

# Operation and Installation

RV/Mobile Generator Sets



Models:

**7CCKM**  
**7CCFKM**  
**7CCKMR**  
**7CCFKMR**

**ISO 9001**  
**KOHLER**  
GENERATORS  
INTERNATIONALLY REGISTERED

**KOHLER**<sup>®</sup>  
POWER SYSTEMS

TP-5571 3/94b

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**California Proposition 65**

** WARNING**

Engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

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# Table of Contents

SUBJECT	PAGE	SUBJECT	PAGE
<b>Safety Precautions and Instructions</b> .....	<b>I</b>	Checking Electrolyte Level .....	3-12
Routine Service Parts .....	VIII	Checking Specific Gravity .....	3-12
California Emission Certification .....	VIII	Cylinder Head Service .....	3-13
<b>Glossary of Abbreviations</b> .....	<b>IX</b>	Valve Service .....	3-13
<b>Section 1. Specifications</b> .....	<b>1-1</b>	Wattage Requirements .....	3-14
General Specifications .....	1-1	Generator Service .....	3-15
Engine .....	1-2	General .....	3-15
Generator .....	1-3	Storage Procedure .....	3-15
Controller .....	1-4	<b>Section 4. Troubleshooting</b> .....	<b>4-1</b>
Service Views .....	1-5	Engine .....	4-1
<b>Section 2. Operation</b> .....	<b>2-1</b>	Generator .....	4-3
Prestart Checklist .....	2-1	<b>Section 5. Wiring Diagrams</b> .....	<b>5-1</b>
Start/Stop Procedure .....	2-1	Four-Lead Reconnectable (Single Phase) ...	5-2
Automatic Deicing (For Gasoline Models Only) .....	2-1	Twelve-Lead Reconnectable (Three Phase) .	5-4
Circuit Protection .....	2-2	<b>Section 6. Installation</b> .....	<b>6-1</b>
<b>Section 3. Scheduled Maintenance</b> .....	<b>3-1</b>	Introduction .....	6-1
Lubrication System .....	3-2	General Information .....	6-1
Low Oil Pressure Shutdown .....	3-2	Generator Selection and Wattage Requirements .....	6-2
Oil Check .....	3-2	Installation Factors .....	6-2
Oil Change .....	3-3	Electrical Load .....	6-2
Oil Type .....	3-3	Lighting Load .....	6-2
Cooling System .....	3-4	Motor Loads .....	6-3
Ignition System .....	3-4	Appliance Loads .....	6-3
Spark Plugs .....	3-4	Kilowatt Derating .....	6-4
Gasoline Fuel System .....	3-5	7CCKM-RV/7CCKMR-Mobile Generator Set Mounting .....	6-5
Specification– Gasoline .....	3-5	Compartment Size .....	6-5
Fuel Filter– Gasoline Only .....	3-5	Air Requirements .....	6-6
Gasoline Carburetor Adjustments .....	3-6	Mounting .....	6-8
Main and Idle Fuel Mixture .....	3-6	7CCKMR-Mobile Generator Set Mounting ...	6-9
LP Gas Fuel System .....	3-7	Below-floor Mount .....	6-9
Specification– LP Liquid .....	3-7	Vehicle-floor Mount .....	6-10
Specification– LP Vapor .....	3-7	Extended Shaft Option .....	6-10
LP Carburetor Adjustments .....	3-8	Fuel System .....	6-12
Main Fuel Mixture .....	3-8	Gasoline .....	6-12
Idle Fuel Mixture .....	3-8	LP Gas Fuel System .....	6-13
Fuel Valve and Filter– LP Liquid .....	3-8	Exhaust Systems .....	6-14
Choke Adjustments .....	3-9	Electrical Systems .....	6-18
Choke Adjustment Procedure for Operation Above 10°F (-12.2°C) (From original factory set position) .....	3-9	Battery and Connections .....	6-19
Choke Adjustment Procedure for Operation Below 10°F (-12.2°C) .....	3-9	AC Load Lead Connections .....	6-20
Electronic Governor .....	3-10	Remote Switch Connection .....	6-21
Air Cleaner .....	3-10	<b>Section 7. Installation Drawings</b> .....	<b>7-1</b>
Battery .....	3-11	<b>Section 8. Service Ordering Instructions</b> ..	<b>8-1</b>
Battery Charging (if equipped) .....	3-11	Service Manual Procurement .....	8-1
Cleaning .....	3-12	<b>Section 9. Operating Hour Service Log</b> ...	<b>9-1</b>

# Safety Precautions and Instructions

A generator set, like any other electro-mechanical device, can pose potential dangers to life and limb if improperly maintained or imprudently operated. The best way to prevent accidents is to be aware of the potential dangers and to always use good common sense. In the interest of safety, some general precautions relating to the operation of a generator set follow. Keep these in mind. This manual contains several types of safety precautions which are explained below.

## DANGER

Danger is used to indicate the presence of a hazard that will cause severe personal injury, death, or substantial property damage if the warning is ignored.

## WARNING

Warning is used to indicate the presence of a hazard that can cause severe personal injury, death, or substantial property damage if the warning is ignored.

## CAUTION


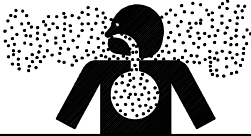
Caution is used to indicate the presence of a hazard that will or can cause minor personal injury or property damage if the warning is ignored.

## NOTE

Note is used to notify people of installation, operation, or maintenance information that is important but not hazard-related.

Safety decals are affixed to the generator set in prominent places to advise the operator or service technician of potentially hazardous situations. The decals are reproduced here to improve operator recognition and thereby increase decal effectiveness. For a further explanation of decal information, reference the accompanying safety precautions. Before operating or servicing the generator set, be sure you understand the message of these decals. Replace decals if missing or damaged.

## EXHAUST SYSTEM

 <b>WARNING</b>

<p><b>Carbon monoxide.</b> <b>Can cause severe nausea, fainting, or death.</b></p> <p>The exhaust system must be leakproof and routinely inspected.</p>

**Carbon monoxide can cause severe nausea, fainting, or death.** Install exhaust system tail pipe so discharged exhaust gases will not be drawn into vehicle interior through windows, doors, air conditioners, etc. Do not use flexible tail piping since this type could crack and allow lethal exhaust fumes to enter the vehicle.

**Carbon monoxide can cause severe nausea, fainting, or death.** Never operate the generator set inside a building unless the exhaust gas is piped safely outside. Never operate in any area where exhaust gas could accumulate and seep back inside an occupied building or vehicle. Be careful when parking your vehicle to avoid obstructing the exhaust outlet. The exhaust gases must discharge freely, otherwise carbon monoxide may deflect into the vehicle. Avoid breathing exhaust fumes when working on or near the generator set. Carbon monoxide is particularly dangerous because it is an odorless, colorless, tasteless, nonirritating gas that can cause death if inhaled for even a short period of time.

## ACCIDENTAL STARTING





**Accidental starting.**

**Can cause severe injury or death.**

Disconnect battery cables before working on generator set (negative lead first and reconnect it last).

**Accidental starting can cause severe injury or death.** Disconnect battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator. The generator set can be started by remote start/stop switch unless this precaution is followed.

## MOVING PARTS


<b>⚠ WARNING</b>	
	
<b>Hazardous voltage.</b>	<b>Moving rotor.</b>
<b>Can cause severe injury or death.</b>	
Do not operate generator set without all guards and electrical enclosures in place.	

<b>⚠ WARNING</b>	
	
<b>Rotating parts.</b>	
<b>Can cause severe injury or death.</b>	
Do not operate generator set without all guards, screens, or covers in place.	

**Exposed moving parts can cause severe injury or death.** Keep hands, feet, hair, clothing, and test leads away from belts and pulleys when unit is running. Replace guards, covers, and screens before operating generator set.

**Flying projectiles can cause severe injury or death.** Retorque all crankshaft and rotor hardware after servicing. When making adjustments or servicing generator set, do not loosen crankshaft hardware or rotor thru-bolt. If rotating crankshaft manually, direction should be clockwise only. Turning crankshaft bolt or rotor thru-bolt counterclockwise can loosen hardware and result in serious personal injury from hardware or pulley flying off engine while unit is running.



## ENGINE BACKFIRE/FLASH FIRE


<b>⚠ WARNING</b>	
	
<b>Fire.</b>	
<b>Can cause severe injury or death.</b>	
Do not smoke or permit flame or spark to occur near fuel or fuel system.	

**A flash fire can cause severe injury or death.** Do not smoke or permit flame or spark to occur near carburetor, fuel line, fuel filter, fuel pump, or other potential sources of spilled fuel or fuel vapors. When removing fuel line or carburetor, use a proper container to catch all fuel.

**A sudden backfire can cause severe injury or death.** Do not operate with air cleaner removed.

## HAZARDOUS VOLTAGE/ ELECTRICAL SHOCK

<b>⚠ WARNING</b>	
	
<b>Hazardous voltage.</b>	<b>Moving rotor.</b>
<b>Can cause severe injury or death.</b>	
Do not operate generator set without all guards and electrical enclosures in place.	

<b>⚠ WARNING</b>	
	
<b>Hazardous voltage.</b>	
<b>Backfeed to utility system can cause severe injury, death, or property damage.</b>	
Do not connect to any building electrical system without connecting through an approved device and after building main switch is open.	

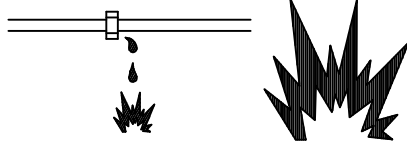
**Hazardous voltage can cause severe injury or death.** The heat sink of the voltage regulator contains high voltage. Do not touch voltage regulator heat sink when testing or electrical shock will occur.

**Hazardous voltage can cause severe injury or death.** Perform electrical service only as prescribed in equipment manual. Be sure that generator is properly grounded. Never touch electrical leads or appliances with wet hands, when standing in water, or on wet ground as the chance of electrocution is especially prevalent under such conditions. Wiring should be inspected at the interval recommended in the service schedule— replace leads that are frayed or in poor condition. The function of a generator set is to produce electricity and wherever electricity is present, there is the hazard of electrocution.

**Hazardous “backfeed” voltage can cause severe injury or death.** The generator must not be used to “backfeed” by connecting it to building/campground electrical circuits. Install a transfer switch in vehicle generator installations to prevent connection of vehicle and other sources of power. Electrical backfeed into a utility electrical system can cause serious injury or death to utility personnel working on transmission lines.

**Hazardous voltage can cause severe injury or death.** Short circuits can cause bodily injury and/or equipment damage. Do not contact electrical connections with tools or jewelry while adjustments are made. Remove wristwatch, rings, and jewelry that can cause short circuits.

## FUEL SYSTEM



**Explosive fuel vapors.  
Can cause severe injury or death.**

Use extreme care when handling, storing,  
and using fuels.

**Explosive fuel vapors can cause severe injury or death.** All fuels are highly explosive in a vapor state. Use extreme care when handling, storing, and using fuels. Store fuel in a well-ventilated area away from spark-producing equipment and out of the reach of children. Never add fuel to the tank while the engine is running since spilled fuel may ignite on contact with hot parts or from ignition spark. Do not smoke or permit flame or spark to occur near potential sources of spilled fuel or fuel vapors. Keep fuel lines and connections tight and in good condition— don't replace flexible fuel lines with rigid lines. Flexible sections are used to avoid breakage due to vibration. Should any fuel leakage, fuel accumulation, or electrical sparks be noted, **DO NOT OPERATE GENERATOR SET.** Have systems repaired before resuming generator operation.

**Explosive fuel vapors can cause severe injury or death.** Additional precautions must be taken when using the following fuels:

**Gasoline**— Store gasoline only in approved red containers clearly marked GASOLINE. Do not store gasoline in any occupied building.

**Propane (LP)**— Adequate ventilation is mandatory. Propane is heavier than air; install gas detectors low in room. Inspect detectors often.

**Explosive fuel vapors can cause severe injury or death.** Spilled fuel can cause an explosion. Use a container to catch fuel when draining fuel system. Wipe up all spilled fuel after draining system.

**Explosive fuel vapors can cause severe injury or death.** Fuel leakage can cause an explosion. Check LP vapor gas fuel system for leakage using a soap-water solution with fuel system test pressurized to 6-8 ounces per square inch (10-14 inches water column). Do not use test solutions that contain ammonia or chlorine, since the soap will not bubble for an accurate leakage test.

**Explosive fuel vapors can cause severe injury or death.** Fuel leakage can cause an explosion. Check LP liquid withdrawal gas fuel system for leakage using a soap-water solution with fuel system test pressurized not less than 90 psi (621 kPa). Do not use test solutions that contain ammonia or chlorine, since the soap will not bubble for an accurate leakage test.

## BATTERY

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**Sulfuric acid in batteries.**  
**Can cause severe injury or death.**

Use protective goggles and clothes. Can cause permanent damage to eyes, burn skin, and eat holes in clothing.

**Sulfuric acid in batteries can cause severe injury or death.** Sulfuric acid in battery can cause permanent damage to eyes, burn skin, and eat holes in clothing. Always wear splash-proof safety goggles when working around the battery. If battery electrolyte is splashed in the eyes or on skin, immediately flush the affected area for 15 minutes with large quantities of clean water. In the case of eye contact, seek immediate medical aid. Never add acid to a battery once the battery has been placed in service. Doing so may result in hazardous spattering of electrolyte.

**Explosion can cause severe injury or death.** Battery gases can cause an explosion. Do not smoke or permit flame or spark to occur near a battery at any time, particularly when it is being charged. Avoid contacting terminals with tools, etc. to prevent burns and to prevent sparks that could cause an explosion. Remove wristwatch, rings, and any other jewelry before handling battery. Never connect negative (-) battery cable to positive (+) connection terminal of starter solenoid. Do not test battery condition by shorting terminals together or sparks could ignite battery gases or fuel vapors. Any compartment containing batteries must be well ventilated to prevent accumulation of explosive gases. To avoid sparks, do not disturb battery charger connections while battery is being charged and always turn charger off before disconnecting battery connections. When disconnecting battery, remove negative lead first and reconnect it last.

## HAZARDOUS NOISE



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**Hazardous noise.**  
**Can cause loss of hearing.**

Never operate generator without a muffler or with faulty exhaust system.

## HOT PARTS

 <b>WARNING</b>

<b>Hot engine and exhaust system. Can cause severe injury or death.</b>
Do not work on generator set until unit is allowed to cool.

**Fire can cause severe injury or death.** Hot exhaust system can ignite adjacent combustible materials. Do not locate electrical wiring, fuel lines, or combustible material above the exhaust muffler. Be careful when parking your vehicle to prevent grass fires started by exhaust system and hot exhaust gases.

**Fire can cause severe injury or death.** Hot generator can ignite debris in compartment. Keep the compartment and generator set clean and free of debris and combustible materials to minimize chances of fire. Do not block fuel/oil drain opening in generator mounting tray. If sub-flooring is used, cut a corresponding hole in the sub-flooring for drain opening.

**Hot parts can cause severe injury or death.** Do not touch hot engine parts. An engine gets hot while running and exhaust system components get extremely hot.

## NOTES

### NOTE

**This generator set does not comply with United States Coast Guard (U.S.C.G.) requirements and must not be used for marine applications.** Use only generator sets specified for marine use in marine installations. U.S.C.G. Regulation 33CFR183 requires a generator set to be "ignition protected" when used in a gasoline-fueled environment.

### NOTE

Do not "tee" into fuel injected fuel systems. Use a two dip tube arrangement for fuel supply. Consult an Authorized Kohler Service Dealer for further fuel system installation information.

### NOTE

**HARDWARE DAMAGE!** Engine and generator may make use of both American Standard and metric hardware. Be sure to use the correct size tools to prevent rounding of bolt heads and nuts.

**When replacing hardware, do not substitute with inferior grade hardware.** Screws and nuts are available in different hardness ratings. American Standard hardware uses a series of markings and metric hardware uses a numeric system to indicate hardness. Check markings on bolt head and nuts for proper identification.

## Routine Service Parts

Your Kohler generator dealer/distributor has a complete listing of parts for your generator set. Contact him for service.

Part Description	Kohler Part No.
Engine:	
Air Filter Element	278858
Oil Filter	277233
Fuel Filter: 1/4 in. inlet	228269
Ignition System:	
Spark Plug	235041-S
Misc.:	
Black Spray Paint	221292

## California Emission Certification

If your engine/generator has this identification label, it is certified for operation in the state of California.

IMPORTANT ENGINE INFORMATION  
THIS ENGINE MEETS 1995-1998  
CALIFORNIA EMISSION CONTROL  
REGULATIONS FOR ULGE ENGINES

DISPLACEMENT: \_\_\_\_\_  
FAMILY: \_\_\_\_\_  
BUILD DATE: \_\_\_\_\_

REFER TO OWNERS MANUAL FOR  
SAFETY, MAINTENANCE SPECS AND  
ADJUSTMENTS. FOR SALES AND  
SERVICE IN US/CANADA CALL:  
1-800-544-2444

**KOHLER**  
POWER SYSTEMS

This engine/generator is certified to operate on liquid propane fuel.

This engine certified with engine modifications.

If the engine/generator has this identification label, the fuel system is factory set and no adjustment is possible.

# Glossary of Abbreviations

Abbreviations are used throughout this manual. Normally in the text they will appear in complete form with the abbreviation following in parenthesis the first time they are used. After that they will appear in the abbreviated form. The commonly used abbreviations are shown below.

AC	alternating current	etc.	etcetera, (and so forth)
AHWT	anticipatory high water temp.	ext.	external
ALOP	anticipatory low oil pressure	°F	Fahrenheit degree
AM	amplitude modulation	fl. oz.	fluid ounce, fluid ounces
Amp	ampere	FM	frequency modulation
Amps	amperes	fs	full scale
ANSI	American National Standard Institute	ft.	foot, feet
API	American Petroleum Institute	ft. lbs.	foot pound, foot pounds
approx.	approximate, approximately	ga.	gauge
A/R	as required, as requested	gal., gals.	gallon, gallons
A/S	as supplied, as stated, as suggested	gal./hr.	gallons per hour
ASA	American Standards Association	GPH	gallons per hour
assy.	assembly	GPM	gallons per minute
ASTM	American Society for Testing Materials	gr.	grade
ATDC	after top dead center	grd.	ground
ATS	automatic transfer switch	HCHT	high cylinder head temperature
aux.	auxiliary	HET	high exhaust temperature
AWG	American Wire Gauge	Hg	mercury (element)
AWM	appliance wiring material	H <sub>2</sub> O	water
BHP	brake horsepower	HP	horsepower
bmep	brake mean effective power	hr, hrs	hour
Btu	British thermal unit	HWT	high water temperature
°C	Celsius degree	Hz	hertz (cycles per second)
cc	cubic centimeter	ID	inside diameter
CCA	cold cranking Amps.	in.	inch(es)
CEC	Canadian Electrical Code	inc.	incorporated
cfh	cubic feet per hour	in. lbs.	inch pounds
cfm	cubic feet per minute	int.	internal
CID	cubic inch displacement	int.-ext.	internal-external
cm	centimeter, centimeters	ISO	International Standards Organization
cmm	cubic meters per minute	J	joule, joules
co.	company	JIS	Japanese Industry Standard
cont'd.	continued	kg	kilogram, kilograms
C.S.A.	Canadian Standards Association	kg/cm <sup>2</sup>	kilograms per square centimeter
cu. in.	cubic inch, cubic inches	kgm	kilogram meter(s)
cyl.	cylinder	km	kilometer, kilometers
dba	decibels	kPa	kiloPascal, kiloPascals
DC	direct current	kph	kilometers per hour
DCR	direct current resistance	kV	kilovolt
deg.	degree	kVA	kilovolt amperes
dept.	department	kW	kilowatt, kilowatts
dia.	diameter	kWH	kilowatt hour
e.g.	example given	L	liter, liters
EMI	electromagnetic interference	LxWxH	length x width x height
		LED, LEDs	light emitting diode
		lb., lbs.	pound, pounds
		L/hr.	liter per hour, liters per hour
		L/min.	liter(s) per minutes,
		LOP	low oil pressure
		LP	liquefied petroleum
		LWT	low water temperature

m	meter, meters	OS	overspeed, oversize
m <sup>3</sup>	cubic meter, cubic meters	OV	overvoltage
max.	maximum	oz.	ounce, ounces
MCM	one thousand circular mils.	PF	power factor
mi.	mile, miles	pot.	potentiometer
mil	one one-thousandth of an inch	ppm	parts per million
min.	minimum	psi	pounds per square inch
mJ	millijoule, millijoules	pt., pts.	pint, pints
MJ	mega joule, mega joules	qt., qts.	quart, quarts
mm	millimeter, millimeters	qty.	quantity
m <sup>3</sup> /min	cubic meters per minute	ref.	reference
MPa	megaPascal	RFI	radio frequency interference
mph	miles per hour	rms	root mean square
MS	military standard	rpm	revolutions per inch
mW	milliwatt, milliwatts	SAE	Society of Automotive Engineers
MW	megawatt, megawatts	sec.	second, seconds
N/A	not available	SCR	silicon controlled rectifier
NEC	National Electrical Code	spec, specs	specification
NEMA	National Electrical Manufacturers Association	sq.	square
NFPA	National Fire Protection Association	sq. cm	square centimeters
Nm	Newton meter, Newton meters	sq. in.	square inch, square inches
no., nos.	number, numbers	tach	tachometer
NPT	National Standard taper pipe thread per general use	TDC	top dead center
N/R	not required	temp.	temperature
OC	overcrank	TIF	telephone influence factor
OD	outside diameter	turbo	turbocharger
OEM	original equipment manufacturer	UNC	Unified coarse thread (was NC)
		UNF	Unified fine thread (was NF)
		UL	Underwriter's Laboratories, Inc.
		US	undersize
		V	volt, volts
		vac	Volts alternating current
		vdc	volts direct current
		W	watt, watts

# Section 1. Specifications

## Introduction

Your vehicle is equipped with a dependable Kohler alternating-current generator set. Service requirements of the generator set are minimal but it is important that the required services be performed at the prescribed intervals. Please take a few moments to read through this manual then carefully follow all service recommendations to keep your set in top conditions. In the space provided, record the MODEL,

SPECIFICATION, SERIAL and ENGINE SPEC. numbers as found on the nameplate attached to the face of the controller (see Section 8– Service Ordering Instructions). This information will enable your Kohler generator service dealer/distributor to supply the correct part or data for your particular version. Keep this manual in your vehicle for future reference.

## Specifications

### General Specifications

	7CCKM/CCKMR (60Hz)	7CCFKM/CCFKMR (50Hz)
Dimensions– L x W x H– in. (mm)	26.23 x 21.09 x 15.25 (666 x 536 x 387)	26.23 x 21.09 x 15.25 (666 x 536 x 387)
Weight– lbs. (kg)	335 (152)	335 (152)
Air requirements:		
Combustion– cfm	25	25
Cooling– cfm	540	540
Free air opening	85 sq. in. (548 sq. cm)	85 sq. in. (548 sq. cm)

Fuel Consumption	Gasoline– gph (Lph)			
	25%	50%	75%	100%
7CCKM/CCKMR (60 Hz)	0.57 (2.20)	0.72 (2.70)	0.97 (3.70)	1.27 (4.80)
7CCFKM/CCFKMR (50 Hz)	0.48 (1.80)	0.60 (2.30)	0.80 (3.00)	1.05 (4.00)
Fuel Consumption	LP Gas– gph (Lph)			
	25%	50%	75%	100%
7CCKM/CCKMR (60 Hz)	0.68 (2.60)	0.87 (3.30)	1.07 (4.00)	1.29 (4.90)
7CCFKM/CCFKMR (50 Hz)	0.57 (2.20)	0.72 (2.70)	0.89 (3.40)	1.08 (4.10)

## Engine

Some general engine specifications are listed below. Refer to the appropriate service section and the engine service manual for specific service details.

	7CCKM 7CCKMR	7CCFKM 7CCFKMR
Manufacturer	Kohler	
Model	K-582	
Cycle	4	
Number cylinders	2	
Compression ratio	7:1	
Displacement– cu.in. (L)	57.7 (945.7)	
Rated horsepower	12.7	10.6
RPM	1800	1500
Bore– in. (mm)	3.50 (88.9)	
Stroke– in. (mm)	3.0 (76.2)	
Valve material: intake	Forged steel	
Valve material: exhaust	Stelliteâ (with rotator)	
Valve clearance– in. (mm):		
Intake	0.008-0.010 (0.20-0.25)	
Exhaust	0.017-0.020 (0.43-0.51)	
Cylinder block material	Cast iron	
Cylinder head tightening torque– ft. lbs (KgM)	35 (4.84)	
Cylinder head material	Aluminum alloy	
Piston rings	2 Compression/1 oil	
Crankshaft material	Ductile iron	
Bearings	Replaceable sleeve	
Governor	Electronic	
Lubrication system	Full pressure	
Oil capacity (with filter)– qts. (L)	4 (3.78)	
Oil type (API)	SC, SD, SE, or SF	
Oil pressure– psi (kPa)	40-65 (276-448)	
Fuel type:		
Gasoline	87 octane unleaded (min.)	
LP vapor gas (inlet pressure)	7-11 water column, 4-6 oz. per sq. in.	
LP liquid withdrawal	50-250 psi	
Battery voltage	12	
Battery ground	Negative	
Spark plug type	Championâ RH10	
Spark plug gap:		
Gasoline– in. (mm)	0.025 (0.64)	
LP gas– in. (mm)	0.018 (0.46)	
Spark plug tightening torque– ft. lbs (Nm)	18-22 (24-30)	
Ignition system	Electronic	
Starter motor	Bendix-drive electric starter motor	
Cranking current at 70° F.	100 amps	
Cooling system	Air cooled	

## Generator

	<b>7CCKM 7CCKMR</b>	<b>7CCFKM 7CCFKMR</b>
Rated kW	7.0 (6.7 if equipped with battery charging)	5.8
Rated kW– LP liquid withdrawal	6.3	5.8
Rated kW– LP vapor withdrawal	6.3	5.8
Rated kW– 3-phase models	7.0 (6.7 if equipped with battery charging)	N/A
Frequency– Hz	60	50
Rated voltage	120V, 2 wire, single phase 120/240V, 3 wire, single phase	110V, 2 wire, single phase 110/220V, 3 wire, single phase
Rated amps	58.3 (120 volt)	52.7 (110 volt)
Rated amps	29.2 (240 volt)	26.4 (220 volt)
Stator resistance (ohms)* leads:		
1-2, 3-4, 33-44	0.28	0.59
55-33	1.26	1.7
B1-B2	0.08	0.14
C1-CP, C2-CP	1.0	1.0
Rotor resistance (ohms)	4.6-5.7	
Excitation method	Solid state brush	
Coupling type	Direct	
Overbolt torque– in. lbs. (Nm)	60 (7)	
Voltage regulator type (single-phase models)	PowerBoostä IIIE	
Voltage regulator type (three-phase models)	PowerBoostä V	
Insulation (rotor and stator)	Class 155, epoxy varnish, vacuum impregnated	
Winding material	Copper	
Bearing, number and type	1, replaceable ball	
Battery charging current	15 amp (regulated)	
Circuit protection:		
Controller	15-amp fuse	
Battery charger (if equipped)	25-amp self-resetting circuit breaker**	
Voltage regulator	5-amp fuse	
Deicing Module	5-amp fuse	

\* Most ohmmeters will not give accurate readings when measuring less than 1 ohm. The stator can be considered good if a low resistance reading (continuity) is obtained and there is no evidence of shorted windings (discoloration). Do not confuse a low resistance reading with a reading indicating a shorted winding.

\*\* Circuit breakers are HACR approved

DERATION: The kilowatts of the generator set will decrease 3% for each 1000 feet (305 meters) above sea level and 2% for each 10°F (5.5°C) increase in temperature above 60°F (16°C) and 11.1% when converted to LP fuel.

NOTE: Even though the generator model is 7 kW, it may be circuit breaker limited. Refer to the generator set's nameplate located on the controller cover.

## Controller

The Kohler relay controller has a rocker-type momentary contact start/stop switch for operating the set at the controller. Also included is a connector for attaching a remote start/stop switch located inside the vehicle. See Figure 1-1. The green generator on lamp on the optional remote control panel will light whenever the generator is running. If the generator set has automatically stopped due to low oil pressure, 14 psi  $\pm$  2 psi (96 kPa) or less, the cause must be eliminated before the set can be restarted.

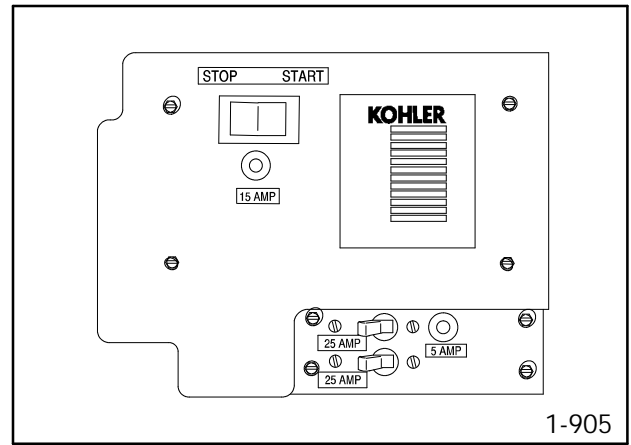
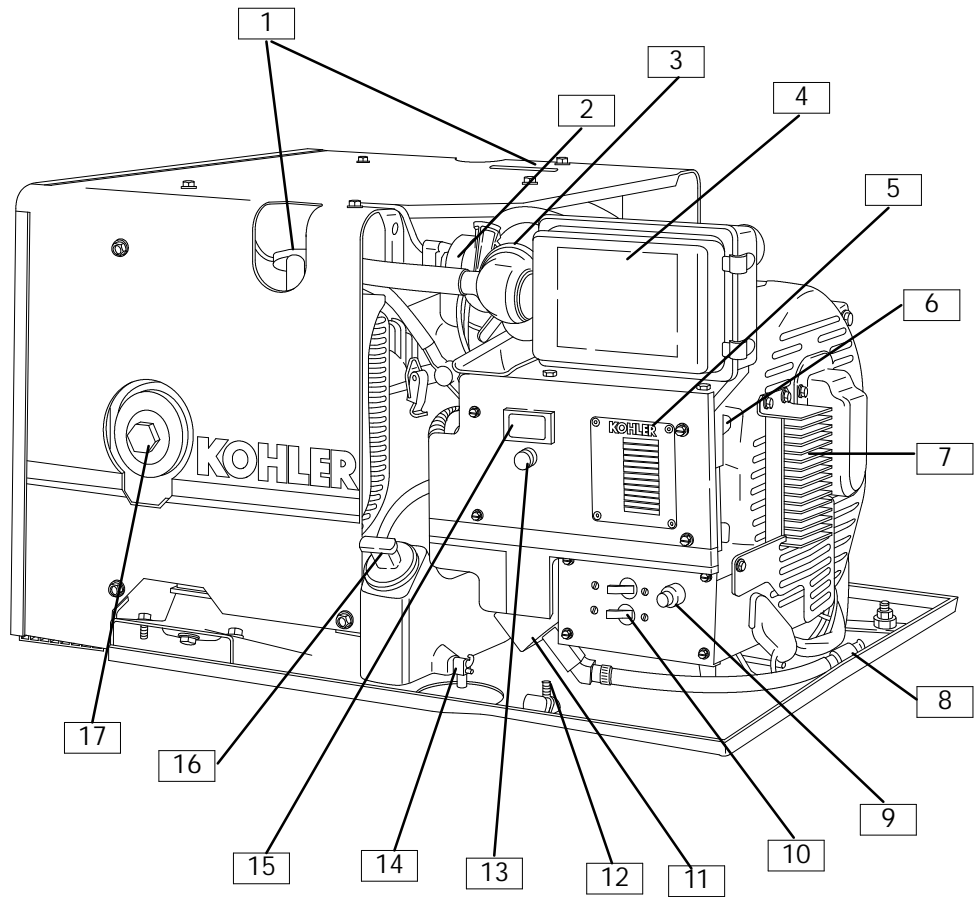


Figure 1-1. Controller

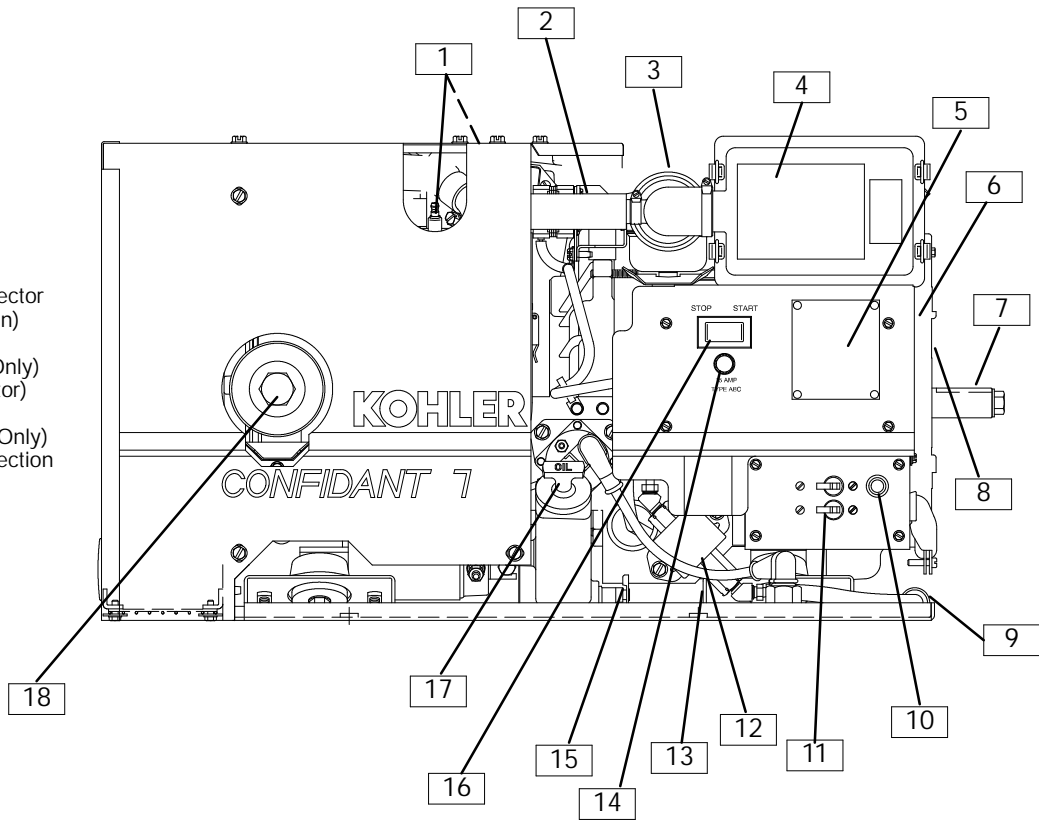
1. Spark Plugs
2. Choke Adjustment
3. Carburetor
4. Air Cleaner
5. Nameplate
6. Remote Control Connector
7. Voltage Regulator
8. Fuel Filter (Gasoline Only)
9. Fuse (Voltage Regulator)
10. Line Circuit Breakers
11. Fuel Pump (Gasoline Only)
12. Battery Positive Connection
13. Fuse (DC Controls)
14. Oil Drain
15. Start/Stop Switch
16. Oil Fill/Oil Check
17. Oil Filter (Spin On)



1-922

Figure 1-2. Service View 7CCKM

1. Spark Plugs
2. Choke Adjustment
3. Carburetor
4. Air Cleaner
5. Nameplate
6. Remote Control Connector
7. Extended Shaft (Option)
8. Voltage Regulator
9. Fuel Filter (Gasoline Only)
10. Fuse (Voltage Regulator)
11. Line Circuit Breakers
12. Fuel Pump (Gasoline Only)
13. Battery Positive Connection
14. Fuse (DC Controls)
15. Oil Drain
16. Start/Stop Switch
17. Oil Fill/Oil Check
18. Oil Filter (Spin On)



ADV-5806-A

Figure 1-3. Service View 7CCKMR-Mobile (Extended-Shaft Model)

# Section 2. Operation

To insure continued satisfactory operation, the following items should be checked before each start-up.

## Prestart Checklist

**OIL LEVEL:** Should be at or near full mark (not over).

**AIR INLETS:** Must be clear and unobstructed.

**COMPARTMENT:** Interior must be clean.

**AIR CLEANER:** Must be clean and properly installed.

**AIR SHROUDING:** Must be tight and in proper position.

**EXHAUST:** Tail pipe must be clear, muffler and piping tight and in good condition.

**ELECTRICAL:** All connections (including battery) must be tight.

## Start/Stop Procedure

Follow the instructions below to start/stop the generator set. The starter motor may burn out if these instructions are not followed.

Move the start/stop switch into the start position and hold in this position until the engine is running, then release. Do not crank engine continuously for more than 10 seconds at a time. Allow a 60-second cooldown period between cranking attempts if the engine does not start. If the unit fails to start after three attempts contact an authorized service dealer/distributor for repair.

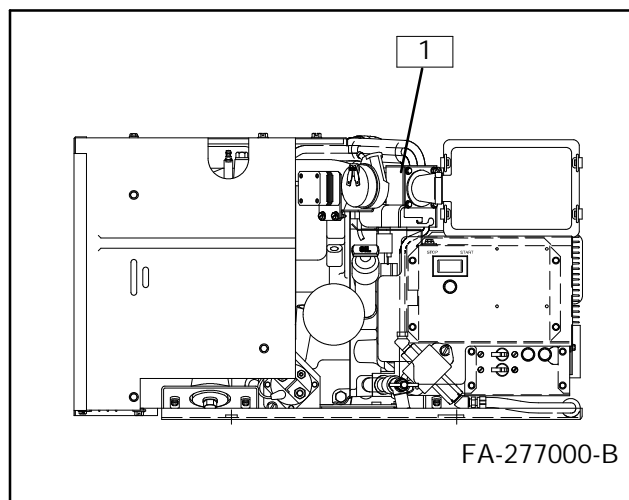
To stop, move the switch to the stop position. It is not necessary to hold the switch in the stop position until the unit stops. A relay automatically disengages and shuts the unit down. If the generator stops automatically, identify and correct the problem before attempting to restart.

## Automatic Deicing (For Gasoline Models Only)

The automatic deicing module mounted between the carburetor air horn and air cleaner warms the incoming air to reduce moisture from entering the fuel system. This reduces carburetor icing and crankcase breather freezeup. The system will function whenever the generator set is running.

An internal cartridge heater which is controlled by high- and low-limit thermostats heats the deicing module. The low-limit thermostat (located in the intake manifold) turns the cartridge heater on when the outside air temperature reaches approximately 40° F (4° C). When the deicing module reaches 185° F (85° C) the high-limit thermostat (located in the deicing module) cycles the cartridge heater off.

When the generator set is turned off, heat retained in the deicing module and the carburetor assembly reduces condensation accumulation inside the carburetor, thereby reducing throttle plate icing.



1. Deicing Module

**Figure 2-1. Automatic Deicing**

# Circuit Protection

**AC circuit breaker(s)**– will trip when a fault is detected in the AC output circuit. See Section 4– Troubleshooting to determine cause of fault. After fault is corrected, reset AC circuit breaker by placing in ON position. Unit is now ready to be restarted. Circuit breakers are HACR (Heating, Air Conditioning and Refrigeration) approved.

## NOTE

Circuit breaker ampere rating and availability are subject to change.

**Input (controller) fuse (15 amp)**– indicates a fault in the controller circuit. See Section 4– Troubleshooting. After fault is corrected, fuse must be replaced. Unit is now ready to be restarted.

**Voltage regulator fuse (5 amp)**– indicates a fault in the voltage regulator and/or generator circuit. After fault is corrected, replace fuse. Voltage regulator circuit is now functional.

**Battery charging circuit breaker (25 amp on sets equipped with battery charging)**– indicates a fault in the battery charging circuit. Breaker will automatically reset.

**Deicing fuse (5 amp)**– indicates a fault in the deicing module and/or circuit. After fault is corrected, replace fuse. Deicing circuit is now functional.

# Section 3. Scheduled Maintenance

In addition to the routine services listed in this manual, there are other important steps that should be taken to keep a generator set in top condition. Usually, tools and instruments required for these additional steps are not available to the generator set owner. For this reason,

the set should be returned periodically to an authorized service dealer/distributor for complete servicing and tune-up. The benefits of such service will be improved performance and continuous satisfactory operation during a long trouble-free service life.

Perform Service at Intervals Indicated (●)	Before Starting	Every 50 Hrs. or 6 Months	Every 100 Hrs. or 12 Months	Every 500 Hrs.
Check exhaust outlet	●			
Check oil level	●			
Check fuel supply	●			
Keep cooling air inlets and outlets clean	●			
Remove loose dirt from compartment	●			
Check electrolyte level in battery	●			
Check air cleaner (replace if dirty)		●		
Change lube oil (change oil initially after first five hours of operation)			●	
Replace lube filter			●	
Service or replace spark plugs			●	
Check battery specific gravity			●	
Check and tighten electrical connections			●	
Check and tighten mounting bolts and vibromounts			●	
Blow dust out of generator			●	
Clean spark arrestor			●	
Check valve-tappet clearance				●*
Service cylinder heads				●*
Check compression				●
Replace fuel filter				●

\* Performed by an authorized Kohler service dealer/distributor.

**NOTE**

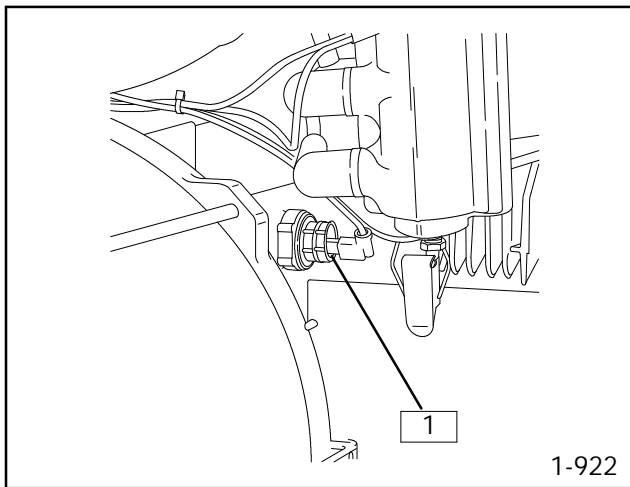
Unleaded gasoline is recommended. If leaded gasoline is used, service cylinder heads every 250 hours.

# Lubrication System

Your engine has a positive pressure lubrication system and low oil pressure shutdown.

## Low Oil Pressure Shutdown

The low oil pressure shutdown feature protects the engine against internal damage if the oil pressure drops below 14 psi  $\pm$  2 psi (96.5 kPa) due to oil pump fault or other malfunction. It does not protect against damage due to operating with the oil level below the safe range— *it is not a low oil level shutdown*. The only protection against running out of oil is checking the level regularly and adding oil as needed. Location of the low oil pressure (LOP) switch is shown in Figure 3-1.

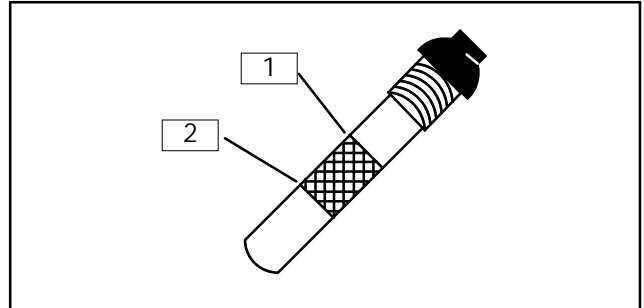


1. Low Oil Pressure Switch

**Figure 3-1. Low Oil Pressure Switch**

# Oil Check

Check crankcase oil level daily or before each start. To check oil level, remove oil cap/dipstick assembly and wipe dipstick clean (see Figure 3-3). Reposition dipstick in crankcase on top of hole (do not turn plug in) before removing for a reading. Oil level should read between max and min marks on dipstick. Do not operate set if oil level exceeds the max mark or registers below the min mark on dipstick. Figure 3-2.

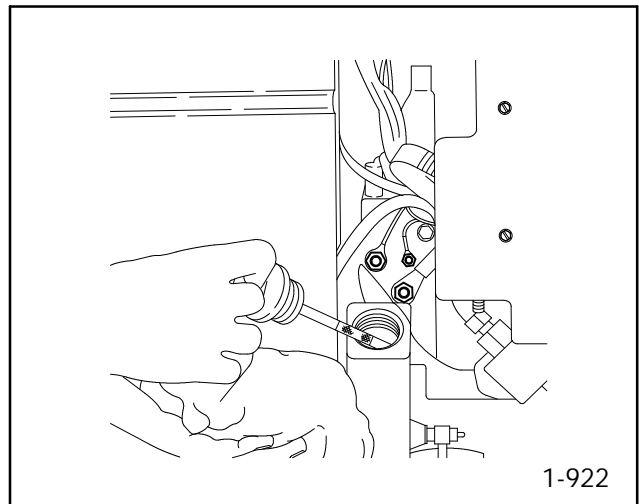


1. Max Mark  
2. Min Mark

**Figure 3-2. Lube Oil Level**

### NOTE

Do not check oil level when the set is in operation. The engine must be stopped and on a level surface when checking oil. Most accurate oil reading is obtained by shutting down the generator and waiting several minutes before checking oil.



**Figure 3-3. Oil Check**

# Oil Change

## Break-In Period Oil Recommendations

Generator set engines may be shipped dry; the oil used in factory testing has been drained. Before operating a new set, fill the engine crankcase with oil. Do not use synthetic oil during the first five hours of operation or the rings may not seat properly. Select oil of viscosity appropriate for operating air temperature. See Oil Type following. Fill the crankcase to the max mark of dipstick.

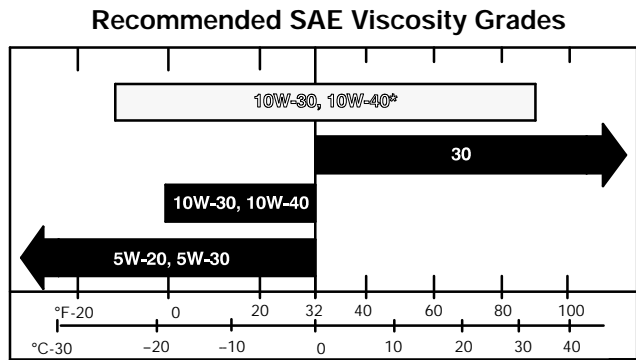
On a new engine, change the oil after the first five hours of operation and thereafter at 100-hour intervals or 12 months, whichever occurs first. Replace the oil filter (Kohler filter #277233) at every oil change. Whenever possible, drain the oil while it is still warm. To drain, place container below unit and open petcock (located to the right of the dipstick assembly). Allow adequate time for generator to drain completely. Remove filter by rotating filter counterclockwise with an oil filter wrench. After draining, close drain petcock then install replacement filter. Before installing replacement filter, apply a light coating of oil to the rubber seal at the base of the filter. Add new oil of proper weight and grade specified under Oil Type following. After restarting, check the area around the filter for evidence of leakage. Tighten filter if needed to stop leakage.

Oil Refill Capacity: 4 U.S. Quarts (3.8L)\*

\* An additional 1/2 pint (0.23L) is required when the oil filter is replaced. To avoid overfilling, check dipstick before adding the last quart of oil. Add oil gradually and check oil level several times. Recheck oil level after starting unit and add oil as necessary to bring level up to Max mark.

## Oil Type

Use high-quality detergent oils meeting the requirements of SAE service class SC, SD, SE, and SF in the Kohler K-582 engine. Use straight-weight oils specified. If multi-viscosity oil is used, be aware of the resulting increase in oil consumption and combustion deposits when used in temperatures above 32°F (0°C). Base oil selection on air temperature at time of operation. Consult the SAE Viscosity Grade chart (see Figure 3-4).



\* Using multi-grade oil causes greater oil consumption.

**Figure 3-4. Temperature range expected before next oil change**

## Cooling System

To prevent generator set overheating damage, keep the compartment cooling air inlets clean and unobstructed at all times.

A fan on the rotor of the generator draws cooling air into the compartment through the generator cooling slots and expels it at the engine-generator adapter. The engine of the generator set features an Air-Vac reverse-flow cooling system. Fins on the engine flywheel pull cooling air past the fins of the cylinder heads, and heated air is discharged downward and out of the compartment through the discharge chute. See Figure 3-5.

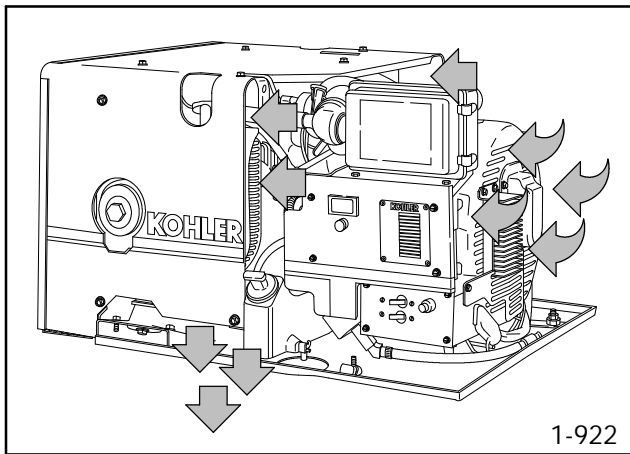


Figure 3-5. Cooling Air Circulation

## Ignition System

### Spark Plugs

Every 100 hours remove both spark plugs and check condition (see Figure 3-6). Reset gap or replace plug if needed. Proper generator operation is indicated by a light deposit of gray or tan material on plug electrodes. A dead white, blistered coating could indicate overheating. A black (carbon) coating may indicate an overrich fuel mixture caused by a clogged air cleaner or improper carburetor adjustment.

#### NOTE

Do not sandblast, wire brush, scrape, or otherwise service poor-condition plug— best results are obtained by replacing plug. Use only resistor-type plugs. Set spark plug gap at 0.025 in. (0.64 mm) on gasoline-fueled sets and 0.018 in (0.46 mm) on LP gas-fueled sets. Tighten plug to 18-22 ft. lbs. (24-30) when installing.

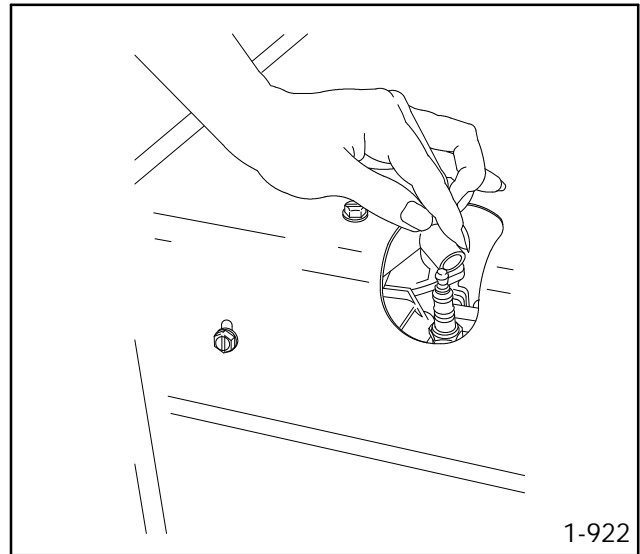
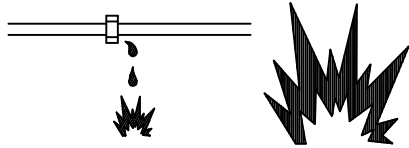


Figure 3-6. Removing Spark Plug

# Gasoline Fuel System

**WARNING**



**Explosive fuel vapors.  
Can cause severe injury or death.**

Use extreme care when handling, storing, and using fuels.

**Explosive fuel vapors can cause severe injury or death.** All fuels are highly explosive in a vapor state. Use extreme care when handling, storing, and using fuels. Store fuel in a well-ventilated area away from spark-producing equipment and out of the reach of children. Never add fuel to the tank while the engine is running since spilled fuel may ignite on contact with hot parts or from ignition spark. Do not smoke or permit flame or spark to occur near potential sources of spilled fuel or fuel vapors. Keep fuel lines and connections tight and in good condition— don't replace flexible fuel lines with rigid lines. Flexible sections are used to avoid breakage due to vibration. Should any fuel leakage, fuel accumulation, or electrical sparks be noted, **DO NOT OPERATE GENERATOR SET.** Have systems repaired before resuming generator operation.

**Explosive fuel vapors can cause severe injury or death.** Additional precautions must be taken when using the following fuels:

**Gasoline**— Store gasoline only in approved red containers clearly marked **GASOLINE**. Do not store gasoline in any occupied building.

**Propane (LP)**— Adequate ventilation is mandatory. Propane is heavier than air; install gas detectors low in room. Inspect detectors often.

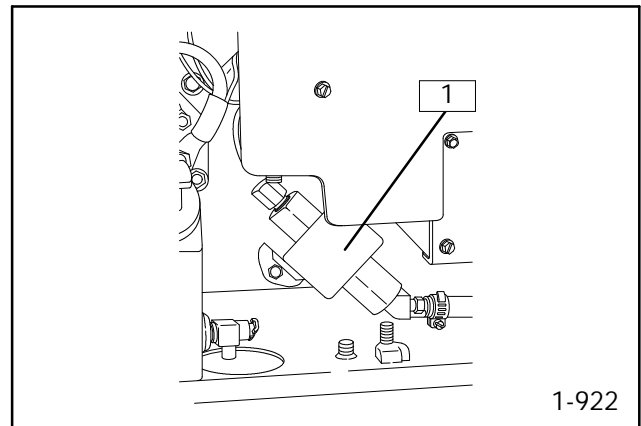
## Specification— Gasoline

For best results, use only clean, fresh, regular-grade, unleaded gasoline with a pump sticker octane rating of 87 or higher in the U.S.A. In countries using the research rating method, it should be 90 octane minimum.

Use unleaded gasoline, since it leaves fewer combustion chamber deposits. Regular grade leaded

gasoline may be used; however, be aware that the combustion chamber and cylinder head will require more frequent service. Gasohol containing no more than 10% ethanol can be used if unleaded gasoline is unavailable. Never use gasohol containing more than 10% ethanol or gasoline containing methanol. Oil must not be mixed with the fuel.

Do not use gasoline left over from the previous season. Use fresh gasoline to ensure it is blended for the season, and to reduce the formation of gum deposits which could clog the fuel system.

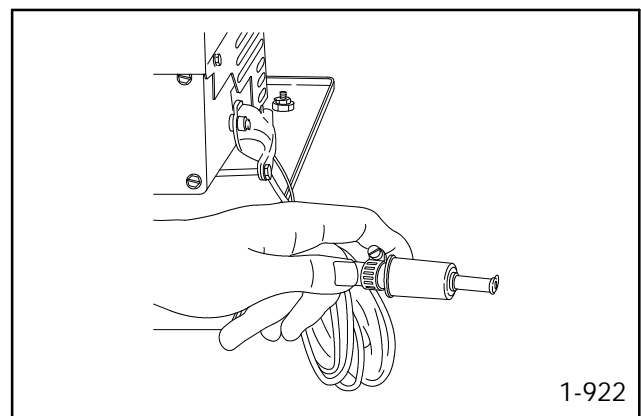


1. Fuel Pump

**Figure 3-7. Gasoline Fuel Pump**

## Fuel Filter— Gasoline Only

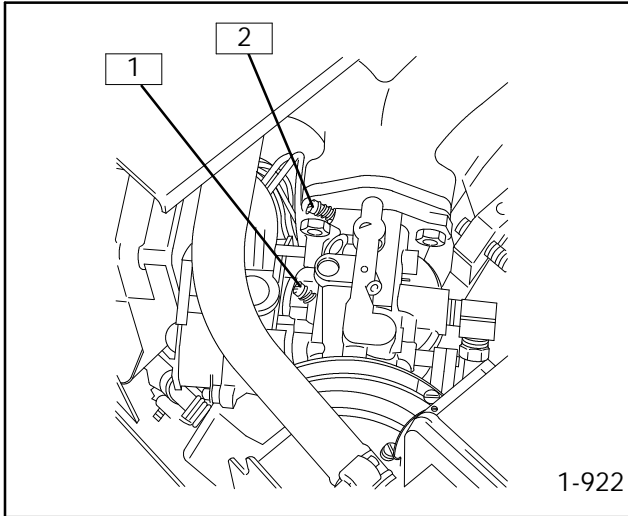
The 7 kW generator set utilizes an in-line type fuel filter located before the electric (solid-state) fuel pump. Replace the filter every 500 hours of running time or when rough operation indicates an engine tune-up may be necessary. Fuel pump and fuel filter locations are shown in Figure 3-7 and Figure 3-8.



**Figure 3-8. Gasoline Fuel Filter**

# Gasoline Carburetor Adjustments

Lack of power and black sooty exhaust smoke usually indicate that the fuel mixture is too rich. An overrich mixture may be caused by a clogged air cleaner or improperly adjusted choke. Always check the air cleaner before readjusting the choke or carburetor. If the engine skips (misses) or backfires, the fuel mixture may be too lean. To locate adjustment needles refer to Figure 3-9.



1. Main Fuel Needle
2. Idle Fuel Needle

**Figure 3-9. Carburetor Adjustment Needles**

## NOTE

Turning the adjusting needles **in** (clockwise) decreases the supply of fuel to the carburetor. This gives a leaner fuel/air mixture. Turning the adjusting needles **out** (counterclockwise) increases the supply of fuel to the carburetor. This gives a richer fuel/air mixture.

## Main and Idle Fuel Mixture

1. Stop the engine. Turn the main fuel and idle fuel adjusting needles **in** (clockwise) until they bottom *lightly*.

## NOTE

The ends of the main fuel and idle fuel adjusting needles are tapered to critical dimensions. The needles and seats will be damaged if the needles are forced.

2. **Preliminary Settings:** Turn the main fuel and idle fuel adjusting needles **out** (counterclockwise) from lightly bottomed as follows:

**Main Fuel Needle**      **2 1/2 Turns**

**Idle Fuel Needle**      **1 1/2 Turns**

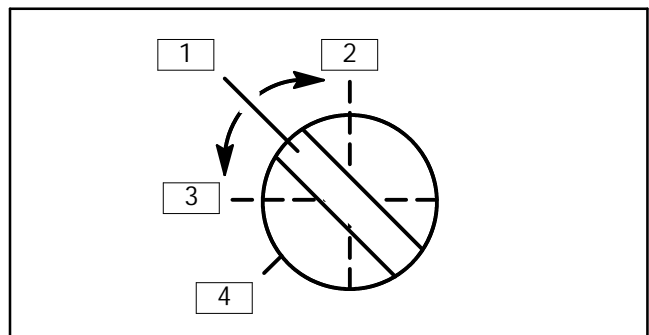
3. Start the engine and run at half load for 5-10 minutes to warm up. The engine must be warm before making final settings.
4. **Final Setting– Main Fuel:** Place engine 3/4 to full load. Turn main fuel adjusting needle **in** (clockwise) from preliminary setting until the engine does not operate smoothly. Note the position of the needle.

Then turn the adjusting needle **out** (counterclockwise) 1/4 turn.

## NOTE

At higher elevations the main fuel adjustment needle will require leaning.

5. **Final Setting– Idle Fuel:** Set idle fuel adjusting needle using the same procedure as in step 4.



1. Adjust 1/4 turn richer than lean operating limit.
2. Lean
3. Rich
4. Fuel-Adjusting Screw

**Figure 3-10. Carburetor Adjustment**

# LP Gas Fuel System

## Specification– LP Liquid

The LP gas liquid withdrawal fuel system utilizes a vaporizer and regulator to convert LP gas from a liquid to a gaseous state. Vaporized fuel is combined with air in the carburetor to produce the correct air/fuel mixture for proper combustion. Be sure the LP gas is blended for the season and/or geographic location in which the generator is operated. To locate carburetor adjustments refer to Figure 3-11.

## Specification– LP Vapor

The LP gas system consists of a shutoff valve, a secondary regulator, and carburetor that adjusts the mixture of fuel and air for proper combustion. A propane LP gas is used.

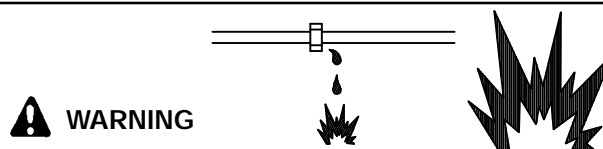
The gas and supply pressure should not exceed six ounces. To check inlet pressure, remove plug on fuel inlet of gas regulator. Insert ounce pressure gauge or manometer. Adjust pressure to 4-6 ounces or 7-11 inches water column. Inlet pressure is adjusted on primary regulator (pressure greater than 10 ounces will not allow electric fuel valve to open under certain circumstances).

### NOTE

If using a removable fuel container as a fuel source, use a quick-close coupling on the fuel line or a check valve installed in the fuel line to prevent fuel leakage during a container change.

### NOTE

A hydrostatic relief valve is also required between the container shutoff valve and the automatic shutoff valve on the generator set.



**Explosive fuel vapors.**  
**Can cause severe injury or death.**

Use extreme care when handling, storing, and using fuels.

**Explosive fuel vapors can cause severe injury or death.** Fuel leakage can cause an explosion. Check LP vapor gas fuel system for leakage using a soap-water solution with fuel system test pressurized to 6-8 ounces per square inch (10-14 inches water column). Do not use test solutions that contain ammonia or chlorine, since the soap will not bubble for an accurate leakage test.

**Explosive fuel vapors can cause severe injury or death.** Fuel leakage can cause an explosion. Check LP liquid withdrawal gas fuel system for leakage using a soap-water solution with fuel system test pressurized not less than 90 psi (621 kPa). Do not use test solutions that contain ammonia or chlorine, since the soap will not bubble for an accurate leakage test.

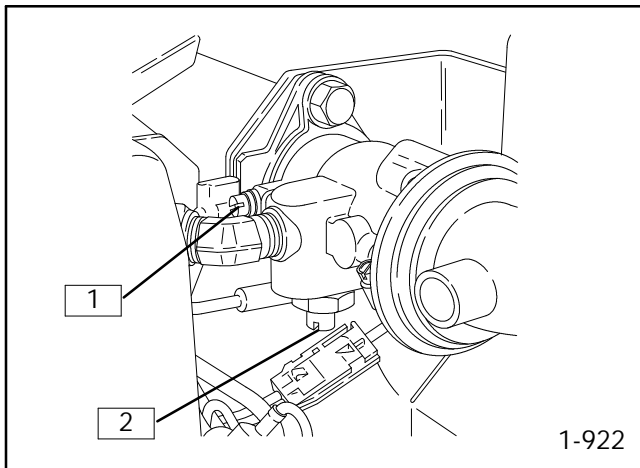
# LP Carburetor Adjustments

## Main Fuel Mixture

For preliminary setting turn the main-fuel valve clockwise until it bottoms lightly (do not force), then back out 1 turn. With the engine thoroughly warmed up and running at rated rpm under full load, turn main-fuel valve in until the engine slows down (lean setting) then turn valve out until the engine regains full speed (about 1/8 turn). When properly adjusted, the engine will operate with steady governor action. Improper adjustment (rich setting) causes improper operation of the vaporizer and excess fuel consumption.

## Idle Fuel Mixture

The idle system functions only at part- and no-load conditions. For this reason, the idle setting has only a momentary effect. To adjust, stop the engine and then turn the idle-fuel screw all the way in (clockwise) then back out 1/4 turn. Adjust for proper no-load operation.

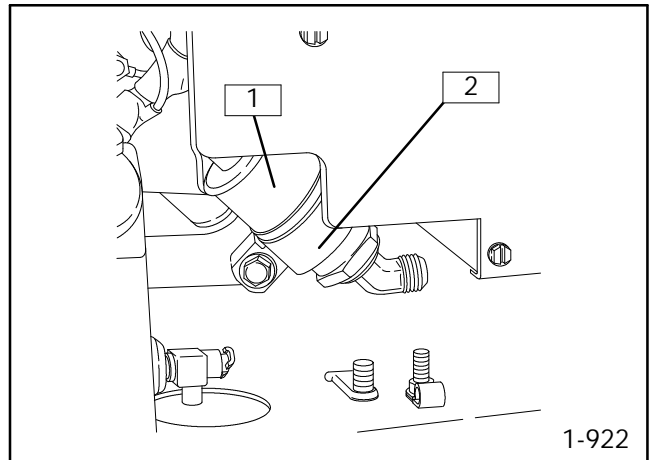


1. Idle-Fuel Adjustment
2. Main-Fuel Adjustment

**Figure 3-11. LP Gas Carburetor Adjustments**

## Fuel Valve and Filter– LP Liquid

The LP fuel valve contains a replaceable filter which should be inspected yearly or after every 100 hours of operation. Normally, the filter requires replacement only after accumulation of filtered debris restricts fuel flow to the regulator/vaporizer. Rough generator operation and/or the presence of frost on the fuel valve outer surface indicates filter replacement is necessary. Figure 3-12 shows the location of the LP gas fuel valve and fuel filter.

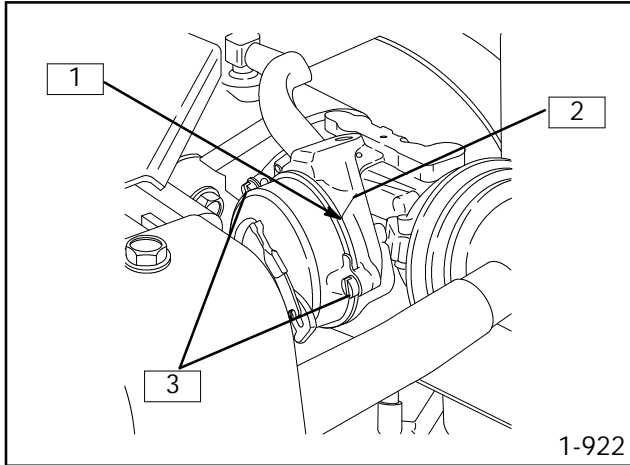


1. Fuel Valve
2. Fuel Filter

**Figure 3-12. LP Fuel Valve Assembly**

# Choke Adjustments

A Kohler thermo-electric automatic choke is used to enrich the gasoline fuel mixture during starting. The choke automatically closes as the ambient temperature cools or as the engine temperature decreases. As the engine warms, the coils inside the choke allow the choke plate to open. If readjustment is needed, loosen the two screws securing the choke bracket to the carburetor and shift the position of the choke assembly (Figure 3-13). When properly set, the choke plate should be within 5 to 10 degrees of full open at approximately 70°F (21°C).



1. Scribe Mark
2. Casting Mark
3. Adjusting Screws

**Figure 3-13. Automatic Choke Adjustment**

## Choke Adjustment Procedure for Operation Above 10°F (-12.2°C) (From original factory-set position)

1. Where the choke casting mark meets the black plastic cover of the choke, make a scribe mark on the choke's black cover. See Figure 3-13.
2. Loosen the two choke-adjusting screws and rotate choke cover counterclockwise toward leaner setting (follow direction of arrow on choke).
3. When the distance between the scribe mark on the black cover and the casting mark is 5/16 in. (8 mm) tighten the two choke adjusting screws.

## Choke Adjustment Procedure for Operation Below 10°F (-12.2°C)

### NOTE

If not previously adjusted, leave as factory set. Otherwise, follow procedure below.

1. If scribe mark has been made on the choke's black cover, loosen the two choke-adjusting screws and rotate choke cover clockwise (opposite direction of arrow on choke).
2. When the scribe mark on the black plastic cover of the choke and the choke casting mark line up, tighten the two adjusting screws.

## Electronic Governor

The governor control system consists of an electronic isochronous governor, an electro-mechanical actuator, and a magnetic pickup. The magnetic pickup supplies electrical pulses to the isochronous governor (control unit) each time one of the ring gear teeth passes the pickup. The control unit then compares the frequency of these pulses to a preset reference and provides a signal to the actuator which, in turn, controls the carburetor and hence the engine speed. This is a closed-loop system and typically provides  $\pm 0.25\%$  steady-state speed regulation.

## Air Cleaner

The engine is equipped with a dry-type air cleaner. Every 50 hours (more often if operating under dusty or dirty conditions) remove element and service by tapping element lightly against flat surface to dislodge loose surface dirt. Do not clean in any liquid or blow out with compressed air as this will ruin filter material in element. If dirty, bent, or damaged replace element with genuine Kohler replacement.

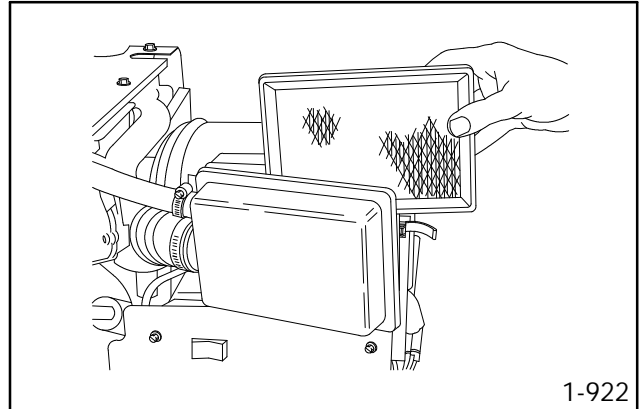


Figure 3-14. Air Cleaner Service

# Battery

If generator set is equipped with a battery charging feature, refer to the following section for general maintenance. Use a 12-volt battery with a rating of at least 290 cold cranking amps/55-amp hr. When using a maintenance-free battery, it is not necessary to check the specific gravity or electrolyte level. Otherwise, these procedures should be done at the intervals specified in the Service Schedule. A negative-ground system is used. The wiring diagram shows battery connections. Make sure battery is properly connected and terminals are tight.

## Battery Charging (if equipped)

The generator is equipped with a battery charging system to keep the starting battery fully charged. The system requires no additional maintenance. Be sure to observe battery polarity when connecting battery to generator set.

### NOTE

The generator set will not start if the battery connections are made in reverse.



### Sulfuric acid in batteries.

**Can cause severe injury or death.**

Use protective goggles and clothes. Can cause permanent damage to eyes, burn skin, and eat holes in clothing.

### **Sulfuric acid in batteries can cause severe injury or death.**

Sulfuric acid in battery can cause permanent damage to eyes, burn skin, and eat holes in clothing. Always wear splash-proof safety goggles when working around the battery. If battery electrolyte is splashed in the eyes or on skin, immediately flush the affected area for 15 minutes with large quantities of clean water. In the case of eye contact, seek immediate medical aid. Never add acid to a battery once the battery has been placed in service. Doing so may result in hazardous spattering of electrolyte.

### **Explosion can cause severe injury or death.**

Battery gases can cause an explosion. Do not smoke or permit flame or spark to occur near a battery at any time, particularly when it is being charged. Avoid contacting terminals with tools, etc. to prevent burns and to prevent sparks that could cause an explosion. Remove wristwatch, rings, and any other jewelry before handling battery. Never connect negative (-) battery cable to positive (+) connection terminal of starter solenoid. Do not test battery condition by shorting terminals together or sparks could ignite battery gases or fuel vapors. Any compartment containing batteries must be well ventilated to prevent accumulation of explosive gases. To avoid sparks, do not disturb battery charger connections while battery is being charged and always turn charger off before disconnecting battery connections. When disconnecting battery, remove negative lead first and reconnect it last.

## Cleaning

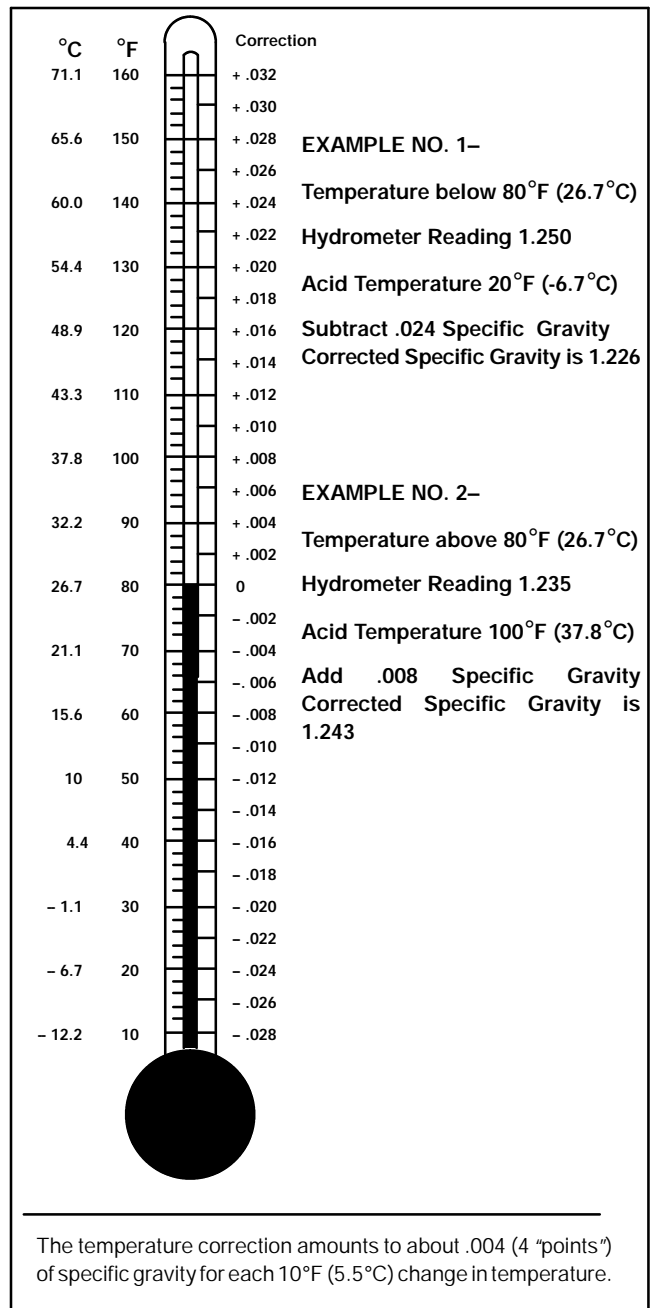
Keep battery clean by wiping it with a damp cloth. Keep all electrical connections dry and tight. If corrosion is present, disconnect cables from battery and remove corrosion with a wire brush. Clean battery and cables with a solution of baking soda and water. Be careful that cleaning solutions do not enter battery cells. When cleaning is complete, flush battery and cables with clean water and wipe with a dry cloth. After the battery cables are reconnected, coat terminals with petroleum jelly or other nonconductive grease.

## Checking Electrolyte Level

Check the level of electrolyte before each start-up. Remove filler caps and check to see that electrolyte level is up to bottoms of filler holes. Refill as necessary with distilled water or clean tap water. DO NOT add fresh electrolyte. Be sure filler caps are tight.

## Checking Specific Gravity

Use a battery hydrometer to check the specific gravity of the electrolyte in each battery cell. While holding the hydrometer vertical, read the number on the glass bulb at the top of the electrolyte level. If the hydrometer used does not have a correction table, use the one in Figure 3-15. Determine specific gravity and electrolyte temperature of battery cells. Locate temperature in Figure 3-15 and adjust specific gravity by amount shown. The battery is fully charged if the specific gravity is 1.260 at an electrolyte temperature of 80°F (26.7°C). The difference between specific gravities of each cell should not exceed  $\pm 0.01$ . The battery should be charged if the specific gravity is below 1.215 at an electrolyte temperature of 80°F (26.7°C).



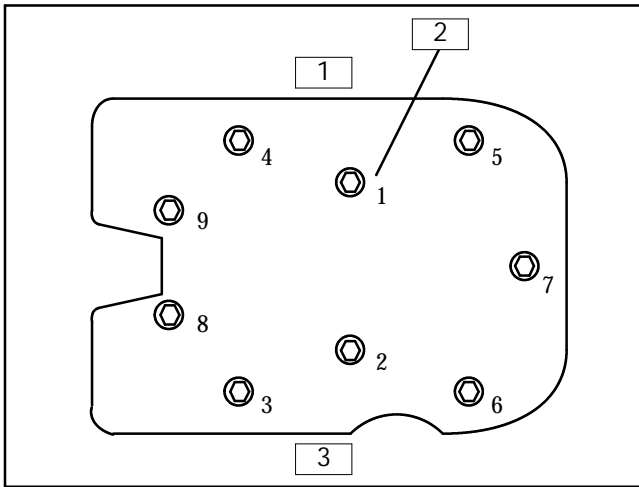
**Figure 3-15. Specific Gravity Temperature Correction**

# Cylinder Head Service

After each 500 hours of operation, remove the cylinder heads from the engine and service. Remove carbon deposits from combustion chamber in head. Scrape and remove carbon with a sharp piece of wood or plastic. Use wood or similar material to avoid scratching aluminum surfaces of the cylinder head. Always use new cylinder head gaskets. Tighten head bolts in the proper sequence and to the torque value specified. See Figure 3-16.

## NOTE

If the engine is operated on leaded fuel or under certain conditions, such as continued light load or relatively constant speed, carbon may build up more rapidly. If there are heavy deposits of carbon on spark plug electrodes, service the heads at 250-hour intervals.



**Figure 3-16. Cylinder Head Fastener Tightening Sequence**

1. Use new gaskets when reinstalling heads.
2. Tightening Sequence
3. Tighten Head Bolts to 35 ft. lbs. (4.84 KgM) Torque

# Valve Service

After each 500 hours of operation (or sooner if a loose valve is detected), check clearance between the valve stems and tappets. The engine must be stopped and cooled to normal ambient temperatures to accurately gauge and adjust valve clearances. Use the following procedure to adjust.

1. Turn engine over until piston in #1 cylinder (closest to flywheel) is at Top Dead Center (TDC) on compression— in this position, both valves WILL BE CLOSED and cam will have no effect on tappet.
2. Measure clearance between valve stem and tappet with a feeler gauge. To adjust, turn adjusting screw on tappet in or out until proper clearance is attained.

## CLEARANCE SPECIFICATIONS

### Intake

0.008–0.010 in. (0.20 mm–0.25 mm)

### Exhaust

0.017–0.020 in. (0.43 mm–0.51 mm)

3. After adjusting valve tappet clearance on #1 cylinder, turn engine over until #2 cylinder is at TDC on compression and repeat adjustment on this cylinder.

If the set has stopped due to causes other than lack of fuel, engine malfunction, or low oil pressure, check the fuse. If blown, replace the fuse then restart the generator set. If the fuse blows again, contact a Kohler generator dealer/distributor for assistance in locating and correcting the cause.

## Wattage Requirements

If you exceed the rated capacity of your generator, the circuit breaker(s) located in the controller will trip to protect the generator against damage. A short in the vehicle's AC circuit or having too many appliances/tools on at the same time results in an overload condition. If the circuit breaker(s) trip, the set may continue running but there will be no AC output to the protected circuit. Before resetting the circuit breaker(s), turn off some of the appliances/tools and lights inside the vehicle to reduce the load to within the rated limits of the set. If this is done and the circuit breaker(s) trips again after being reset, a short circuit is indicated. In this event, turn off the set and have a qualified electrician locate and correct the cause of the short circuit.

The average wattage requirements of some common appliances/tools and motor loads are listed in the following charts. Use these figures to calculate the total load on your set to avoid the inconvenience of having the circuit breaker trip due to overload. The lighting load is easily determined by adding the wattage rating of each bulb in the circuit. Check the nameplate rating on motors and appliances/tools in your vehicle for exact wattage requirements.

Electrical Appliance	Rating (Watts)
Blanket	50-250
Blender	600
Broiler	1350
Fan, Air Circulating	25-100
Fan, Furnace	270
Heater, Space	750-1500
Heater, Water	1500
Pan, Frying	1200
Percolator, Coffee	650
Radio	50-100
Television	300-750
Toaster	750-1200

**Figure 3-17. Appliance Average Wattage Ratings**

Construction Tools	Motor Starting Watts	Running Watts
Air Compressor (Small)	1500	725
Air Compressor 3/4 hp	4000+	2000
Drill, 1/4 in.	500	250
Drill, 3/8 in.	600	350
Drill, 1/2 in.	800	600
Grinder 1/2 hp	1500	1200
Hammer, Demolition	2000	1800
Hammer, HD Rotary	1500	1200
Paint Sprayer (Airless)	400	240
Polisher, Orbit	500	360
Power Paint Roller	120	90
Power Plane	600	450
Router	900	700
Saw, Circular 6 1/2 in.	2200	1000
Saw, Circular 7 1/4 in.	2500	1200
Saw, Table 10 in.	4000	1500
Saw, Sabre (Worm Drive)	2500	1200
Sander, Belt	1500	600
Sander, Finishing	900	360
Screwdriver, Power	1000	530
Shear, 12 gauge	1800	720
Soldering Gun	-	250
Vacuum Cleaner, Wet/Dry	1500	1260
Wrench, Impact 1/2 in.	2000	840

**Figure 3-18. Construction Tool Average Wattage Ratings.**

# Generator Service

## General

Under normal conditions, regular generator service will not be required. If operating under dusty and dirty

conditions, use dry compressed air to blow dust out of the generator. Do this with the generator set operating and direct the stream of air in through the cooling slots at the end of the generator.

## Storage Procedure

If your generator set is to be out of service for a considerable length of time (2 months or more), take the following steps to preserve the set before placing it in storage.

1. Change the oil and filter when the engine is still warm from operation. Refer to Oil Change. Run the engine for a few minutes to distribute the clean oil.
2. Gasoline-fueled generators– drain the carburetor bowl (or run unit until empty) to reduce the formation of gum deposits caused by operating on stale fuel. Remove the bowl by unscrewing retaining bolt on bottom of bowl. Replace the bowl after draining the fuel. Use of a gas stabilizer for gasoline-fueled generators is permitted in lieu of draining the carburetor bowl; add the correct amount of gas stabilizer to the fuel and follow all recommendations of the gas stabilizer manufacturer.
3. Gasoline-fueled generators only– remove the fuel line at the fuel pump outlet to drain fuel line to carburetor. Reconnect fuel line. The pump itself requires no additional maintenance.
4. Remove the spark plugs. Pour about 1 tablespoon of engine oil into each spark plug hole. Crank the engine two or three revolutions to lubricate the cylinders. Reinstall spark plugs
5. Clean the exterior surface of the generator set; then spread a light film of oil over unpainted metallic surfaces which could rust or corrode.

# Section 4. Troubleshooting

When troubles occur, don't overlook simple causes. Improper fuel or an empty fuel tank could cause a starting problem. Make sure all electrical connections are secure. Remember that the battery negative must have a good ground. The following charts list some

common problems. If procedures in this manual do not correct the problem, take the generator set to a service dealer/distributor. Tell the service dealer/distributor personnel exactly what happened when the problem occurred and any adjustments made to the set.

## Engine

Problem	Possible Cause	Corrective Action
Will not crank	Weak or dead battery	Recharge or replace
	15-amp controller fuse blown	Replace fuse
	Defective start/stop switch	Replace
	Remote start cable disconnected	Reconnect
	Defective starter solenoid	Replace
	Battery connections made in reverse	Correct (circuit board replacement may be necessary)
Will not start	Out of fuel	Replenish
	Clogged fuel filter	Replace
	Air cleaner clogged	Clean or replace
	Faulty spark plug	Replace or regap spark plugs
	Shorted or open ignition coil	Replace
	Faulty ground	Clean and retighten
	Loose spark plug wire connection	Reconnect and/or tighten
	Weak or dead battery	Recharge or replace
	Fuse blown	Replace
	Battery connections made in reverse	Correct
	Choke adjustment wrong	Adjust
	Low oil pressure (LOP) shutdown	Correct cause of shutdown
Hard starting	Stale or bad fuel	Replace
	Air cleaner clogged	Clean or replace element
	Carburetor adjustment wrong	Adjust
	Faulty spark plug	Replace or regap spark plugs
	Weak ignition coil	Replace
	Improper cooling	Inspect cooling system
	Choke adjustment wrong	Adjust
Stops suddenly	Out of fuel	Replenish
	Air cleaner clogged	Clean or replace element
	Faulty spark plug	Replace or regap spark plugs
	Low oil pressure	Check oil level
	Controller voltage-supply fuse blown	Replace fuse

<b>Problem</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
Stops suddenly (Continued)	Deicing module fuse blown (gasoline-fueled models only)	Replace fuse
	Defective deicing module (gasoline-fueled models only)	Have unit serviced by an authorized Kohler service dealer/distributor
Lacks power	Air cleaner clogged	Clean or replace element
	Improper cooling	Inspect cooling system
	Engine overload	Reduce load
	Bad or stale fuel	Replace
	Faulty spark plug	Replace or regap spark plugs
	Carburetor adjustment wrong	Adjust
	Carbon build-up	Have unit serviced by an authorized Kohler service dealer/distributor
	Governor not properly adjusted or defective	Have unit serviced by an authorized Kohler service dealer/distributor
Operates erratically	Air cleaner clogged	Clean or replace element
	Stale or bad fuel	Replace
	Faulty spark plug	Replace or regap spark plugs
	Carburetor adjustment wrong	Adjust
	Governor not properly adjusted or defective	Check engine speed using frequency meter or tachometer
Overheats	Improper cooling	Check intake and outlet openings
	Air cleaner clogged	Clean or replace element
	Carburetor adjustment too lean	Adjust

# Generator

Problem	Possible Cause	Corrective Action
No AC output	Circuit breaker in OFF Position	Reset to ON position
	AC circuit breaker tripping due to overload on generator set	Reduce load (see Wattage Requirements)
	Short circuit in vehicle circuit causing breaker to trip	Reset– if it trips repeatedly, stop set and contact service center
	General malfunction such as faulty component or other internal fault	Contact generator service dealer/distributor for repairs
Low output or excessive drop in voltage	Engine speed too low	Contact generator service dealer/distributor for repairs
	Generator overloaded	Reduce load
No battery charging output (if equipped)	25-amp circuit breaker open	Allow circuit breaker to reset; if breaker blows again contact generator service dealer/distributor for repair
	Defective battery charging alternator	Contact generator service dealer/distributor
High voltage	Loose voltage regulator sensing leads– defective voltage regulator	Contact generator service dealer/distributor

# Section 5. Wiring Diagrams

Use the following table to locate the wiring diagram for your specific application. Refer to the nameplate attached to the controller cover of the unit to obtain the

specification number. The information supplied below is for factory-shipped units and may not apply for field-converted units.

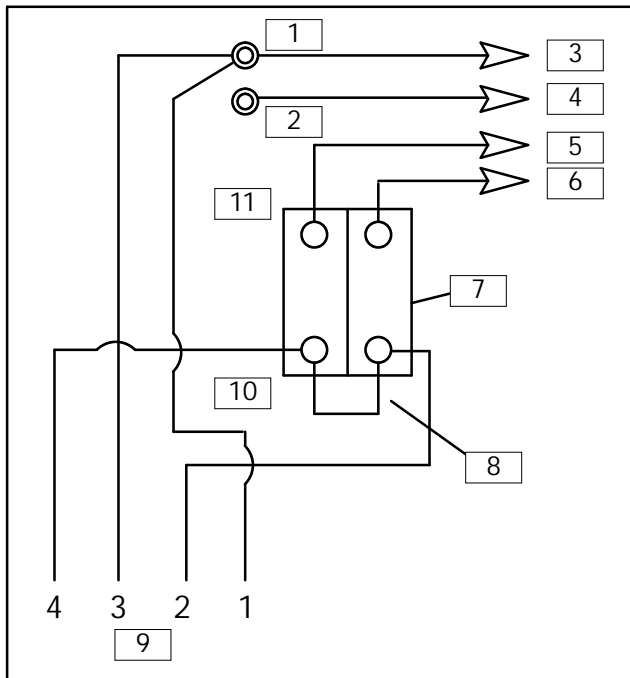
Fuel	Phase	Hz	Specification Number	Wiring Diagram Number	Figure Numbers
Gasoline	Three	60	PA-140275 PA-140277	227761	Figures 5-5 & 5-6
LP Liquid or LP Vapor Withdrawal	Single	60	PA-140269 PA-140270 PA-140271 PA-140273 PA-140280 PA-140281 PA-140282 PA-140293 PA-140294	227762	Figures 5-7 & 5-8
Gasoline	Single	50 60	PA-140266 PA-140267 PA-140268 PA-140272 PA-140274 PA-140276 PA-140278 PA-140279	227763	Figures 5-9 & 5-10

# Four-Lead Reconnectable (Single-Phase) Generator Sets Where Generator Output Can Be Reconnected For 120 Volt or 120/240 Volt, 60 Hz; or 110 Volt or 110/220 Volt, 50 Hz

The following information illustrates the reconnection of 4-lead generator sets. Follow the National Electrical Code (NEC).

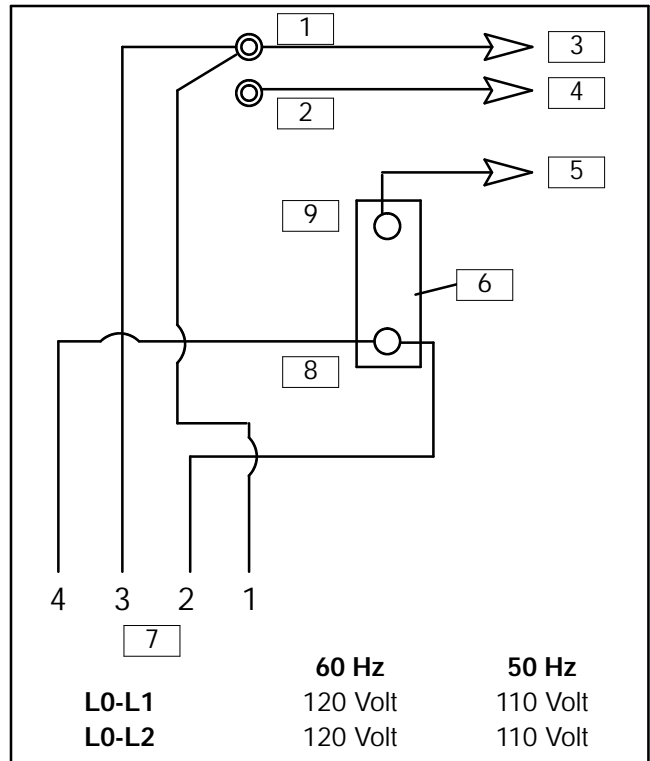
### NOTE

When reconnecting a generator set to a voltage different than nameplate voltage, place a notice on the unit indicating this change. Authorized Kohler dealers offer a decal (part no. 246242) for this purpose.



1. L0 (Neutral)
2. Ground
3. L0
4. Ground
5. L1
6. L2
7. Factory Two-Pole or (2) 1-Pole Circuit Breakers
8. Jumper Lead
9. Stator Leads
10. Line Side
11. Load Side

**Figure 5-1. 120 Volt, 3 Wire**



1. L0 (Neutral)
2. Ground
3. L0
4. Ground
5. L1
6. 1-Pole Circuit Breaker
7. Stator Leads
8. Line Side
9. Load Side

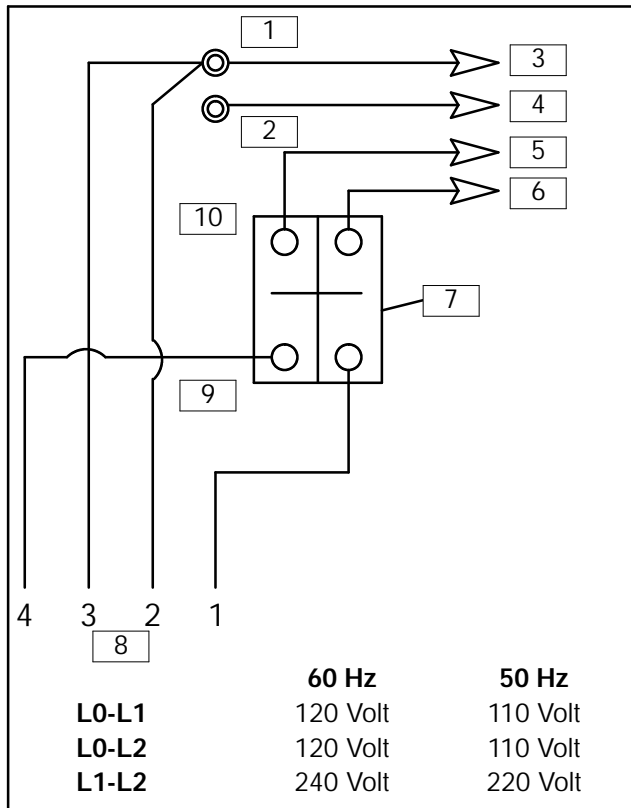
**Figure 5-2. 120 Volt, 2 Wire**

## 120-Volt (or 110-Volt) Configurations– Figure 5-1 and Figure 5-2

When using a factory two-pole circuit breaker, do not connect the load-side terminals of the circuit breaker together. See Figure 5-1. Use a single-pole circuit breaker if the installation requires a 120-volt, 2-wire system. See Figure 5-2. Size the output lead (L1) accordingly when connecting stator phase leads together. Use a jumper lead on the *line* side of the circuit breaker to balance the load of the generator set.

## 120/240-Volt (or 110/220-Volt) Configurations– Figure 5-3

Jumper lead not used. If unit was originally wired for straight 120 volt (or 110 volt), 3 wire, remove jumper lead. See Figure 5-1 for location. Circuit breaker MUST be a circuit breaker manufacturer two-pole circuit breaker. Two single-pole circuit breakers do not conform to NEC requirements when supplying a 240-volt (or 220-volt) load. This is true even if they are mechanically attached together. Leads L1 and L2 are different phases and must never be connected together.



1. L0 (Neutral)
2. Ground
3. L0
4. Ground
5. L2
6. L1
7. Factory Two-Pole Circuit Breaker
8. Stator Leads
9. Line Side
10. Load Side

**Figure 5-3. 120/240 Volt, 3 Wire**





### **WARNING**

#### **Accidental starting. Can cause severe injury or death.**

Disconnect battery cables before working on generator set (negative lead first and reconnect it last).

**Accidental starting can cause severe injury or death.** Disconnect battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator. The generator set can be started by remote start/stop switch unless this precaution is followed.

**WARNING**

**Hazardous voltage.      Moving rotor.**

**Can cause severe injury or death.**

Do not operate generator set without all guards and electrical enclosures in place.

**Hazardous voltage can cause severe injury or death.** Perform electrical service only as prescribed in equipment manual. Be sure that generator is properly grounded. Never touch electrical leads or appliances with wet hands, when standing in water, or on wet ground as the chance of electrocution is especially prevalent under such conditions. Wiring should be inspected at the interval recommended in the service schedule– replace leads that are frayed or in poor condition. The function of a generator set is to produce electricity and wherever electricity is present, there is the hazard of electrocution.

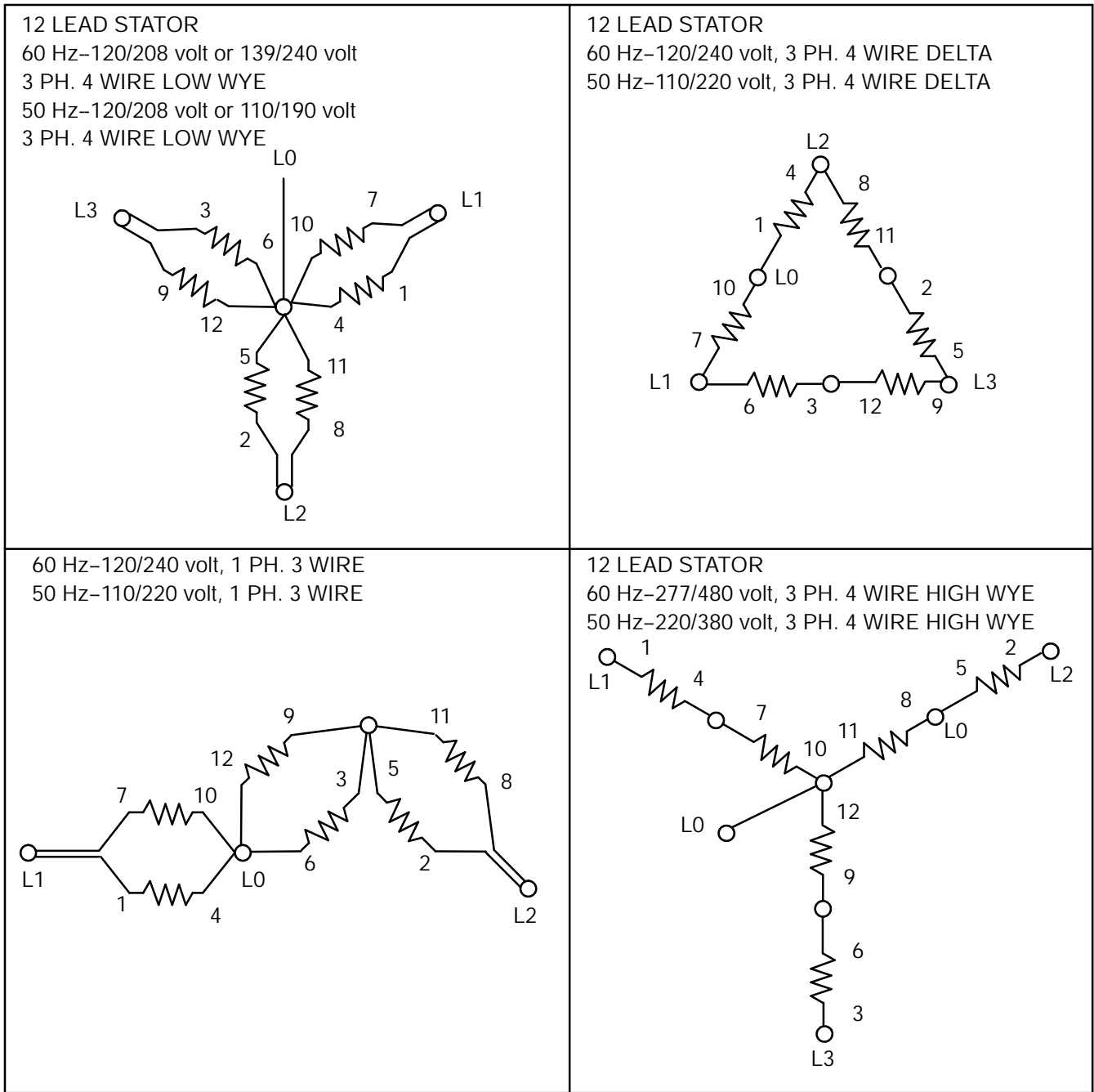
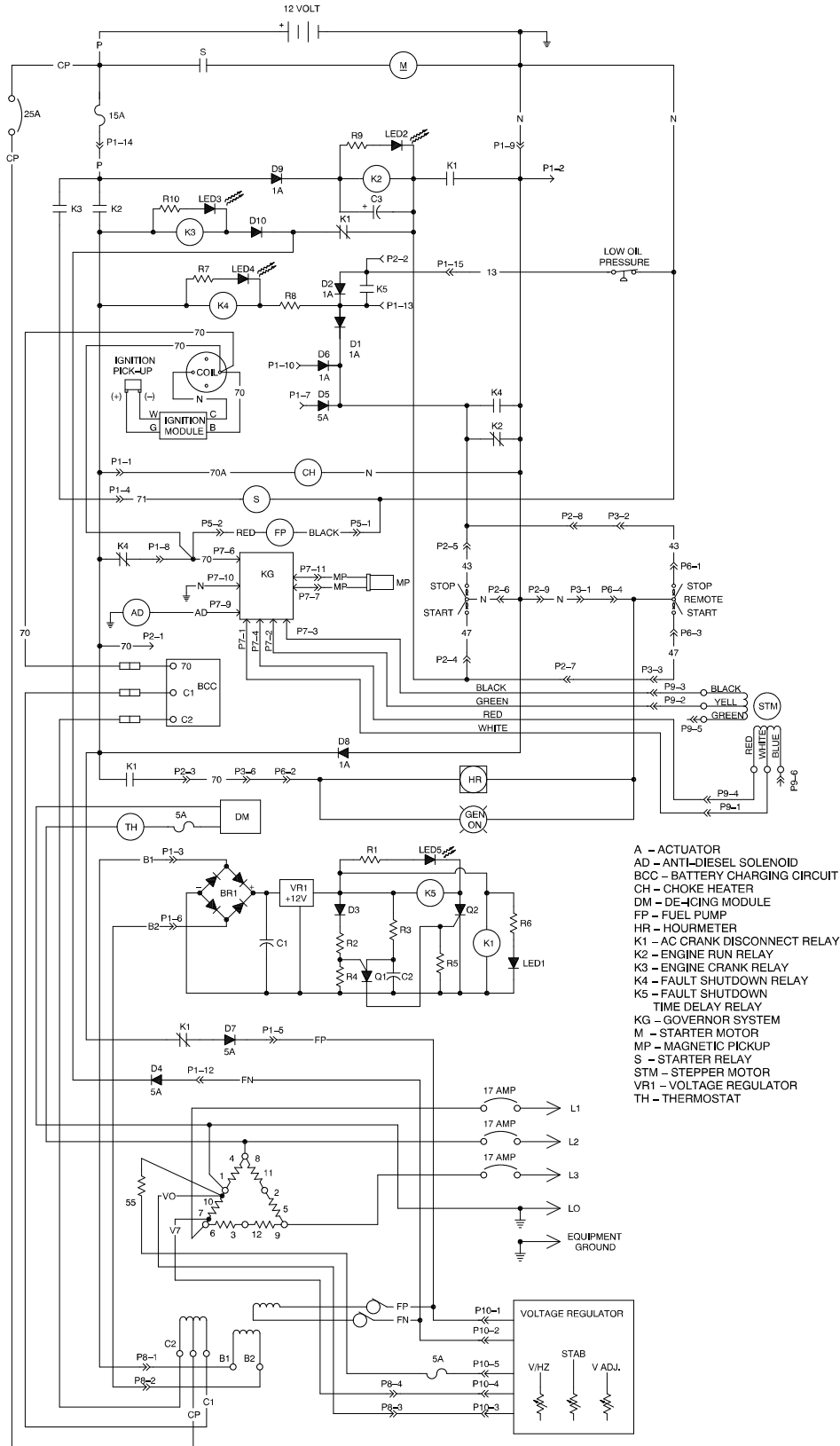
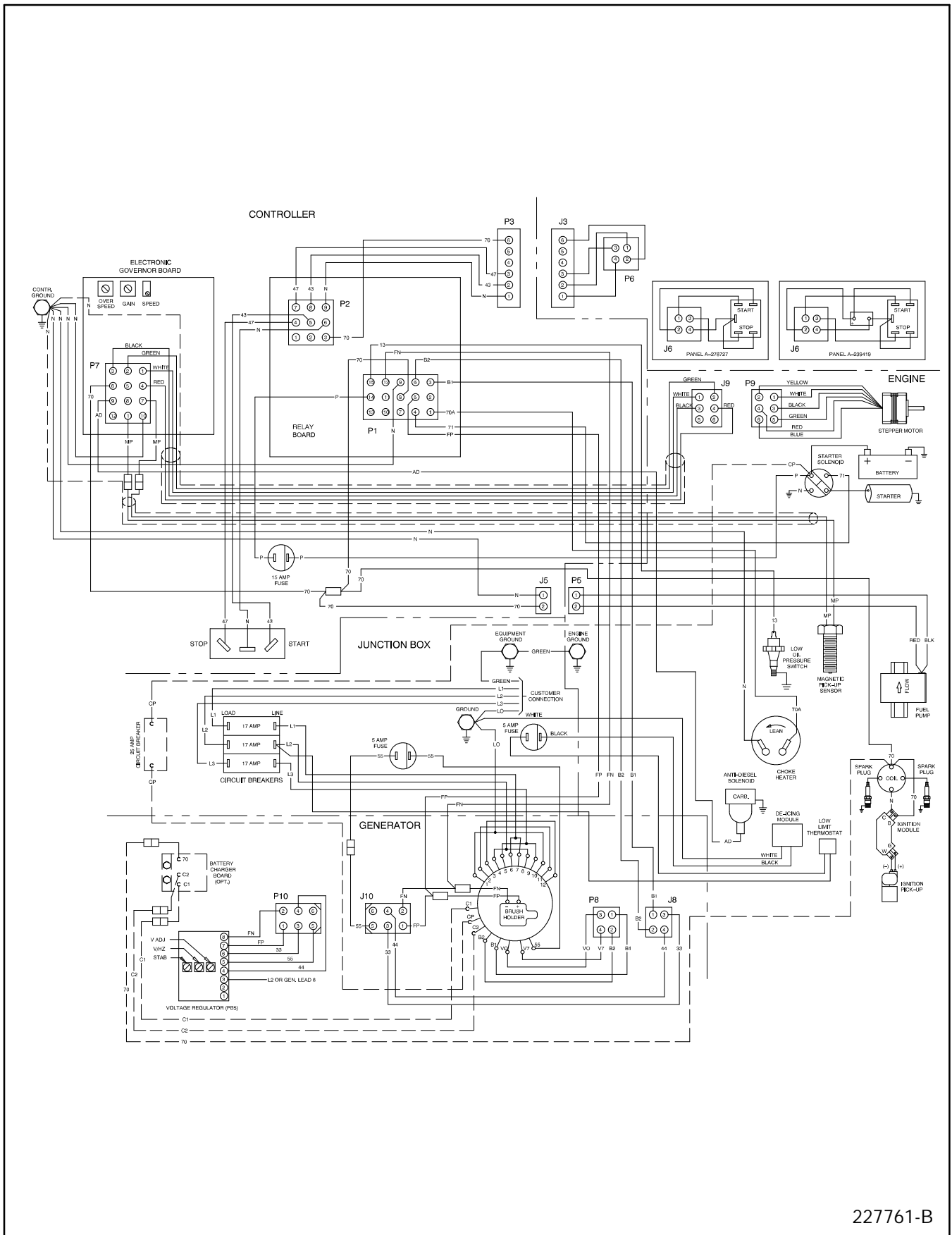


Figure 5-4. Three-Phase Voltage Reconnections

# NOTES

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227761-B

Figure 5-6. Point-to-Point of Wiring Diagram 227761

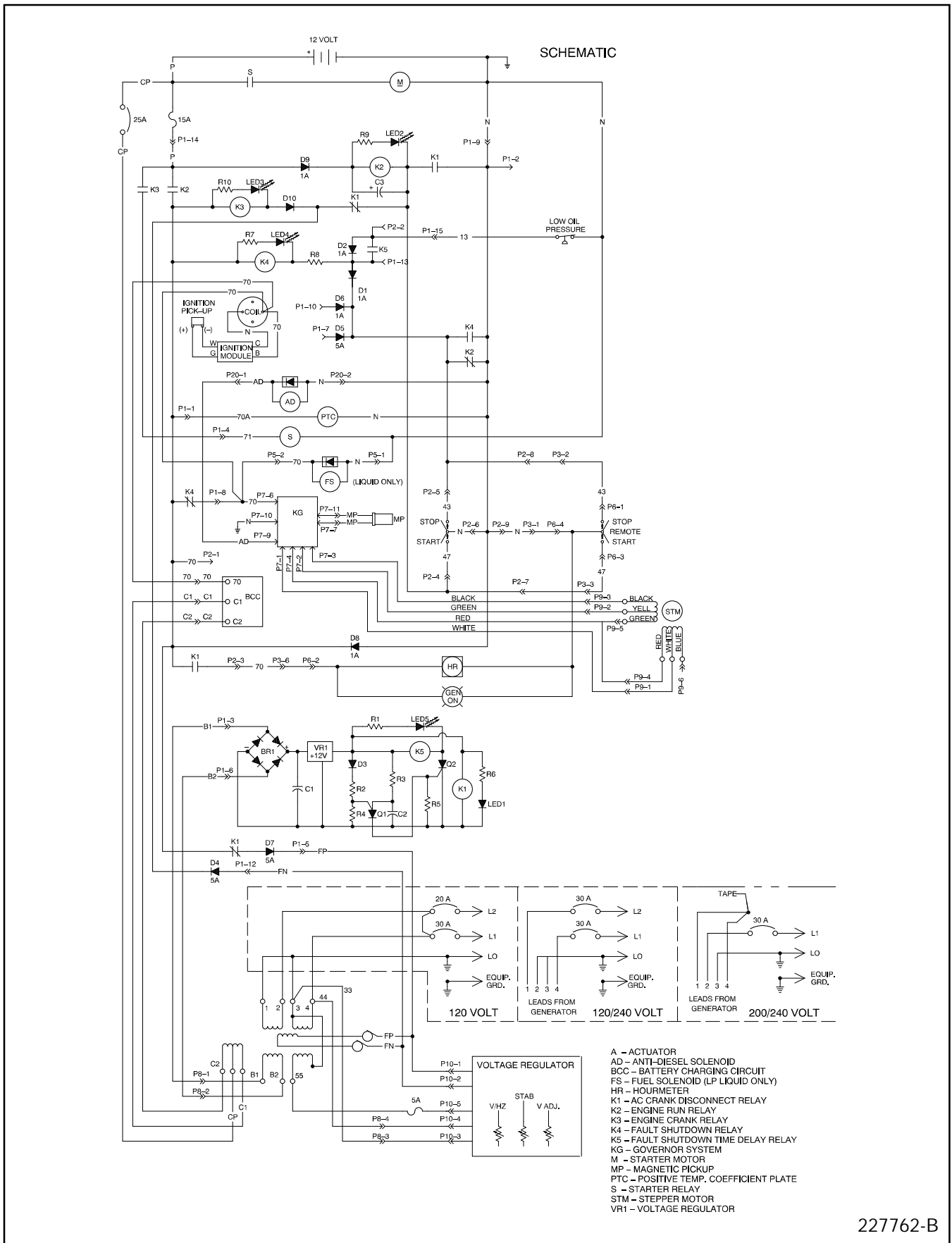


Figure 5-7. Schematic of Wiring Diagram 227762

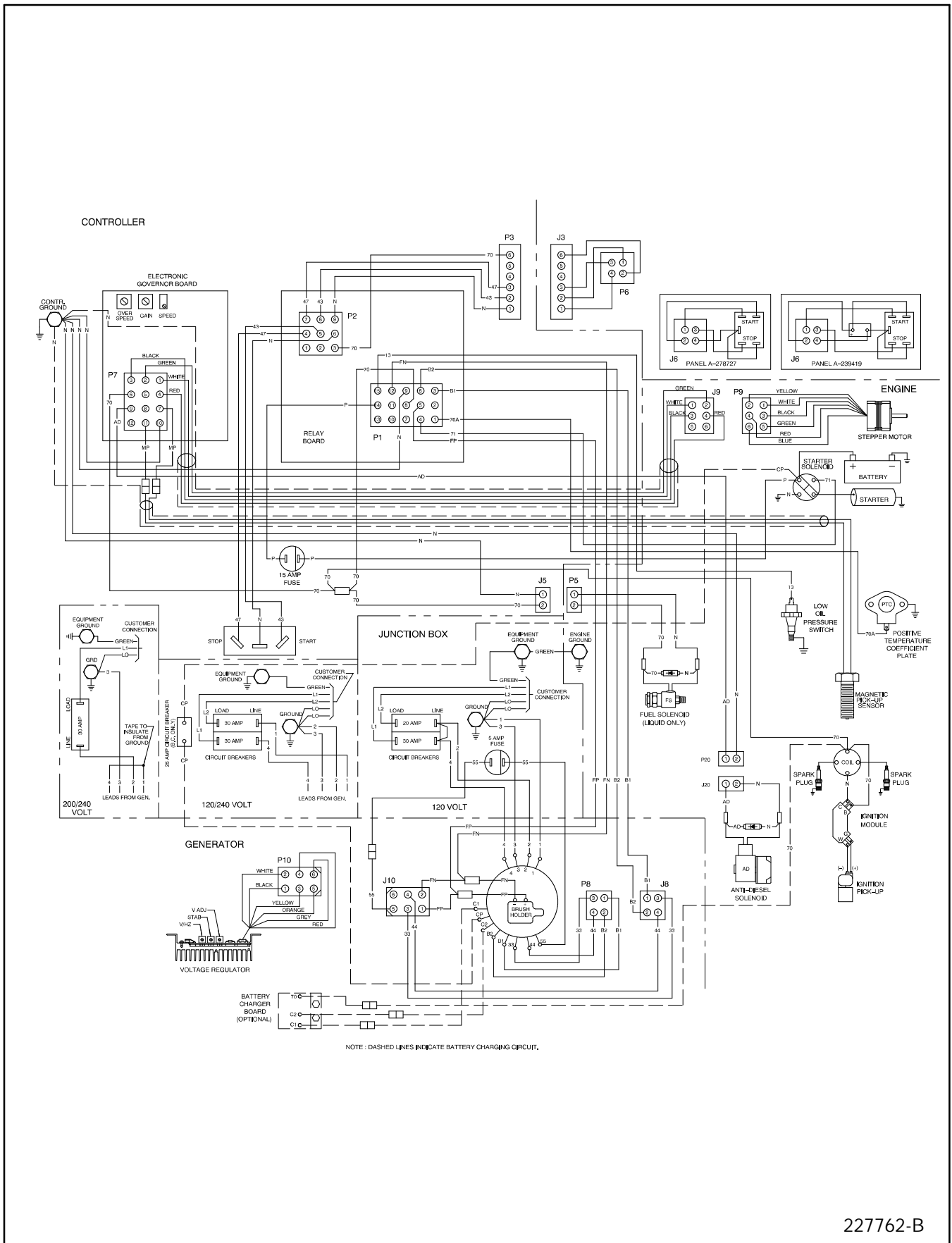
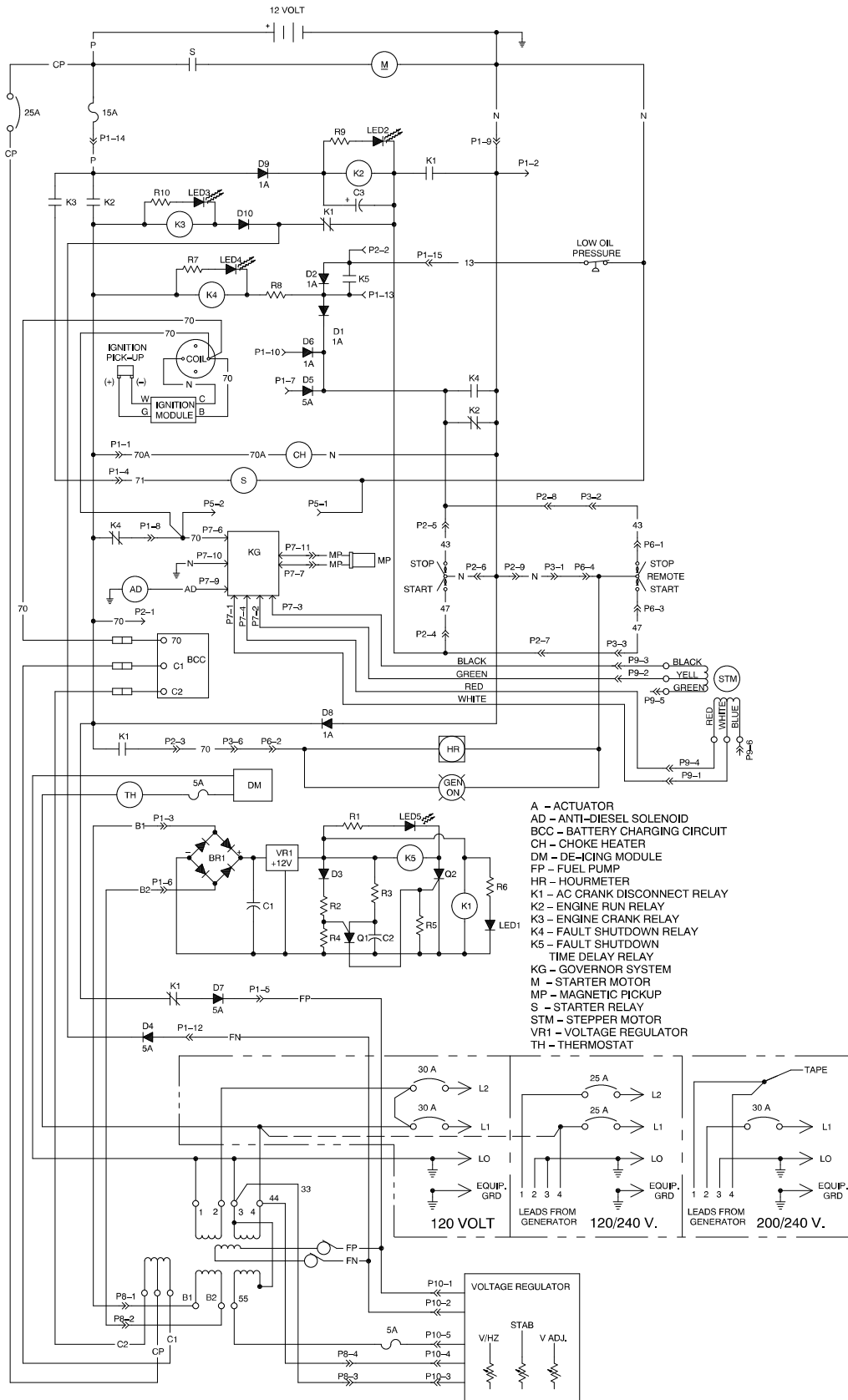


Figure 5-8. Point-to-Point of Wiring Diagram 227762

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227763-B

Figure 5-9. Schematic of Wiring Diagram 227763

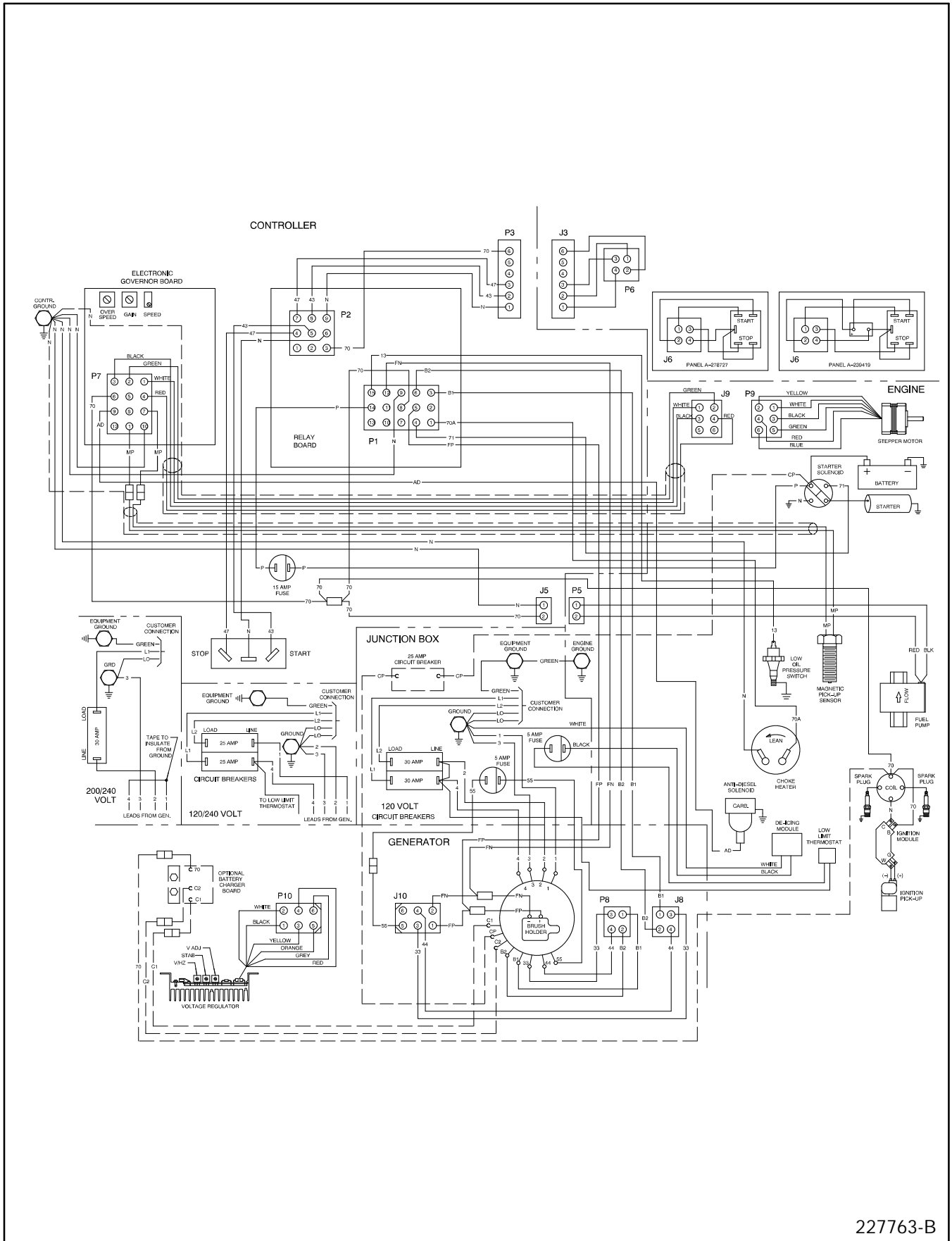


Figure 5-10. Point-to-Point of Wiring Diagram 227763

# Section 6. Installation

## Introduction

Use this section as a guide when installing an RV/Mobile generator set in a vehicle; then refer to Section 3 for specific service instructions. Comply with the Kohler detailed installation instructions. Find additional requirements in the following two sources: (1) ANSI A 119.2/NFPA 501 C and (2) article 551 of ANSI/NFPA 70, National Electrical Code. Comply with state and local requirements when installing the generator set.

### NOTE

**This generator set does not comply with United States Coast Guard (U.S.C.G.) requirements and must not be used for marine applications.** Use only generator sets specified for marine use in marine installations. U.S.C.G. Regulation 33CFR183 requires a generator set to be "ignition protected" when used in a gasoline-fueled environment.

## General Information

This section covers RV and Mobile generator set installation. To determine which model is involved, check the model number found on the nameplate attached to the controller of the generator being installed. Follow all instructions to insure proper installation.

## Features

All models feature Kohler designed and built 4-cycle, air-cooled gasoline engines, rotating-field, alternating-current generators, and relay controllers. Each generator is directly connected to the Kohler engine for permanent alignment. Kohler uses permanent magnet-type starting motors to crank the engine during start-up. Each controller includes a start/stop switch for test operating the set at the controller. The controller also has a keyed connector for connecting a wiring harness to a remote start/stop switch (usually located on the dashboard of the vehicle). All Kohler RV/Mobile sets are mounted on a steel drip pan-type mounting tray for quick installation to the frame of the vehicle. Add oil to the crankcase as needed to bring the level up to the max. mark. Following are some general specifications.

Specifications	
Weight (approx.) 7kW	335 lbs. (152 kg)
Air Requirements – Combustion	25 CFM
– Cooling	540 CFM
Fuel Inlet Connection Size– Gasoline	5/16 in. I.D. (7.9 mm)
Fuel Type	Unleaded Regular Gasoline, LP Gas Vapor, or LP Gas Liquid Withdrawal
Battery Voltage	12
Battery Recommendation (min.)	290 CCA, 55 Amp hr.
Battery Ground	Negative

# Generator Selection and Wattage Requirements

Consider total wattage requirements (lights, motors, appliances, tools) in selecting a generator set, or sizing wattage requirements when available space and construction may limit the size of the generator set. Refer to the following when figuring wattage requirements.

## Installation Factors

Each generator set is shipped as a unit except for the optional exhaust system components which are shipped loose for assembly after the set is installed in the vehicle.

Consider the following factors when preplanning the installation.

1. **ELECTRICAL LOAD:** Does the set selected have adequate capacity to handle the load?
2. **COMPARTMENT SIZE:** Will there be sufficient room around the set to maintain minimum clearances?
3. **AIR REQUIREMENTS:** Are the compartment air inlets and outlets sized to allow adequate circulation of air for cooling and combustion?
4. **COMPARTMENT FLOOR:** Is the compartment floor strong enough to support the weight of the generator set?
5. **FUEL SYSTEM:** Is the system designed to prevent fuel starvation of either the main engine or generator set engine?
6. **EXHAUST SYSTEM:** Will the system meet all safety requirements after installation?
7. **ELECTRICAL CONNECTIONS:** Will all systems (battery, load and remote switch) be compatible with vehicle systems?

Each of these installation considerations is covered in detail on the following pages.

## Electrical Load

While the electrical load of the vehicle should have been calculated prior to purchase of the generator set, recheck the load before installing the set to make sure that the capacity is ample to meet demands without overloading.

## Lighting Load

The lighting load is usually easiest to calculate. In most cases, add the wattage of each lamp to be operated by the generator set. Note that some lights may be on a DC circuit powered by the vehicle's 12-volt battery. Make sure the total includes only lights actually on the generator set AC circuit.

The lighting load is usually light in mobile installations; however, it must be accurately calculated to prevent overloading which could occur, for example, if all lights happen to be on when the air conditioner or other motor loads start-up.

## Motor Loads

When figuring generator set capacity requirements for installation involving motor loads, do not overlook the high current demanded by the motor during start-up. The in-rush or starting current may be 2-5 times higher than that required when the motor reaches normal operating speed. Allow reserve capacity for in-rush demands plus other loads on the line as the motor starts.

Air conditioning units are perhaps the most common types of motor load for generator sets in recreational vehicles. The starting characteristics of the different makes of air conditioners vary greatly— one particular 13,500 Btu unit has, for example, lower starting requirements than an 11,000 Btu unit of another make. When only one unit is involved, there is usually no starting problem, provided, the lighting and appliance loads are not too high when the unit is started.

The trend is toward larger-capacity air conditioners and the use of multiple units in larger vehicles. Simultaneous starting of two units can present problems if the generator capacity for the load is marginal. Because of the variation in starting characteristics between air conditioners, no definite statements are made

regarding multiple-motor starting capabilities of the generator sets covered. Consider delayed starting or easy-starting devices on air conditioner units whenever involving simultaneous starting of more than one motor. The starting and running requirements of some motor loads common to mobile applications are listed in Figure 6-1. Use this guide when selecting generator set capacity requirements involving motor loads. See Figure 6-2 for generator set capabilities regarding air conditioners. Capabilities will vary according to kilowatt derating following. For specific information regarding simultaneous starting of two or more motors, contact your distributor.

## Appliance Loads

Generator sets in recreational vehicles are often used to furnish AC for appliances such as TV, stereo, electric water heaters, etc. With the exception of the resistance-type loads such as the water heater, requirements for appliances are usually low. Such loads must not, however, be overlooked when figuring total requirements. Reserve capacity for anticipated appliance loads to avoid overloading the set. The average power requirements of some electrical appliances are listed in Figure 6-3.

Motor Requirements	1/4 HP	1/3 HP	1/2 HP	3/4 HP	1 HP	2 HP	3 HP
Starting (In-Rush)	750	1000	1500	2000	3300	4000	5000
Running Watts	350	400	600	750	1100	2000	3000

Figure 6-1. Motor Requirements

Kohler Model	Wattage Capacity	Will Operate Air-Conditioner(s) of Size Indicated	"Power to Spare" for lighting, appliance, tools, etc.
7CCKM	7,000	Two— 13,500 Btu	3000

Figure 6-2. Air Conditioner Ratings (60 Hz)

## Kilowatt Derating

The maximum kilowatt curve shows the performance of laboratory sets equipped with quiet-type muffler, corrected to sea level barometer, and operated at ambient temperature of 60°F (16°C). The kilowatts of the generator set will decrease 3% for each 1000 feet (305 meters) above sea level and 2% for each 10°F (5.5°C) increase in ambient temperature above 60°F (16°C), and 11.1% when converted to LP fuel.

Electrical Appliance	Ratings (Watts)
Blanket	50-250
Blender	600
Dryer, Hair	500-1200
Fan, Air Circulating	25-100
Fan, Furnace	270
Heater, Space	750-1500
Heater, Water	1500
Pan, Frying	1200
Percolator, Coffee	650
Radio	50-100
Television	300-750
Toaster	750-1200

Figure 6-3. Appliance Ratings (60 Hz)

Construction Tools	Motor Starting Watts	Running Watts
Air Compressor (Small)	1500	725
Air Compressor 3/4 hp	4000+	2000
Drill, 1/4 in.	500	250
Drill, 3/8 in.	600	350
Drill, 1/2 in.	800	600
Grinder 1/2 hp	1500	1200
Hammer, Demolition	2000	1800
Hammer, HD Rotary	1500	1200
Paint Sprayer (Airless)	400	240
Polisher, Orbit	500	360
Power Paint Roller	120	90
Power Plane	600	450
Router	900	700
Saw, Circular 6 1/2 in.	2200	1000
Saw, Circular 7 1/4 in.	2500	1200
Saw, Table 10 in.	4000	1500
Saw, Sabre (Worm Drive)	2500	1200
Sander, Belt	1500	600
Sander, Finishing	900	360
Screwdriver, Power	1000	530
Shear, 12 gauge	1800	720
Soldering Gun	–	250
Vacuum Cleaner, Wet/Dry	1500	1260
Wrench, Impact 1/2 in.	2000	840

Figure 6-4. Construction Tool Average Wattage Ratings.

# 7CCKM-RV/7CCKMR-Mobile Generator Set Mounting

## Compartment Size

When planning compartment size requirements, allow the minimum clearances for cooling of the generator set as shown in Figure 6-5.

### NOTE

Since the sets are flexibly mounted, the minimum clearances will assure that the sides of the compartment and the set will not rub while the set is in operation or while the vehicle is in transit.

Front	0.6 in. (15.2 mm)
Side	0.6 in. (15.2 mm)
Top	0.6 in. (15.2 mm)
Rear	0.6 in. (15.2 mm)

**Figure 6-5. Minimum Clearance Requirements**

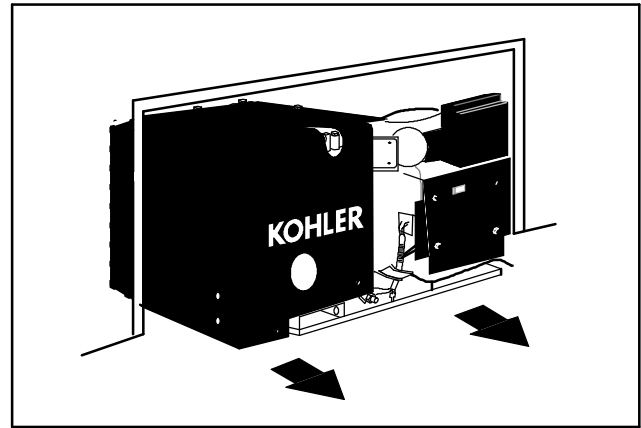
### NOTE

Minimum clearances listed are for cooling-air circulation. Routine servicing of the generator set requires additional clearance.

To meet CSA standard, maintain a minimum clearance of 3" (8 cm) between exhaust piping and any combustible material in compartment or surrounding exhaust outlet in compartment floor

Consider the thickness of insulating and sound-deadening material used to line the compartment when planning clearances. Maintain minimum clearance requirements— if necessary, enlarge the compartment. Securely fasten the generator set to avoid unwanted movement from vibration and road shock. On a typical installation, support the mounting tray ends with angle iron and have a full door for service access. Use the same number of bolts as mounting holes in the tray to support the structure.

When designing the compartment, allow sufficient room for the set to be easily removed when major service is required. See Figure 6-6. Note that the compartment door must have air-intake openings having a free area equal to or greater than that specified under Air Requirements following.



**Figure 6-6. Slide Tray Feature for Complete Removal**

Make sure that the compartment is vapor tight and completely sealed from the inside of the vehicle to prevent exhaust or other fumes from entering the vehicle.

### NOTE

If below-floor installation is desired, construct an enclosure around the generator set to protect electrical parts from road splash.

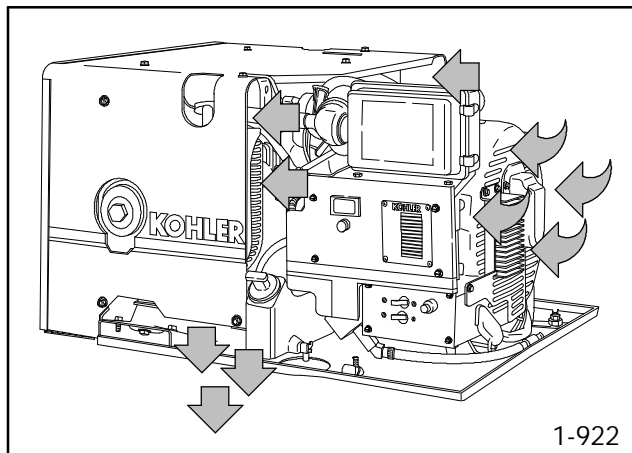
### NOTE

Install a mud flap if mounting generator set near a vehicle wheel.

Line the compartment with a sound-deadening material. Use fireproof (or highly resistant to fire) material. An available type of 3-layer foam material does a very efficient job of absorbing sound. This type material is easily cut to size with scissors and installs using special fire-retardant adhesive which bonds the material to almost any surface that is clean and dry.

## Air Requirements

A fan on the rotor of the generator draws cooling air into the compartment through the generator cooling slots and expels it at the engine-generator adapter. The engine of the generator set features an Air-Vac™ reverse-flow cooling system. Fins on the engine flywheel pull cooling air past the fins of the cylinder heads and discharge the heated air downward and out of the compartment through the discharge chute. See Figure 6-7.



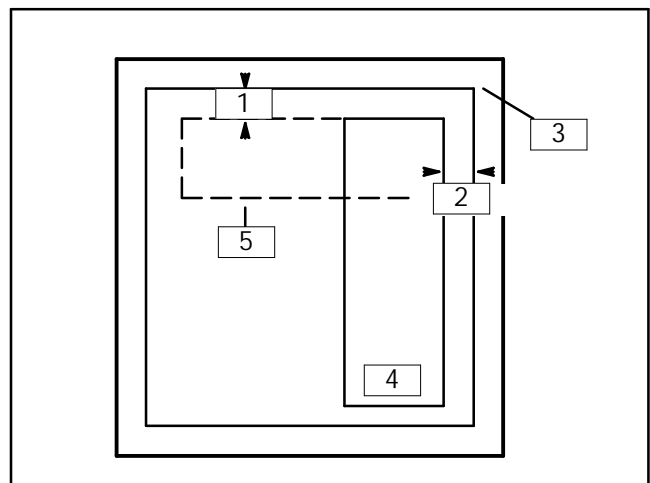
**Figure 6-7. Cooling Air Circulation**

To prevent damage to the generator set from overheating, make sure the compartment openings are large enough to allow adequate circulation of cooling air. The minimum free-air opening in the compartment is 85 sq. in. (548 sq. cm.). The free-air opening may be located in the compartment door, floor, or end wall. See Figure 6-9 for position of the free-air opening in the compartment floor or end wall. Position of the compartment door free-air opening is shown in Figure 6-8.

If the air-intake opening is located in the compartment floor or end wall, keep a space between the generator end and the compartment air opening. The width of the space must equal a point on the compartment floor 5° from the top of the generator. (Typically, a distance of 1 in. (2.5 cm) on most 7 kW generator installations.) See Figure 6-9. Install a fireproof floor (flooring made of a noncombustible material) between the mounting tray and enclosure walls. Follow these precautions to prevent hot air from leaving the generator compartment and igniting combustible material beneath the vehicle.

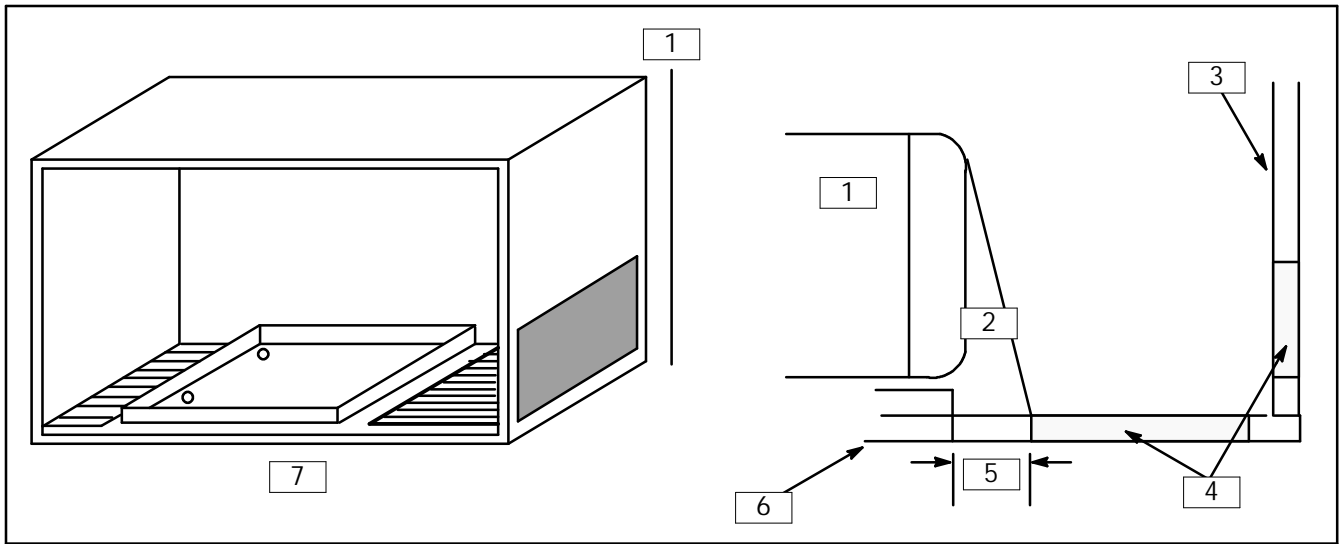
### NOTE

Install a baffle beneath the engine air discharge to prevent expelled air from raising dust or ruining grass beneath the vehicle.



1. 3" minimum (76.2 mm)
2. 2" minimum (50.8 mm)
3. Generator end
4. Air in
5. (Optional)

**Figure 6-8. Screen Position for Compartment Door**

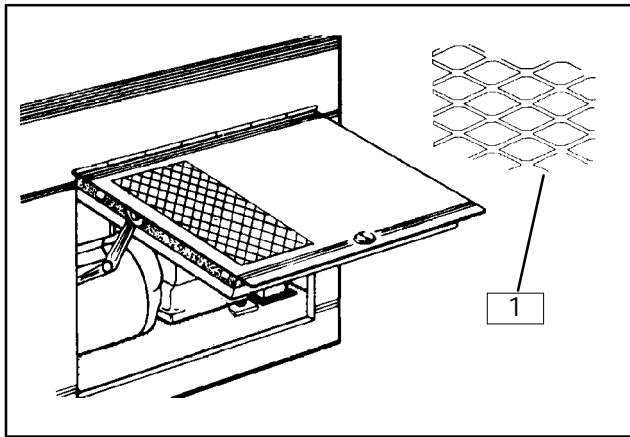


1. Generator end
2. 5°
3. End wall
4. Air inlet at floor or end wall

5. 1 in. (2.5 cm) max.
6. Compartment floor
7. Mounting tray must not cover any portion of air inlet/outlet openings.

**Figure 6-9. Floor or End Wall Air Inlets**

Remember, louvers, screens, and protective-decorative grill work restrict the air flow. Even a simple, relatively open mesh, screen shown in Figure 6-10 will restrict air flow as much as 45%. Increase the intake opening to compensate for such restrictions.



1. Wide Mesh Screen

**Figure 6-10. Inlet Screen/Louvers Restrict Air Flow**

## Mounting



Mount generator set by securing the generator tray directly to the compartment floor. If floor mounting is undesirable or impractical, an oversized mounting tray is available through your Kohler generator dealer/distributor. This tray permits slide tray installation as shown in Figure 6-6. Observe minimum compartment clearances listed in Figure 6-5 for all installations.

### NOTE

To avoid igniting combustible material beneath the vehicle, extend the mounting tray or fireproof floor (made of a non-combustible material) the full length and width of the enclosure. Install a fireproof floor between the mounting tray and enclosure walls if a floor or end wall air inlet is used.

### NOTE

**OVERHEATING!** Position the screen relative to the generator end as shown in Figure 6-9 or Figure 6-8 to prevent overheating.

 <b>WARNING</b>

<b>Hot engine and exhaust system. Can cause severe injury or death.</b>
Do not work on generator set until unit is allowed to cool.

**Fire can cause severe injury or death.** Hot exhaust system can ignite adjacent combustible materials. Do not locate electrical wiring, fuel lines, or combustible material above the exhaust muffler. Be careful when parking your vehicle to prevent grass fires started by exhaust system and hot exhaust gases.

**Fire can cause severe injury or death.** Hot generator can ignite debris in compartment. Keep the compartment and generator set clean and free of debris and combustible materials to minimize chances of fire. Do not block fuel/oil drain opening in generator mounting tray. If sub-flooring is used, cut a corresponding hole in the sub-flooring for drain opening.

### NOTE

Install a baffle plate beneath the generator engine air discharge (that will not cause back pressure) to prevent expelled air from raising dust or ruining grass beneath the vehicle.

### NOTE

Do not leave generator sets equipped with an optional swing-down tray in the tilted position for more than one hour; otherwise engine oil can bypass the piston rings and cause hydrostatic lock. Always place unit in the normal mounting position when not servicing the unit.

# 7CCKMR-Mobile Generator Set Mounting

Besides compartment mount (described earlier), mobile generator sets may be mounted below the floor or on the vehicle's floor. Following is specific information pertaining to mobile generator set installation.

Give special consideration when installing a mobile generator set to reduce the effects of Radio Frequency Interference (RFI) and Electro-Magnetic Interference (EMI). In some instances, particularly in mobile applications, where using high output, two-way radios, RFI and EMI may interfere with the signals to the generator set's electronic controls. Careful planning of the installation can minimize the effects of RFI and EMI.

- Be sure that the battery and ground connections are tight and in good condition (not corroded). For DC ground connections make sure to tightly connect the ground wire to the generator set ground wire or metal tray. Use internal- or external-tooth star washers to assure proper contact with metal parts.
- Observe how the antenna cables, or any other RFI/EMI carrying wires, are routed in relationship to the generator set. While these wires should be shielded, they can still radiate energy or they may not be properly grounded. Do *NOT* run the generator DC power lines next to these wires or in the same cable raceway.
- Locate the generator set so that the sensitive electronic equipment (located inside the controller) is as far away as possible from the antenna or signal-carrying wires. Locating the generator set's controller opposite of the RFI/EMI source is preferred.

## Below-Floor Mount

Mount the generator set in an enclosure below the floor of the vehicle in a below-floor installation.

### NOTE

Kohler offers a kit for below-floor installation. The kit includes specific installation instructions.

### NOTE

In a below-floor installation, the vehicle must support the weight of the generator set and enclosure. Contact vehicle manufacturer if unsure about the vehicle's ability to support the unit.

When planning a below-floor installation, choose a proper location and keep in mind the following suggestions.

- Install mud flaps to protect the generator end and/or engine end (depending upon where the unit is positioned in the vehicle) from road splash.
- Install baffles to protect generator set enclosure air-inlet openings from dirt, rocks or debris.
- Provide an opening on the vehicle's side large enough for maintaining the serviceable components of the generator set. Serviceable components include oil check, oil fill, oil filter, carburetor adjustments and circuit breaker control.
- Provide adequate clearance for movement and/or removal of exhaust components.

### NOTE

Be sure to follow the mounting hole pattern supplied with the below floor mounting kit. Keep housing panels square to each other.



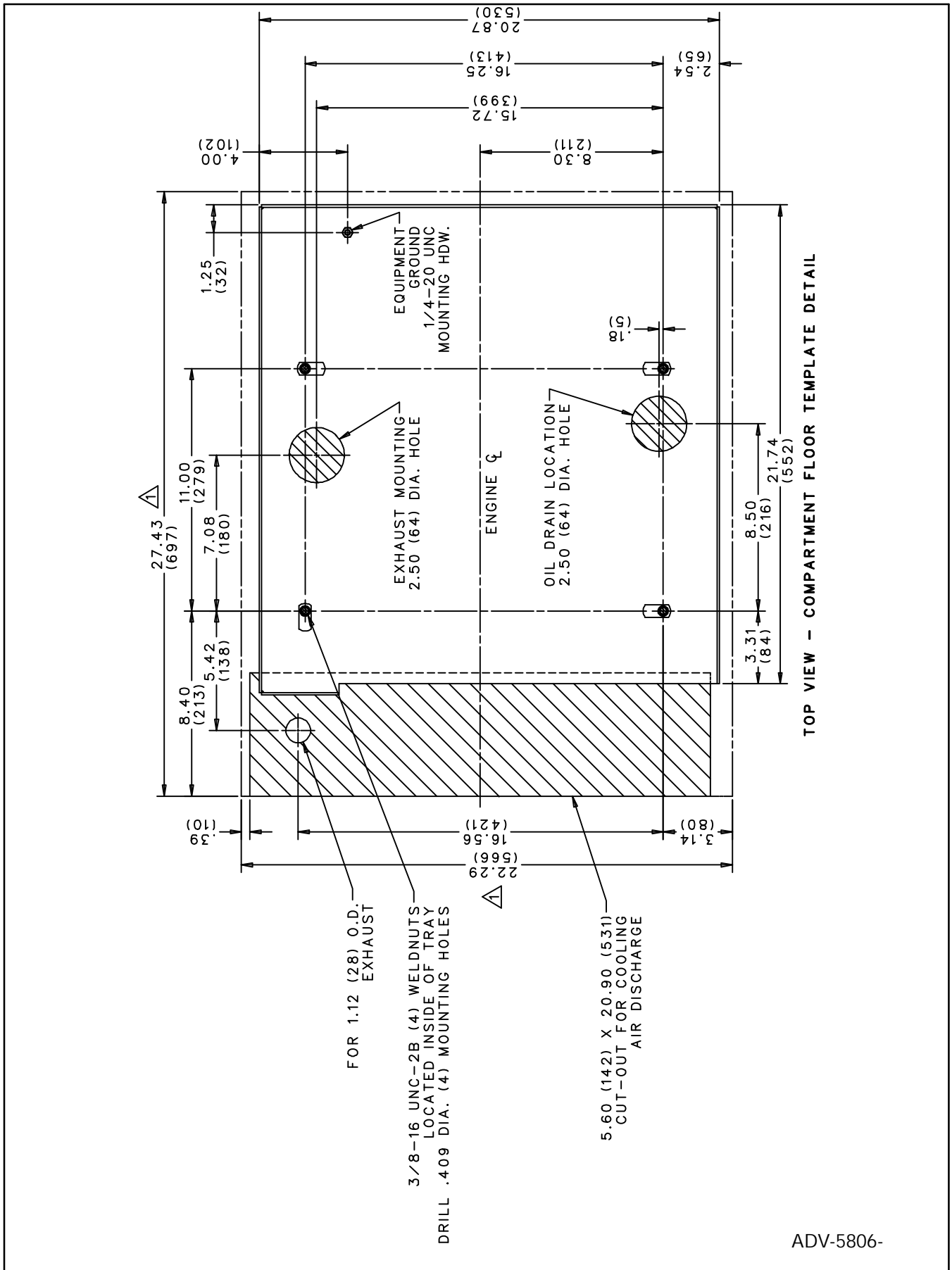


Figure 6-13. Floor Template- 7CCKM-RV and 7CCKMR-Mobile Standard Tray

# Fuel System

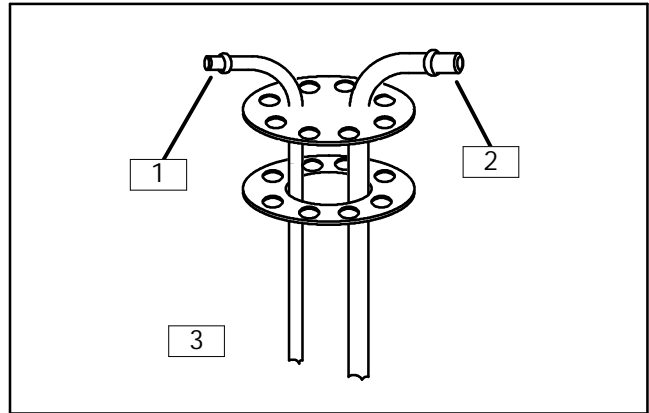
## Gasoline

For best results, use only clean, fresh, regular-grade unleaded gasoline with a pump sticker octane rating of 87 or higher in the U.S.A. In countries using the research rating method, it should be 90 octane minimum.

Use Gasohol containing no more than 10% ethanol if unleaded gasoline is unavailable. Never use gasohol containing more than 10% ethanol or gasoline containing methanol. Do not mix oil with the fuel.

Design the gasoline fuel system for the generator set to operate independently of the system for the vehicle engine if both engines are to be operated at the same time. The best way to do this is to have separate fuel tanks; however, this is usually impractical because of space restrictions. In most installations, both engines operate from a common tank with a separate dip tube arrangement as shown in Figure 6-14. This prevents the smaller engine from being starved of fuel by the larger engine. The generator set dip tube is generally shorter than the vehicle dip tube. With this arrangement fuel may not be available to the generator set when fuel supply is low.

A simple tee fitting is sometimes used to provide fuel for both engines off a common tank; however, this usually prohibits simultaneous operation. There is also the possibility that operation of either engine could completely drain the fuel line and even the carburetor fuel bowl of the other engine, thus making starting difficult if not impossible. Avoid the tee arrangement or use only as a last resort.



1. Fuel line to generator set
2. Fuel line to vehicle engine
3. Keep fuel line away from exhaust

**Figure 6-14. Two Dip Tubes in Fuel Tank**

### NOTE

Do not tee into fuel-injected fuel systems. Use a two-dip tube arrangement for fuel supply. Consult an authorized Kohler service dealer/distributor for further fuel system installation information.

Exercise care when routing the fuel line from the main tank to the generator set. Keep fuel lines as short as possible but maintain adequate clearance from exhaust system. Run fuel lines along the frame or undercarriage— never run fuel lines inside the vehicle. Locate fuel lines below the generator set compartment with entry point near the fuel pump. Use a fuel line sized to handle the flow of fuel and withstand road shock and year-round climate conditions. If steel tubing is used, it should be 1/8 in. (3.2 mm) I.D. (minimum) with an 8 in. (230 mm) (minimum) flexible section to allow free movement of the generator set.

## LP Gas Fuel System

Use a flexible hose designated for use with LP gas between the generator set and main tank. Exercise care when routing the fuel line. A two-inch minimum clearance is required between the fuel line and any bare exhaust components. Electrical wiring cannot be tied to any fuel lines and should be routed so that it will not inadvertently contact fuel lines. If the flexible hose passes through sheet metal, install grommets or clamps to prevent hose abrasion. The LP fuel system shall conform to section 3-6.4 of NFPA58, "Storage and Handling of Liquefied Petroleum Gases."

For LP gas system, use UL-classified pipe joint sealing compound to prevent dangerous fuel leaks. Use a sealing compound approved for use with LP gas. Apply UL-classified sealing compound at all fuel line pipe joints.

After all the LP connections have been completed, the entire system shall be test pressurized to 6-8 ounces (10-14 inches water column). Test the connections for leakage with soapy water or bubble solution. Do not use solutions that contain ammonia or chlorine, since the soap will not bubble for an accurate leakage test.

Do not exceed six ounces gas and supply pressure. To check inlet pressure, remove plug on fuel inlet for gas regulator. Insert ounce pressure gauge or manometer. Adjust operating pressure to 4-6 ounces or 7-11 inches water column; inlet pressure is adjusted on primary regulator.

### NOTE

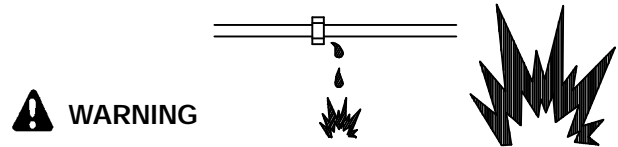
Fuel leakage could cause an explosion. Test pressurized the entire system to 6-8 ounces (10-14 inches water column) after all LP-gas connections are completed.

### NOTE

Under certain circumstances, gas pressure above 10 ounces can result in inoperative gas valve.

### NOTE

The use of flexible fuel lines should be limited to areas where vibration and/or movement of connected components is likely (such as main fuel line to generator set). Use seamless steel tubing wherever long main fuel lines are required.



**WARNING**

**Explosive fuel vapors.  
Can cause severe injury or death.**

Use extreme care when handling, storing,  
and using fuels.

**Explosive fuel vapors can cause severe injury or death.** Fuel leakage can cause an explosion. Check LP vapor gas fuel system for leakage using a soap-water solution with fuel system test pressurized to 6-8 ounces per square inch (10-14 inches water column). Do not use test solutions that contain ammonia or chlorine, since the soap will not bubble for an accurate leakage test.

**Explosive fuel vapors can cause severe injury or death.** Fuel leakage can cause an explosion. Check LP liquid withdrawal gas fuel system for leakage using a soap-water solution with fuel system test pressurized not less than 90 psi (621 kPa). Do not use test solutions that contain ammonia or chlorine, since the soap will not bubble for an accurate leakage test.

# Exhaust Systems

The 7 kW models have several exhaust kits which include spark arrestor muffler and mounting hardware. See Figure 6-15, Figure 6-16, and Figure 6-17. Some kits install on vehicles with the compartment located at floor level while the others install on vehicles with below-floor installations. These kits allow the routing of the exhaust pipe to either the right side or left side of the vehicle. Consult the appropriate installation drawing for specific mounting dimensions.

Because the length varies with most installations, exhaust kits do not include a tail pipe. However, install a tail pipe to direct the exhaust gases beyond the perimeter of the vehicle. Use a tail pipe with as few gradual bends as possible to avoid excessive back pressure, and direct exhaust away from air stream. To meet CSA standard, maintain a minimum clearance of 3" between exhaust piping and any combustible material in compartment or surrounding exhaust outlet in compartment floor (see page 6-11, Figure 6-13)

## NOTE

Install a 278621 spark arrestor for generator operation in State and Federal campgrounds.

## NOTE

Clean 278621 spark arrestor once a season.

## NOTE

Exhaust air from the generator set air duct must have a minimum of 12" ground clearance. Back pressure of 1/2" water column differential (when using a manometer) is preferred.

## NOTE

Kohler also offers a below-the-floor mounting kit which comes with complete assembly instructions.

## NOTE

Position exhaust system components well away from the drain opening in the bottom of the mounting tray. Also make sure the components are not blocking access to the oil drain plug.

## WARNING

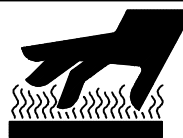


**Carbon monoxide.**  
**Can cause severe nausea, fainting, or death.**

The exhaust system must be leakproof and routinely inspected.

**Carbon monoxide can cause severe nausea, fainting, or death.** Install exhaust system tail pipe so discharged exhaust gases will not be drawn into vehicle interior through windows, doors, air conditioners, etc. Do not use flexible tail piping since this type could crack and allow lethal exhaust fumes to enter the vehicle.

## WARNING

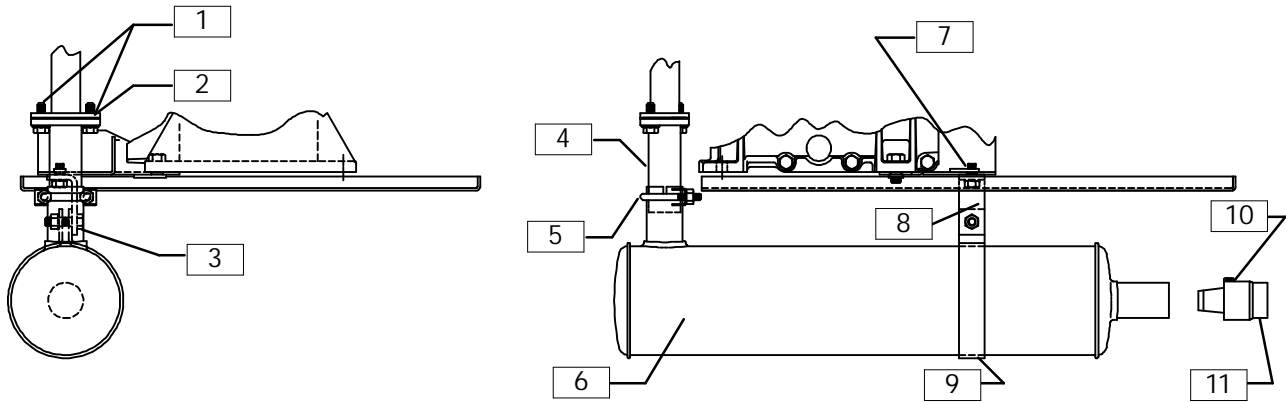


**Hot engine and exhaust system.**  
**Can cause severe injury or death.**

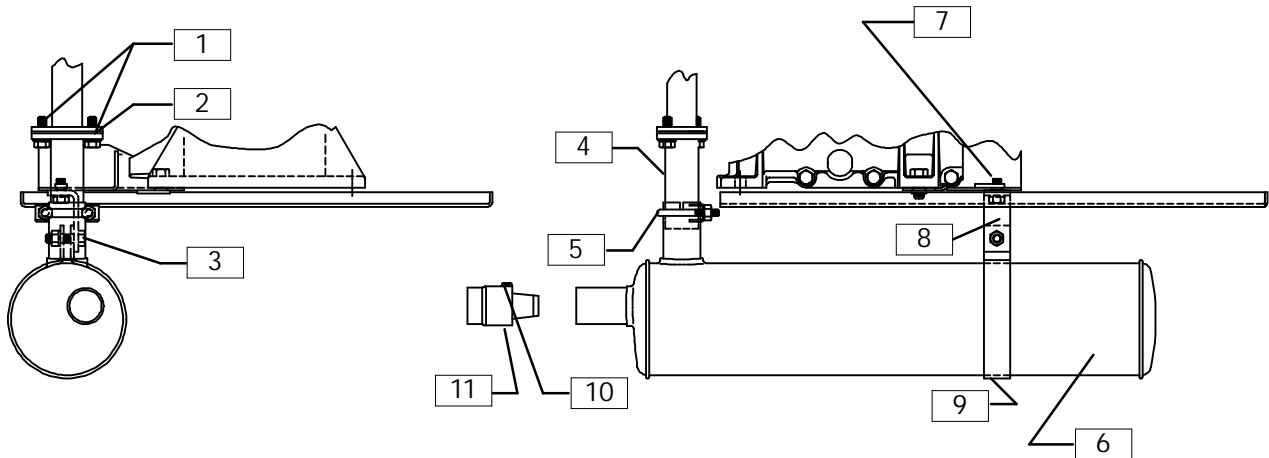
Do not work on generator set until unit is allowed to cool.

**Fire can cause severe injury or death.** Hot exhaust system can ignite adjacent combustible materials. Do not locate electrical wiring, fuel lines, or combustible material above the exhaust muffler. Be careful when parking your vehicle to prevent grass fires started by exhaust system and hot exhaust gases.

**MUFFLER MOUNTING (RIGHT SIDE)- KIT# PA-278639**



**MUFFLER MOUNTING (LEFT SIDE)- KIT# PA-278638**



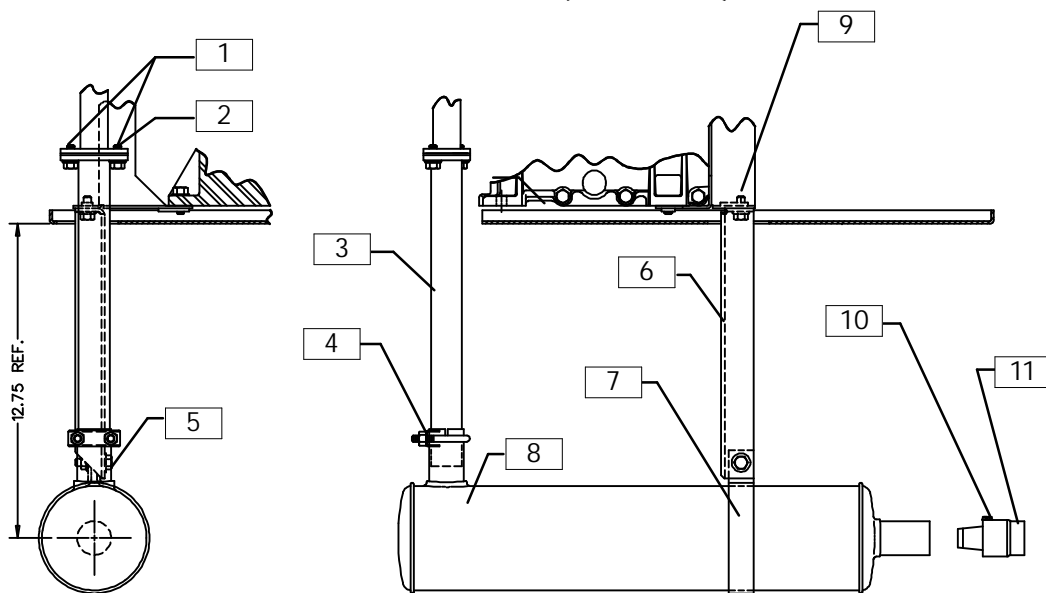
DW-277000-H

1. Screw (X-6217-1) qty. 2
2. Exhaust Gasket (278320)
3. Screw (X-125-24), Washer (X-25-85), and Whiz Nut (X-6210-7)
4. Exhaust Adapter (278766)
5. Muffer Clamp (X-722-8)
6. Muffler  
(278736 for kit PA-278639 and 278737 for kit PA-278638)

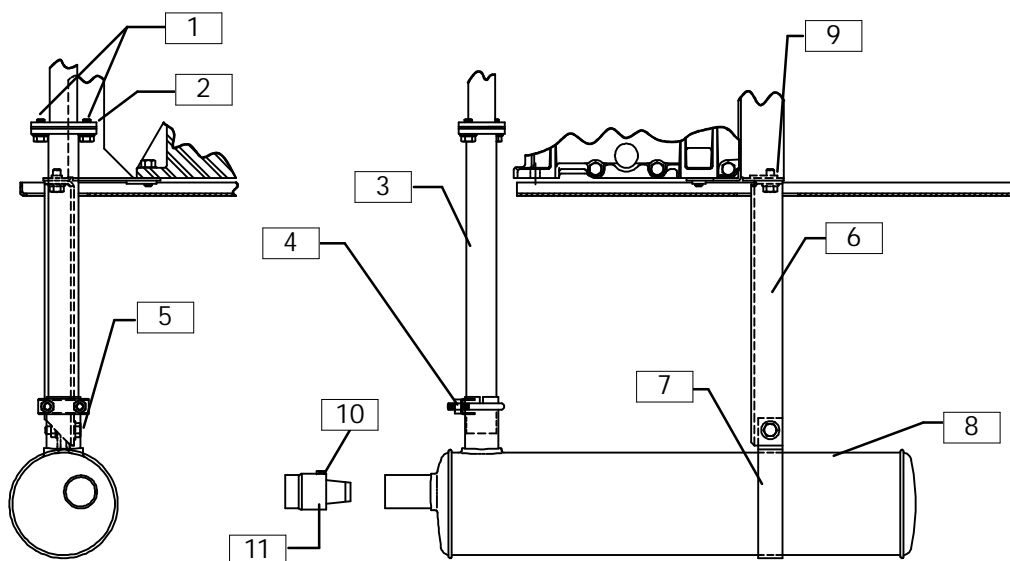
7. Screw (X-6217-1)  
Use hole in oil pan to mount muffler hanger.
8. Muffer Mounting Bracket (278772)
9. Muffer Mounting Strap (278769)
10. Drill Screw (X-794-3)
11. Spark Arrestor (278621)  
Attach to end of tail pipe.

**Figure 6-15. Exhaust Kits**

**EXTENDED MUFFLER MOUNTING (RIGHT SIDE)- KIT# PA-227435**



**EXTENDED MUFFLER MOUNTING (LEFT SIDE)- KIT# PA-227436**



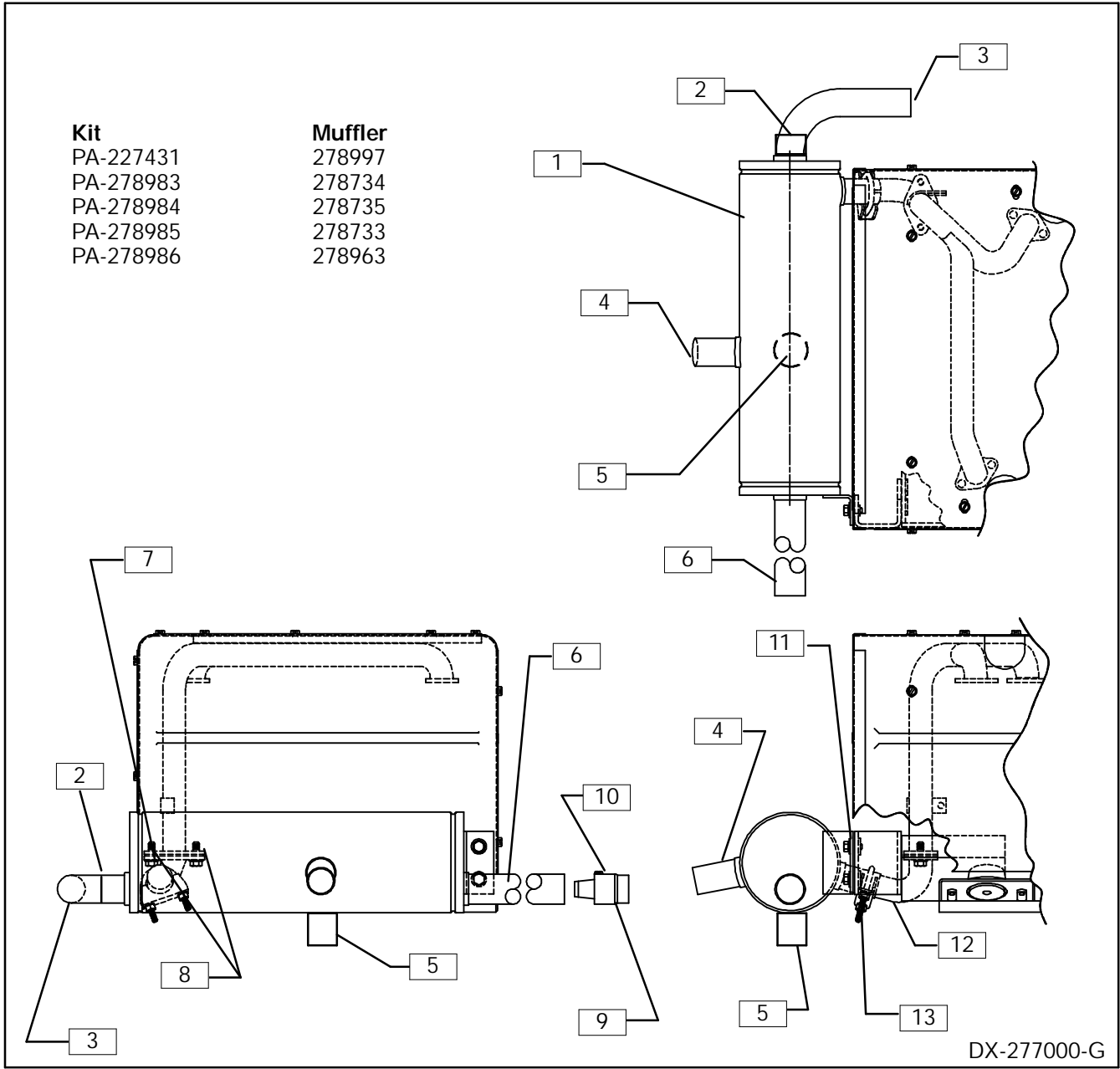
DW-277000-H

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1. Screw (X-6217-1) qty. 2</li> <li>2. Exhaust Gasket (278320)</li> <li>3. Exhaust Adapter (227434)</li> <li>4. Muffler Clamp (X-722-8)</li> <li>5. Screw (X-125-24), Washer (X-25-85), Whiz Nut (X-6210-7)</li> <li>6. Muffler Mounting Bracket (227433)</li> <li>7. Muffler Mounting Strap (278769)</li> </ul> | <ul style="list-style-type: none"> <li>8. Muffler<br/>(278736 for kit PA-227435 and 278737 for kit PA-227436)</li> <li>9. Screw (X-6217-1)<br/>Use hole in oil pan to mount muffler hanger</li> <li>10. Drill Screw (X-794-3)</li> <li>11. Spark Arrestor (278621)<br/>Attach to end of tail pipe.</li> </ul> |
|---|---|

**Figure 6-16. Exhaust Kits**

**Kit**  
 PA-227431  
 PA-278983  
 PA-278984  
 PA-278985  
 PA-278986

**Muffler**  
 278997  
 278734  
 278735  
 278733  
 278963



DX-277000-G

- 1. Muffler (See listing above for proper part number)
- 2. Muffler Outlet (278997)
- 3. Muffler Outlet (278735)
- 4. Muffler Outlet (278733)
- 5. Muffler Outlet (278963)
- 6. Muffler Outlet (278734)
- 7. Exhaust Gasket (278320)
- 8. Screw (X-6217-1) qty. 2
- 9. Spark Arrestor (278621)  
Attach to end of tail pipe.
- 10. Drill Screw (X-794-3)
- 11. Screw (X-6217-2) qty. 2
- 12. Exhaust Adapter (278979)
- 13. U-Clamp (X-722-8)

**Figure 6-17. Exhaust Systems for Generator Sets Mounted Below Floor**

# Electrical Systems

Battery, load lead, and remote switch panel connections complete the installation. Make final connections to the battery only after all other connections have been made as this will prevent unintentional starting. The following paragraphs state some specific details on each connection. Refer to the wiring diagram for specific details— connections should be made only by qualified electricians. Securely support or harness all generator wiring to prevent abrasion. Provide additional support to prevent exposure to the exhaust system and drippage of fuel, oil, or grease— provide at least 2" (51 mm) clearance between electrical wiring and hot exhaust parts. Also, do not locate wiring below or close to fuel system parts or oil fill tube. Some other points to consider when making AC load connections are covered in the following paragraphs.

**NOTE**

For inspection and servicing keep wiring connections accessible.

Distance Between Generator Set and Battery ft. (m)	Cable Size (AWG)		
	At 0°F (-18°C)	At 32°F (0°C)	At 75°F (24°C)
40 (12.2)	0	0	1
30 (9.1)	0	1	2
25 (7.6)	1	2	4
20 (6.1)	2	2	6
15 (4.6)	2	4	6
10 (3.0)	4	6	8
5 (1.5)	6	6	8
2.5 (0.8)	8	8	8

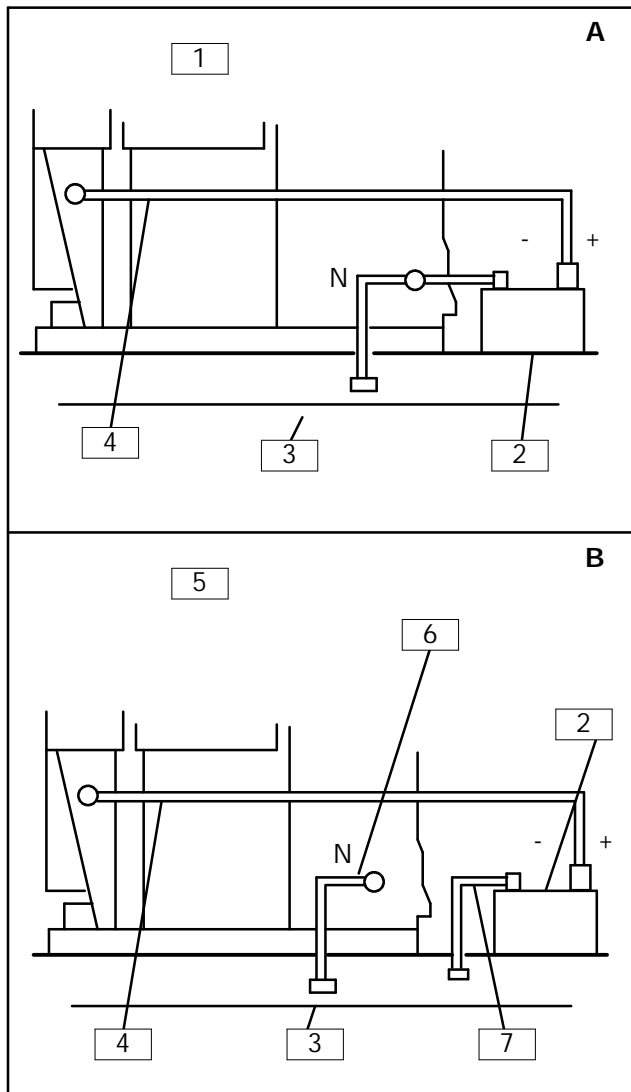
**Figure 6-18. Battery Cable Size**

## Battery and Connections

If using the same battery for starting the vehicle engine and the generator engine, ground the negative battery terminal to the vehicle frame. Heavy gauge (#4) ground strap must connect the ground lug on the generator set to the vehicle frame as illustrated in Figure 6-19.

### NOTE

A ground connection is required between the generator and the vehicle frame even if the battery used to start the generator is not the same as the vehicle's.



1. Using separate battery for generator set
2. 12-volt battery
3. Vehicle frame
4. Battery positive
5. Using same battery as vehicle engine
6. Ground strap vehicle frame
7. Battery negative to vehicle frame

**Figure 6-19. Battery Connection Details**



### WARNING



**Sulfuric acid in batteries.  
Can cause severe injury or death.**

Use protective goggles and clothes. Can cause permanent damage to eyes, burn skin, and eat holes in clothing.

**Explosion can cause severe injury or death.** Battery gases can cause an explosion. Do not smoke or permit flame or spark to occur near a battery at any time, particularly when it is being charged. Avoid contacting terminals with tools, etc. to prevent burns and to prevent sparks that could cause an explosion. Remove wristwatch, rings, and any other jewelry before handling battery. Never connect negative (-) battery cable to positive (+) connection terminal of starter solenoid. Do not test battery condition by shorting terminals together or sparks could ignite battery gases or fuel vapors. Any compartment containing batteries must be well ventilated to prevent accumulation of explosive gases. To avoid sparks, do not disturb battery charger connections while battery is being charged and always turn charger off before disconnecting battery connections. When disconnecting battery, remove negative lead first and reconnect it last.

### NOTE

Battery charging is an option. Be sure provisions are made to charge battery.

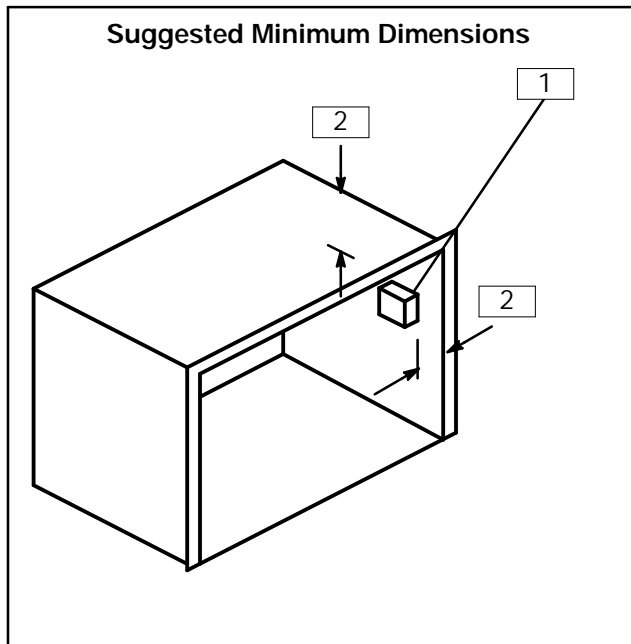
## AC Load Lead Connections

Each set has four color-coded load leads and a connector for attaching flexible conduit from the generator end bracket to the load terminal junction box typically installed in the compartment. The black leads (L1 and L2) are hot, the white lead (L0) is neutral, and the green lead is the hazard ground.

### NOTE

Route load leads through flexible conduit and keep circuit away from the generator set, specifically fuel and exhaust system components.

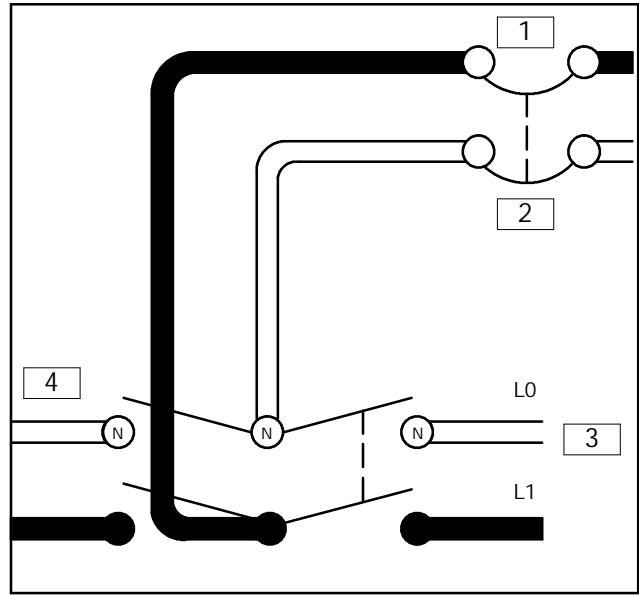
Figure 6-20 represents position and dimensions for typical junction box installation. Install a junction box to make the generator set accessible for inspection and service.



1. Box for field connection should be accessible after installation for inspection and servicing
2. 2" (50.8 mm)

**Figure 6-20. RV Junction Box**

The AC load lead L0 (white) is always the neutral lead on Kohler generator sets— make sure the neutral of the AC circuit in the vehicle is connected to lead L0 (white). If equipment ground-type plugs and receptacles (3 pronged) are used in the vehicle, the green wire must be connected to the U-shaped pin. On vehicles which also have provisions for using an outside AC power source, completely isolate the neutral as well as the hot (black) leads from the generator set when power is switched to the outside source. See Figure 6-21.



1. AC vehicle circuit
2. Ground fault circuit protection
3. Generator set
4. 120-V outside power

**Figure 6-21. Transfer Switch Connections 2-Wire AC Circuit**

### NOTE

Use a double-pole, double-throw transfer switch rated for the calculated load of the RV to transfer the load from one source to the other. Install a ground-fault circuit interrupter in the wiring system to protect all branch circuits.

**⚠ WARNING**

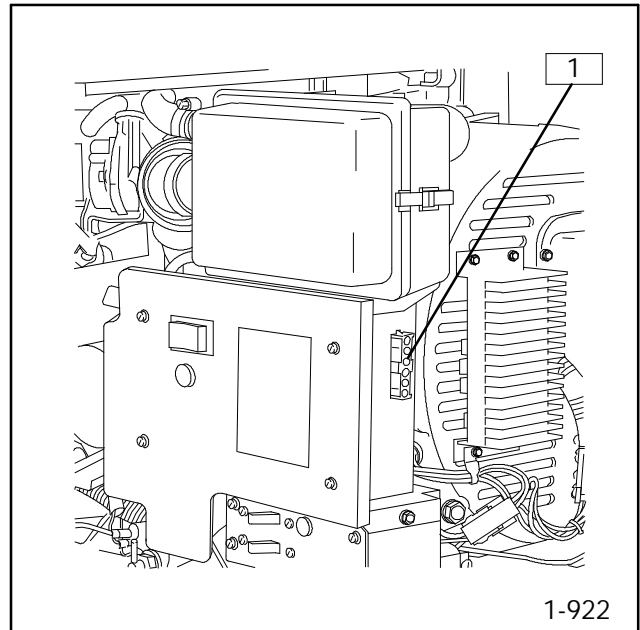


**Hazardous voltage.**  
**Backfeed to utility system can cause severe injury, death, or property damage.**  
Do not connect to any building electrical system without connecting through an approved device and after building main switch is open.

**Hazardous “backfeed” voltage can cause severe injury or death.** The generator must not be used to “backfeed” by connecting it to building/campground electrical circuits. Install a transfer switch in vehicle generator installations to prevent connection of vehicle and other sources of power. Electrical backfeed into a utility electrical system can cause serious injury or death to utility personnel working on transmission lines.

## Remote Switch Connection

Kohler offers a remote switch panel for mounting on the dashboard or elsewhere in the vehicle. It measures 2 in. x 4 in. (51 mm x 103 mm) and requires a cutout of 1 3/4 in. x 3 1/4 in. (44 mm x 83 mm). The panel includes start/stop switch, generator ON light, and a digital hourmeter. Kohler also offers wiring harnesses of different lengths with keyed plugs or pigtails for quick connection between the controller on the set (Figure 6-22) and the remote-switch panel in the vehicle. The chart on the following page lists the part numbers of wiring harnesses. Use the wiring diagram shown in Figure 6-23 if the installer elects to use just a start/stop switch or separate lights and hourmeter.

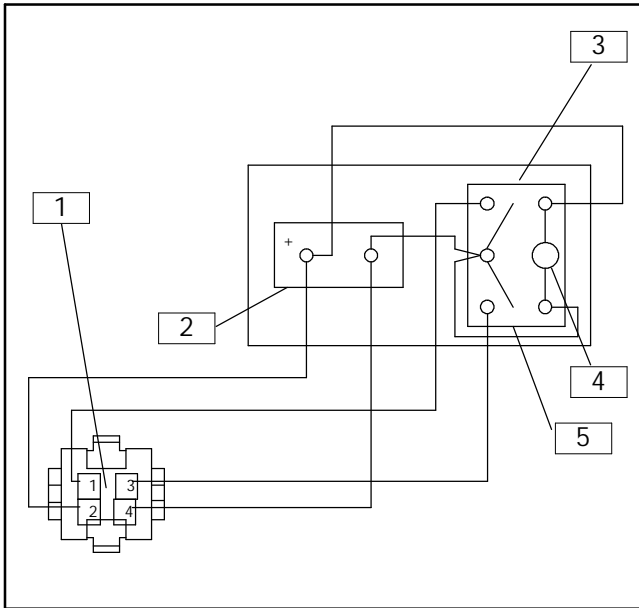


1. Remote Connection

**Figure 6-22. Controller– Remote Connection**

**Remote Switch Assembly Digital Hourmeter  
PAA-239419**

Part No.	Length	Connectors
PA-278682	3 Ft.	6-Pin, In-line male plug
PA-278681	1 Ft.	Pigtail Leads
PA-278728	30 Ft.	Both Ends
PA-278729	40 Ft.	Both Ends
PA-278730	15 Ft.	Both Ends



1. Requires a 4-pin (four square) to 6-pin (in-line) wiring harness adapter for connection to the generator set.
2. Hourmeter
3. Top
4. On Light
5. Rocker Switch

**Figure 6-23. Remote Control Panel Wiring**

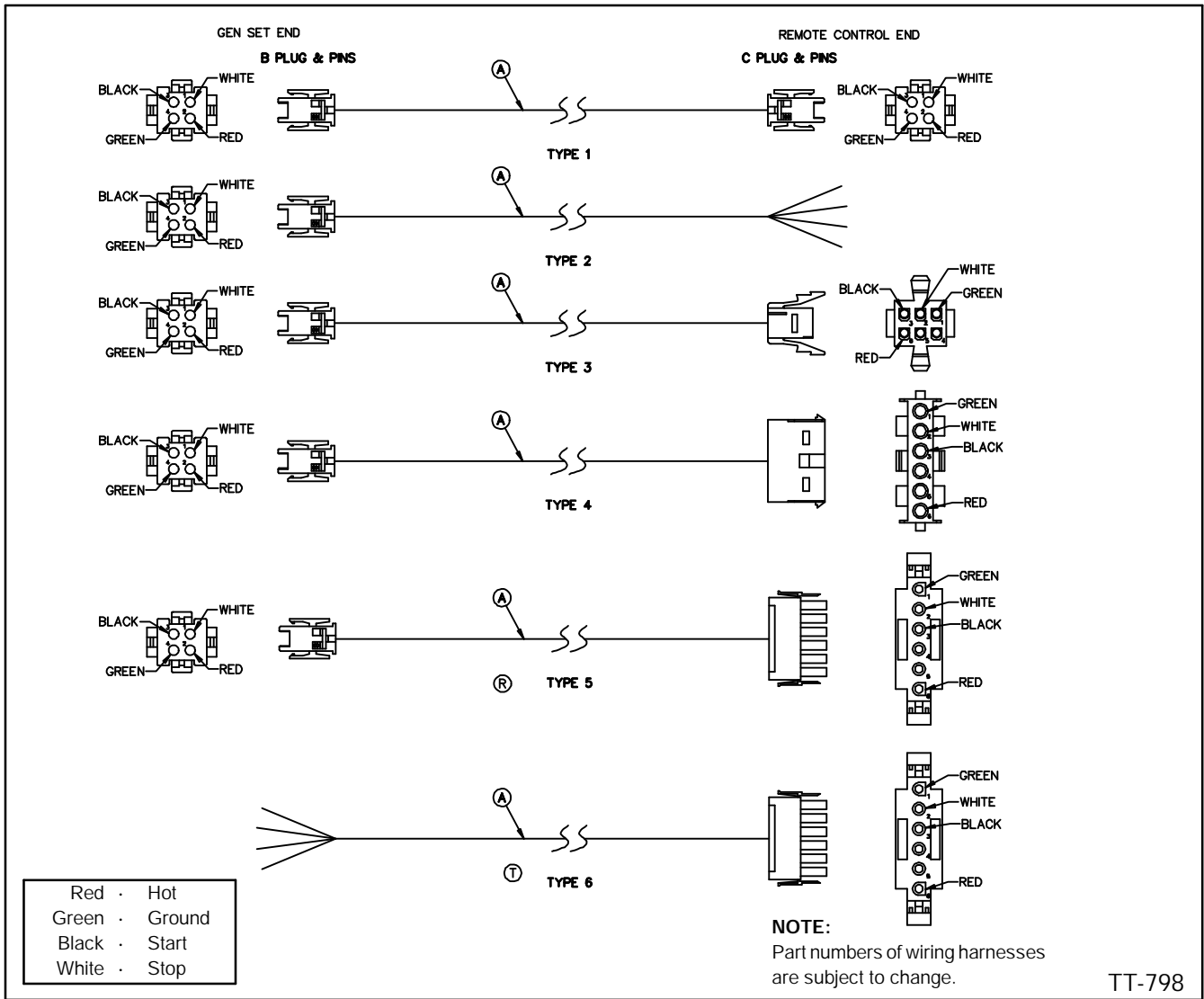
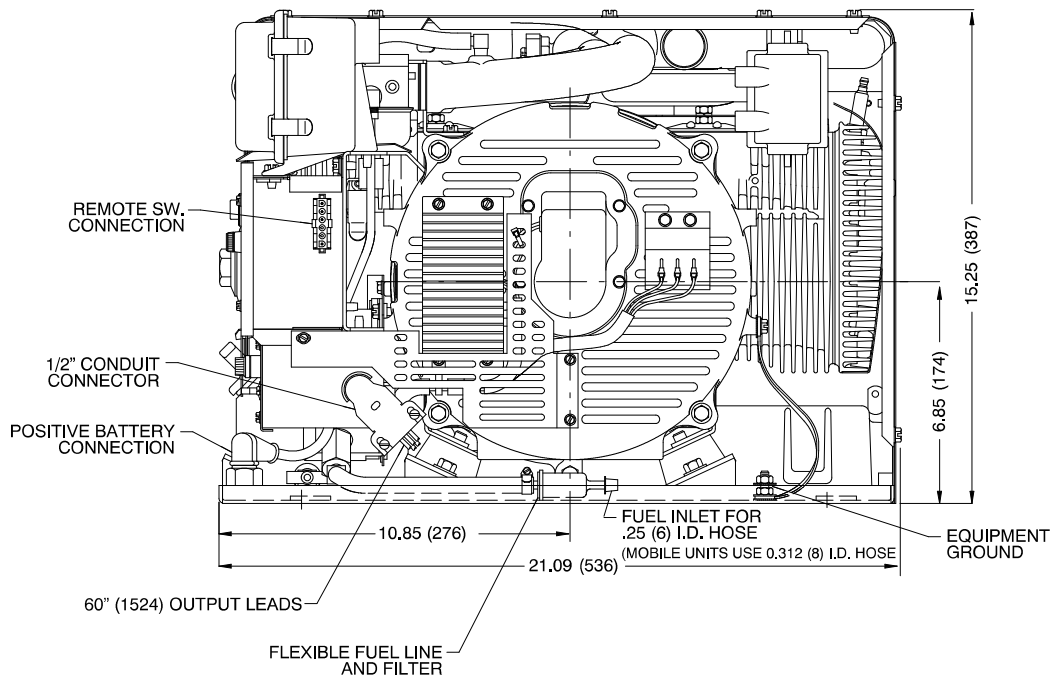
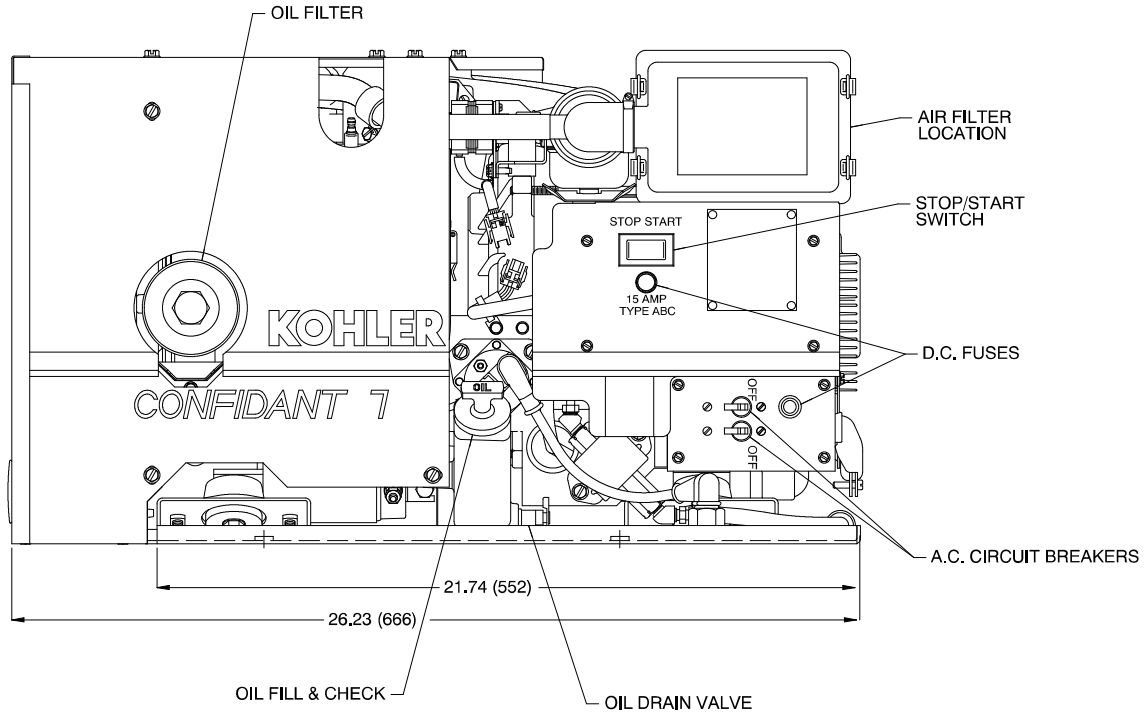


Figure 6-24. Available Wiring Harnesses

Part No.	Type	Cable Length ft. (cm)
PA-239412	1	30 (914)
PA-239413	1	40 (1219)
PA-239414	1	15 (457)
PA-239430	2	1 (30.5)
PA-239433	3	3 (91)
PA-239436	2	3 (91)
PA-239439	2	5 (152)
PA-278371	4	1 (30.5)
PA-278372	4	3 (91)
PA-278681	6	1 (30.5)
PA-278682	5	3 (91)
PA-278728	5	30 (914)
PA-278729	5	40 (1219)
PA-278730	5	15 (457)

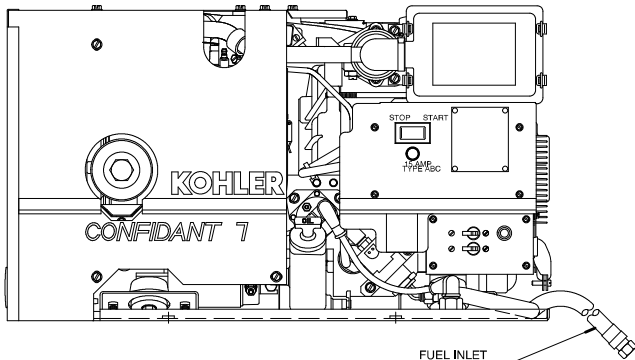
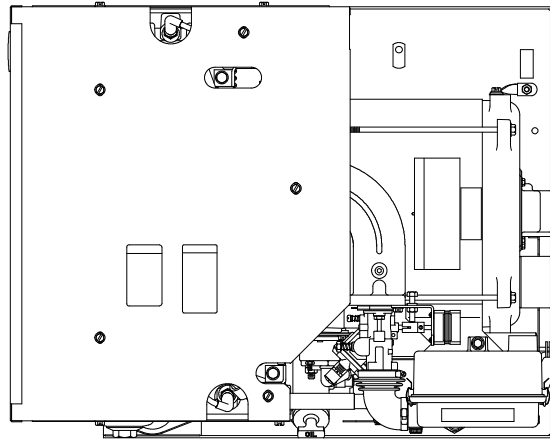
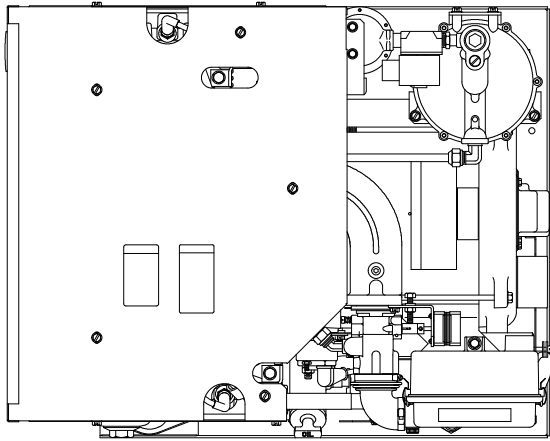
Figure 6-25. Available Wiring Harnesses

# Section 7. Installation Drawings



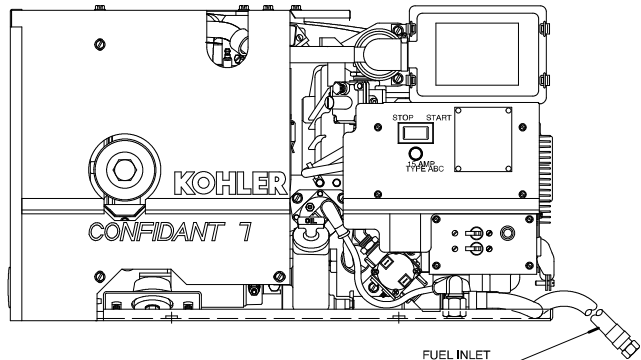
Gasoline

ADV-5803-B



FUEL INLET  
36.0 (914) LG, FLEXIBLE FUEL LINE  
5/8-18 SAE 45° FLARE FEMALE SWIVEL

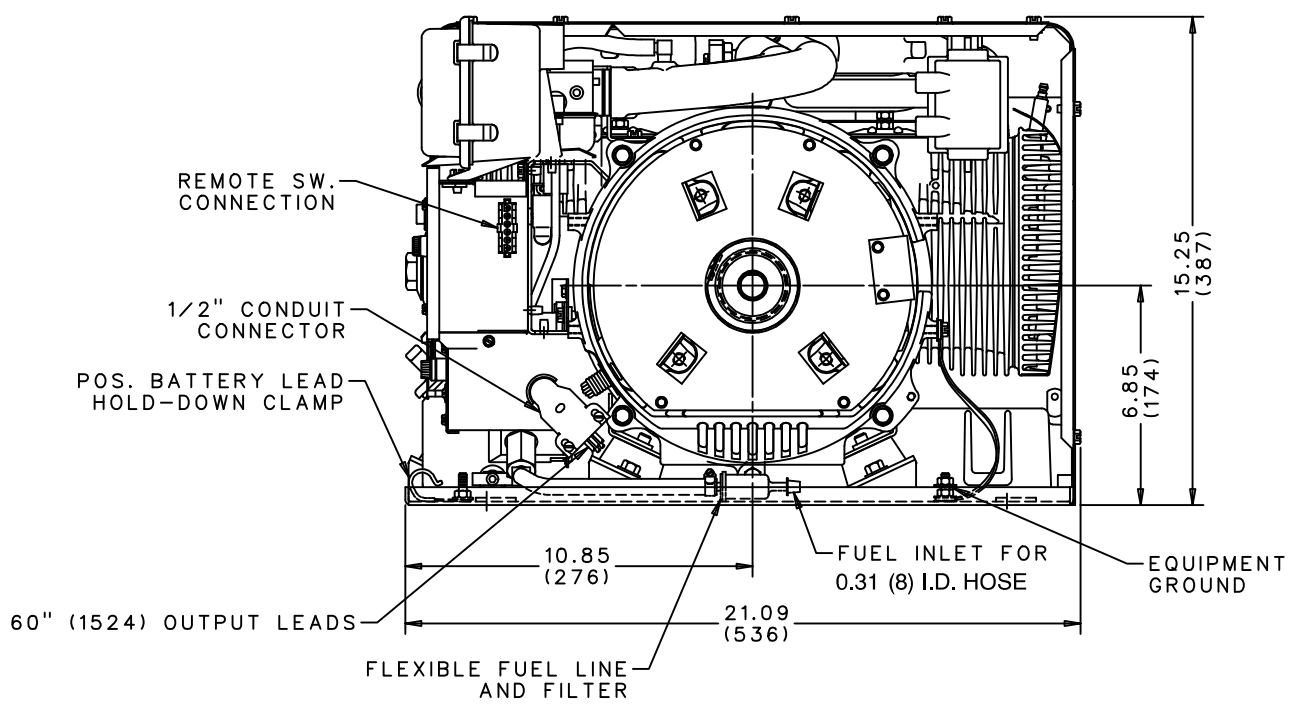
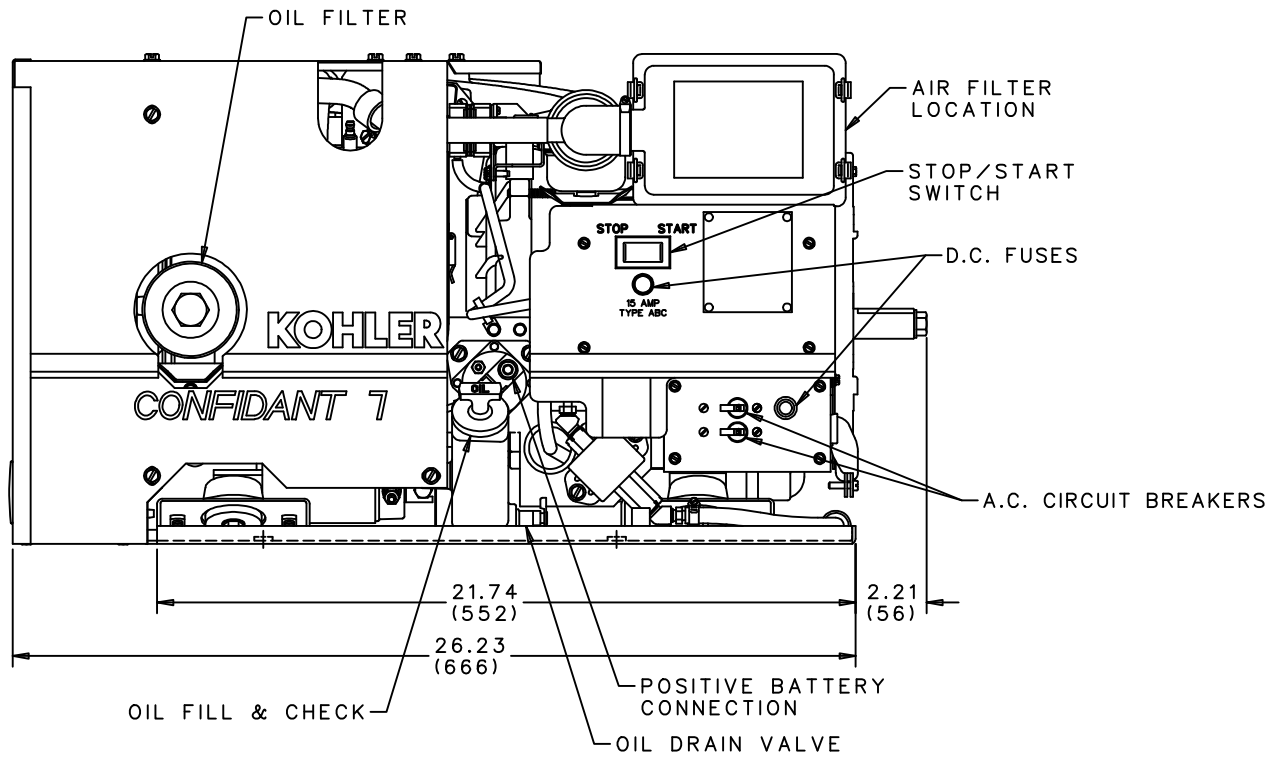
LP LIQUID WITHDRAWAL



FUEL INLET  
36.0 (914) LG, FLEXIBLE FUEL LINE  
5/8-18 SAE 45° FLARE FEMALE SWIVEL

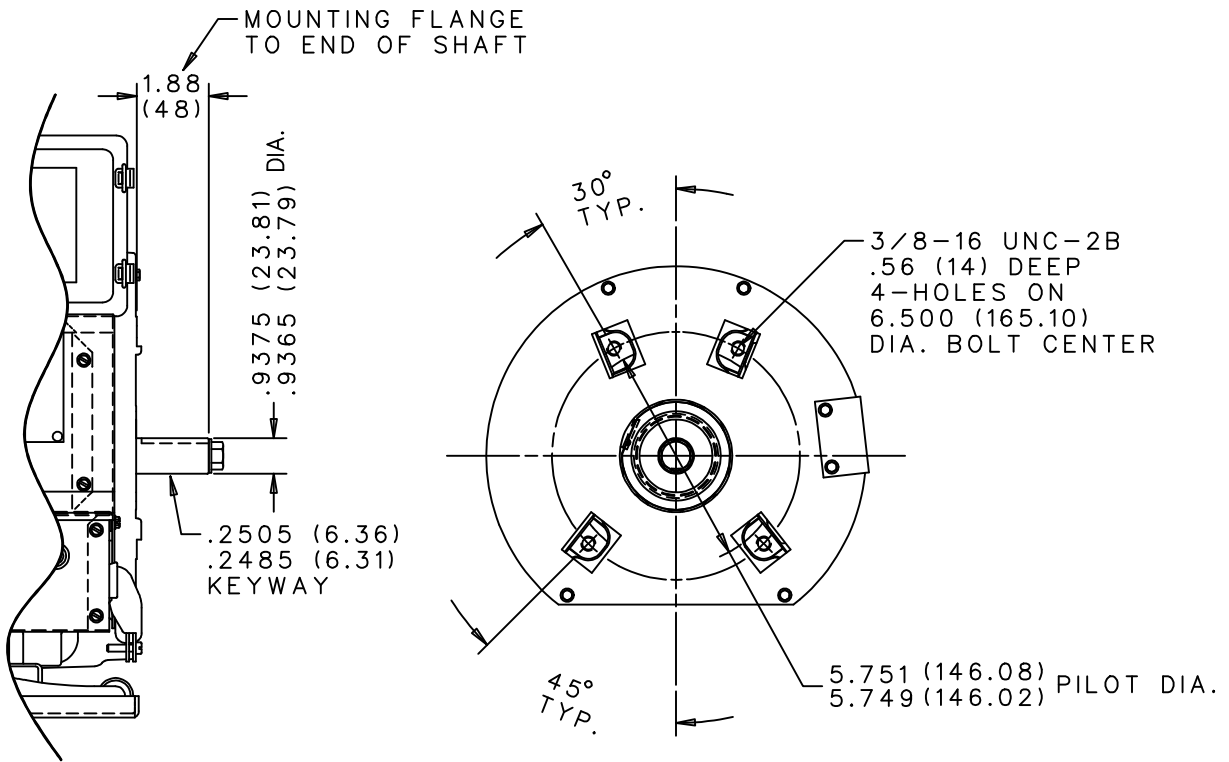
LP VAPOR WITHDRAWAL

LP Liquid/Vapor  
ADV-5803-B



**7CCKMR Mobile  
with Extended Shaft**

**ADV-5806-A**



POWER TAKE OFF AND SHAFT DIMENSIONS

ADV-5806-A

# Section 8. Service Ordering Instructions

Please include the MODEL, SPECIFICATION, SERIAL and ENGINE SPEC. numbers found on the nameplate attached to the controller of the generator set in any communication regarding your generator set. Your authorized service dealer/distributor will need these numbers to provide the correct parts and information for your generator set. Do not attempt to replace major items or any item that calls for special tools or procedures— have this done only by qualified Kohler generator specialists. Check the yellow pages of your telephone directory under the heading GENERATORS-ELECTRIC for Kohler Generator Service Dealers in your area.

KOHLER CO., Kohler, Wisconsin 53044  
Phone 414-565-3381  
Fax 414-459-1646 (North American Sales)  
Fax 414-459-1614 (International)

For Sales & Service in U.S.A. & Canada  
Phone 1-800-544-2444

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## Service Manual Procurement

Obtain a service manual or parts catalog for your generator set through your local dealer or Kohler generator distributor. Record Model, Spec. and Serial numbers (from generator set nameplate) in the spaces below.

Model No. \_\_\_\_\_

Spec. No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Engine Spec. No. \_\_\_\_\_



**TP-5571 3/94b**

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# **KOHLER**<sup>®</sup> POWER SYSTEMS

KOHLER CO. Kohler, Wisconsin 53044  
Phone 414-565-3381, Web site [www.kohlergenerators.com](http://www.kohlergenerators.com)  
Fax 414-459-1646 (U.S.A. Sales), Fax 414-459-1614 (International)  
After July 26, 1997, use area code 920 instead of 414  
For the nearest sales and service outlet in U.S.A. and Canada  
Phone 1-800-544-2444