trained and are capable of handling all service needs.

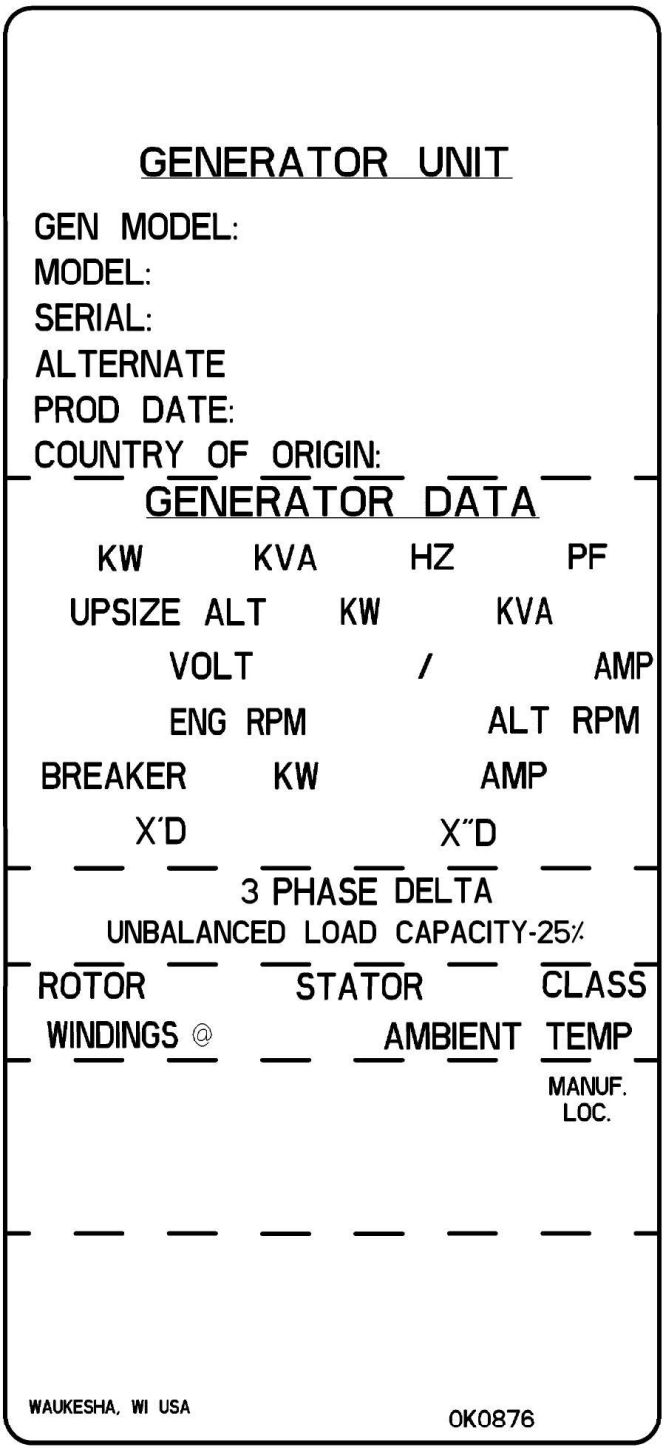
AUTHORIZED SERVICE DEALER LOCATION

To locate the nearest INDEPENDANT AUTHORIZED SERVICE DEALER, please call this number:

1-800-333-1322

or visit the dealer locator at:

www.generac.com/Service/DealerLocator/



SAMPLE LABEL

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Section 4 Operation

Section 5 Maintenance

⚠WARNING

California Proposition 65. Engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm. (000004)

⚠WARNING

California Proposition 65. This product contains or emits chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm. (000005)

Section 1 Safety

1.1 — Introduction

Thank you for purchasing this stationary automatic standby generator set. Every effort was made to ensure that the information in this manual was both accurate and complete at the time it was released. However, the manufacturer reserves the right to change, alter or otherwise improve this product at any time without prior notice.

This generator is designed to automatically supply electrical power to operate critical loads during a utility power failure. The unit is factory installed in an all-weather metal enclosure and **is intended exclusively for outdoor installation** using either Natural gas (NG) or Liquid Propane vapor (LPV).

NOTE: All 22-48 kW units are field convertible between NG or LPV, while 60 kW units are built per fuel requirements and are not field convertible.

When properly sized, the generator is suitable for supplying typical residential/commercial loads, such as induction motors (sump pumps, refrigerators, freezers, air conditioners, furnaces, etc.), electronic components (computers, monitors, televisions, etc.), lighting, microwaves, and other residential and business loads.

READ THIS MANUAL THOROUGHLY: The operator is responsible for proper and safe use of this equipment. Read and thoroughly understand the contents of this manual before attempting to use the equipment. If any portion of this manual is not fully understood, contact the nearest Independent Authorized Service Dealer for assistance.

SAVE THESE INSTRUCTIONS: The manufacturer suggests that this manual and the rules for safe operation be copied and posted near the generator installation site. Safety should be stressed to all operators and potential operators of this equipment.

SAFETY: Throughout this manual, and on tags and decals affixed to the unit, DANGER, WARNING, CAUTION and NOTE blocks are used to alert personnel to special instructions about a particular operation, function or service that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Their definitions are as follows:

⚠ DANGER!

INDICATES A HAZARDOUS SITUATION OR ACTION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.

⚠ WARNING!

Indicates a hazardous situation or action which, if not avoided, could result in death or serious injury.

⚠ CAUTION!

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTE: Notes contain additional information important to an operation or procedure.

Four commonly used safety symbols accompany the DANGER, WARNING and CAUTION blocks. The type of information each indicates is as follows:

This symbol points out important Safety Information that, if not followed, could endanger personal safety and/or property of others.

This symbol points out a potential Explosion Hazard.

This symbol points out a potential Fire Hazard.

This symbol points out a potential Electrical Shock Hazard.

These “Safety Alerts” cannot eliminate the hazards that they signal. Strict compliance with these special instructions, plus common sense, are major accident prevention measures.

1.2 — Safety Information

Study these safety rules carefully before operating or servicing this equipment. Become familiar with this Owner's Manual and with the unit. The generator can operate safely, efficiently and reliably only if it is properly installed, operated and maintained. Many accidents are caused by failing to follow simple rules or precautions.

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and on tags and decals affixed to the unit are not all-inclusive. If using a procedure, work method or operating technique the manufacturer does not specifically recommend, ensure that it is safe for personnel. Also make sure the procedure, work method or operating technique used does not render the generator unsafe.

⚠ **Despite the safe design of this generator, operating this equipment imprudently, neglecting its maintenance or being careless can cause possible injury or death. Permit only responsible and capable persons to install, operate and maintain this equipment.**

⚠ **Potentially lethal voltages are generated by these machines. Ensure steps are taken to make the machine safe before attempting to work on the generator.**

⚠ **Parts of the generator are rotating and/or hot during operation. Exercise care near a running generator.**

⚠ **The installation of this generator must always comply with applicable codes, standards, laws and regulations.**

⚠ **A running generator gives off DEADLY carbon monoxide, an odorless, colorless, poisonous gas. Breathing carbon monoxide can cause dizziness, throbbing temples, nausea, muscular twitching, headache, vomiting, weakness, sleepiness, inability to think clearly, fainting, unconsciousness or even death.**

⚠ **The control panel for this unit is intended to be operated by qualified service personnel only.**

1.3 — General Hazards

- For safety reasons, this equipment should only be installed, serviced and repaired by a Service Dealer or other competent, qualified electrician or installation technician who is familiar with applicable codes, standards, regulations and product Installation Manual guidelines. The operator also must comply with all such codes, standards, regulations and product Installation Manual guidelines.
- The engine exhaust fumes contain carbon monoxide, which can be DEADLY. This dangerous gas, if breathed in sufficient concentrations, can cause unconsciousness or even death. DO NOT alter or add to the exhaust system or do anything that might render the system unsafe or in noncompliance with applicable codes and standards.
- Install a carbon monoxide alarm indoors, according to manufacturer's instructions/recommendations.
- Adequate, unobstructed flow of cooling and ventilating air is critical for correct generator operation. Do not alter the installation or permit even partial blockage of ventilation provisions, as this can seriously affect safe operation of the generator. The generator MUST be installed and operated outdoors only.
- Keep hands, feet, clothing, etc. away from drive belts, fans, and other moving or hot parts. Never remove any drive belt or fan guard while the unit is operating.
- When working on this equipment, remain alert at all times. Never work on the equipment when physically or mentally fatigued.
- Inspect the generator regularly, and contact the nearest Dealer for parts needing repair or replacement.
- Before performing any maintenance on the generator, remove the control panel fuse and disconnect the Negative (-) battery cable to prevent accidental startup. When disconnecting battery cables always remove the NEGATIVE (-) cable first. When reconnecting the cables, connect the POSITIVE (+) cable first.
- Never use the generator or any of its parts as a step. Stepping on the unit can stress and break parts, and may result in dangerous operating conditions from leaking exhaust gases, fuel leakage, oil leakage, etc.

1.4 — Exhaust Hazards

- Generator engine exhaust contains DEADLY carbon monoxide, an odorless, colorless, poisonous gas. Breathing carbon monoxide can cause dizziness, throbbing temples, nausea, muscular twitching, headache, vomiting, weakness, sleepiness, inability to think clearly, fainting, unconsciousness or even death. If any carbon monoxide poisoning symptom is experienced, move into fresh air and immediately seek medical attention.
- This generator is designed for OUTDOOR installation ONLY. Never operate the generator inside any garage or other enclosed space.

1.5 — Electrical Hazards

- All generators covered by this manual produce dangerous electrical voltages that can cause fatal electrical shock. Utility power delivers extremely high and dangerous voltages to the transfer switch, as does the standby generator when it is in operation. Avoid contact with bare wires, terminals, connections, etc. while the unit is running. Ensure all appropriate covers, guards and barriers are in place, secured and/or locked before operating the generator. If work must be done around an operating unit, stand on an insulated, dry surface to reduce potential shock hazard.
- Do not handle any kind of electrical device while standing in water, while barefoot, or while hands or feet are wet. DANGEROUS ELECTRICAL SHOCK MAY RESULT.
- The generator may crank and start at any time when utility power is lost. When this occurs, load circuits are transferred to the STANDBY (generator) power source. Before working on the generator, always move the Main Circuit Breaker switch on the control panel down to the OFF (Open) position, press the OFF key on the control panel keypad, remove the 7.5 amp fuse, and disconnect the battery negative cable (black) from the battery negative (-) terminal.
- In case of accident caused by electric shock, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor. AVOID DIRECT CONTACT WITH THE VICTIM. Use a nonconducting implement, such as a dry rope or board, to free the victim from the live conductor. If the victim is unconscious, apply first aid and get immediate medical help.
- Never wear jewelry when working on this equipment. Jewelry can conduct electricity resulting in electric shock, or may get caught in moving parts resulting in injury.

1.6 — Fire Hazards

- For fire safety, the generator must be installed and maintained properly. Installation MUST always comply with applicable codes, standards, laws, regulations and product Installation Manual guidelines. Adhere strictly to local, state, and national electrical and building codes. Comply with regulations of the Occupational Safety and Health Administration (OSHA). Also, ensure that the generator is installed in accordance with the manufacturer's instructions and recommendations. Following proper installation, do nothing that might alter a safe installation and render the unit in noncompliance with the aforementioned codes, standards, laws and regulations.
- Keep a fire extinguisher near the generator at all times. Extinguishers rated "ABC" by the National Fire Protection Association are appropriate for use on the standby generator. Keep the extinguisher properly charged and be familiar with its use. Consult the local fire department with any questions pertaining to fire extinguishers.

1.7 — Explosion Hazards

- Do not smoke around the generator. Wipe up any fuel or oil spills immediately. Ensure that no combustible materials are left in the generator compartment, or on or near the generator as FIRE or EXPLOSION may result. Keep the area surrounding the generator clean and free from debris.

⚠WARNING!

If this generator is used to power electrical load circuits normally powered by a utility power source, it is required by code to install a transfer switch. The transfer switch must effectively isolate the electrical system from the utility distribution system when the generator is operating (NEC 702). Failure to isolate an electrical system by such means will result in damage to the generator and also may result in injury or death to utility power workers due to backfeed of electrical energy.

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2.1 — Emission Information

The U.S. Environmental Protection Agency (EPA) requires that the generator comply with exhaust emission standards. The generator is certified to meet the applicable EPA emission levels, and is certified for use as a stationary engine for standby power generation. Any other use may be a violation of federal and/or local laws. To ensure that the engine complies with the applicable emission standards for the duration of the engine's life, it is important to follow the maintenance specifications in Section 5.

2.1.1— Emissions Data Plate

A data plate is attached to the valve cover to verify compliance with EPA emissions regulations.

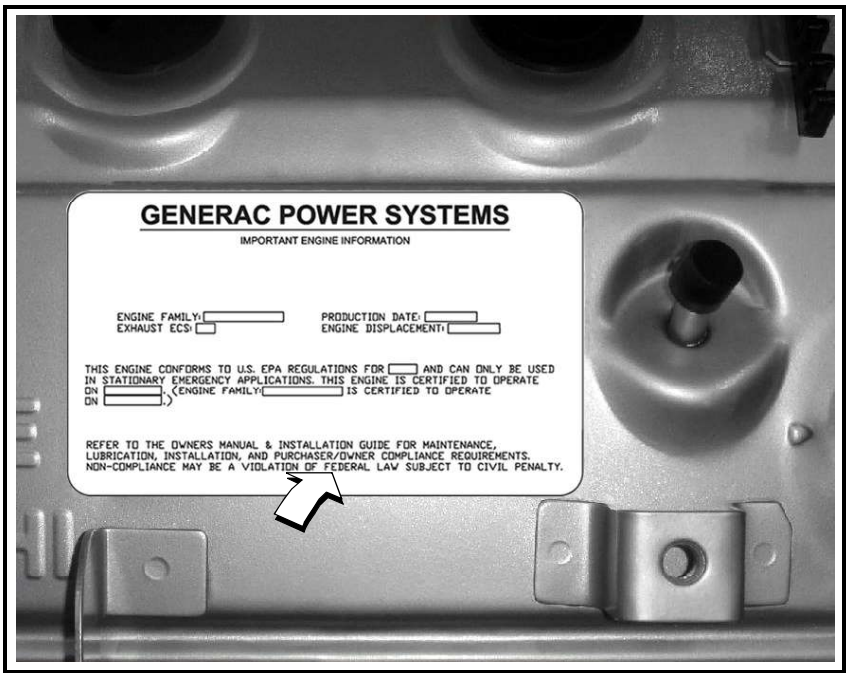


Figure 2-1. Emissions Data Plate (Sample)

2.2 — Specifications

Model	22 kW	25 kW	27 kW	30 kW	32 kW	36 kW	38 kW	45 kW	48 kW	60 kW
Engine	**2.4L**	**1.5L**	**2.4L**	**1.5L**	**2.4L**	**2.4L**	**2.4L**	**2.4L**	**5.4L**	**2.4L**
Generator Set										
Rotor Insulation	Class H				Class F	Class H	Class F	Class H	Class F	Class H
Stator Insulation	Class H									
Dimensions L x W x H	62.2 x 30.6 x 38.6				76.8 x 35 x 46.1					
Product Weight W/ Steel Enclosure (lbs)	–	865	–	895	–		1255		–	1283
Product Weight W/ Aluminum Enclosure (lbs)	900	777	940	807	1225	1235	1202		1555	1230
Shipping Weight W/ Steel Enclosure (lbs)	–	931	–	961	–		1355		–	1383
Shipping Weight W/ Aluminum Enclosure (lbs)	966	843	1006	873	1325	1335	1302	1302	1655	1330
Engine System										
Type	In-Line								V-type	In-Line
Dry Weight (lbs)	287	243	287	243	287				527	287
Bore (in/mm)	3.41/86.5	3.05/77.4	3.41/86.5	3.05/77.4	3.41/86.5				3.55/90.2	3.41/86.5
Stroke (in/mm)	3.94/100	3.13/79.5	3.94/100	3.13/79.5	3.94/100				4.17/105.9	3.94/100
Displacement (liters)	2.4	1.5	2.4	1.5	2.4				5.4	2.4
Firing Order	1-3-4-2								1-3-7-2-6-5-4-8	1-3-4-2
Direction or Rotation	CW From Flywheel									
Compression Ratio	9.5:1	11:1	9.5:1	11:1	9.5:1				9:1	9.5:1
Spark Plug Gap (mm)	1.07-1.17	0.9	1.07-1.17	0.9	0.71	1.07-1.17	0.71	1.07-1.17	1.29-1.45	0.71
Cooling System										
Water Pump	Belt Driven									
Fan Speed (rpm)	1980	2484	1980	2484	1500	1865	1500	1865	1954	2100
Fan Diameter (inches)	18.1	17.7	18.1	17.7	22.0					
Fan Mode	Pusher				Puller					
Air Flow (ft^3/min.)	2400	2490	2400	2490	2200	2725	2200	2725	4350	3280
Coolant Capacity (gallons/ liters)	2.5/9.5	2.0/7.6	2.5/9.5	2.0/7.6	2.5/9.5				3.0/11.4	2.5/9.5
Heat Rejection to Coolant (Btu/h)	99,000	112,000	105,000	135,000	145,000	193,000	145,000	193,000	186,000	270,000
Max Operating Air Temp on Radiator	150° F (60° C)									
Max Ambient Temp	140° F (50° C)									
Thermostat (Full Open)	190° F (88° C)									
Lubricating System										
Oil Pump Type	Gear									
Oil Filter Type	Full Flow Spin-On Cartridge									
Crankcase Oil Capacity (quarts/liters)	4/3.8								6/5.7	4/3.8
Lubricating Oil Type	5W-30									
Air Intake System										
Type	Naturally Aspirated				Turbo/ Aftercooled	Naturally Aspirated	Turbo/ Aftercooled	Naturally Aspirated		Turbo/ Aftercooled
Exhaust System										

Model	22 kW	25 kW	27 kW	30 kW	32 kW	36 kW	38 kW	45 kW	48 kW	60 kW
Engine	**2.4L**	**1.5L**	**2.4L**	**1.5L**	**2.4L**	**2.4L**	**2.4L**	**2.4L**	**5.4L**	**2.4L**
Breather	Closed				Open	Closed	Open	Closed		Open
Exhaust Flow at Rated Output 60 Hz	165 cfm	203 cfm	180 cfm	237 cfm	300 cfm	420 cfm	300 cfm	420 cfm	414 cfm	494 cfm
Exhaust Temperature at Rated Output	900° F	1100° F	1000° F	1130° F	1075° F	1100° F	1075° F	1100° F	1025° F	1050° F
Electrical System										
Battery Charge Alternator	12V, 30 Amp	12V, 15 Amp	12V, 30 Amp	12V, 15 Amp	12V, 30 Amp					
Recommended Battery	Group 26								Group 24F	Group 26
Static Battery Charger	2.5 Amp									
Governor System										
Type	Electronic									
Frequency Regulation	Isochronous									
Steady State Regulation	+/- 0.25%									
Voltage Regulator										
Type	Electronic									
Sensing Phase	Single									
Regulation	+/- 1%									
Fuel System										
Operating Pressure	5-14” WC									

A complete specification sheet is included in the documentation provided with the unit at the time of purchase. For additional copies, consult your local Independent Authorized Service Dealer.

2.3 — Engine Oil Recommendations

To maintain the product warranty, use only genuine Generac replacement parts. Generac maintenance kits include both the oil filter and air filter, and can be obtained through any Authorized Dealer.

Although the unit is filled at the factory with 5W-20 engine oil, replace with 5W-30 engine oil at the first oil change which is due at 30 hours break-in. Select a high-quality detergent oil classified “SJ or SH.” Detergent oils keep the engine cleaner and reduce carbon deposits. After break-in, a synthetic oil that meets or exceeds SAE specifications is recommended. Once synthetic oil is used, it should be used for the life of the generator. It is not recommended to go back to a mineral oil. Do not use special additives.

NOTE: If not already equipped, it is strongly recommended to use the optional Cold Weather Start Kit for temperatures below 32°F. The oil grade for temperatures below 32°F is 5W-30 synthetic oil.

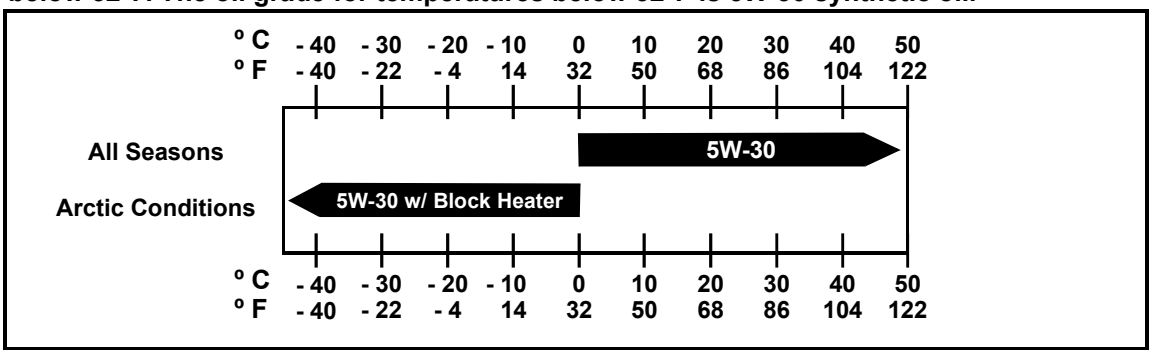


Figure 2-2. Lubricating Oil Recommendations

2.4 — Weather and Maintenance Kits

To keep the generator running at its peak, the following kits are offered:

- Cold Weather Kit
  - Recommended for climates with temperatures below 32°F
- Extreme Cold Weather Kit
  - Recommended Block Heater Kit for protection in temperatures below 32°F
- Scheduled Maintenance Kit
  - Kit includes the recommended parts to maintain the generator. Refer to the Service Schedule for regular maintenance intervals.

For additional information, or to order any of these kits, please contact an Independent Authorized Service Dealer or Customer Service Representative.

2.5 — Coolant Water Treatment

Use of improper coolants can damage the engine cooling system. Use demineralized water or distilled water for best results. Hard water causes scale deposits, which reduces cooling efficiency and raises internal temperatures, possibly leading to engine damage. Use an anti-corrosive to prevent rot in summer and anti-freeze to prevent freezing in winter.

Dilute the anti-freeze based on a theoretical temperature that is 9-18°F (5-10°C) below the lowest temperature expected in the area. A ratio of 40-60% is most common range.

Freezing Point °F (°C)	-13 (-25)	-31 (-35)	-58 (-50)
Coolant (% Volume)	40	50	60
Water (% Volume)	60	50	40

NOTE: Use only Peak Fleet-Charge® 50/50 ethylene glycol type coolant (available from any authorized dealer).

⚠ CAUTION!

Do not use propylene glycol type coolant. Using the wrong coolant, mixing different types of coolant, or even mixing different brands of the correct type of coolant, can produce unsatisfactory results, possibly leading to engine damage.

2.6 — Fuel Requirements

The Stationary Emergency Generator may be equipped with one of the following fuel systems:

- Natural Gas Fuel System
- Propane Vapor (LPV) fuel system

Recommended fuels must have a BTU content of at least 1,000 BTUs per cubic foot (37.26 megajoules per cubic meter) for NG, or at least 2,520 BTUs per cubic foot (93.8 megajoules per cubic meter) for LPV. If converting to LPV from NG, a minimum LP tank size of 250 gallons (946 liters) is recommended. See the Installation Manual for complete details and procedures.

2.7 — Reconfiguring the Fuel System

While some models are created fuel specific for either Natural gas (NG) or Liquid Propane vapor (LPV) and are not fuel convertible, others are configured at the factory for NG, but are field convertible to LPV. Units fitted with a dual fuel carburetion system are generally configured for the selected fuel source during installation.

To reconfigure the fuel system, change the jet in the demand regulator, and then navigate to the appropriate menu to assign the new fuel type. Before proceeding, be aware that the fuel conversion software is password protected.

NOTE: Generac recommends that fuel conversion be done by an authorized dealer or a qualified, competent installation contractor or electrician who is familiar with applicable codes, standards and regulations.

2.7.1— Fuel Conversion Procedure from NG to LPV

1. Turn off the main gas supply.
2. Remove battery negative cable (black) from battery negative (-) terminal.
3. Remove carburetor fuel hose from outlet port. See Figure 2-3.
4. Remove screw at front of power wire connector and pull connector from fuel solenoid.
5. Expand spring clamp on fuel enrichment hose and remove from hose barb.

NOTE: On 5.4L (48 kW) units, remove two screws (with flat washers, lock washers and hex nuts) to release fuel inlet flange from frame rail. This will provide adequate access to the regulator for jet conversion.

6. Remove black pipe assembly from outlet port. If clearance is not sufficient, first remove fuel solenoid assembly.
7. Rotate NG fuel jet counterclockwise to remove from the outlet port.

NOTE: Both the NG and LP fuel jets are slotted, so that they may be removed and installed using an ordinary flat blade screwdriver.

8. Rotate LP fuel jet counterclockwise to remove from the jet keeper port.

NOTE: The orifice size is stamped on each jet. The jet with the larger orifice is used for running on NG.

9. Rotate LP fuel jet clockwise to install in the outlet port.
10. Rotate NG fuel jet clockwise to install in the jet keeper port.
11. Install fuel solenoid assembly, if removed.

NOTE: Solenoid must be installed with flow arrow pointed toward black pipe assembly. See inset of Figure 2-3.

12. Apply appropriate pipe sealant to threads of black pipe assembly and install into outlet port.

NOTE: On 5.4L (48 kW) units, install two screws (with flat washers, lock washers and hex nuts) to fasten fuel inlet flange to frame rail.

13. Expand spring clamp on fuel enrichment hose and install onto hose barb.
14. Push power wire connector onto fuel solenoid and install screw.
15. Install carburetor fuel hose onto outlet port.
16. Install battery negative cable (black) onto battery negative (-) terminal.
17. Turn on the main gas supply.
18. See Subsection 2.7.2—Change Fuel Selection.

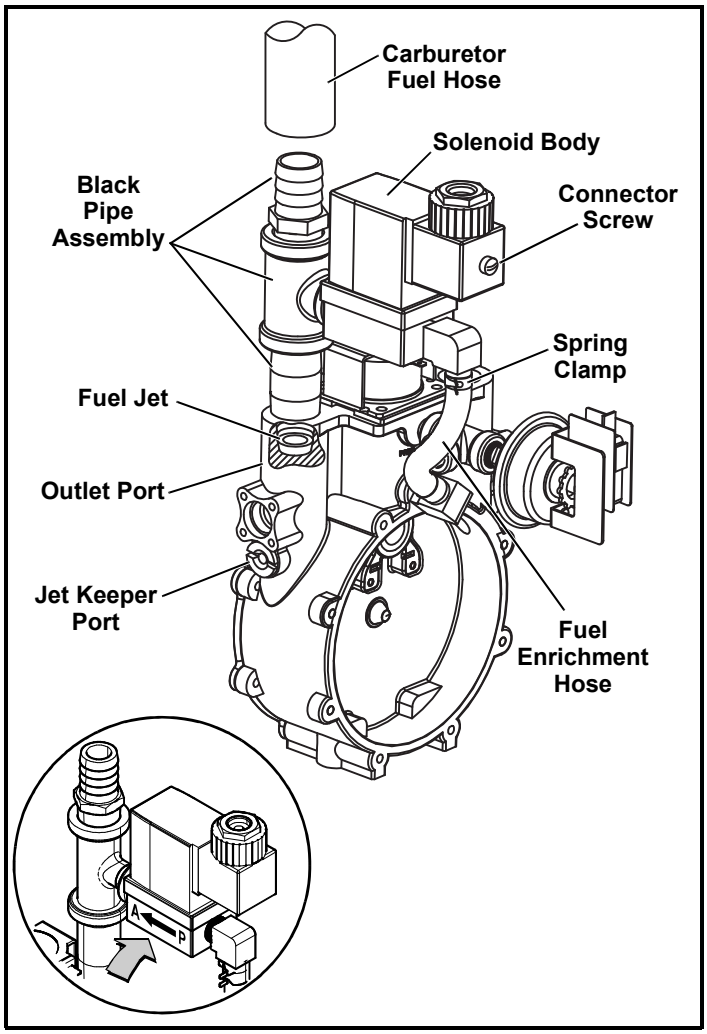


Figure 2-3. Demand Regulator Assembly

⚠ DANGER!

Serious injury, including death, or damage will occur if not configured properly. Consult an Authorized Dealer with any questions.

2.7.2— Change Fuel Selection

⚠ CAUTION!

Failure to convert both the hardware and software will result in decreased performance and an increase in emissions, which is a violation of Environmental Protection Agency (EPA) regulations. It is the responsibility of the installer to make sure that only the correct recommended fuel is supplied to the generator fuel system. Thereafter, the owner/operator must ensure that only the proper fuel is supplied.

1. Once fuel regulator is converted to desired fuel type call 888-9ACTIVATE for the control panel password. This fuel selection conversion is required to be password protected by EPA regulations.
2. Access the control panel located behind the viewing window at the rear of the unit.
3. From the Home screen, press ESCAPE to display the Main Menu.
4. Navigate the software using UP ARROW, DOWN ARROW, ENTER and ESCAPE. For more detailed information, see Subsection 4.3 —Menu Navigation.

2.8 — Battery Requirements

Group 26, 12 Volt	**1.5L, 2.4L Engines:** For areas where temperatures regularly drop below 32° F (0° C).
NOTE: Battery dimensions (L x W x H) for Group 26 battery must not exceed 8-3/16" x 6-13/16" x 7-3/4" (208mm x 173mm x 197mm).	
Group 24F, 12 Volt	**5.4L Engine:** For areas where temperatures regularly drop below 32° F (0° C).
NOTE: Battery dimensions (L x W x H) for Group 24F battery must not exceed 10-3/4" x 6-13/16" x 9" (273mm x 173mm x 229mm).	

2.8.1— Battery Charger

A 2.5 amp battery charger is integrated into the control panel module. It operates as a “Smart Charger” which ensures output charging levels are safe and continuously optimized to promote maximum battery life.

2.9 — Corrosion Protection

Periodically wash and wax the enclosure using automotive type products. Frequent washing is recommended in salt water/coastal areas.

Section 3 Activation and Startup

3.1 — Orientation

NOTE: The 2.4L (32 kW) unit is depicted in the artwork used in this manual. The location and appearance of some components may vary between engine models.

The side of the enclosure with the viewing window is identified as the rear of the generator set. The right and left sides are identified by standing at the rear and looking towards the front of the unit.

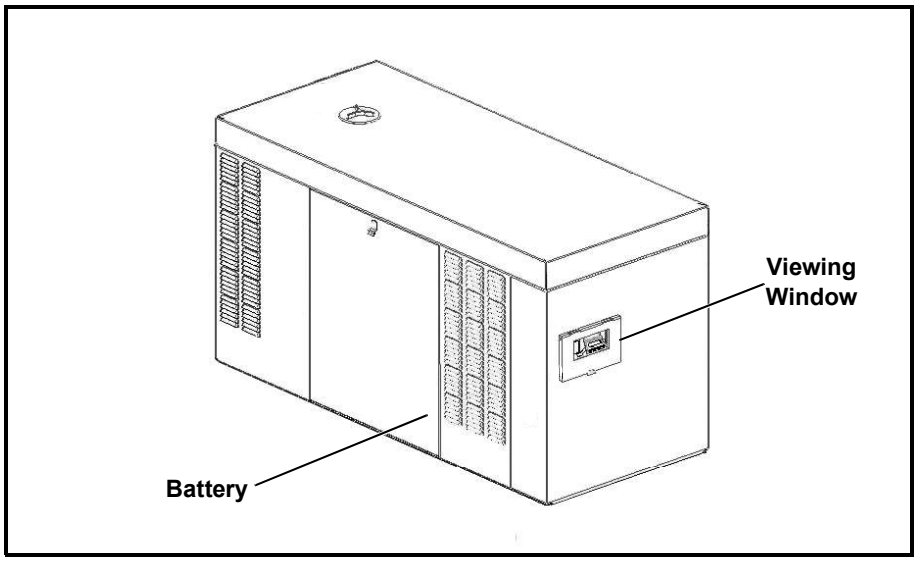


Figure 3-1. Enclosure (Rear Left View)

3.2 — Remove Side Access Panels

NOTE: Access panels are located at both the left and right sides of the enclosure.

1. Remove key from bag attached to door of unit.
2. Insert key into latch and rotate counterclockwise 1/2 turn. See Figure 3-2.
3. Raise panel using thumb latch.

Figure 3-2. Access Panel Key

3.3 — Install Battery

CAUTION: Always connect the positive battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion which could result in serious injury.

1. Loosen two screws with nylon washers to release hold-down clamp from battery tray.
2. Install battery onto tray.
3. Install two screws with nylon washers to secure hold-down clamp to battery tray.
4. Install battery positive cable (red) to battery positive (+) terminal.
5. Install battery negative cable (black) to battery negative (-) terminal.

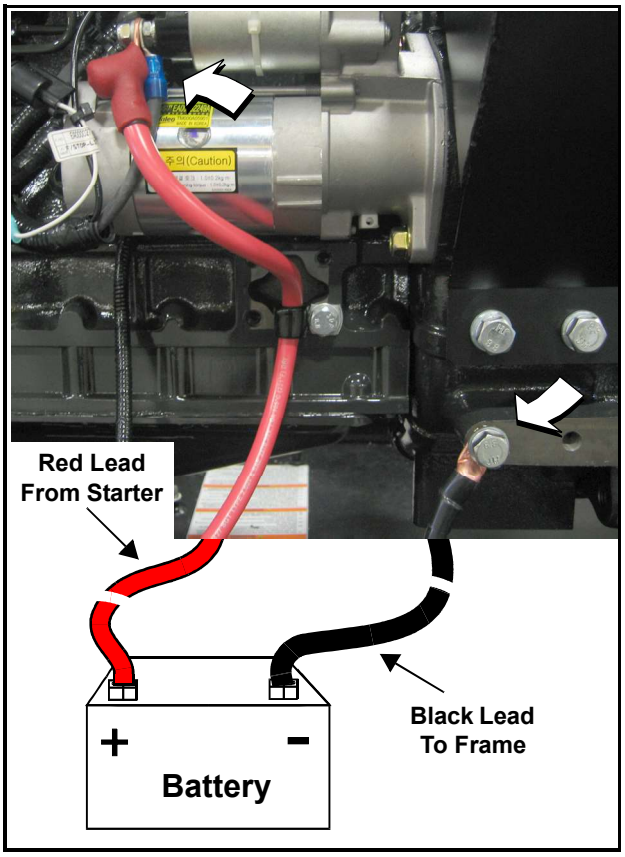


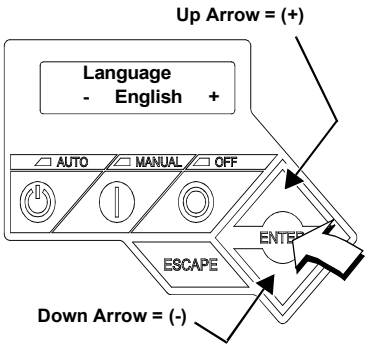
Figure 3-3. Battery Cable Connections

3.4 — Open Viewing Window

1. Remove plastic film from both sides of viewing window.
2. Rotate viewing window upward to access control panel.
3. To hold viewing window in the open position, remove rod from clip at back of window and insert into hole in frame. See Figure 3-4.

Figure 3-4. Viewing Window

3.5 — Activate Unit

Display Reads:  	**Generator Active** is displayed on the LCD screen when the unit is first powered up. After displaying firmware and hardware version codes, as well as other system information, the Installation Wizard is launched, and the Language screen is displayed. Use UP ARROW or DOWN ARROW to scroll to desired language. Press ENTER.	If the wrong language is selected, it may be changed later using the Edit menu.
Display Reads: **Activate me (ENT) or ESC to run in manual**	Press ENTER.	Press ESCAPE to abort the activation sequence. NOT ACTIVATED is displayed and the generator will run in manual mode only. Disconnect and reconnect the negative battery cable to restart the activation routine. If power is removed after a successful activation, no data is lost, but the time and date must be updated.
Display Reads: **To Activate go to www.activategen.com**	Go to www.activategen.com or call 1-888-9ACTIVATE (922-8482, US & Canada only) if activation passcode is not available. If activation pass code is available, wait a few seconds for the next display.	
Display Reads: **SN 1234567890 PASS CODE XXXXX**	Use UP ARROW or DOWN ARROW to increment or decrement the digit to correspond to the first number of the pass code. Press ENTER. Repeat step to enter remaining digits.	Press ESCAPE to return to preceding digits if a correction becomes necessary. If attempts to enter the activation code are unsuccessful, check the number against the code given on activategen.com. If it is correct, contact 1-888-9ACTIVATE (922-8482, US & Canada only).
Display Reads: **Select Hour (0-23) - 6 +**	Use UP ARROW or DOWN ARROW to increment or decrement the hour. Press ENTER. Use UP ARROW or DOWN ARROW to increment or decrement the minute. Press ENTER. Use UP ARROW or DOWN ARROW to select the month. Press ENTER. Use UP ARROW or DOWN ARROW to increment or decrement the date. Press ENTER. Use UP ARROW or DOWN ARROW to increment or decrement the year. Press ENTER.	

Display Reads: **Quiet Test Mode?** **Yes No**	Use UP ARROW or DOWN ARROW to select either Yes or No. Press ENTER.	Select YES to perform exercise at low speed. Select NO to perform exercise at normal operating speed.
Display Reads: **Select Hour (0-23)** **- 1 +**	Set Exercise Time. Use UP ARROW or DOWN ARROW to increment or decrement the hour. Press ENTER. Use UP ARROW or DOWN ARROW to increment or decrement the minute. Press ENTER. Use UP ARROW or DOWN ARROW to scroll to the day of the week. Press ENTER.	In the AUTO mode, the engine starts and runs once each week at the time and day specified. During the exercise cycle, the unit runs approximately 12 minutes and then shuts down. Transfer of loads to the generator does not occur unless utility power fails.

3.6 — Start and Run Engine

1. Pull up rubber flap covering fuse holder and verify installation of 7.5 amp fuse. See A of Figure 3-5.
2. Move the Main Circuit Breaker switch down to the OFF (Open) position. See B of Figure 3-5.
3. Press MANUAL on the control panel to start the engine. A blue LED illuminates to confirm that the system is in the MANUAL mode. See C of Figure 3-5.
4. Allow the engine to run until it reaches normal operating temperature.
5. Press OFF on the control panel to stop the engine. A red LED illuminates to confirm that the system is in the OFF mode.

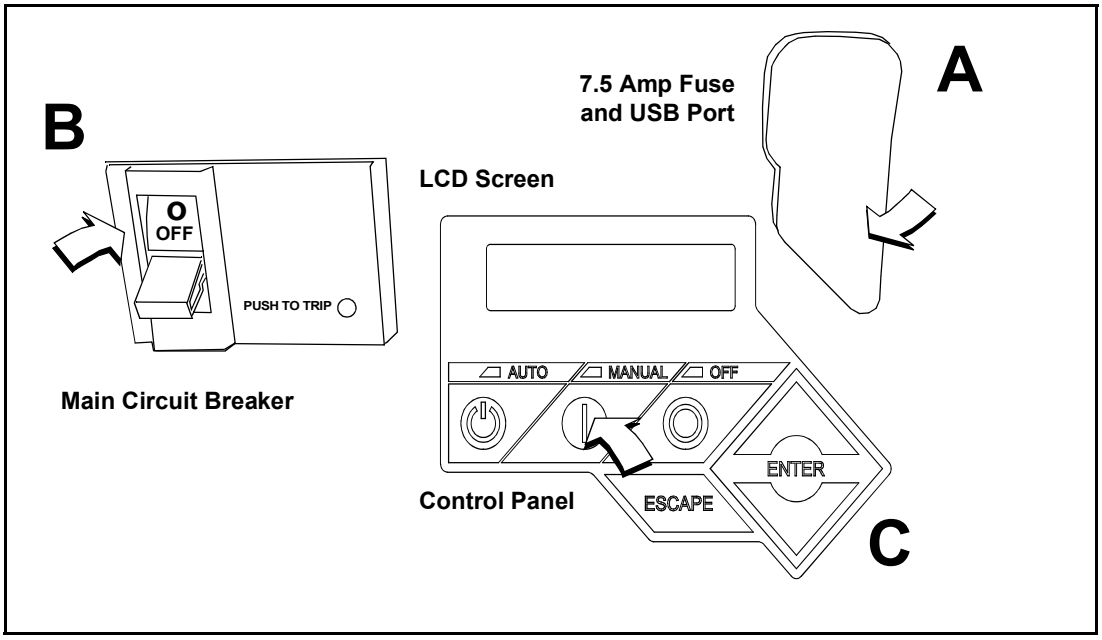


Figure 3-5. Generator Control Panel

3.7 — Operational Checks

⚠ CAUTION!

The following procedures require special tools and skills. Contact an authorized service provider to perform these tasks.

3.7.1— Self Test

Upon power up, the controller goes through a system self test which checks for the presence of utility voltage on the DC circuits. This is done to prevent damage if the installer mistakenly connects AC utility power sense wires into the DC terminal block. If utility voltage is detected, the controller displays a warning message and locks out the generator, thereby preventing damage to the controller. Remove power to the controller to clear this warning.

Utility voltage must be turned on and present at the N1 and N2 terminals inside the generator control panel for this test to be performed and pass.

Before starting, complete the following:

1. Verify that the generator is OFF. A red LED on the control panel illuminates to confirm that the system is in the OFF mode.
2. Verify that the Main Circuit Breaker switch on the generator control panel is in the OFF (Open) position.
3. Turn off all circuit breakers/electrical loads that will be powered by the generator.
4. Check the coolant and engine lubricating oil levels. See Subsections 5.7.5 and 5.7.7, respectively.

During initial start up only, the generator may exceed the normal number of start attempts and experience an “over crank” fault. This is due to accumulated air in the fuel system during installation. Reset the control board and restart up to two more times, if necessary. If unit fails to start, contact the local dealer for assistance.

3.7.2— Check Manual Transfer Switch Operation

Refer to the manufacturer’s instructions.

⚠ DANGER!

Do not attempt manual transfer switch operation until all power voltage supplies to the transfer switch have been positively turned off. Failure to turn off all power voltage supplies will result in extremely hazardous and possibly fatal electrical shock.

3.7.3— Electrical Checks

Complete electrical checks as follows:

1. Verify that the generator is OFF. A red LED on the control panel illuminates to confirm that the system is in the OFF mode.
2. Verify that the Main Circuit Breaker switch on the generator control panel is in the OFF (Open) position.
3. Turn OFF all circuit breakers/electrical loads that will be powered by the generator.
4. Turn on the utility power supply to the transfer switch using the means provided (such as a utility main line circuit breaker).

⚠ DANGER!

The transfer switch is now electrically “hot.” Contact with “hot” parts will result in extremely hazardous and possibly fatal electrical shock.

5. Use an accurate AC voltmeter to check utility power source voltage across transfer switch terminals N1, N2, and N3 (if three phase). Normal line-to-line voltage should be equivalent to rated unit voltage.
6. Check utility power source voltage across terminals N1, N2, and N3 (if three phase) and the transfer switch neutral lug.
7. When certain that utility supply voltage is compatible with transfer switch and load circuit ratings, turn OFF the utility power supply to the transfer switch.
8. Press MANUAL on the control panel to crank and start the engine.

9. Allow the engine to warm up for about five minutes. Move the Main Circuit Breaker switch on the generator control panel up to the ON (or closed) position.

⚠ DANGER!

Generator power voltage is now supplied to the transfer switch. Contact with live transfer switch parts will result in dangerous and possibly fatal electrical shock.

10. Connect an accurate AC voltmeter and a frequency meter across transfer switch terminal lugs E1, E2, and E3 (if three phase).
11. Successively connect the AC voltmeter test leads across terminal lugs E1, E2, and E3 (if three phase) and neutral; then across E2 and neutral. Voltage reading in each case should match utility voltage reading. If system is three phase, verify that generator phase rotation matches utility phase rotation.
12. Move the Main Circuit Breaker switch on the generator control panel down to the OFF (Open) position.
13. Press OFF on the control panel to shut the engine down.

⚠ DANGER!

Do not proceed unless certain that generator AC voltage and frequency are correct and within the stated limits.

3.7.4— Test Generator Under Load

To test the generator set with electrical loads applied, proceed as follows:

1. Verify that the generator is OFF. A red LED on the control panel illuminates to confirm that the system is in the OFF mode.
2. Turn OFF all breakers/electrical loads that will be powered by the generator.
3. Turn OFF the utility power supply to the transfer switch, using the means provided (such as a utility main line circuit breaker).

⚠ DANGER!

Do not attempt manual transfer switch operation until all power voltage supplies to the transfer switch have been positively turned off. Failure to turn off all power voltage supplies will result in extremely hazardous and possibly fatal electrical shock.

4. Manually set the transfer switch to the STANDBY position, i.e., load terminals connected to the generator's E1, E2, and E3 (if three phase) terminals.
5. Press MANUAL on the control panel. The engine will crank and start.
6. Allow the engine to warm up for a few minutes.
7. Move the Main Circuit Breaker switch on the generator control panel up to the ON (or closed) position. The switch is now powered by the standby generator.
8. Turn ON the circuit breaker/electrical loads powered by the generator.
9. Connect a calibrated AC voltmeter and a frequency meter across terminal lugs E1, E2, and E3 (if three phase). Voltage should be approximately unit rated voltage. Check with clamp on amp meter to ensure unit is not overloaded.
10. Let the generator run at full rated load for 20-30 minutes. Listen for unusual noises, vibration or other indications of abnormal operation. Check for oil leaks, evidence of overheating, etc.
11. When testing under load is complete, turn OFF electrical loads.
12. Move the Main Circuit Breaker switch on the generator control panel up to the OFF (or open) position.
13. Allow the engine to run at no-load for 2-5 minutes.
14. Press OFF on the control panel to shut the engine down. A red LED illuminates to confirm that the system is in the OFF mode.

3.7.5— Check Automatic Operation

To check the system for proper automatic operation, proceed as follows:

1. Verify that the generator is OFF. A red LED on the control panel illuminates to confirm that the system is in the OFF mode.
2. Install front cover of the transfer switch.
3. Turn ON the utility power supply to the transfer switch, using the means provided (such as a utility main line circuit breaker).

NOTE: Transfer Switch will transfer back to utility position.

4. Move the Main Circuit Breaker switch on the generator control panel up to the ON (or closed) position.
5. Press AUTO on the control panel. The system is now ready for automatic operation.
6. Turn OFF the utility power supply to the transfer switch.

With the generator ready for automatic operation, the engine will crank and start when the utility source power is turned OFF after a 10 second delay (factory default setting). After starting, the transfer switch connects load circuits to the standby side. Let the system operate through its entire automatic sequence of operation.

With the generator running and loads powered by generator AC output, turn ON the utility power supply to the transfer switch. The system transfers back to the utility position and then runs through the cool down cycle and shuts down.

3.8 — Final Instructions

1. Use key to install left and right side access panels.
2. Close viewing window.

NOTE: Obtain viewing window hasp, if not installed. See Figure 3-6. With the retaining tab at the bottom, insert square end of hasp into slot below viewing window. Push on hasp until it snaps in place. Gently pull on hasp to verify that it will not come free.

3. Install customer supplied padlock into hasp.

Figure 3-6. Install Viewing Window Hasp

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4.1 — Control Panel

NOTE: The control panel is intended for use by qualified service personnel only.

The control panel is located behind the viewing window at the rear of the unit.

⚠ WARNING!

With the control panel set to AUTO, the engine may crank and start at any time without warning. Such automatic starting occurs during the programmed exercise cycle or when utility power source voltage drops below the configured level. To prevent possible injury that might occur during sudden starts, always set the control panel to OFF, remove the negative battery cable from the negative battery post, and remove the 7.5 amp fuse before working on or around the generator or transfer switch. For added security, place a DO NOT OPERATE tag or placard on both the control panel and transfer switch.

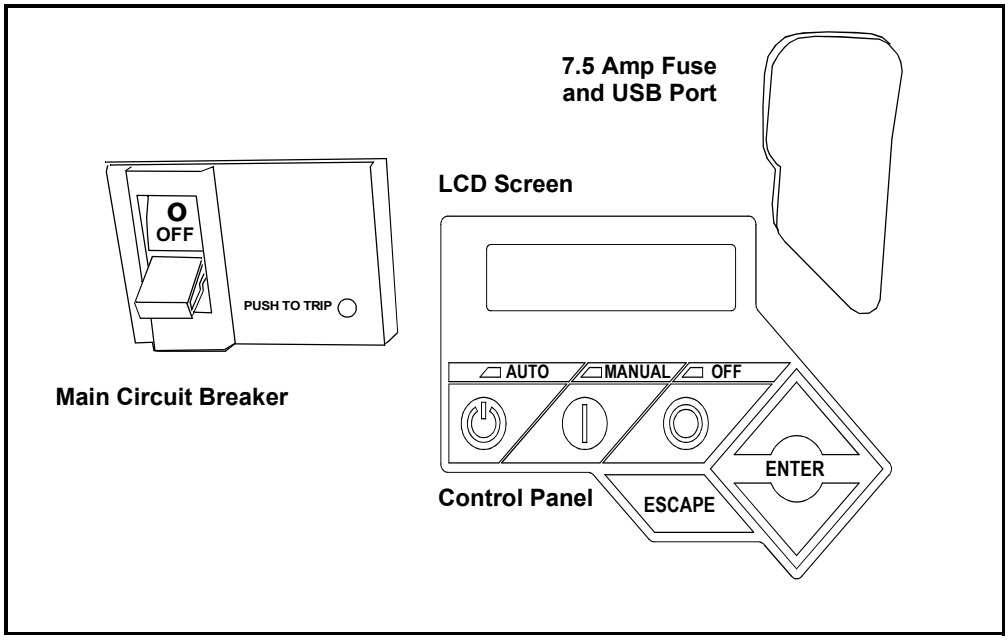


Figure 4-1. Generator Control Panel

4.2 — Auto/Manual/Off

Feature	Description
AUTO	Press to activate fully automatic operation. Green LED illuminates to confirm that system is in AUTO mode. Transfer to standby power occurs if utility power fails. Functionality of exercise timer is enabled, if set.
MANUAL	Press to crank and start engine. Blue LED illuminates to confirm that system is in MANUAL mode. Transfer to standby power occurs if utility power fails. Functionality of exercise timer is disabled.
OFF	Press to shut down engine, if running. Red LED illuminates to confirm that system is in OFF mode. Transfer to standby power does not occur if utility power fails.

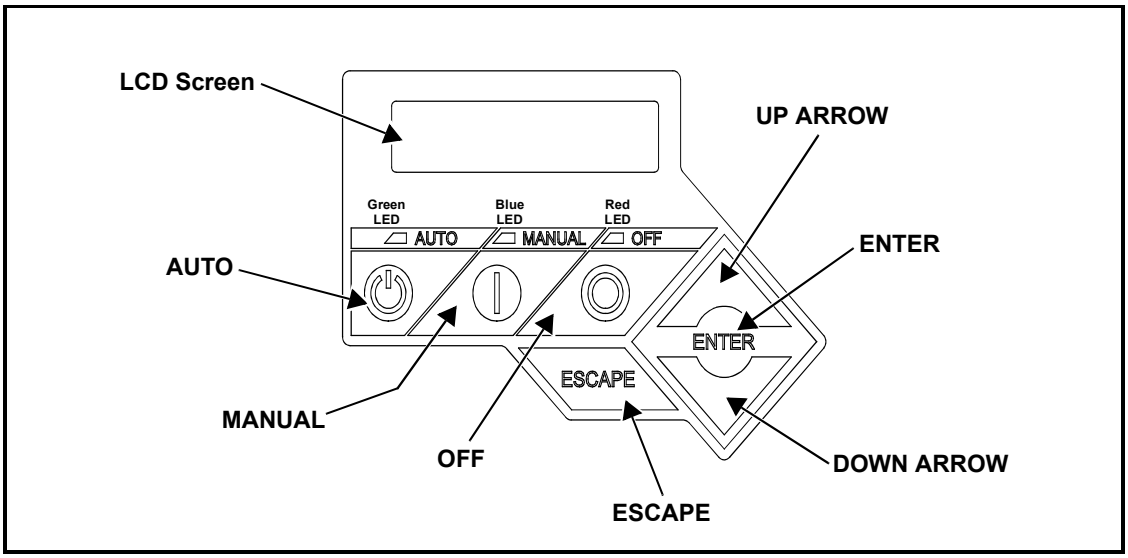


Figure 4-2. Control Panel and LCD Screen

4.3 — Menu Navigation

See Figure 4-3.

Feature	Description
System Menus	
HOME Screen	The system returns to the Home screen if the control panel is not used for five minutes. The screen normally displays a Status message, such as Ready to Run (Auto mode) or Switched to OFF (Off mode), and the total Hours of Protection. If an active alarm/warning condition occurs, the associated Alarm/Warning message is displayed. To clear the Alarm/Warning message, press OFF on the control panel followed by ENTER. In the event of multiple Alarms/Warnings, the next message is then displayed. The highest priority alarm is always displayed first.
Display Backlight	Normally off. If the operator presses any button, the backlight will automatically light and remain on for 30 seconds.
MAIN MENU	Enables the operator to navigate the software using UP ARROW, DOWN ARROW, ENTER and ESCAPE. The Main Menu can be accessed from any sub menu by consecutively pressing ESCAPE. Each time ESCAPE is pressed, the preceding menu is displayed. The Main Menu is reached when the System, Date/Time, Battery, and Sub Menus are displayed.
SUB-MENUS	The Sub-Menus screen includes HISTORY, MAINT, EDIT, AND DEALER menus.
HISTORY	The HISTORY screen includes an Alarm Log and Run Log. The Alarm Log displays the last 50 alarm events. The Run Log displays the last 50 operational events.
MAINTENANCE MENU	Includes Run Hours, Maintenance Log, and Scheduled. Run Hours displays cumulative hours on engine. Maintenance Log displays the last service warnings and service completions. Scheduled displays when the next scheduled maintenance interval warning will occur.
EDIT MENU	Includes Language, Current Date/Time, Exercise Settings, Firmware Update, Startup Delay, and Warmup Time. All of these settings are adjustable without a password.
DEALER MENU	Includes settings that are password protected and can be adjusted by an Independent Authorized Service Dealer during installation or a service visit.

Feature	Description
Navigation	
ESCAPE	Used to abort a routine or back up to the preceding menu.
ENTER	Used to make a selection or save an entry.
UP ARROW **DOWN ARROW**	Used to move forward or backward from menu to menu or to scroll forward or backward (increment or decrement) through available selections.
NOTE: Pressing the control panel illuminates the backlight for 30 seconds. The backlight also illuminates for 30 seconds whenever an active Alarm/Warning message is displayed.	

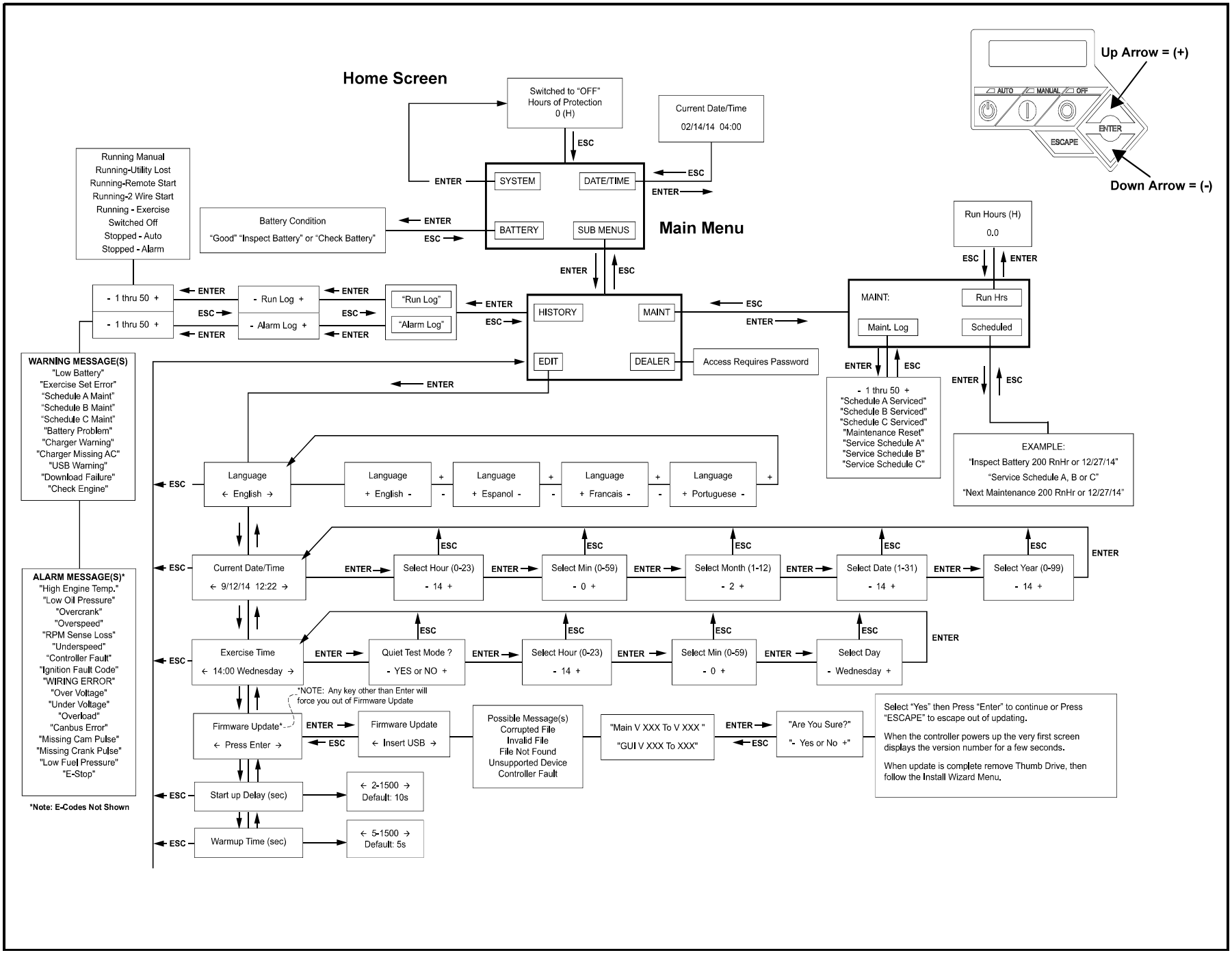

Home Screen
Switched to "OFF"
Hours of Protection
0 (H)
Current Date/Time
02/14/14 04:00
ESC
ENTER
SYSTEM
DATE/TIME
BATTERY
SUB MENUS
Main Menu
Battery Condition
"Good" "Inspect Battery" or "Check Battery"
Running Manual
Running-Utility Lost
Running-Remote Start
Running-2 Wire Start
Running - Exercise
Switched Off
Stopped - Auto
Stopped - Alarm
- 1 thru 50 +
- Run Log +
- Alarm Log +
"Run Log"
"Alarm Log"
HISTORY
MAINT
EDIT
DEALER
Access Requires Password
Run Hours (H)
0.0
MAINT:
Run Hrs
Maint. Log
Scheduled
- 1 thru 50 +
"Schedule A Serviced"
"Schedule B Serviced"
"Schedule C Serviced"
"Maintenance Reset"
"Service Schedule A"
"Service Schedule B"
"Service Schedule C"
EXAMPLE:
"Inspect Battery 200 RnHr or 12/27/14"
"Service Schedule A, B or C"
"Next Maintenance 200 RnHr or 12/27/14"
WARNING MESSAGE(S)
"Low Battery"
"Exercise Set Error"
"Schedule A Maint"
"Schedule B Maint"
"Schedule C Maint"
"Battery Problem"
"Charger Warning"
"Charger Missing AC"
"USB Warning"
"Download Failure"
"Check Engine"
ALARM MESSAGE(S)*
"High Engine Temp."
"Low Oil Pressure"
"Overcrank"
"Overspeed"
"RPM Sense Loss"
"Underspeed"
"Controller Fault"
"Ignition Fault Code"
"WIRING ERROR"
"Over Voltage"
"Under Voltage"
"Overload"
"Canbus Error"
"Missing Cam Pulse"
"Missing Crank Pulse"
"Low Fuel Pressure"
"E-Stop"
*Note: E-Codes Not Shown
Language
← English →
Language
+ English -
Language
+ Espanol -
Language
+ Francais -
Language
+ Portuguese -
Current Date/Time
← 9/12/14 12:22 →
Select Hour (0-23)
- 14 +
Select Min (0-59)
- 0 +
Select Month (1-12)
- 2 +
Select Date (1-31)
- 14 +
Select Year (0-99)
- 14 +
Exercise Time
← 14:00 Wednesday →
Quiet Test Mode ?
- YES or NO +
Select Hour (0-23)
- 14 +
Select Min (0-59)
- 0 +
Select Day
- Wednesday +
*NOTE: Any key other than Enter will force you out of Firmware Update
Firmware Update*
← Press Enter →
Firmware Update
← Insert USB →
Possible Message(s)
Corrupted File
Invalid File
File Not Found
Unsupported Device
Controller Fault
"Main V XXX To V XXX "
"GUI V XXX To XXX"
"Are You Sure?"
"- Yes or No +"
Select "Yes" then Press "Enter" to continue or Press "ESCAPE" to escape out of updating.
When the controller powers up the very first screen displays the version number for a few seconds.
When update is complete remove Thumb Drive, then follow the Install Wizard Menu.
Start up Delay (sec)
← 2-1500 →
Default: 10s
Warmup Time (sec)
← 5-1500 →
Default: 5s
Up Arrow = (+)
Down Arrow = (-)
AUTO
MANUAL
OFF
ENTER
ESCAPE

Figure 4-3. Navigation Menu

4.4 — Alarm/Warning Conditions

The owner/operator is alerted to Alarm and/or Warning conditions via the control panel LCD screen. All Alarm conditions cause the generator to shut down. The Warning messages alert the operator to conditions that do not disable the unit or require immediate correction.

The possible Alarm/Warning messages are listed below.

Alarm Messages

- High Engine Temperature
- Low Oil Pressure
- Overcrank
- Overspeed
- RPM Sense Loss
- Underspeed
- Controller Fault
- Ignition Fault Code
- WIRING ERROR
- Over Voltage
- Under Voltage
- Overload
- Canbus Error
- Missing Cam Pulse
- Missing Crank Pulse
- Low Fuel Pressure
- E-Stop

Warning Messages

- Low Battery
- Exercise Set Error
- Schedule A Maintenance
- Schedule B Maintenance
- Schedule C Maintenance
- Battery Problem
- Charger Warning
- Charger Missing AC
- USB Warning
- Download Failure
- Check Engine

NOTE: Unless properly trained to correct and clear Alarm/Warning conditions, contact an Authorized Dealer or trained service technician.

4.5 — Change Time and Date

To change the time and date after activation, see the Navigation Menu in Figure 4-3. If power is lost (battery is disconnected/reconnected, control panel fuse is removed/installed, etc.), the display automatically prompts the user for the Time and Date. All other information is retained in memory.

4.6 — Programmable Timers

4.6.1— Dealer Programmable

4.6.1.1—Exercise Time

A programmable exercise time is provided. In the AUTO mode, the engine starts and runs once each week at the time and day specified. During the exercise cycle, the unit runs approximately 12 minutes and then shuts down. Transfer of loads to the generator does not occur unless utility power fails.

NOTE: A Dealer password is required to change the duration of Exercise Cycle.

4.6.2— User Programmable

4.6.2.1—Start-Up Delay Timer

A programmable line interrupt delay (or Start-Up Delay) timer is provided. When utility voltage fails (falls below 60% of nominal), the start-up delay timer is started. If the voltage rises above the Utility Volts Low threshold, the timer is reset. If the utility voltage remains below the threshold during the duration of the timer, the unit cranks and starts.

NOTE: The factory default setting is five seconds, but is adjustable from 2 to 1500 seconds.

4.6.2.2—Warm-Up Delay Timer

A programmable Warm-Up Delay timer is provided. As soon as the generator starts, the warm-up timer is started. When the warm-up timer expires, the control transfers load to the generator (through the transfer switch) if the utility voltage is less than 80% of nominal. If utility voltage is greater than the threshold at expiration of the warm-up time, the load is **not** transferred to the generator and a cool-down period begins. At the end of the cool-down period, the generator stops.

NOTE: The factory default setting is five seconds, but is adjustable from 5 to 1500 seconds.

4.7 — USB Port for Firmware Updates

A USB port is located beneath the rubber flap on the control panel, and is provided for firmware updates. Firmware updates must be performed by an Independent Authorized Service Dealer.

NOTE: The USB port is intended for use with a USB thumb drive only. The USB port is not intended for charging devices such as phones or laptops. Do not connect any consumer electronics to the USB port.

4.8 — Battery Charger

NOTE: The battery charger is integrated into the control panel module.

The battery charger ensures:

- Output is continually optimized to promote maximum battery life.
- Charging levels are safe.

NOTE: A warning message is displayed on the LCD screen when the battery requires service.

4.9 — Transfer Switch Automatic Operation

In AUTO, the generator starts automatically when utility source voltage drops below the preset level. Once the unit starts, loads are transferred to the standby power source.

To select automatic operation:

1. Verify that the transfer switch main contacts are set to the UTILITY position (loads connected to the utility power source).
2. Verify that normal UTILITY power source voltage is available to transfer switch terminal lugs N1, N2 and N3 (if three phase).
3. Move the Main Circuit Breaker switch on the control panel up to the ON (Closed) position.
4. Press AUTO on the control panel. A green LED illuminates to confirm that the system is in the AUTO mode.

4.9.1— Automatic Sequence of Operation

4.9.1.1—Utility Failure

If the control panel is set to AUTO when the utility power fails, a ten second Start-Up Delay timer is started (user programmable). If utility power is still absent when the time expires, the engine cranks and starts.

Once started, a **five** second engine Warm-Up Delay timer starts (user programmable). When the time has elapsed, the load is transferred to the generator. If utility power is restored (above 90% of nominal, dealer programmable) between the time the engine is first started and expiration of the warm-up time, the controller completes the start cycle and then runs through its normal cool-down cycle (while the load remains on the utility source throughout the episode).

4.9.1.2—Cranking

The cyclic cranking is controlled as follows:

Fifteen (15) seconds crank, seven (7) seconds rest, seven (7) seconds crank, seven (7) seconds rest; this sequence is repeated for a total of six (6) crank cycles.

4.9.1.3—Load Transfer

With the generator running, the transfer of load is dependent upon the operating mode as follows:

AUTO	• Starts and runs if utility power fails (falls below 60% of nominal) for **five** consecutive seconds (adjustable). • Starts a **five** second (adjustable) engine warm-up timer. • Does not execute transfer if utility power returns before expiration of warm-up timer (but finishes the warm-up and cool-down cycles). • Transfers back to utility once utility power returns (above 80% of nominal) for **fifteen** consecutive seconds. • Only shuts down if OFF is pressed or an alarm shutdown occurs. • Once utility power returns, starts a cool-down cycle before it shuts down. **NOTE:** Cool-down cycle is **five** minutes if turbocharger equipped, one minute if naturally aspirated.
	EXERCISE
	• Only works in AUTO mode. • Does not exercise if generator is already running in AUTO. • During exercise cycle, transfers only if utility power fails for **ten** consecutive seconds.
MANUAL	• Engine cranks and runs even if utility power is present, but does not transfer to generator. • Transfers to generator if utility fails (falls below 60% of nominal) for **ten** consecutive seconds. • Transfers back to utility when utility returns for **fifteen** consecutive seconds. The engine continues to run until the AUTO or OFF key is pressed.

4.10 — Transfer Switch Manual Operation

⚠ DANGER!

DO NOT attempt to activate the transfer switch manually until all power voltage supplies to the switch have been completely turned off. Failure to turn off all power voltage supplies may result in extremely hazardous and possibly fatal electrical shock.

Prior to automatic operation, manually exercise the transfer switch to verify that there is no binding or interference with proper operation of the mechanism. Manual operation of the transfer switch is required if automatic operation fails.

IMPORTANT NOTE: Always use the applicable transfer switch owner's manual for actual manual transfer switch operation instructions. The information presented here describes a transfer switch, which is not used for three phase applications. See specific manual for three phase transfer switch.

4.10.1— Transfer to Generator Power

When utility power fails, manually transfer to standby power and start the generator as follows:

1. Press OFF on the control panel. A red LED illuminates to confirm that the system is in the OFF mode.
2. Move the Main Circuit Breaker switch down to the OFF (Open) position.
3. Turn off the utility power supply to the transfer switch using the means provided (such as a utility main line circuit breaker).
4. Use the manual transfer handle inside the transfer switch to move the main contacts to the STANDBY position (loads connected to the standby power source).
5. Press MANUAL on the control panel. The engine cranks and starts.
6. Allow the engine to run for two minutes to bring it up to normal operating temperature.
7. Move the Main Circuit Breaker switch up to the ON (Closed) position.

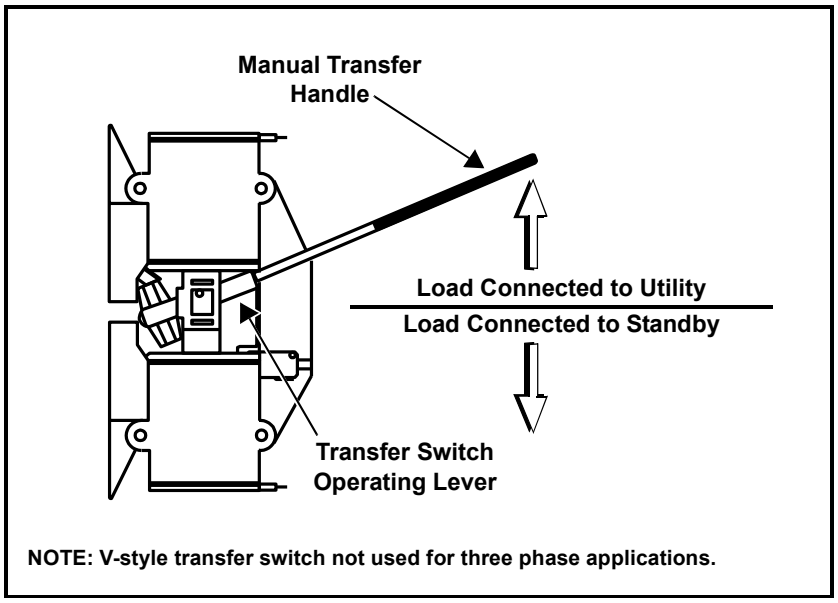


Figure 4-4. Manual Transfer Switch Operation (Typical)

4.10.2— Transfer Back to Utility Power

When utility power is restored, manually transfer back to utility power and shut down the generator as follows:

NOTE: Verify that utility voltage has returned and is at the proper value.

1. Move the Main Circuit Breaker switch down to the OFF (Open) position.
2. Allow the engine to run for two minutes at no-load to bring it up to normal operating temperature.
3. Press OFF on the control panel to shut down the engine.
4. Verify that utility power supply to the transfer switch is turned off.
5. Use the manual transfer handle inside the transfer switch to move the main contacts to the UTILITY position (loads connected to the utility power source).
6. Turn on the utility power supply to the transfer switch using the means provided.
7. Press AUTO on the control panel. A green LED illuminates to confirm that the system is in the AUTO mode.

5.1 — Component Locations

The side of the enclosure with the viewing window is identified as the rear of the generator set. The right and left sides are identified by standing at the rear and looking towards the front of the unit.

NOTE: The 2.4L (32 kW) unit is depicted in the artwork used in this manual. The location and appearance of some components may vary between engine models.

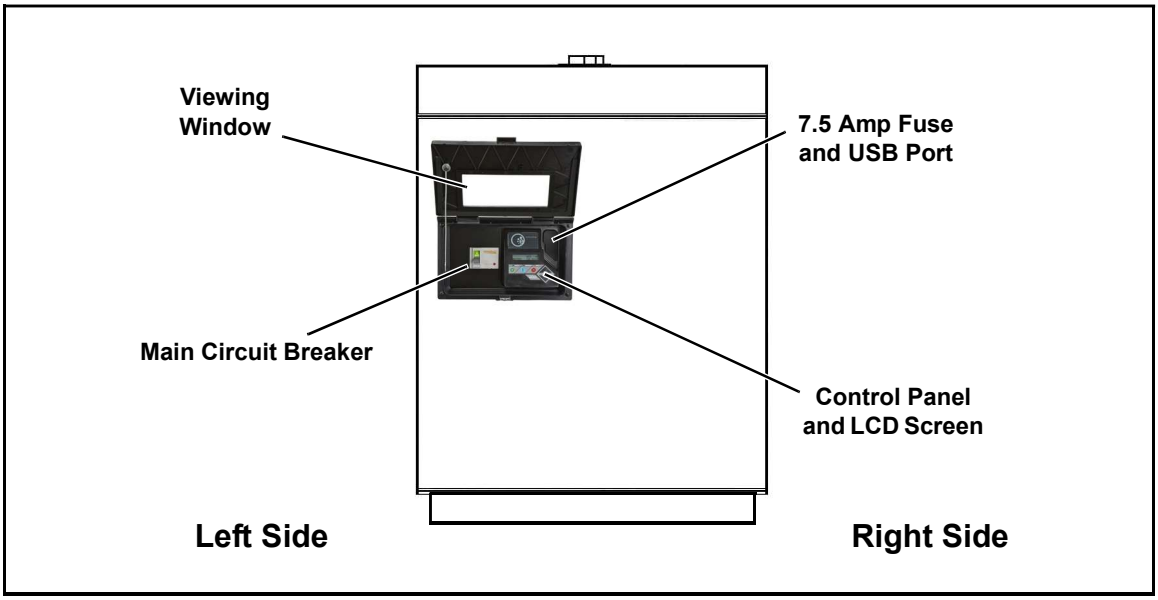


Figure 5-1. Rear View

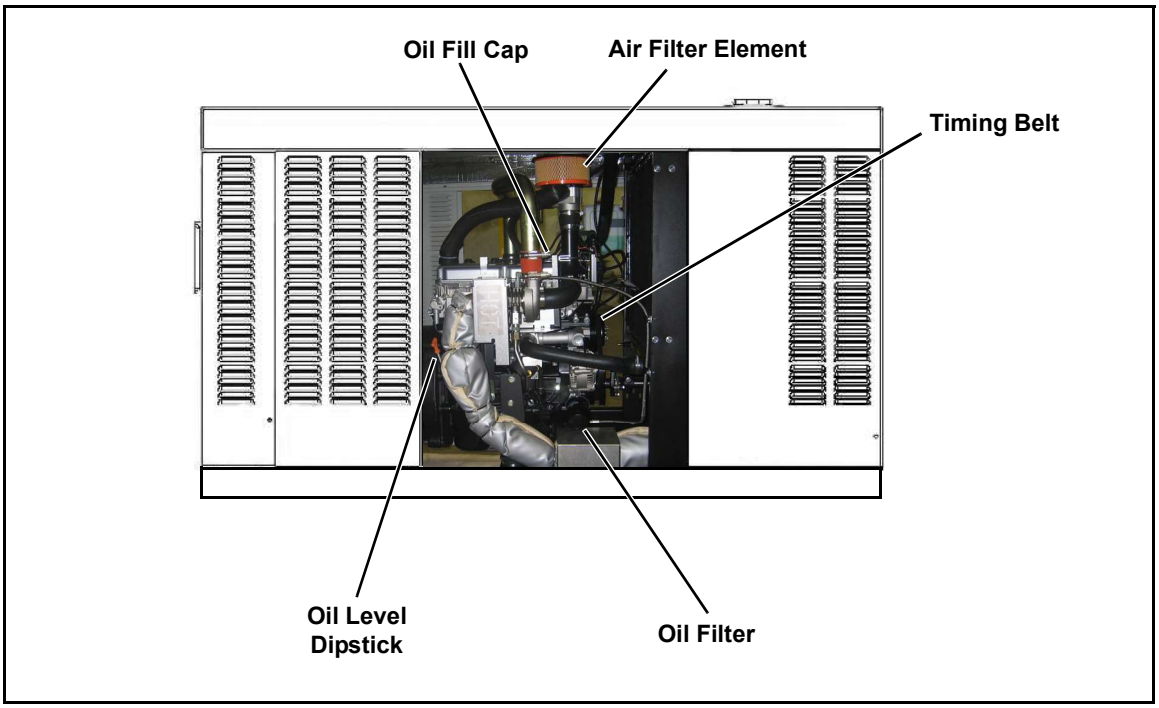


Figure 5-2. Right Side View

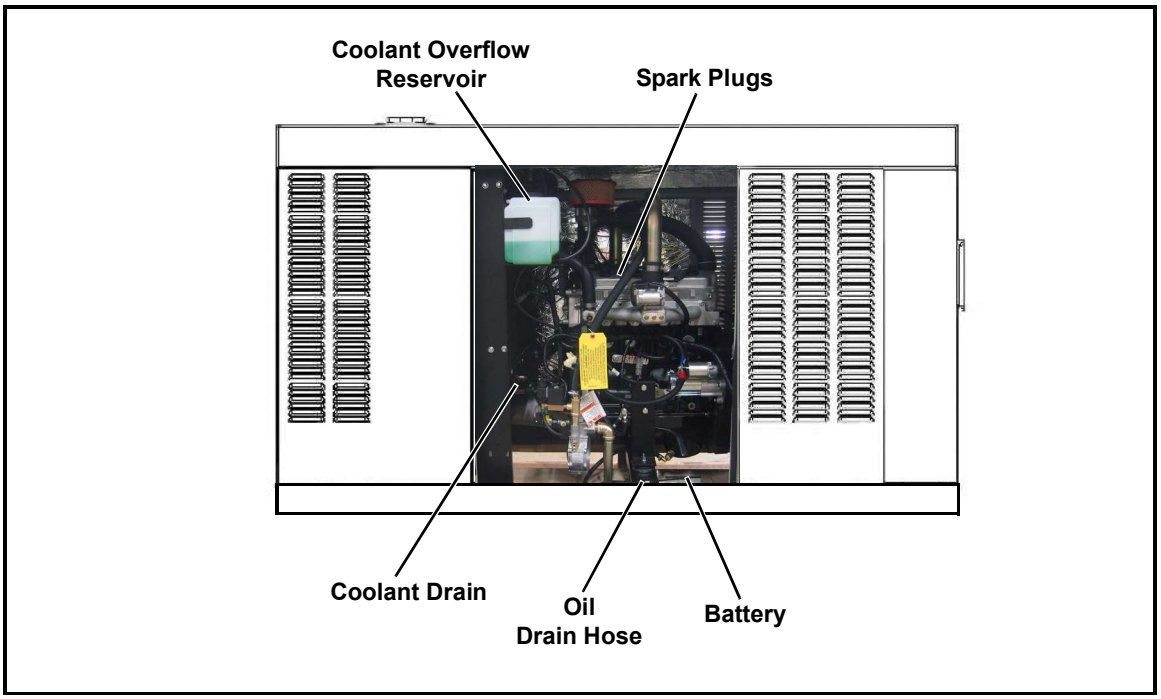


Figure 5-3. Left Side View

NOTE: All normal maintenance and service items are easily accessible for consumer convenience. Wherever possible, touch points are colored orange to provide for quick and easy recognition.

5.2 — Access Panels

Access panels are located at both the left and right sides of the enclosure.

5.2.1— Removal

1. Insert key into latch and rotate counterclockwise 1/2 turn. See Figure 5-4.
2. Raise panel using thumb latch.

Figure 5-4. Access Panel Key

5.2.2— Installation

1. Lower panel into position using thumb latch.
2. Insert key into latch and rotate clockwise 1/2 turn.

5.3 — Service Maintenance Intervals

NOTE: Use only Genuine Generac parts to ensure warranty coverage.

⚠CAUTION!

All generator service must be performed by an authorized service provider or a qualified service personnel only.

It is important to perform all maintenance at the interval specified in the Service Maintenance Schedule. This ensures safe and proper operation, as well as compliance with applicable emissions standards. Critical emissions maintenance must be performed for the Emissions Warranty to remain valid. Service and repairs may be performed by an authorized service provider, any qualified service technician, or repair shop.

Observe the maintenance tasks and intervals shown in the table below.

Service	30 Hours Engine Break In	Daily If Running Continuously	Schedule A Every Year or 125 Hours	Schedule B Every 2 Years or 250 Hours	Schedule C Every 1000 Hours
Check Enclosure Louvers		O	O	O	O
Check Fuel Lines		O	O	O	O
Check Coolant Level and Hoses		O	O	O	O
Check Radiator for Clogging		O	O	O	O
Check Lubricating Oil Level and Drain Hose		O	O	O	O
Replace Lubricating Oil and Oil Filter	O		O	O	O
Check Battery Condition/Fluid Level			O	O	O
Check/Adjust Accessory/Drive Belt Tension			O	O	O
Replace Air Filter Element			O	O	O
Drain/Flush Coolant System				O	O
Clean/Gap/Replace Spark Plugs				O	O
Replace Timing Belt (2.4L Engines Only)					O
Tighten Critical Fasteners					O

NOTE: If the unit reaches a Schedule A or Schedule B maintenance interval with 900 to 999 total hours, have an authorized service provider perform the Schedule C maintenance tasks as well (and reset the A-B-C/Year maintenance schedule counter).

5.4 — Remove From Service

To ensure safety, follow the steps below prior to inspection, maintenance or service.

IMPORTANT NOTE: If currently experiencing a utility outage, see Subsection 6.3 —Removal From Service During Utility Outages for special instructions.

1. Open the viewing window. See Subsection 3.4 —Open Viewing Window.
2. Move the Main Circuit Breaker switch down to the OFF (Open) position. See A of Figure 5-5.
3. Press OFF on the control panel. A red LED illuminates to confirm that the system is in the OFF mode. See B of Figure 5-5.
4. Remove T1 fuse from transfer switch.
5. Pull up rubber flap covering fuse holder and remove 7.5 amp fuse. See C of Figure 5-5.
6. Disconnect NEGATIVE battery cable.
7. Place a DO NOT OPERATE tag or placard on both the control panel and transfer switch.
8. If the unit has been running, wait five minutes for the engine to cool.

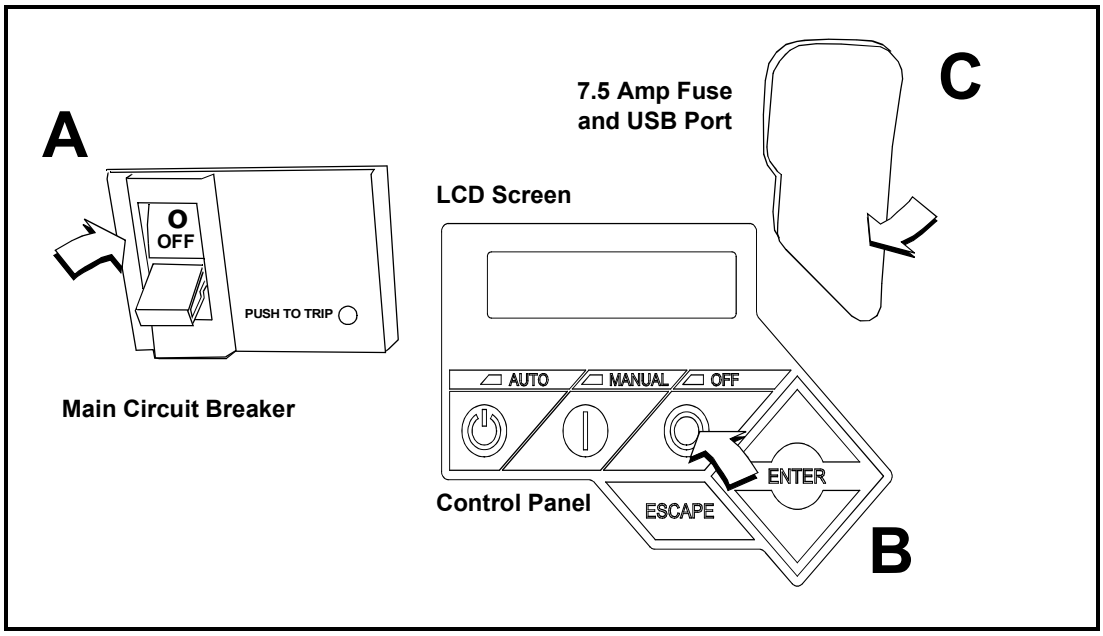


Figure 5-5. Generator Control Panel

5.5 — 30 Hour Break-In

Perform the following task:

- Replace Lubricating Oil and Oil Filter

NOTE: See Subsection 5.7.8 under Schedule A Maintenance.

5.6 — Daily Maintenance

Perform the following tasks:

- Check Enclosure Louvers
- Check Fuel Lines
- Check Coolant Level and Hoses
- Check Radiator for Clogging
- Check Lubricating Oil Level and Drain Hose

NOTE: See Subsection 5.7.3 through Subsection 5.7.7 under Schedule A Maintenance.

5.7 — Schedule A Maintenance

NOTE: Perform Schedule A maintenance once each year or after 125 hours of service, whichever comes first.

NOTE: The 2.4L (32 kW) unit is depicted in the artwork used in this manual. For the general location of components in all other models, see Subsection 5.7.1—Schedule A Maintenance Item Locations.

5.7.1— Schedule A Maintenance Item Locations

NOTE: The side of the enclosure with the viewing window is identified as the rear of the generator set. The right and left sides are identified by standing at the rear and looking towards the front of the unit.

Model	22/27 kW	25/30 kW	32/38 kW	36/45 kW	48 kW	60 kW
Engine	**2.4L**	**1.5L**	**2.4L**	**2.4L**	**5.4L**	**2.4L**
Coolant Overflow Reservoir	**L**	**L**	**L**	**L**	**L**	**L**
Oil Dipstick	**R**	**R**	**R**	**R**	**L**	**R**
Oil Drain Hose	**L**	**R**	**L**	**L**	**R**	**L**
Oil Filter	**R**	**R**	**R**	**R**	**L**	**R**
Oil Fill Cap	**E**	**E**	**E**	**E**	**R**	**E**
Oil Supply Tank Fill Cap	**-**	**-**	**-**	**TL**	**-**	**TL**
Battery	**L**	**R**	**L**	**L**	**R**	**L**
Fan Belt	**E**	**E**	**E**	**E**	**E**	**E**
Air Filter Element	**L**	**R**	**L**	**L**	**E**	**L**

R = Right Side **L** = Left Side **E** = Either Side **T** = Top - = Not Applicable

5.7.2— Preliminary Instructions

1. See Subsection 5.4 —Remove From Service.
2. Remove left and right side access panels. See Subsection 5.2 —Access Panels.
3. Remove battery negative cable (black) from battery negative (-) terminal.

5.7.3— Check Enclosure Louvers

1. Verify that intake and exhaust louvers and openings are clean and unobstructed. Keep clear of leaves, grass, snow, and debris.
2. Wipe exterior surfaces clean using a damp cloth.
3. Loosen dirt, oil, etc. with a soft bristle brush.
4. Remove loose dirt and debris using a vacuum cleaner, or low pressure compressed air (not exceeding 25 psi).

NOTE: Periodically wash and wax enclosure using automotive type products. Frequent washing is recommended in salt water/coastal areas.

5.7.4— Check Fuel Lines

1. Check fuel lines for leaks. Tighten fittings and clamps, if necessary.
2. Check fuel lines for nicks, dents, kinks or other damage. Replace as necessary.

5.7.5— Check Coolant Level and Hoses

⚠ WARNING!

Do not add coolant when the engine is hot. Steam and scalding fluids can cause severe burns.

1. Verify that the coolant level is between the HOT and COLD marks on the overflow reservoir. See Figure 5-6.

NOTE: Coolant expands when hot, so the level may be higher than the HOT mark. Do not add coolant higher than the HOT mark.

2. If the coolant level is below the COLD mark, remove fill cap from overflow reservoir and add coolant. See Subsection 2.5 —Coolant Water Treatment.
3. Check coolant hoses for leaks. Tighten hose clamps, if necessary.
4. Check hoses for nicks, cuts, tears or general deterioration. Replace as necessary.

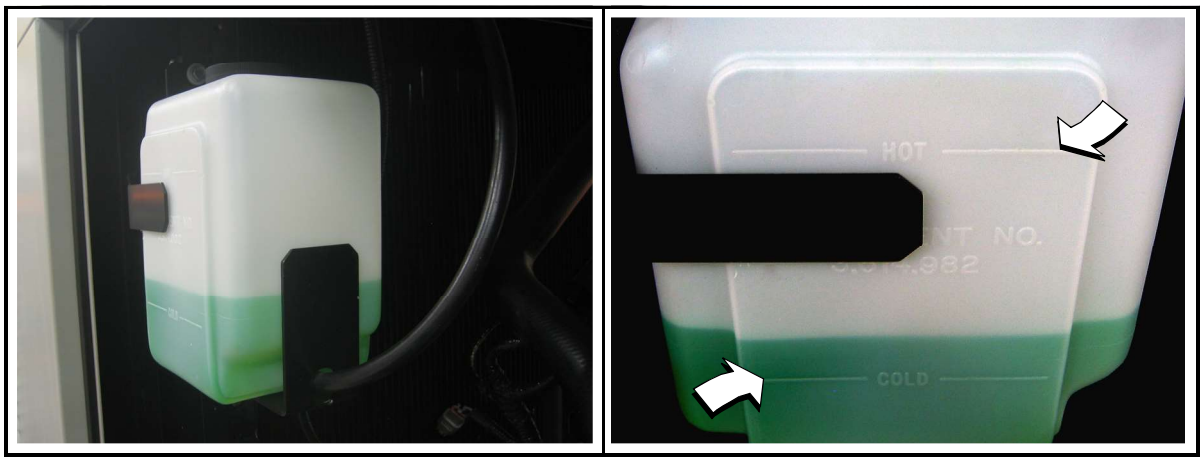


Figure 5-6. Coolant Overflow Reservoir

5.7.6— Check Radiator for Clogging

1. Direct beam of flashlight into enclosure to inspect the radiator fins.
2. Look for debris, accumulations of dirt or other deposits.
3. Carefully remove any debris from radiator fins. Use warm soapy water and a soft bristled brush to remove dirt and other deposits, if necessary.

5.7.7— Check Lubricating Oil Level and Drain Hose

NOTE: If changing engine lubricating oil and filter, see Subsection 5.7.8—Replace Lubricating Oil and Oil Filter.

1. If the engine was running, allow at least 10 minutes to elapse to ensure that the oil has fully drained into the oil pan.

NOTE: The most accurate oil level readings are obtained when the engine is cold.

2. Remove the dipstick and wipe dry with a clean, lint free cloth. See B of Figure 5-7
3. Slowly insert the dipstick into the dipstick tube.
4. Verify that the dipstick is fully seated in the dipstick tube.

NOTE: Some dipsticks require more effort to fully seat than others.

5. Allow at least 10 seconds to elapse.
6. Slowly remove the dipstick.

7. Verify that the oil level is at or near the FULL mark. Add oil as necessary. See A of Figure 5-7

NOTE: Observe the oil level on both sides of the dipstick. The lower of the two readings is the correct oil level measurement.

8. If necessary, remove the oil fill cap and slowly add oil. **Do not fill above "FULL" mark on dipstick**.
9. Install dipstick and oil fill cap.
10. Install battery negative cable (black) onto battery negative (-) terminal.
11. Pull up rubber flap covering fuse holder and install 7.5 amp fuse.
12. Press MANUAL on the control panel to start the engine.
13. Allow the engine to run for one minute.
14. Press OFF on the control panel to shut down the engine. A red LED illuminates to confirm that the system is in the OFF mode.
15. Return to step 1.

NOTE: The most common reasons for inaccurate oil level readings are:

- **Reading the dipstick before the oil has fully drained into the oil pan.**
- **Inserting and removing the dipstick too quickly.**
- **Reading the dipstick when it has not been fully seated in the dipstick tube.**
- **Reading only the high level side of the dipstick.**

16. Check oil drain hose for leaks. Check hose for nicks, cuts, tears or general deterioration. Replace as necessary.
17. Pull up rubber flap covering fuse holder and remove 7.5 amp fuse.
18. Remove battery negative cable (black) from battery negative (-) terminal.

NOTE: On 36 kW, 45 kW, and 60 kW models, check the level of oil in the clean oil supply tank. Add clean oil as necessary. For more information, see Subsection 5.11 —Lube Oil Maintainer System.

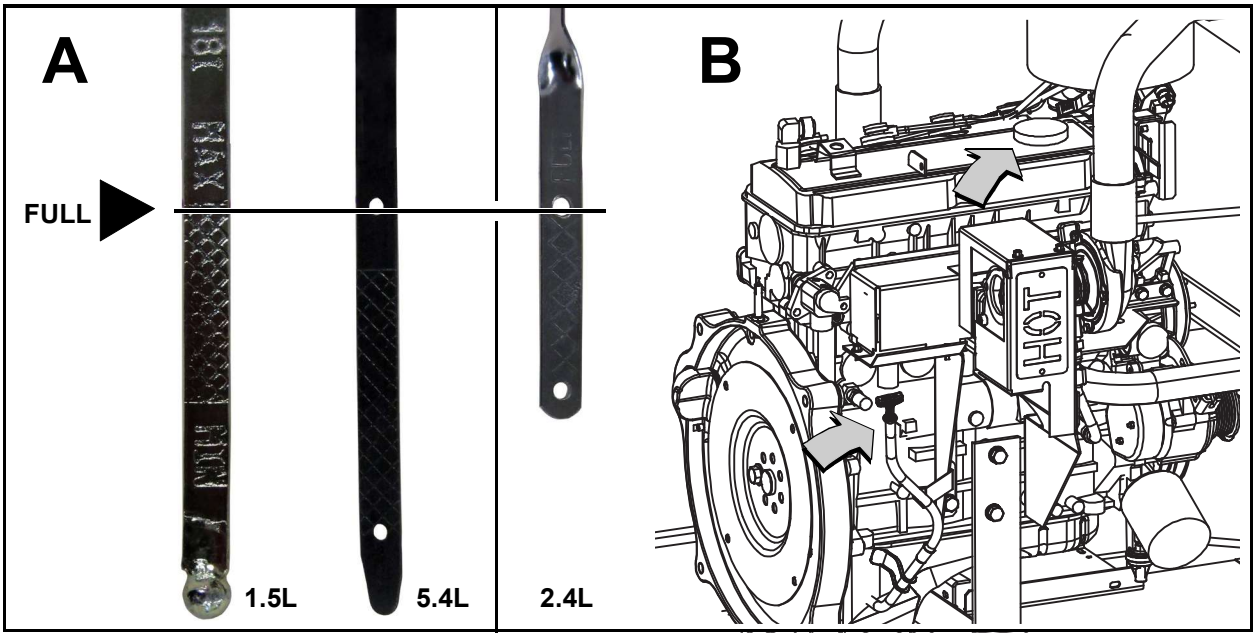


Figure 5-7. Oil Level Dipstick and Oil Fill Cap

5.7.8— Replace Lubricating Oil and Oil Filter

NOTE: On 36 kW, 45 kW, and 60 kW models, close shutoff valve to avoid draining the oil supply tank with the crankcase oil. For more information, see Subsection 5.11 —Lube Oil Maintainer System.

1. Remove oil drain hose from holding clamp. See A of Figure 5-8

2. Use one wrench to hold hex on hose fitting (to prevent rotation), and use second wrench to remove drain plug.

⚠ WARNING!

Hot oil may cause burns. Allow engine to cool before draining oil. Avoid prolonged or repeated skin exposure with used oil. Thoroughly wash exposed areas with soap

3. Drain oil into a suitable container.
4. Install drain plug onto end of oil drain hose.
5. Install oil drain hose into holding clamp.
6. Rotate oil filter counterclockwise to remove from oil filter adapter. See B of Figure 5-8
7. Apply a light coat of clean engine oil to gasket of **new** oil filter.
8. Install oil filter by hand until gasket just contacts oil filter adapter. Tighten oil filter an additional 3/4 to one full turn.
9. Remove fill cap and fill engine with the recommended quantity and type of oil. See Subsection 2.3 —Engine Oil Recommendations. Crankcase oil capacity is listed below:

Lubrication System Capacity (Oil Pan Including Oil Filter)						
Model	**22/27 kW**	**25-30 kW**	**32/38 kW**	**36/45 kW**	**48 kW**	**60 kW**
Engine	**2.4L**	**1.5L**	**2.4L**	**2.4L**	**5.4L**	**2.4L**
4.0 quarts (3.8 liters)	O	O	O	O		
6.0 quarts (5.7 liters)					O	
5.25 quarts (5 liters)						O

10. Install fill cap.
11. Install battery negative cable (black) onto battery negative (-) terminal.
12. Pull up rubber flap covering fuse holder and install 7.5 amp fuse.
13. Press MANUAL on the control panel to start the engine.
14. Allow the engine to run for one minute. Check for leaks while the engine is running.
15. Press OFF on the control panel. A red LED illuminates to confirm that the system is in the OFF mode.
16. Wait ten minutes for the engine to cool and to allow oil to drain back to the oil pan.
17. Check oil level and add oil as necessary. See Subsection 5.7.7—Check Lubricating Oil Level and Drain Hose.
18. Install fill cap.

NOTE: On 36 kW, 45 kW, and 60 kW models, open shutoff valve to enable Lube Oil Maintainer System.

NOTE: Dispose of used oil and oil filter at a proper collection center.

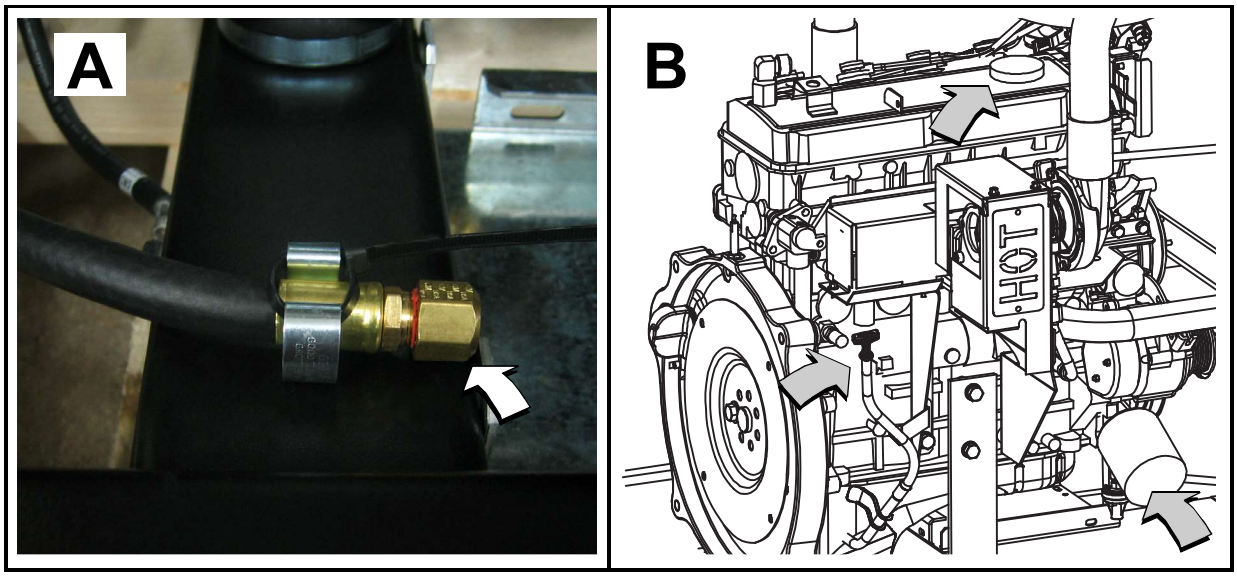
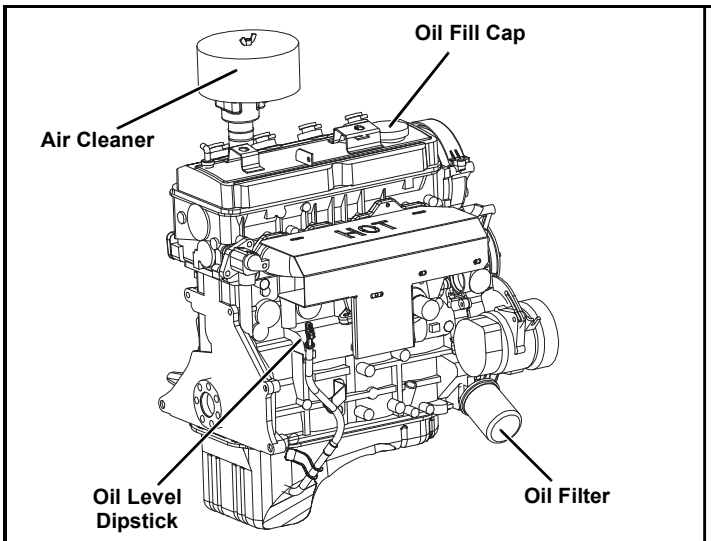
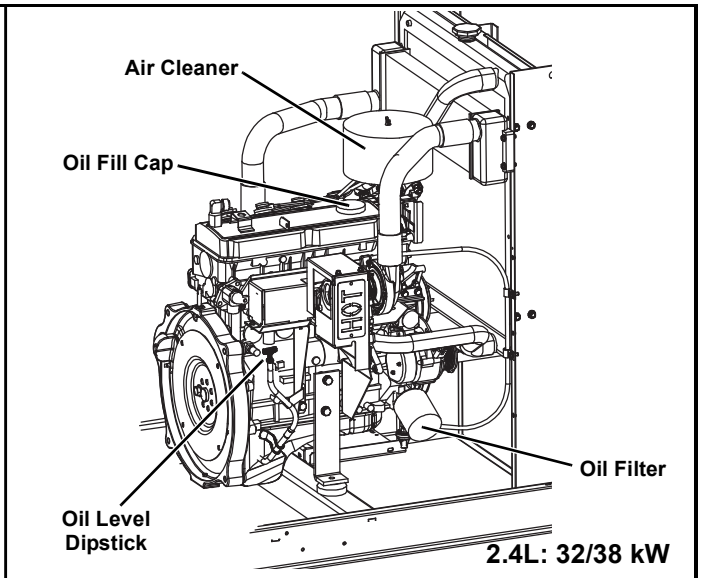


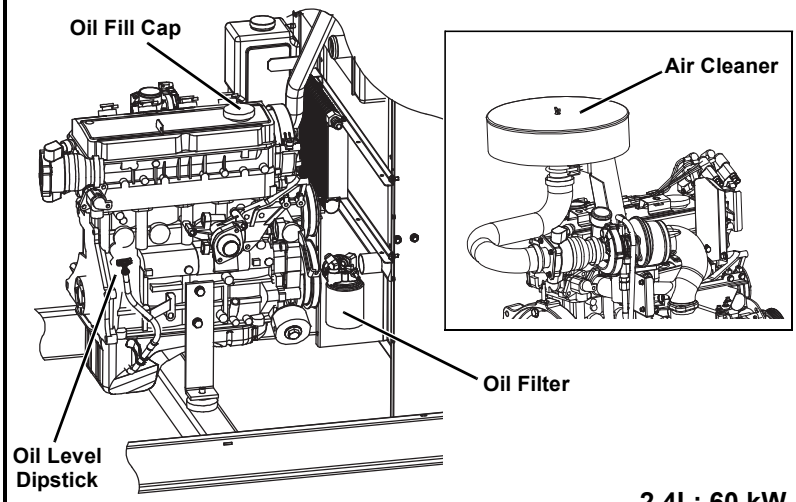
Figure 5-8. Oil Drain Hose, Fill Cap, Dipstick and Filter



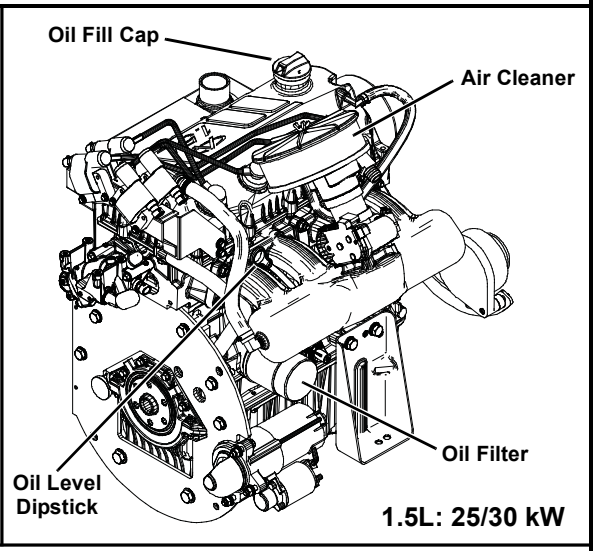
2.4L: 22/27/36/45 kW



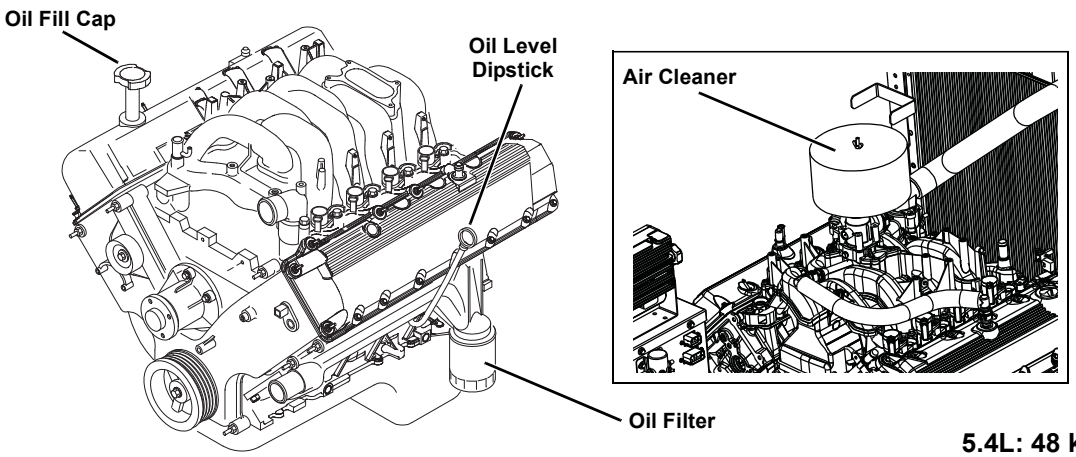
2.4L: 32/38 kW



2.4L: 60 kW



1.5L: 25/30 kW



5.4L: 48 kW

Figure 5-9. Engine Oil and Air Cleaner Maintenance (All Models)

5.7.9— Check Battery Condition/Fluid Level

5.7.9.1— Check Condition and Clean

1. Verify that top of battery is clean and dry. Dirt and electrolyte on top of the battery can cause battery to self-discharge. Clean battery top with a solution of baking soda (sodium bicarbonate) and water (5 teaspoons baking soda per quart or liter of water). When solution stops bubbling, rinse off the battery with clean water.
2. Clean cable clamps and battery terminals using a wire brush or sandpaper to remove any oxidation.
3. Inspect battery screws, clamps and cables for breakage, loose connections and corrosion. Tighten and clean as necessary.
4. Check the battery posts for melting or damage caused by over tightening.
5. Inspect battery for discoloration, raised top or a warped or distorted case, which might indicate that the battery has been frozen, overheated or overcharged.
6. Inspect the battery case for cracks or leaks.
7. Check the battery fluid level of unsealed batteries. See Subsection 5.7.9.2—Check Fluid Level.
8. Check the battery state of charge. See Subsection 5.7.9.3—Check State of Charge.
9. Replace battery if necessary. See Subsection 5.7.9.4—Battery Replacement.

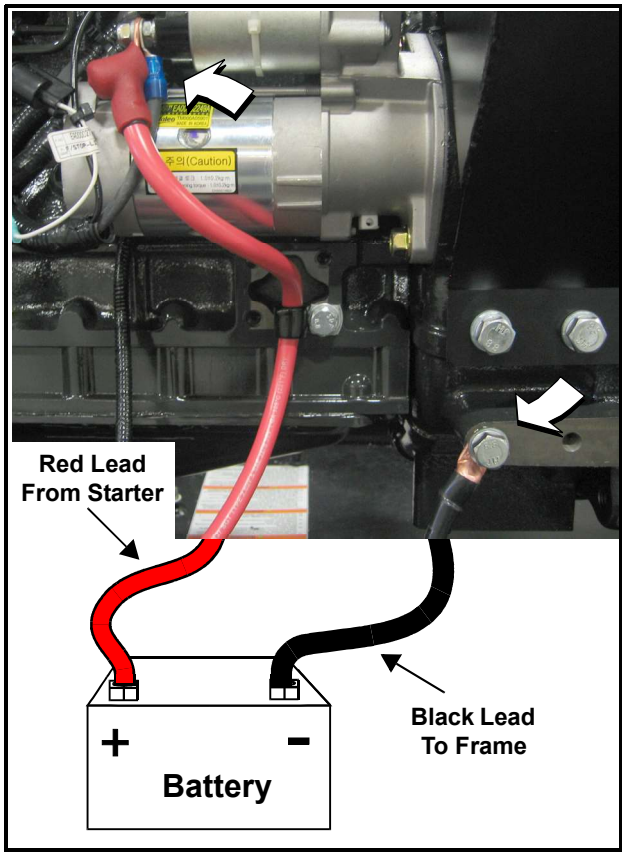


Figure 5-10. Battery Cable Connections

5.7.9.2— Check Fluid Level

Check the fluid level of unsealed batteries. If necessary, fill with distilled water only. DO NOT use tap water.

5.7.9.3— Check State of Charge

Check the state of charge using a Digital Multimeter. Recharge and retest if state of charge is below manufacturer's recommendations. Replace battery if necessary.

5.7.9.4— Battery Replacement

Removal

⚠CAUTION!

Always disconnect the negative battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion which could result in serious injury.

1. Remove battery negative cable (black) from battery negative (-) terminal.
2. Remove battery positive cable (red) from battery positive (+) terminal.
3. Install rubber protective cover over battery positive (+) terminal. See A of Figure 5-11
4. Loosen two screws with nylon washers to release battery hold-down clamp from battery tray.
5. Grasp battery strap, and lift battery from battery tray. See B of Figure 5-11
6. Remove rubber protective cover from battery positive (+) terminal.

Installation

⚠ CAUTION!

Always connect the positive battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion which could result in serious injury.

1. Install rubber protective cover over battery positive (+) terminal. See A of Figure 5-11
2. Grasp battery strap and lift battery. See B of Figure 5-11
3. Set battery onto battery tray.
4. Tighten two screws with nylon washers to secure hold-down clamp to battery tray.
5. Remove rubber protective cover from battery positive (+) terminal.
6. Install battery positive cable (red) to battery positive (+) terminal.
7. Install battery negative cable (black) to battery negative (-) terminal.

NOTE: If continuing with Schedule A maintenance procedures, leave the battery negative cable (black) disconnected.

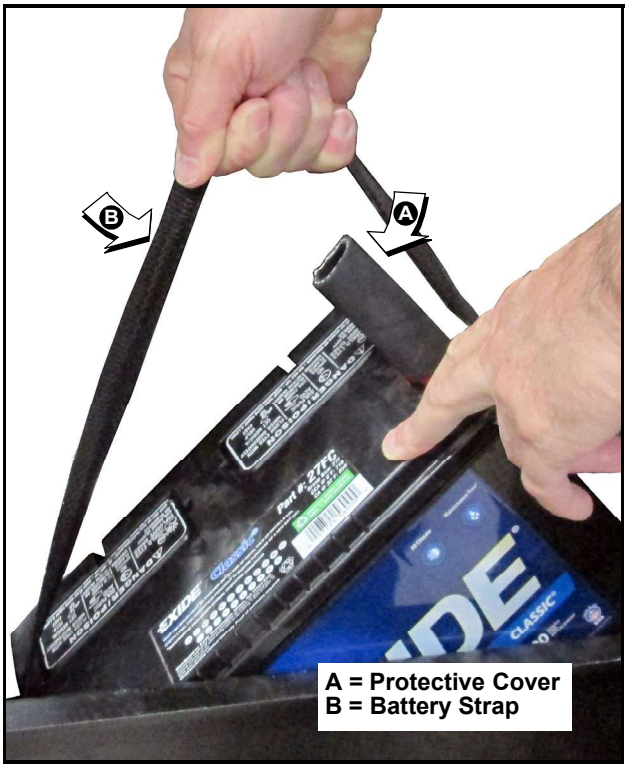


Figure 5-11. Remove/Install Battery

5.7.10— Check and Adjust Accessory/ Drive Belt

5.7.10.1— Check

Check the accessory/drive belt condition.

1. Perform visual inspection as follows:
   - Inspect belt for cracks, fraying, excessive wear or other damage.
   - Verify that belt is free of grease and oil. Replace belt if contaminated.

NOTE: Use a solution of soap and warm water to clean pulleys, if necessary. Avoid use of solvents, but if used, always follow by a soap and water wash.

2. Check the fan belt deflection. Adjust the belt deflection as follows:
   - Using a suitable gauge, apply 22 lbs (10 kgf) force midway between the water pump and alternator pulleys. See Figure 5-12

NOTE: 5.4L (48 kW) units are provided with an automatic belt tensioner and do not need adjustment.

- Take note of gauge reading. If belt deflection is not within specification, see Subsection 5.7.10.2—Adjust.

Belt Deflection	English	Metric
	3/8 - 5/8 Inches	7.6 - 12.7 cm

5.7.10.2— Adjust

1. Loosen DC alternator tension bracket screw. Rotate alternator outward to reduce belt deflection, rotate inward to increase belt deflection.
2. Tighten DC alternator tension bracket screw to 17-22 ft-lbs (23-30 N-m).
3. Recheck belt deflection and repeat steps as necessary.

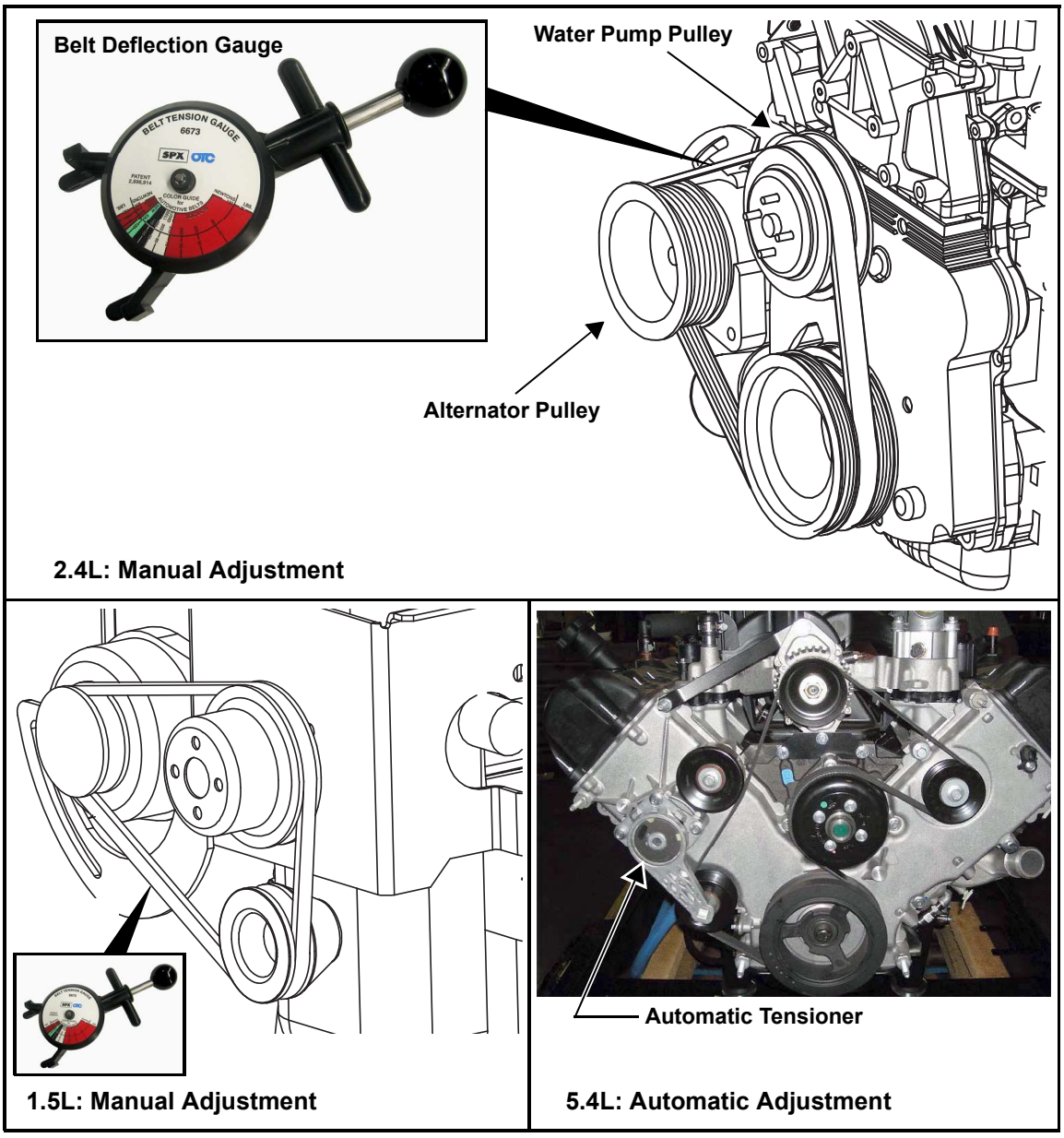


Figure 5-12. Check Accessory/Drive Belt Deflection

5.7.11— Replace Air Filter Element

1. Remove wing nut, lock washer and flat washer from threaded rod to release air cleaner cover. See Figure 5-13
2. Remove the air filter element and discard.
3. Thoroughly clean air cleaner cover of any dust, dirt, or debris.
4. Place **new** air filter element against adapter flange.

NOTE: The air filter element is not directional.

5. Install air cleaner cover over threaded rod. Install flat washer, lock washer and wing nut. Tighten wing nut until snug.

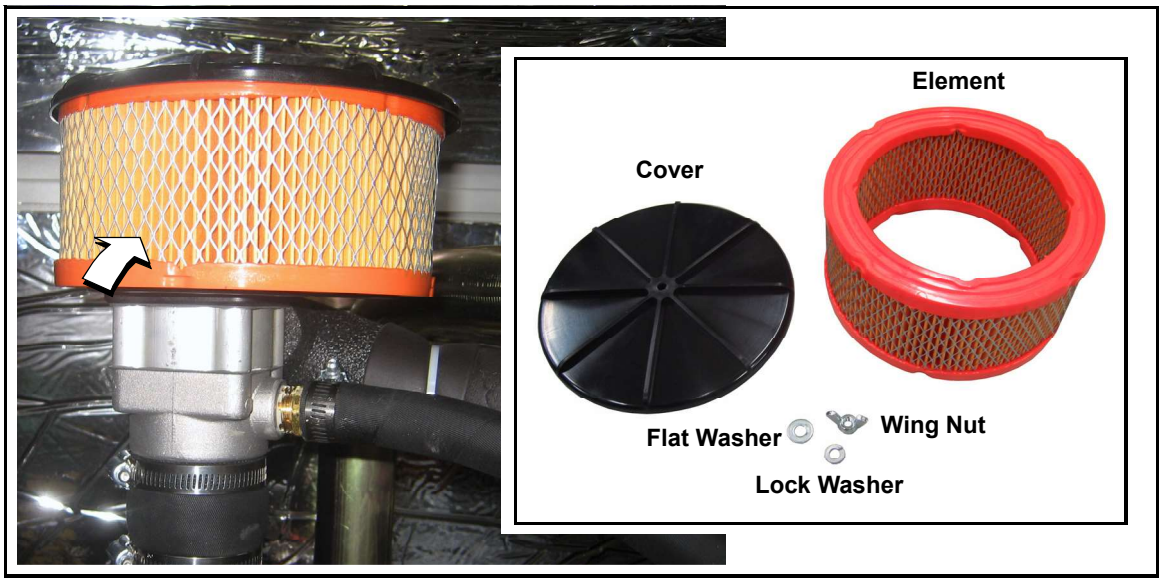


Figure 5-13. Air Cleaner Cover and Filter Element

NOTE: Service kits are available from Independent Authorized Service Dealers.

5.7.12— Final Instructions

If only performing Schedule A maintenance procedures, proceed as follows:

1. Install battery negative cable (black) onto battery negative (-) terminal.
2. Install left and right side access panels. See Subsection 5.2 —Access Panels.
3. See Subsection 5.10 —Return To Service.

5.8 — Schedule B Maintenance

NOTE: Perform Schedule B maintenance every two years or after 250 hours of service, whichever comes first. Before proceeding below, first perform all tasks listed under Schedule A Maintenance.

NOTE: The 2.4L (32 kW) unit is depicted in the artwork used in this manual. For the general location of components in all other models, see Subsection 5.8.1—Schedule B Maintenance Item Locations.

5.8.1— Schedule B Maintenance Item Locations

NOTE: The side of the enclosure with the viewing window is identified as the rear of the generator set. The right and left sides are identified by standing at the rear and looking towards the front of the unit.

Model	22/27 kW	25/30 kW	32/38 kW	36/45 kW	48 kW	60 kW
Engine	**2.4L**	**1.5L**	**2.4L**	**2.4L**	**5.4L**	**2.4L**
Coolant Drain Hose	**L**	**R**	**L**	**L**	**R**	**L**
Radiator Fill Cap	**T**	**T**	**T**	**T**	**T**	**T**
Coolant Overflow Reservoir	**L**	**L**	**L**	**L**	**L**	**L**
Spark Plugs	**L**	**R**	**L**	**L**	**B**	**L**
R = Right Side **L** = Left Side **B** = Both Sides **T** = Top						

5.8.2— Drain/Flush Coolant System

1. Disconnect and empty coolant overflow reservoir.
2. Install and connect coolant overflow reservoir.

⚠ WARNING!

Verify that the engine is cool before removing the radiator cap. The cooling system is under pressure, so steam and hot liquid can come out forcefully when the cap is loosened.

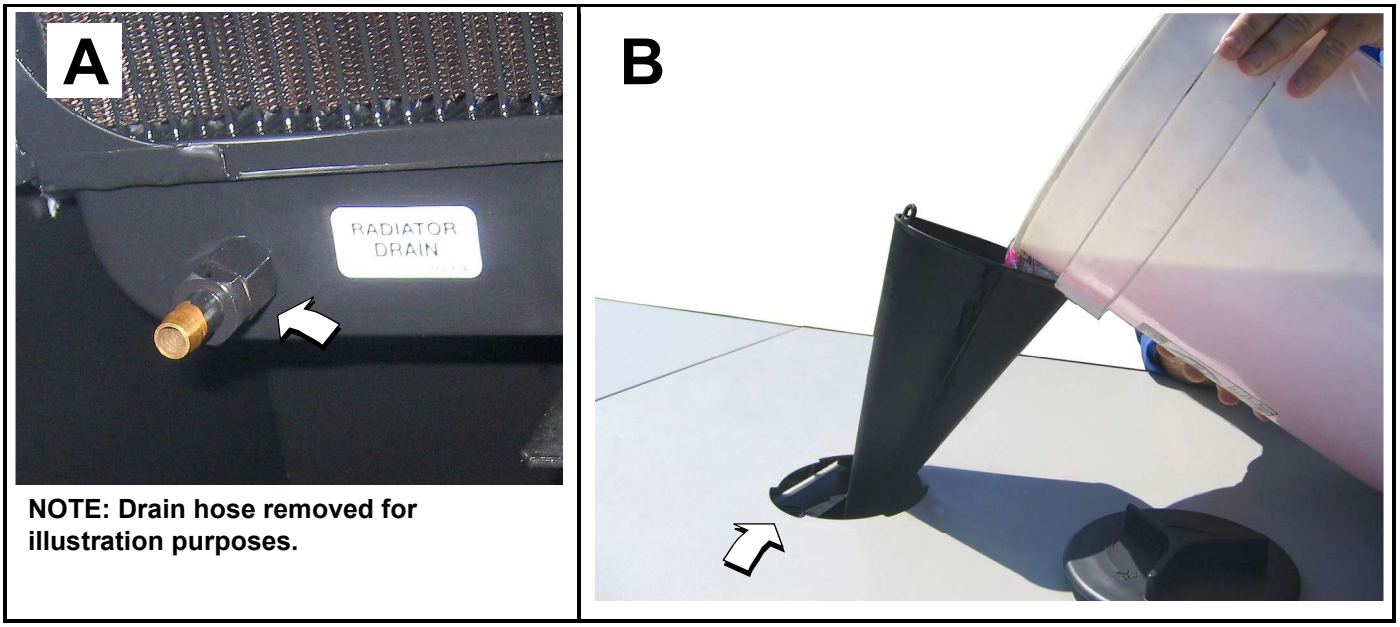
3. Rotate and remove plastic cover at top of enclosure.
4. Slowly unscrew radiator cap.
5. Locate drain cock at bottom left side of radiator.

NOTE: If unit is not equipped with drain hose, install suitable length of rubber hose to drain cock.

6. Rotate hex fitting to open drain cock. See A of Figure 5-14
7. Remove coolant drain hose from holding clamp.
8. Use wrench to hold hex on hose fitting (to prevent rotation), and use second wrench to remove drain plug.
9. Drain coolant into a suitable container.
10. Install plug at end of drain hose.
11. Install drain hose in holding clamp.
12. Rotate hex fitting to close radiator drain cock.
13. Obtain the recommended quantity and type of coolant. See Subsection 2.5 —Coolant Water Treatment.

System Coolant Capacity						
Model	**22/27 kW**	**25/30 kW**	**32/38 kW**	**36/45 kW**	**48 kW**	**60 kW**
Engine	**2.4L**	**1.5L**	**2.4L**	**2.4L**	**5.4L**	**2.4L**
2.0 gallons (7.6 liters)		○				
2.5 gallons (9.5 liters)	○		○	○		○
3.0 gallons (11.4 liters)					○	

14. Insert funnel into filler neck of radiator. See B of Figure 5-14
15. Slowly pour coolant into filler neck until radiator is full.
16. Install radiator cap.
17. Press MANUAL on the control panel to start the engine. A blue LED illuminates to confirm that the system is in the MANUAL mode.
18. Allow engine to run until the thermostat opens, as indicated by heating of the top radiator hose.
19. Check coolant hoses for leaks. Tighten clamps, if necessary.
20. Press OFF on the control panel to shut the engine down.
21. Wait for the engine to cool.
22. Repeat steps 4-21 to drain and refill cooling system.
23. Slowly unscrew radiator cap. Slowly pour coolant into filler neck until radiator is full.
24. Add coolant to the overflow reservoir. See Subsection 5.7.5—Check Coolant Level and Hoses.
25. Install plastic cover at top of enclosure and rotate until tight.
26. Check hoses for nicks, cuts, tears or general deterioration. Replace as necessary.



NOTE: Drain hose removed for illustration purposes.

Figure 5-14. Drain/Fill Coolant System

5.8.3— Clean/Gap/Replace Spark Plugs

Clean, gap or replace spark plugs as follows:

⚠ DANGER!

Never disconnect a spark plug with the engine running. Doing so will result in an electric shock that could result in death or serious injury.

1. Remove battery negative cable (black) from battery negative (-) terminal.
2. Remove spark plug cables from spark plug terminals. See A of Figure 5-15

NOTE: When disconnecting spark plug cable from spark plug terminal, always grasp and pull on the boot at the terminal end of the cable. Pulling on cable portion can result in parts damage.

3. Thoroughly clean area around spark plugs.
4. Remove spark plugs from cylinder head using a 5/8 inch spark plug socket.

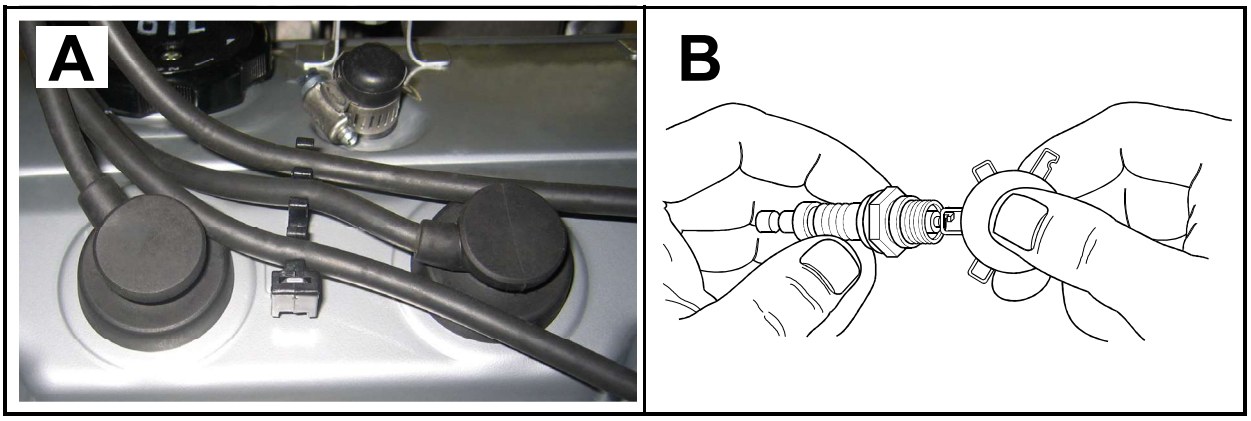


Figure 5-15. Adjust Spark Plug Gap

5. Check condition of threads in cylinder head and on spark plugs. If necessary, soften deposits with penetrating oil and clean out with a thread chaser.
6. Clean spark plugs using a wire brush and commercial solvent. Do not blast spark plugs. Use **new** spark plugs if necessary.
7. See B of Figure 5-15 Check spark plug gap using a wire feeler gauge. Adjust gap by carefully bending ground electrode as follows:

Spark Plug Gap						
Model	**22/27 kW**	**25/30 kW**	**32/38 kW**	**36/45 kW**	**48 kW**	**60 kW**
Engine	**2.4L**	**1.5L**	**2.4L**	**2.4L**	**5.4L**	**2.4L**
0.71 mm (0.028 in.)			O			O
0.9 mm (0.035 in.)		O				
1.07-1.17 mm (0.042-0.046 in.)	O			O		
1.29-1.45 mm (0.051-0.057 in.)					O	

8. Finger tighten spark plugs into cylinder head, and then using a spark plug socket, tighten as follows:

Spark Plug Torque		
Engine	**ft-lbs**	**N-m**
1.5L, 2.4L	18	25
5.4L	13	18

9. Install spark plug cables onto spark plug terminals.
10. Verify that spark plug cables are captured in cable clips at top of valve cover.

5.8.4— Final Instructions

If only performing Schedule A and Schedule B maintenance procedures, proceed as follows:

1. Install battery negative cable (black) onto battery negative (-) terminal.
2. Install left and right side access panels. See Subsection 5.2 —Access Panels.
3. See Subsection 5.10 —Return To Service.

5.9 — Schedule C Maintenance

NOTE: Perform Schedule C maintenance after 1000 hours of service. Before proceeding below, first perform all tasks listed under Schedule A Maintenance and Schedule B Maintenance.

⚠ CAUTION!

⚠ **The following procedures require special tools and skills. Contact an authorized service provider to perform these tasks.**

1. Remove battery negative cable (black) from battery negative (-) terminal.
2. Proceed as follows:
   - Replace Timing Belt (2.4L engines only)
   - Tighten Critical Fasteners

NOTE: Reset the A-B-C/Year time maintenance schedule counter using the Dealer Sub Menu (password required).

3. Install battery negative cable (black) onto battery negative (-) terminal.
4. Install front access panel. Install left and right side access panels. See Subsection 5.2 —Access Panels.
5. See Subsection 5.10 —Return To Service.

5.10 — Return To Service

After inspection, maintenance or service of the generator, return the unit to service as follows:

1. Pull up rubber flap covering fuse holder and install 7.5 amp fuse. See A of Figure 5-16.
2. Install T1 fuse in transfer switch.
3. Press AUTO on the control panel. A green LED illuminates to confirm that the system is in the AUTO mode. See B of Figure 5-16.
4. Move the Main Circuit Breaker switch up to the ON (Closed) position. See C of Figure 5-16.
5. Close the viewing window.
6. Remove the DO NOT OPERATE tag or placard from both the control panel and transfer switch.
7. Reset the time and date.

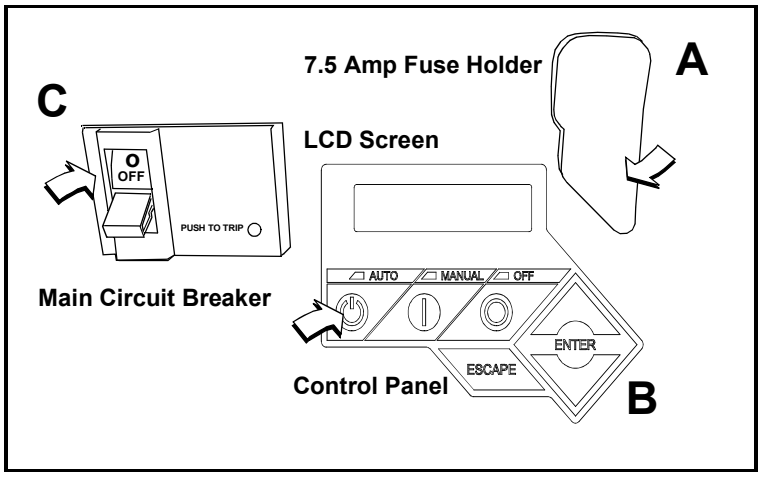


Figure 5-16. Generator Control Panel

5.11 — Lube Oil Maintainer System

5.11.1— Description

NOTE: Oil reservoir is empty when shipped from factory. Fill with clean engine oil to activate the system.

The 36 kW, 45 kW, and 60 kW models are equipped with a Lube Oil Maintainer System. The system is installed at the factory and calibrated at the factory to the correct engine-running crankcase oil level. As needed, the system keeps the engine lubricating oil full by automatically adding clean oil from the oil supply tank.

See A of Figure 5-17. The green bar observed through the viewing lens shows the normal oil level operating range of the Lube Oil Maintainer Regulator during engine running operation. When the oil level is within the green bar, the internal float holds the inlet valve closed to keep the crankcase oil at the current level.

As the engine uses oil, the float drops to open the inlet valve and allow clean oil to be supplied to the crankcase, replenishing engine oil to the full mark indicated on the oil dipstick. The float then rises with the crankcase oil level until it reaches a point where the inlet valve closes.

When the oil level as observed through the viewing lens is below the normal operating range green bar, it is an indication that the oil supply tank is low or the oil inlet screen is clogged. See B of Figure 5-17.

NOTE: It is normal for the oil level to be above the normal operating range green bar when engine is not running.

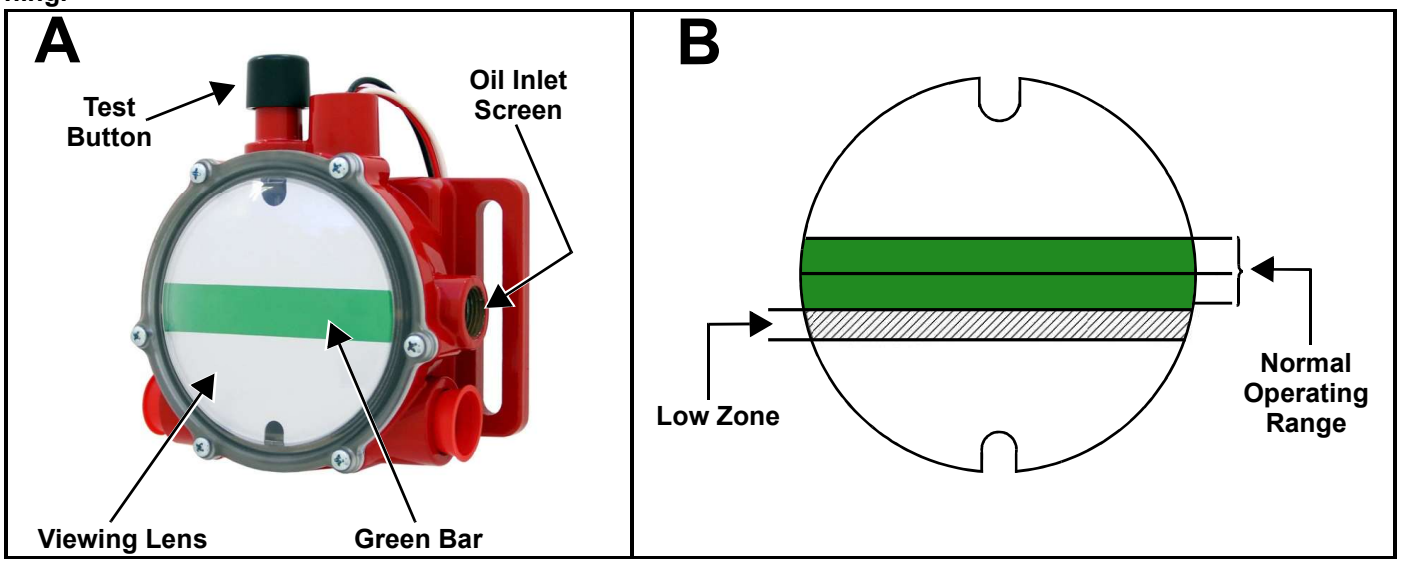


Figure 5-17. Lube Oil Maintainer Regulator

NOTE: When changing engine oil, always close the shutoff valve to avoid draining the clean oil in the oil supply tank with the crankcase oil. See Figure 5-19.

5.11.2— Fill Oil Supply Tank

1. Rotate plastic cover counter-clockwise and remove from top of enclosure. See Figure 5-18.
2. Remove fill cap at top of oil supply tank (Figure 5-20.).
3. Add clean engine oil to oil supply tank (2-1/2 gallons [9.46 liters] capacity).
4. Install fill cap at top of oil supply tank.
5. Install plastic cover at top of enclosure and rotate clockwise until tight.

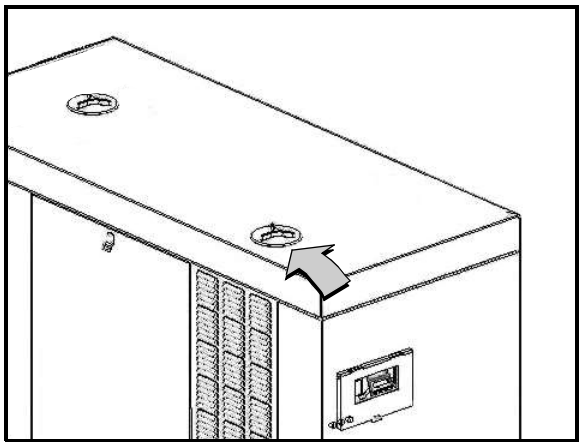


Figure 5-18. Access Oil Supply Tank

5.11.3— Test Functionality

See A of Figure 5-17. Momentarily press the test button to confirm that the float is operating correctly.

⚠CAUTION!

⚠ Do not hold the test button down for a prolonged period of time or the crankcase can be over filled. Over filling the crankcase can result in engine damage.

5.11.4— Shutoff Valve

See Figure 5-19 and Figure 5-20. When draining engine crankcase oil, always close shutoff valve to avoid draining clean oil from supply tank.

After filling crankcase with clean oil, remember to open shutoff valve to enable operation of Lube Oil Maintainer System.

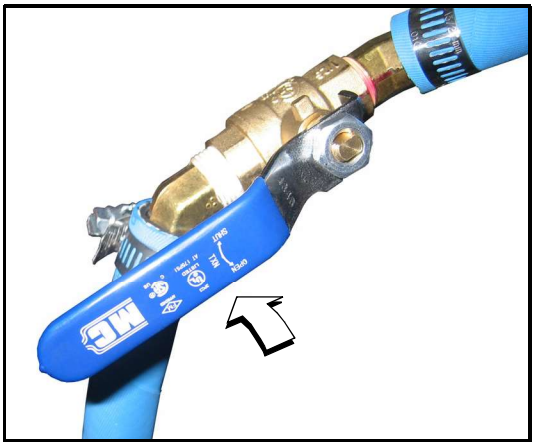


Figure 5-19. Shutoff Valve (Shown in Open Position)

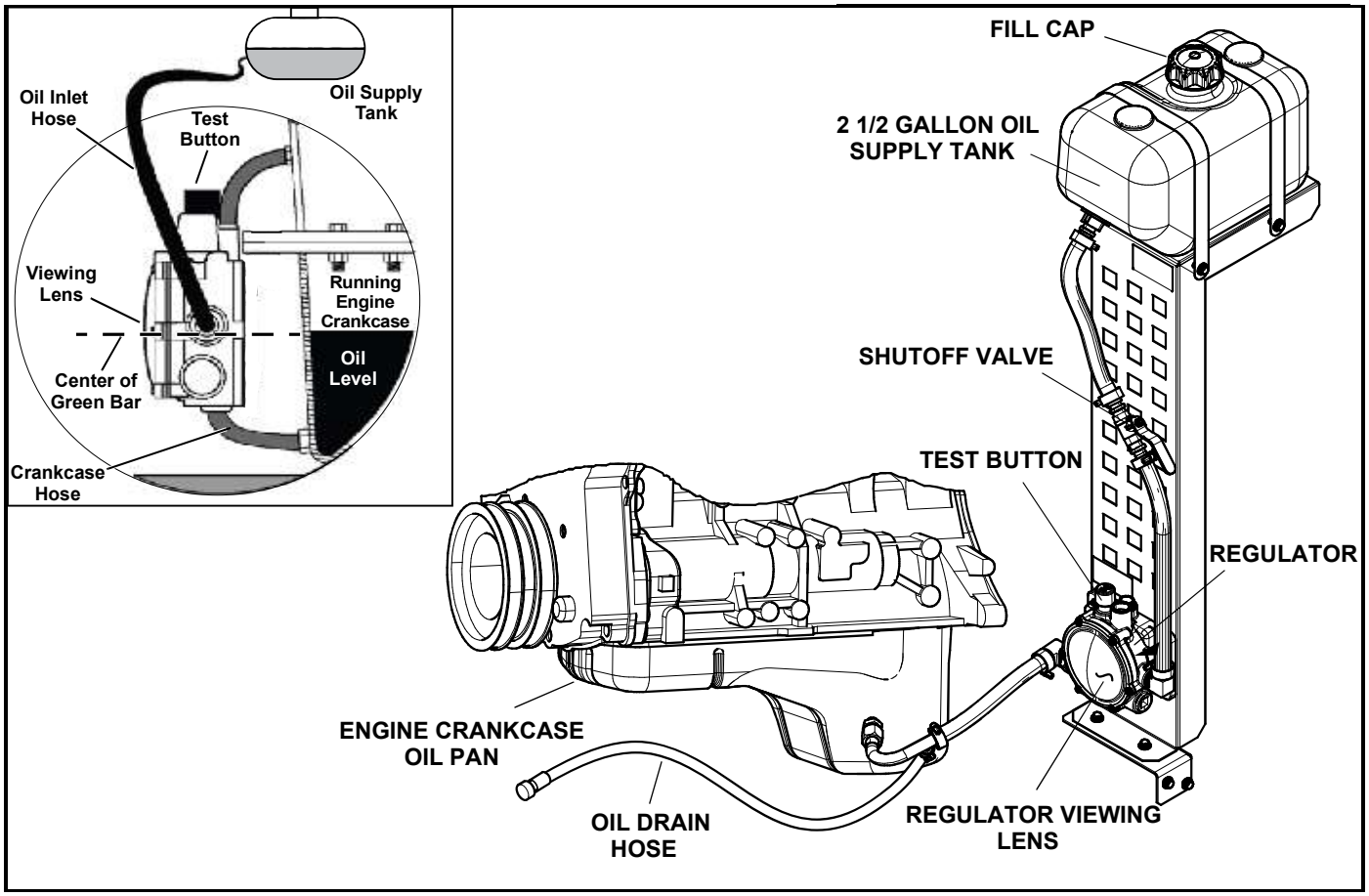


Figure 5-20. Lube Oil Maintainer Assembly and Function Diagram

6.1 — Engine Troubleshooting

Problem	Cause	Correction
The engine will not crank.	Fuse blown.	Replace 7.5 amp fuse in generator control panel. Correct short circuit condition if fuse blows again.
	Loose, corroded or defective battery cables.	Tighten, clean or replace as necessary.*
	Defective starter contact.	Tighten, clean or replace as necessary.*
	Defective starter motor.	Tighten, clean or replace as necessary.*
	Dead Battery.	Charge or replace battery.
The engine cranks but will not start.	Out of fuel.	Replenish fuel. Turn on fuel valve.
	Defective fuel solenoid.	*
	Open F1 7.5 amp fuse.	Replace F1 7.5 amp fuse if fuse blows again.*
	Open F2 15 amp fuse.	Replace F2 15 amp fuse if fuse blows again.*
	Defective fuel system.	*
	No fuel supply.	Turn on fuel supply.*
The engine starts hard and runs rough.	Air cleaner plugged or damaged.	Check/replace air cleaner.
The generator is set to OFF, but the engine continues to run.	Defective keypad.	*
	Defective control board.	*
There is no AC output from the generator.	Main line circuit breaker is in the OFF (OPEN) position.	Reset circuit breaker to ON (CLOSED) position.
	Generator internal failure.	*
There is no transfer to standby after utility source failure.	Defective transfer switch coil.	*
	Defective transfer relay.	*
	Transfer relay circuit open.	*
	Defective control logic board.	*
Unit consumes large amounts of oil.	Engine over filled with oil.	Adjust oil to correct level.
	Engine breather defective.	*
	Incorrect oil type or viscosity.	See Engine Oil Recommendations.
	Damaged gasket, seal or hose.	Check for oil leaks.
* Contact an Independent Authorized Service Dealer for assistance.		

6.2 — Controller Troubleshooting

Active Alarm	Problem	Solution
NOT ACTIVATED	Unit will not start in AUTO with utility loss.	Refer to activation section in Owner's Manual.
NONE	Unit running in AUTO but no power in house.	Check MLCB. Contact servicing dealer if MLCB is in the ON position.
NONE	Unit will not start in AUTO with utility loss.	Check screen for start delay countdown. If the start up delay is greater than expected, contact servicing dealer to adjust from 2 to 1500 seconds.
HIGH TEMPERATURE	Unit shuts down during operation.	Check ventilation around the intake, exhaust and rear of generator. Contact serving dealer if no obstruction is found.
OVERLOAD	Unit shuts down during operation.	Clear alarm and remove loads from the generator. Put back in AUTO and restart.
RPM SENSE LOSS	Unit was running and shuts down, attempts to restart.	Clear alarm and remove loads from the generator. Put back in AUTO and restart. If problem returns, contact servicing dealer to investigate possible fuel issue.
LOW OIL PRESSURE	Unit will not start in AUTO with utility loss.	Check oil level. Add oil per Owner's Manual. Contact servicing dealer if oil level is correct.
RPM SENSE LOSS	Unit will not start in AUTO with utility loss.	Clear alarm. From the MAIN menu on the control panel, navigate to the BATTERY MENU. Contact servicing dealer if battery is GOOD. Replace battery If CHECK BATTERY is displayed.
OVERCRANK	Unit will not start in AUTO with utility loss.	Clear alarm. Attempt to start the unit in MANUAL. If it does not start or starts and runs rough, contact servicing dealer.
OVERSPEED	Unit will not start in AUTO with utility loss.	Contact servicing dealer.
UNDER VOLTAGE	Unit will not start in AUTO with utility loss.	Contact servicing dealer.
UNDERSPEED	Unit will not start in AUTO with utility loss.	Contact servicing dealer.
MISWIRE	Unit will not start in AUTO with utility loss.	Contact servicing dealer.
OVERVOLTAGE	Unit will not start in AUTO with utility loss.	Contact servicing dealer.
LOW BATTERY	Warning active.	Clear alarm. From the MAIN menu on the control panel, navigate to the BATTERY MENU. Contact servicing dealer if battery is GOOD. Replace battery If CHECK BATTERY is displayed.
BATTERY PROBLEM	Warning active.	Contact servicing dealer.
CHARGER WARNING	Warning active.	Contact servicing dealer
SERVICE SCHEDULE A	Warning active.	Perform SERVICE SCHEDULE A maintenance; press ENTER to clear.
SERVICE SCHEDULE B	Warning active.	Perform SERVICE SCHEDULE B maintenance; press ENTER to clear.
SERVICE SCHEDULE C	Warning active.	Perform SERVICE SCHEDULE C maintenance; press ENTER to clear.

6.3 — Removal From Service During Utility Outages

If, during prolonged utility outages, the user wishes to remove the unit from service to conserve fuel, reduce run hours, or to perform maintenance tasks, then complete the steps listed below.

IMPORTANT NOTE: Failure to abide by this procedure can result in equipment damage.

To remove the generator from service while running in AUTO and online, proceed as follows:

1. Turn the main utility disconnect to OFF (Open).
2. Open the viewing window. See Subsection 3.4 —Open Viewing Window.
3. Move the Main Circuit Breaker switch down to the OFF (Open) position.
4. Press OFF on the control panel. A red LED illuminates to confirm that the system is in the OFF mode.

NOTE: If inspection and/or maintenance tasks are to be performed, complete the additional steps listed below.

5. Remove T1 fuse from transfer switch.
6. Pull up rubber flap covering fuse holder and remove 7.5 amp fuse.
7. Remove battery negative cable (black) from battery negative (-) terminal.
8. Place a DO NOT OPERATE tag or placard on both the control panel and transfer switch.

To return the generator to service, proceed as follows:

NOTE: If inspection and/or maintenance tasks were performed, start with step 1. If the unit was just shut down to conserve fuel or to reduce run hours, start at step 5.

1. Install battery negative cable (black) onto battery negative (-) terminal.
2. Pull up rubber flap covering fuse holder and install 7.5 amp fuse.
3. Install T1 fuse in transfer switch.
4. Remove the DO NOT OPERATE tag or placard from both the control panel and transfer switch.
5. Press AUTO on the control panel. A green LED illuminates to confirm that the system is in the AUTO mode. Allow the generator to start and run for a few minutes.
6. Move the Main Circuit Breaker switch up to the ON (Closed) position.
7. Turn the main utility disconnect to ON (Closed).
8. Close the viewing window.

6.4 — Storage

6.4.1— Prepare For Storage

If the generator cannot be exercised every **seven** days and will be out of service longer than 90 days, prepare for storage as follows:

1. Open the viewing window. See Subsection 3.4 —Open Viewing Window.
2. Press MANUAL on the control panel to start the engine. A blue LED illuminates to confirm that the system is in the MANUAL mode.
3. Allow the engine to run until it reaches normal operating temperature.
4. Press OFF on the control panel. A red LED illuminates to confirm that the system is in the OFF mode.
5. Move the Main Circuit Breaker switch on the control panel down to the OFF (Open) position.
6. Pull up rubber flap covering fuse holder and remove 7.5 amp fuse.
7. Turn off utility power to the transfer switch.
8. Place a DO NOT OPERATE tag or placard on both the control panel and transfer switch.
9. Wait five minutes for the engine to cool.
10. Remove left and right side access panels. See Subsection 5.2 —Access Panels.

NOTE: On 36 kW, 45 kW, and 60 kW models, close shutoff valve to avoid draining the oil supply tank with the crankcase oil. For more information, see Subsection 5.11 —Lube Oil Maintainer System.

11. Remove oil drain hose from holding clamp.
12. Use one wrench to hold hex on hose fitting (to prevent rotation), and use second wrench to remove drain plug.
13. Drain oil into a suitable container.
14. Install drain plug onto end of oil drain hose.
15. Install oil drain hose into holding clamp.
16. Rotate oil filter counterclockwise to remove from oil filter adapter.
17. Apply a light coat of clean engine oil to gasket of **new** oil filter.
18. Install oil filter by hand until gasket just contacts oil filter adapter. Tighten oil filter an additional 3/4 to one full turn.
19. Remove oil fill cap and fill engine with the recommended oil. See Subsection 2.3 —Engine Oil Recommendations.
20. Install oil fill cap.

NOTE: Dispose of used oil and oil filter at a proper collection center.

⚠ WARNING!

Always disconnect the negative battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion which could result in serious injury.

21. Remove battery negative cable (black) from battery negative (-) terminal.
22. Remove battery positive cable (red) from battery positive (+) terminal.
23. Remove two screws to release battery hold-down clamp from platform.
24. Remove battery and store on a wooden board in a cool, dry room. Do not store the battery on a concrete or earthen floor.
25. Install left and right side access panels. See Subsection 5.2 —Access Panels.
26. Thoroughly clean and wipe down the generator. See Subsection 2.9 —Corrosion Protection.

6.4.2— Return From Storage

To return the unit to service after storage, proceed as follows:

1. Thoroughly clean and wipe down the generator. See Subsection 2.9 —Corrosion Protection.
2. Remove left and right side access panels. See Subsection 5.2 —Access Panels.
3. Install battery onto tray oriented with the negative (-) post toward the front of the enclosure.
4. Install two screws with nylon washers to secure battery hold-down clamp to tray.
5. Check battery. See Subsection 5.7.9—Check Battery Condition/Fluid Level..

⚠ WARNING!

Always connect the positive battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion which could result in serious injury.

6. Install battery positive cable (red) onto battery positive (+) terminal.
7. Install battery negative cable (black) onto battery negative (-) terminal.
8. Check oil level and add oil as necessary. **DO NOT OVERFILL**.

NOTE: On 36 kW, 45 kW, and 60 kW models, open shutoff valve to enable Lube Oil Maintainer System.

9. Open the viewing window. See Subsection 3.4 —Open Viewing Window.
10. Pull up rubber flap covering fuse holder and install 7.5 amp fuse.
11. Move the Main Circuit Breaker switch up to the ON (Closed) position.

12. Press MANUAL on the control panel to start the engine. A blue LED illuminates to confirm that the system is in the MANUAL mode.
13. Allow the engine to run until it is reaches normal operating temperature. Check for leaks while the engine is running.
14. Press OFF on the control panel. A red LED illuminates to confirm that the system is in the OFF mode.
15. Install left and right side access panels. See Subsection 5.2 —Access Panels.
16. Turn on utility power to the transfer switch.
17. Press AUTO on the control panel. A green LED illuminates to confirm that the system is in the AUTO mode.
18. Reset the time and date.
19. Close the viewing window.

6.5 — Attention After Submersion

Do NOT start and operate the generator if it has been submerged in water. Have a Dealer thoroughly clean, dry, and inspect the generator following any submersion. If the structure (home) has been flooded, it should be inspected by a certified electrician to ensure there won't be any electrical problems during generator operation or when utility power is returned.

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