CARRIER GENERATOR SET

MODEL 69RG15-130W

TECHNICAL SPECIFICATION

Carrier TRANSICOLD

Date:	25, January 11
Specification:	RG69006
Revision:	H

TABLE OF CONTENTS

Page

General Description 3

Design Guidelines 3

Operating Conditions 3

Engine 4

Lubrication System 4

Generator 5

Protective Devices 5

Unit Physical Data 5-6
- Weights 5
- Size 5
- Sound Level 6
- Electrical 6

Materials and Coatings 6

Unit Mounting 6

Accessories 7
- Battery 7
- Battery Charger 7
- Cooling Fan 7
- Exhaust System 7
- Filters 7
- Fuel Tank 7
- Gauges 7
  - Hourmeter 7
  - Water Temperature 7
  - Ampere Meter 7
  - Oil Pressure 7
- Radiator Coil 7
- Water Pump Belt 7

Revision Log 8

Dimensional Drawings (98-02324 Rev A) ....Attached

GENERAL DESCRIPTION

The Carrier Transicold model 69RG15 diesel generator set is designed to provide highly reliable unattended continuous operation for all refrigerated ocean going container units in both over-the-road and rail transport modes. Generator sets are shipped complete and ready to operate. Fueling and connection of battery leads must be completed before first use.

The 69RG15 mounts to properly equipped containers, in front of the refrigeration unit's upper face. Gensets will be provisioned for "Pin" mounting to Container header rail. When mounted, the 69RG envelope allows access to the refrigeration unit control box . This applies to all Carrier and most competitive units as well.

Additionally – The design of the equipment considered the following criteria:

1. Deep footprint to avoid tipping due to rough handling by yard forklift.
2. Fork pockets are extended and reinforced to eliminate fork tine damage.

DESIGN GUIDELINES

Although there are no international design criteria specific to Generator Sets, the 69RG15 is designed to parallel ISO 1496. In addition the 69RG15 meets all U.S. Department of Transportation regulations.

OPERATING CONDITIONS

The 69RG15 is designed specifically for over-the-road and rail transport environments around the world.

Shock – Components able to withstand sustained shocks of 3g's in the horizontal direction and 6 g's in the vertical.

Vibration - +/- 2 g's (peak) or 4g (peak to peak) vertical and Front-to-back, 0.75 g side to side.

Ambient temperature range:

1. Structure.....…….-40 to +52°C (-40 to +125°F)
2. Operation - Start ....-26 to +52°C (-15 to +125°F)
   - Run ….-40 to +52°C (-40 to +125°F)

Functionality - The RG provides a full 15 kW output to eliminate shutdown due to high power draw over loading the engine.

ENGINE	
Manufacturer	Kubota
Model	V2203L-DI (Tier 4 Interim Compliant, Direct Injection)
Type	Vertical, water cooled, 4 cycle diesel, Electronic Speed Control
Number of Cylinders	4
Bore x Stroke	83 x 102.4mm (3.26 x 4.03 in.)
Total Displacement	2216 cc (135.2 cu.in.)
Combustion Chamber	Direct Injection
Horsepower	32 hp@1800 rpm continuous
	27 hp@1800 rpm (altitude 3000ft/914m)
Kilowatt	23.9 kW@1800 rpm continuous
	20 KW@1800 rpm (altitude 3000ft/914m)
Torque	14 kg-meters (101 foot-pounds)
Firing Order	1-3-4-2
Injection Pump	Bosch "K" type mini pump
Governor	Centrifugal ball mechanical/ Electronic Governor
Injection Nozzle	Special Bosch Nozzle
Injection Timing (pressurized)	2.5 ±0.75 deg B.T.D.C.
Compression Ratio	21.5:1
Starting Motor	12v/ 2.5kW
Low Ambient Starting Aid	Intake Air Heater in Air Intake Manifold
Intake Air Heater Amperage	42 Amps @ 12 VDC
Fuel Requirements	
Summer	Diesel No. 2-ASTM/D975.667
Winter	Diesel No. 1-Nos. 1-D or 2-D
Operating Water Temperature (normal)	180 – 200 deg F (82-93 deg C)
LUBRICATION SYSTEM	
Lubricating Oil	
Specification	Heavy Duty API service classification CD (DS)
Capacity	16.3 liters, 16.0 U.S. quarts (includes filter)
Grade	10W30 Base # 10 or above
Oil Pressure	35-60 PSI (3.3 - 5.2 kg/sq. cm)
Oil Level Indicator	Dipstick in oil pan

GENERATOR	Marathon Electric
Output	15.0 Kilowatt 18.75 KVA
Rating	Continuous Duty, 0.8 power factor, 460 VAC
	3 phase, 60 hertz
	1.2 Horsepower/kW starting, code G
Type	Brush-less, rotating field, statically excited
	self-regulated, drip-proof design
Index of Protection "IP" classification	IP 44
Insulation	
Rotor	Wet wound, Thermo setting epoxy - class "H"
Stator	Wet wound, Thermo setting epoxy - additional
	Polybutadiene coating - class "F"
Temperature	Rise per MG1-122.40
	NEMA Std. MG1-1972
Bearings and Lubrication	Double-sealed Heavy Duty 6308 ball bearing
	100,000 hours B-10 life
	Integral Anti-rotation O-ring
	Chevron SRI #2 grease
PROTECTIVE DEVICES	
Low Oil Pressure Safety Switch (LOP)	Engine will not run/start unless pressure is maintained
Setting	Opens @ 18 PSI (1.095 sq. cm) Auto-reset
Water Temperature Switch (HWT)	Opens @ 230 deg F (110 deg C) Auto-reset
Excessive Current Draw by:	
Main Alternator	Circuit Breaker (CB-1) Trips @26 Amps (460 VAC)
Electronic Governor Module (EG)	Fuse (F1, F2, F3) Breaks @10 Amps Replace Fuse
Fuel Heater (FH)	Circuit Breaker (CB-2) Trips @30 Amps Auto-reset
High Water Temperature (HWT)	Circuit Breaker (CB-2) Trips @30 Amps Auto-reset
Safety Relay (SR)	Circuit Breaker (CB-2) Trips @30 Amps Auto-reset
Total Time Meter (TT)	Circuit Breaker (CB-2) Trips @30 Amps Auto-reset
Intake Air Heater circuit	Circuit Breaker (CB-3) Trips @50 Amps Auto-reset
Battery Charger	Circuit Breaker (CB-5) Trips @ 3 Amps manual-reset
UNIT PHYSICAL DATA	
Weights	
Battery	63 lb/ 28.6 kg
Main Alternator	280 lb/127kg
Engine (dry)	434 lb/197 kg (approx.)
Unit	1830 lb/830 kg
Size	
Height	41.25 in/ 104.7 cm
Length	91.5 in/ 232.4 cm
Depth	25.9 in/65.7 cm
Turn Radius	64in/162.6cm

UNIT PHYSICAL DATA (cont'd)	
Sound Level Output	Overall sound pressure level rating = 74 dB(A) per
	DIN 8958 (1) (5-point average at 7 meters)
Electrical	
General	Address system of wire marking on all wiring. Control
	wires to be white, power wires to be red, ground wires
	to be green, green with yellow stripe or lite blue. All wire is
	tin-plated copper.
Power Receptacle	CEE-17, ISO 1496-2, Rated 32 amps @ 440V
MATERIALS AND COATINGS	
Materials	
Hardware	ASTM type 300 stainless steel, corrosion resistant
	cadmium or zinc plated steel
Hood and Removable Panels	Fabricated from aluminum sheet
Frame components	Both cold and hot rolled sheet steel (ASTM 569)
Coatings	
Aluminum Parts	
	Top coat of electrostatically applied TGIC
	(triglycidylisocynurate) powder paint .
	Oven bake cure, post cure thickness range 1.8 - 5 mils.
	Color: CTD Cloud White
Steel Structural Frame and Fuel Tank	Grit blasted to Steel Structures Painting Council (SSPC) No. 10 near white metal.
	Base coat of electrostatically applied TGIC
	(triglycidylisocynurate) red oxide epoxy powder paint,
	oven bake cure, post cure thickness range 2 - 5 mils
	Top coat of electrostatically applied TGIC
	(triglycidylisocynurate) powder paint.
	oven bake cure, post cure thickness range 2 - 5 mils
	Color: CTD Hull Blue
UNIT MOUNTING	
Pin Mount with Clamp Provisions	The mounting bracket is designed with two tapered pins, diameter
	1-13/16 in. (46mm), length 2 inches (51 mm), that seat into mating
	container header mounting brackets. Unit is also equipped with mounting
	Blocks to allow for clamp mounting to corner castings if required.
	Two bolts on the lower sides of the Genset (supplied) are fastened
	Into the tapped holes located on the vertical structural members of
	the container box.

ACCESSORIES		
Battery		
Type		Interstate Maintenance Free (or equivalent)
Rating		190 Min. reserve capacity (25 amps @ 80 F/27 C)
Cold Cranking		700 amps @ 0 deg F/32 deg C
Battery Charger		
Type		Solid State Marine Duty
Input		210-250 VAC +/- 10%, 47-63 Hz, 2 Amps
Output		13.6 VDC, 25 amps for 20 mins
		13.6 VDC, 13 amps continuos
Protection		Safety contactor - reverse polarity.
		Rating of SCR - 55Amps
		Rating of internal bridge rectifier - 50Amps
Filters		
Lubricating Oil		Extended life,spin-on, with internal by-pass (Carrier P/N 30-00463)
Air		Heavy duty “cartridge style” media with cyclonic filtration and pressure differential indicator
Fuel		Spin on Canister type with clear bowl and water drain (Carrier P/N filter assembly 30-01104-13 with element# 30-01079-01)
Radiator Coil		
Type		Copper tube, aluminum fin, steel tubesheet
Unit Capacity (including engine)		6.0 quarts/ 5.7 liters (includes overflow bottle)
Anti-freeze		50/50 mix protection to -34 deg F (-37 deg C)
Protective Coating		Patented acrylic electrocoat
Water Pump Belt		Poly V self tensioning (Carrier # 50-60330-03) neoprene with polyamide cord
Cooling Fan		
Type		Aerodynamic propeller
Size		7 blade, 15" (381 mm) diameter
Material		Polypropylene
Gauges		
Hourmeter	Type	Digital, 12 Volt
	Range	100,000 hours
Water Temperature	Type	Dial Indicating, electric sender
	Range	100-240 deg F (38-116 deg C)
Ammeter	Type	Dial Indicating
	Range	plus/minus 60 amps
Oil Pressure	Type	Dial Indicating, electric sender
	Range	1-100 psi
Exhaust system		
Muffler		Aluminized Steel
Exhaust piping		Stainless steel
Fuel Tank		
Capacity		Fill - 130 US gallons/492 liters Draw - 124 gallons/469 liters

Specification Revision Log

Revision	Date	Comment	Approval
Original	20, Oct '00		JPG
A	20, June '01	Updated layout – all sheets, added sheet 8 - revision log	JPG
B	28, April '03	Revised unit weight, sheet 5	JPG
C	5,January '04	Revised Paint specification to powder base and topcoat	JPG
D	9, May 2006	Updated oil filter and fan belt information (sheet 7)	JPG
E	18, Dec 2007	Updated engine to Tier4i compliant - sheet 4 Changes to protective devices to include Electronic governor module and Air intake heater circuit – Sheet 5 Updated Weights – Sheet 5 Updated Battery Type – Interstate Sheet 7	CM
F	12, Nov 2008	Updated weight – sheet 5 Updated sound output level – sheet 6	CM
G	23, Feb 2010	Updated Air filter – sheet 7	CM
H	25,Jan 2011	Changed fuel filter type from bolt on canister to spin on canister - sheet 7	CM