Installation

Residential/Commercial Generator Sets





Controllers: RDC2 DC2





TP-6803 12/11

California Proposition 65

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

Product Identification Information

Generator Set Identification Numbers

Record the product identification numbers from the generator set nameplate(s).

Accessory Description

Model Designation _____ Specification Number _____ Serial Number _____

Accessory Number

Engine Identification

Record the product identification information from the engine nameplate.

Manufacturer

Model Designation _____

Serial Number _____

Controller Identification

Record the controller description from the generator set operation manual, spec sheet, or sales invoice.

Controller Description

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IMPORTANT SAFETY INSTRUCTIONS. Electromechanical equipment, including generator sets, transfer switches, switchgear, and accessories, can cause bodily harm and pose life-threatening danger when improperly installed, operated, or maintained. To prevent accidents be aware of potential dangers and act safely. Read and follow all safety precautions and instructions. SAVE THESE INSTRUCTIONS.

This manual has several types of safety precautions and instructions: Danger, Warning, Caution, and Notice.



Danger indicates the presence of a hazard that *will cause severe personal injury, death*, or *substantial property damage*.



WARNING

Warning indicates the presence of a hazard that *can cause severe personal injury, death,* or *substantial property damage*.



Caution indicates the presence of a hazard that *will* or *can cause minor personal injury* or *property damage*.

NOTICE

Notice communicates installation, operation, or maintenance information that is safety related but not hazard related.

Safety decals affixed to the equipment in prominent places alert the operator or service technician to potential hazards and explain how to act safely. The decals are shown throughout this publication to improve operator recognition. Replace missing or damaged decals.

Accidental Starting



Accidental starting. Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) Press the generator set off/reset button to shut down the generator set. (2) Disconnect the power to the battery charger, if equipped. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent the starting of the generator set by the remote start/stop switch.

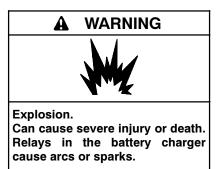
Battery





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

Wear protective goggles and clothing. Battery acid may cause blindness and burn skin.



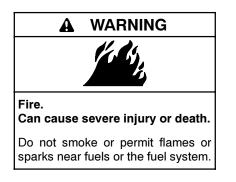
Locate the battery in a well-ventilated area. Isolate the battery charger from explosive fumes.

Battery electrolyte is a diluted sulfuric acid. Battery acid can cause severe injury or death. Battery acid can cause blindness and burn skin. Always wear splashproof safety goggles, rubber gloves, and boots when servicing the battery. Do not open a sealed battery or mutilate the battery case. If battery acid splashes in the eves or on the skin, immediately flush the affected area for 15 minutes with large quantities of clean water. Seek immediate medical aid in the case of eye contact. Never add acid to a battery after placing the battery in service, as this may result in hazardous spattering of battery acid.

Battery acid cleanup. Battery acid can cause severe injury or death. Battery acid is electrically conductive and corrosive. Add 500 g (1 lb.) of bicarbonate of soda (baking soda) to a container with 4 L (1 gal.) of water and mix the neutralizing solution. Pour the neutralizing solution on the spilled battery acid and continue to add the neutralizing solution to the spilled battery acid until all evidence of a chemical reaction (foaming) has ceased. Flush the resulting liquid with water and dry the area. Battery gases. Explosion can cause severe injury or death. Battery gases can cause an explosion. Do not smoke or permit flames or sparks to occur near a battery at any time, particularly when it is charging. Do not dispose of a battery in a fire. To prevent burns and sparks that could cause an explosion, avoid touching the battery terminals with tools or other metal objects. Remove all iewelry before servicing the equipment. Discharge static electricity from your body before touching batteries by first touching a grounded metal surface away from the battery. To avoid sparks, do not disturb the battery charger connections while the battery is charging. Always turn the battery charger off before disconnecting the battery connections. Ventilate the compartments containing batteries to prevent accumulation of explosive gases.

Battery short circuits. Explosion can cause severe injury or death. Short circuits can cause bodily injury and/or equipment damage. Disconnect the battery before generator set installation or maintenance. Remove all jewelry before servicing the equipment. Use tools with insulated handles. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery. Never connect the negative (-) battery cable to the positive (+) connection terminal of the starter solenoid. Do not test the battery condition by shorting the terminals together.

Engine Backfire/Flash Fire



Servicing the air cleaner. A sudden backfire can cause severe injury or death. Do not operate the generator set with the air cleaner removed.

Servicing the fuel system. A flash fire can cause severe injury or death. Do not smoke or permit flames or sparks near the carburetor, fuel line, fuel filter, fuel pump, or other potential sources of spilled fuels or fuel vapors. Catch fuels in an approved container when removing the fuel line or carburetor.

Combustible materials. A fire can cause severe injury or death. Generator set engine fuels and fuel vapors are flammable and explosive. Handle these materials carefully to minimize the risk of fire or explosion. Equip the compartment or nearby area with a fully charged fire extinguisher. Select a fire extinguisher rated ABC or BC for electrical fires or as recommended by the local fire code or an authorized agency. Train all personnel on fire extinguisher operation and fire prevention procedures.

Exhaust System



Can cause severe nausea, fainting, or death.

The exhaust system must be leakproof and routinely inspected.

Generator set operation. Carbon monoxide can cause severe nausea, fainting, or death. Carbon monoxide is an odorless, colorless, tasteless, nonirritating gas that can cause death if inhaled for even a short time. Avoid breathing exhaust fumes when working on or near the generator set. Never operate the generator set inside a building. Never operate the generator set where exhaust gas could seep inside or be drawn into a potentially occupied building through windows, air intake vents, or other openings.

Carbon monoxide detectors. Carbon monoxide can cause severe nausea, fainting, or death. Install carbon monoxide detectors on each level of any building adjacent to the generator set. Locate the detectors to adequately warn the building's occupants of the presence of carbon Keep the detectors monoxide. operational at all times. Periodically test and replace the carbon monoxide detectors according to the manufacturer's instructions.

Carbon monoxide symptoms. Carbon monoxide can cause severe nausea, fainting, or death. Carbon monoxide is a poisonous gas present in exhaust gases. Carbon monoxide is an odorless, colorless, tasteless, nonirritating gas that can cause death if inhaled for even a short time. Carbon monoxide poisoning symptoms include but are not limited to the following:

- Light-headedness, dizziness
- Physical fatigue, weakness in joints and muscles
- Sleepiness, mental fatigue, inability to concentrate or speak clearly, blurred vision
- Stomachache, vomiting, nausea

• Stomachache, vomiting, hausea If experiencing any of these symptoms and carbon monoxide poisoning is possible, seek fresh air immediately and remain active. Do not sit, lie down, or fall asleep. Alert others to the possibility of carbon monoxide poisoning. Seek medical attention if the condition of affected persons does not improve within minutes of breathing fresh air.

Hazardous Noise



Explosive fuel vapors. Can cause severe injury or death.

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

The fuel system. Explosive fuel vapors can cause severe injury or death. Vaporized fuels are highly explosive. Use extreme care when handling and storing fuels. Store fuels 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 because spilled fuel may ignite on contact with hot parts or from sparks. Do not smoke or permit flames or sparks to occur near sources of spilled fuel or fuel vapors. Keep the fuel lines and connections tight and in good condition. Do not replace flexible fuel lines with rigid lines. Use flexible sections to avoid fuel line breakage caused by vibration. Do not operate the generator set in the presence of fuel leaks, fuel accumulation, or sparks. Repair fuel systems before resuming generator set operation.

Gas fuel leaks. Explosive fuel vapors can cause severe injury or death. Fuel leakage can cause an explosion. Check the LP vapor gas or natural gas fuel system for leakage by using a soap and water solution with the fuel system test pressurized to 6-8 ounces per square inch (10-14 inches water column). Do not use a soap solution containing either ammonia or chlorine because both prevent bubble formation. A successful test depends on the ability of the solution to bubble.

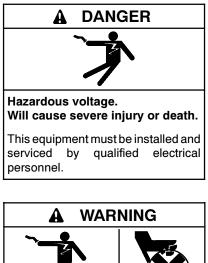


Hazardous noise. Can cause hearing loss.

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

Engine noise. Hazardous noise can cause hearing loss. Generator sets not equipped with sound enclosures can produce noise levels greater than 105 dBA. Prolonged exposure to noise levels greater than 85 dBA can cause permanent hearing loss. Wear hearing protection when near an operating generator set.

Hazardous Voltage/ Moving Parts





Hazardous voltage. Moving parts. Can cause severe injury or death.

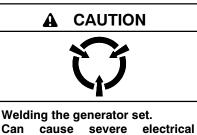
Operate the generator set only when all guards and electrical enclosures are in place.



A

Hazardous voltage. Backfeed to the utility system can cause property damage, severe injury, or death.

If the generator set is used for standby power, install an automatic transfer switch to prevent inadvertent interconnection of standby and normal sources of supply.



equipment damage. Never weld components of the generator set without first

generator set without first disconnecting the battery, controller wiring harness, and engine electronic control module (ECM).

Grounding electrical equipment. Hazardous voltage can cause severe injury or death. Electrocution is possible whenever electricity is present. Ensure you comply with all applicable codes and standards. Electrically ground the generator set, transfer switch, and related equipment and electrical circuits. Turn off the main circuit breakers of all power sources before servicing the equipment. Never contact electrical leads or appliances when standing in water or on wet ground because these conditions increase the risk of electrocution. Welding on the generator set. Can cause severe electrical equipment damage. Before welding on the generator set perform the following steps: (1) Remove the battery cables, negative (-) lead first. (2) Disconnect all engine electronic control module (ECM) connectors. (3) Disconnect all generator set controller and voltage regulator circuit board connectors. (4) Disconnect the engine battery-charging alternator connections. (5) Attach the weld ground connection close to the weld location.

Connecting the battery and the battery charger. Hazardous voltage can cause severe injury or death. Reconnect the battery correctly, positive to positive and negative to negative, to avoid electrical shock and damage to the battery charger and battery(ies). Have a qualified electrician install the battery(ies).

Short circuits. Hazardous voltage/current 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 making adjustments or repairs. Remove all jewelry before servicing the equipment.

Electrical backfeed to the utility. Hazardous backfeed voltage can cause severe injury or death. Install a transfer switch in standby power installations to prevent the connection of standby and other sources of power. Electrical backfeed into a utility electrical system can cause severe injury or death to utility personnel working on power lines.

Heavy Equipment



Unbalanced weight. Improper lifting can cause severe injury or death and equipment damage.

Do not use lifting eyes. Lift the generator set using lifting bars inserted through the lifting holes on the skid.

Hot Parts

it cools.



Hot engine and exhaust system. Can cause severe injury or death. Do not work on the generator set until

Servicing the exhaust system. Hot parts can cause severe injury or death. Do not touch hot engine parts. The engine and exhaust system components become extremely hot during operation.

Servicing the engine heater. Hot parts can cause minor personal injury or property damage. Install the heater before connecting it to power. Operating the heater before installation can cause burns and component damage. Disconnect power to the heater and allow it to cool before servicing the heater or nearby parts.

Notice

NOTICE

Canadian installations only. For standby service connect the output of the generator set to a suitably rated transfer switch in accordance with Canadian Electrical Code, Part 1.

This manual provides installation instructions for Residential/Commercial Model 14/20RESA or 14/20RESAL generator sets. See Figure 1. Refer to TP-6804, Operation Manual, for generator set operation and maintenance instructions.

The generator set is approved for use in stationary applications in locations served by a reliable utility power source.

Have an authorized distributor/dealer install the generator set outdoors according to the instructions in this manual. The generator set installation must comply with the National Electrical Code (NEC) and local code requirements. Do not install this generator set indoors.

Information in this publication represents data available at the time of print. Kohler Co. reserves the right to change this publication and the products represented without notice and without any obligation or liability whatsoever.

Read this manual and carefully follow all procedures and safety precautions to ensure proper equipment operation and to avoid bodily injury. Read and follow the Safety Precautions and Instructions section at the beginning of this manual.



Figure 1 14/20RESA/RESAL Generator Set

List of Related Literature

Figure 2 identifies related literature available for the generator sets covered in this manual. Only trained and qualified personnel should install or service the generator set.

Literature Type	Part Number
OperationManual, 14/20RESA/RESAL Generator Set	TP-6804
Operation/Installation Manual, Model RXT Automatic Transfer Switch	TP-6807
Service Manual, 14/20RESA/RESAL Generator Set	TP-6735
Operation Manual, OnCue Software	TP-6796
Operation/Installation Manual, Model RDT Transfer Switch	TP-6345
Installation Manual, Model RSB Transfer Switch	TP-6486
Operation Manual, Model RSB Transfer Switch	TP-6487
Installation Instructions, Load Control Module (LCM)	TT-1574
Installation Instructions, Programmable Interface Module (PIM)	TT-1584

Figure 2 Related Literature

Startup and Registration

When the generator set is installed, complete the startup and installation checklists supplied with the startup notification form. Complete and sign the startup notification form and register the unit using the Kohler online Warranty Processing System.

For professional advice on generator set power requirements and conscientious service, please contact your nearest Kohler distributor or dealer.

- Consult the Yellow Pages under the heading Generators—Electric.
- Visit the Kohler Power Systems website at KohlerPower.com.
- Look at the labels and stickers on your Kohler product or review the appropriate literature or documents included with the product.
- Call toll free in the US and Canada 1-800-544-2444.
- Outside the US and Canada, call the nearest regional office.

Headquarters Europe, Middle East, Africa (EMEA)

Kohler Power Systems 3 rue de Brennus 93200 Saint Denis France Phone: (33) 1 49 178300 Fax: (33) 1 49 178301

Asia Pacific

Power Systems Asia Pacific Regional Office Singapore, Republic of Singapore Phone: (65) 6264-6422 Fax: (65) 6264-6455

China

North China Regional Office, Beijing Phone: (86) 10 6518 7950 (86) 10 6518 7951 (86) 10 6518 7952 Fax: (86) 10 6518 7955 East China Regional Office, Shanghai

Phone: (86) 21 6288 0500 Fax: (86) 21 6288 0550

India, Bangladesh, Sri Lanka

India Regional Office Bangalore, India Phone: (91) 80 3366208 (91) 80 3366231 Fax: (91) 80 3315972

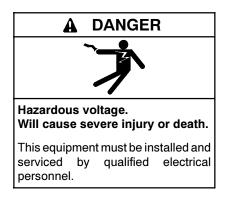
Japan, Korea

North Asia Regional Office Tokyo, Japan Phone: (813) 3440-4515 Fax: (813) 3440-2727

Latin America

Latin America Regional Office Lakeland, Florida, USA Phone: (863) 619-7568 Fax: (863) 701-7131

1.1 Introduction



Have the generator set installed by an authorized Kohler distributor/dealer or authorized representative. Install the equipment in compliance with the National Electrical Code (NEC) and local codes. For Canadian installations, refer to the Canadian Electrical Code (CEC).

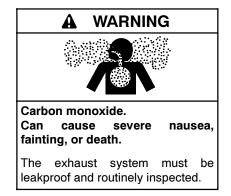
The generator set must be installed outdoors. The exhaust systems on enclosed units are designed for outdoor installation only.

- Note: DO NOT install these generator sets inside a building.
- **Note:** Install carbon monoxide (CO) detector(s) on each level of any building adjacent to a generator set. Locate the detectors to adequately warn the building's occupants of the presence of carbon monoxide.

Obtain a building permit and contact your local utility companies to mark the locations of underground pipes and cables.

Read and follow the safety precautions in this manual and observe the decals on the equipment. Refer to the diagrams and drawings in this manual for dimensions and electrical connections during the installation procedure. Read the entire installation procedure and obtain the accessories and tools needed before beginning installation. Perform the steps in the order shown.

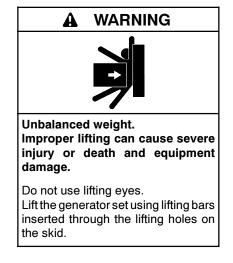
To install optional accessories, follow the instructions provided with each kit.



Generator set operation. Carbon monoxide can cause severe nausea, fainting, or death. Carbon monoxide is an odorless, colorless, tasteless, nonirritating gas that can cause death if inhaled for even a short time. Avoid breathing exhaust fumes when working on or near the generator set. Never operate the generator set inside a building. Never operate the generator set where exhaust gas could seep inside or be drawn into a potentially occupied building through windows, air intake vents, or other openings.

Carbon monoxide detectors. Carbon monoxide can cause severe nausea, fainting, or death. Install carbon monoxide detectors on each level of any building adjacent to the generator set. Locate the detectors to adequately warn the building's occupants of the presence of carbon monoxide. Keep the detectors operational at all times. Periodically test and replace the carbon monoxide detectors according to the manufacturer's instructions.

1.2 Lifting



Model	Weight, kg (lb.)		
14RESA/RESAL	186 (410)		
20RESA/RESAL	227 (500)		

Figure 1-1 Approximate Weights

Approximate generator set weights are shown in Figure 1-1. Use lifting bars inserted through the holes in the skid to lift the unit. See the dimension drawings on the following pages for lifting hole locations.

1.3 Generator Set Inspection

Complete a thorough inspection of the generator set. Check for the following:

- 1. Inspect the generator set for loose or damaged parts or wires. Repair or tighten any loose parts before installation.
- 2. Check the engine oil. Fill, if necessary, with the recommended viscosity and grade of oil. Use synthetic oil, API (American Petroleum Institute) Service Class SG or higher. See TP-6804, Operation Manual, for additional information.

1.4 Location and Mounting

Install the generator set outdoors. Choose a location that is at least 0.9 m (3 ft.) from any building or structure and near the incoming gas service. Allow a minimum of 2.4 m (8 ft.) clearance beyond the exhaust end of the generator set. Locate the generator set so that the hot exhaust does not blow on plants or other combustible materials. Do not install the generator set where exhaust gas could accumulate and seep inside or be drawn into a potentially occupied building.

Notice

DO NOT locate the generator set near patios, decks, play areas, or animal shelters. Keep items such as lawn furniture, toys, sports equipment, and all combustible materials away from the generator set exhaust outlet.

Remind family members, children, and visitors to use caution near the generator set. Generator sets connected to automatic transfer switches start automatically during exercise periods and power outages. Some generator set components become hot when the generator set is running and remain hot for a time after the generator set shuts down.

1.4.1 Mounting Area

The generator set is shipped on an engineered composite mounting pad. Prepare a flat, level mounting area covered with a weed barrier and gravel or a concrete mounting pad. Set the composite mounting pad directly on the gravel or concrete.

Do not install the mounting pad directly on grass, wood, or other combustible materials. Clear all combustible materials, including plants and shrubs, building materials, and lawn furniture, from an area at least 2.4 m (8 ft.) beyond the exhaust end of the generator set. See Figure 1-7 in Section 1.5.

1.4.2 Exhaust Requirements

Figure 1-2 gives the exhaust temperature at rated load. The engine exhaust mixes with the generator set cooling air at the exhaust end of the enclosure. Mount the generator set so that the hot exhaust does not blow on plants or other combustible materials. Maintain the clearances shown in Figure 1-7 in Section 1.5.

Exhaust	Temperature, °C (°F)
Exhaust gas exiting the enclosure at rated kW, °C (°F)	260 (500)

Figure 1-2 Exhaust Flow and Temperature

The generator set requires correct air flow for cooling and combustion. The inlet and outlet openings in the sound enclosure provide the cooling and combustion air. Figure 1-3 shows the locations of the cooling air intake and exhaust vents. Inspect the air inlet and outlet openings inside and outside the housing to ensure that the air flow is not blocked.

The generator set is designed to operate with all enclosure panels and internal baffling in place. If during installation, maintenance or repair the unit must be operated without the complete enclosure and baffling as shipped from the factory make sure the exhaust panel is removed as well.

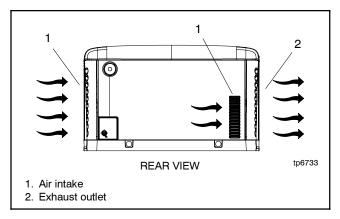


Figure 1-3 Cooling Air Intake and Exhaust

1.5 Dimension Drawings

See the dimension drawings in Figure 1-4 through Figure 1-7 for the generator set dimensions, fuel and electric inlet locations, and recommended clearance.

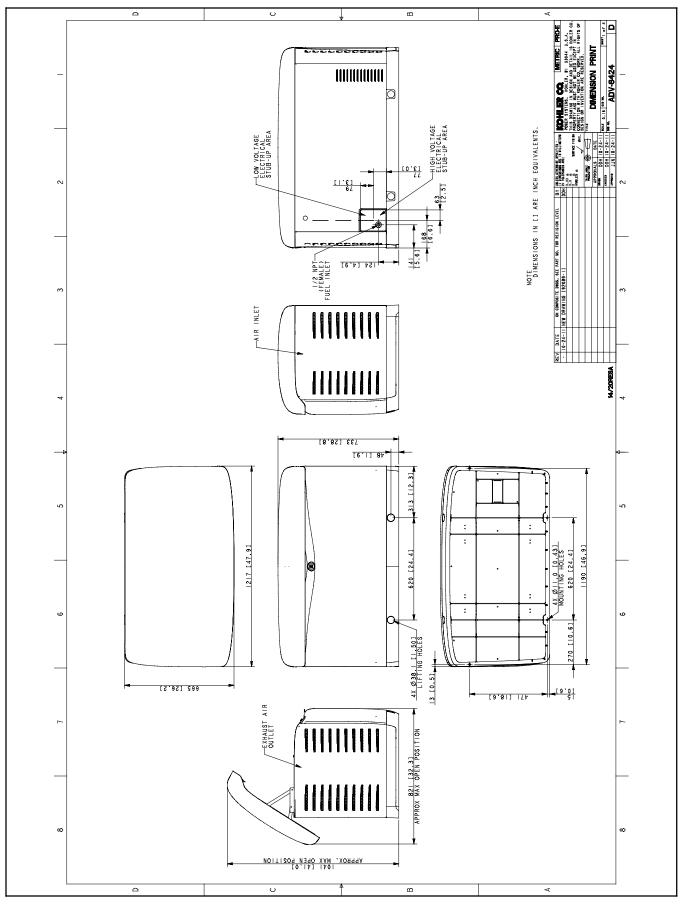


Figure 1-4 Dimension Drawing ADV-8424, Sheet 1

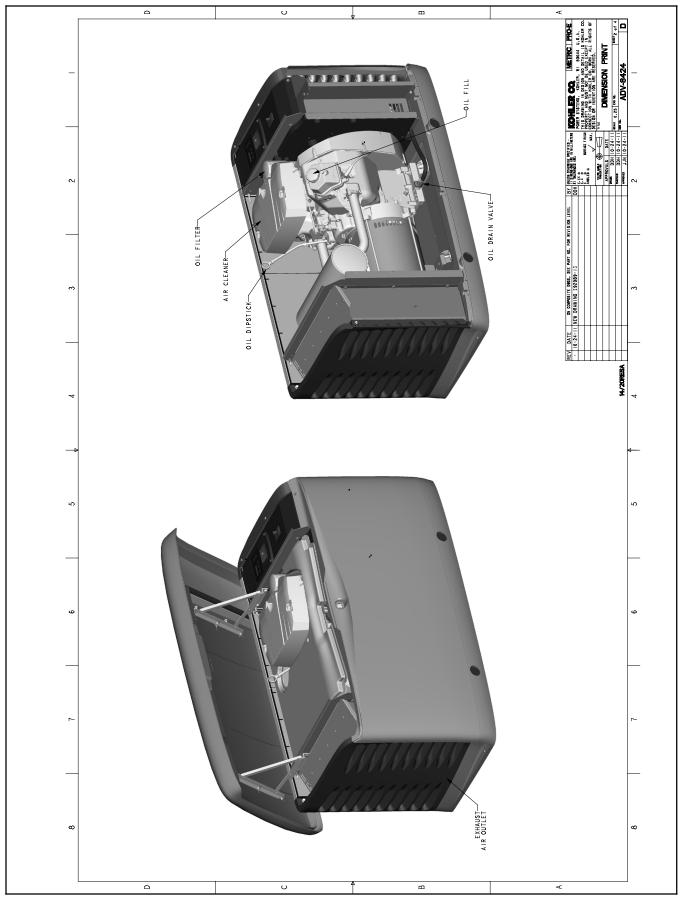


Figure 1-5 Dimension Drawing ADV-8424, Sheet 2

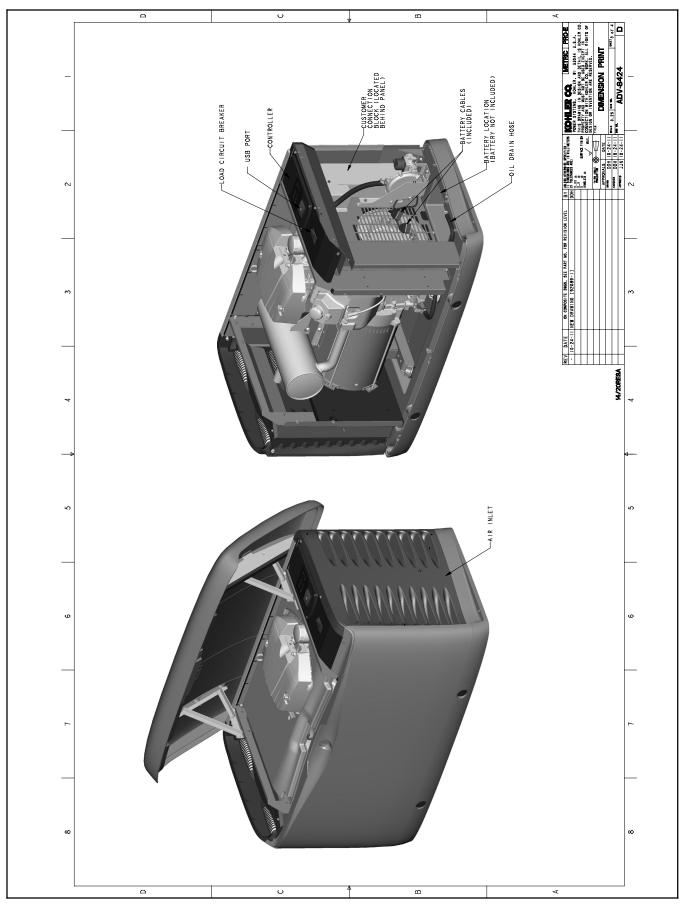


Figure 1-6 Dimension Drawing ADV-8424, Sheet 3

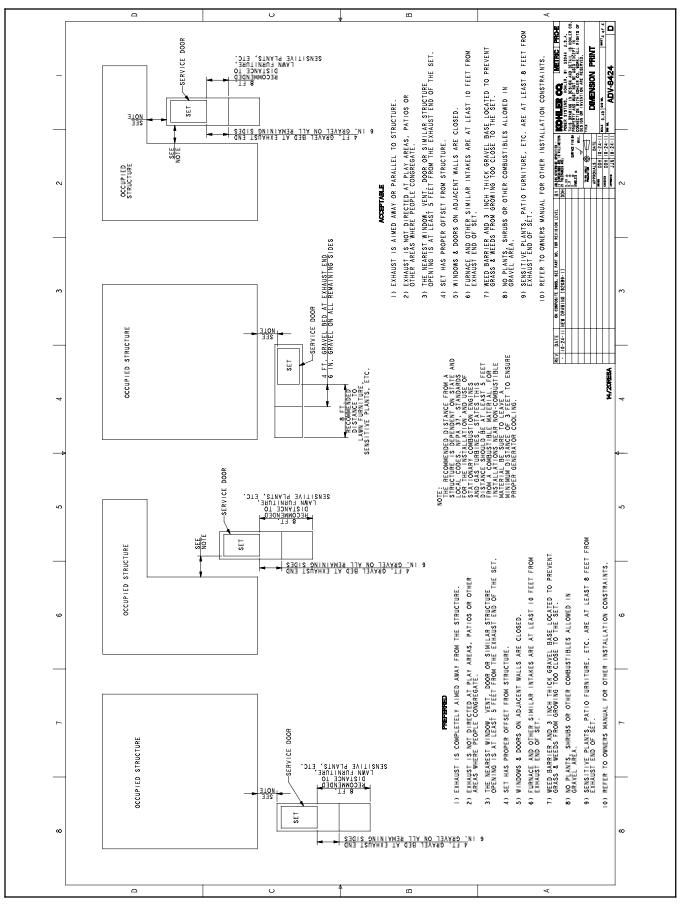


Figure 1-7 Dimension Drawing ADV-8424, Sheet 4

1.6 Fuel Requirements

The generator set operates using natural gas or LP vapor fuel. The generator set is EPA-certified for both natural gas and LP vapor fuels.

The fuel system installation must comply with the NEC and local codes.

1.6.1 Fuel Supply

Because of variable climates and geographical considerations, contact the local fuel supplier for fuel system planning and installation. Figure 1-8 lists the recommended fuel ratings and other fuel supply information for natural gas and LP vapor fuels.

Fuel type	Natural Gas	LP Vapor		
Fuel supply inlet	1/2	NPT		
Fuel supply pressure, kPa (in. H ₂ O)	1.3-2.7 (5-11)	1.7-2.7 (7-11)		
Fuel flow rate, maximum, Btu/hr	.:			
14RESA/RESAL	193,000	203,000		
20RESA/RESAL	281,000	340,000		
Nominal Fuel Rating, Btu/ft. ³				
Natural gas	1000			
LP vapor	2500			

Figure 1-8 Fuel Supply

Verify that the output pressure from the primary gas utility pressure regulator is as shown in Figure 1-8 and that the utility gas meter flow rate is sufficient to supply the generator set at rated load plus all other gas-consuming appliances. For LP tanks, verify that the output pressure is as shown in Figure 1-8. See Figure 1-10 for fuel consumption. Contact the fuel supplier for flow rate information or a gas meter upgrade.

The dimension drawing in Section 1.5 shows the location of the fuel inlet connection. Use flexible sections to prevent fuel line breakage caused by vibration. Hold the fuel solenoid valve with a wrench when tightening the fuel connections. Protect all fuel lines from machinery or equipment contact, adverse weather conditions, and environmental damage.

1.6.2 Fuel Pipe Size

Ensure that the fuel pipe size and length meet the specifications in Figure 1-9. Measure the pipe length from the primary gas pressure regulator to the pipe connection on the generator set fuel inlet. Add 2.4 m (8 ft.) to the measured length for each 90 degree elbow. Compare the total pipe length with the chart in Figure 1-9 to find the required pipe size.

Mi	Minimum Gas Pipe Size Recommendation, in. NPT						
		14RESA	/RESAL	20RESA/RESAL			
Pipe Length, m (ft.)		Natural Gas (193,000 Btu/hr.)	LP Vapor (203,000 Btu/hr.)	Natural Gas (281,000 Btu/hr.)	LP Vapor (340,000 Btu/hr.)		
8	(25)	3/4	3/4	1	3/4		
15	(50)	1	3/4	1	1		
30	(100)	1	1	1 1/4	1		
46	(150)	1 1/4	1	1 1/4	1 1/4		
61	(200)	1 1/4	1	1 1/4	1 1/4		

Figure 1-9 Fuel Pipe Size Recommendations

Fuel Type		Fuel Consumption, m ³ /hr. (cfh)							
		14RESA/RESAL				20RESA/RESAL			
	% Load	60	Hz	50	Hz	60	Hz	50	Hz
	100%	5.4	(193)	4.9	(175)	8.0	(281)	6.4	(225)
	75%	4.7	(163)	4.2	(148)	6.9	(243)	5.4	(189)
Natural Gas	50%	3.5	(124)	3.1	(108)	4.6	(161)	3.9	(139)
-	25%	2.6	(93)	2.4	(84)	3.6	(127)	2.9	(103)
-	100%	2.3	(81)	2.1	(74)	3.9	(136)	2.9	(102)
	75%	2.1	(75)	1.9	(68)	3.1	(109)	2.4	(85)
LP Vapor	50%	1.8	(60)	1.5	(53)	2.3	(82)	1.8	(63)
	25%	1.2	(45)	1.1	(40)	1.7	(59)	1.3	(47)
LP vapor convers 8.58 ft. ³ = 1 lt 0.535 m ³ = 1 36.39 ft. ³ = 1	b. kg	Nominal fue Natural LP vap	gas: 37 M	J/m ³ (1000 J/m ³ (2500					

Figure 1-10 Fuel Consumption

1.7 Fuel Conversion

The multi-fuel system allows conversion from natural gas to LP vapor (or vice-versa) in the field while maintaining emissions-standard compliance. A trained technician or an authorized distributor/dealer can convert the fuel system.

Figure 1-11 shows the fuel system components.



Accidental starting. Can cause severe injury or death.

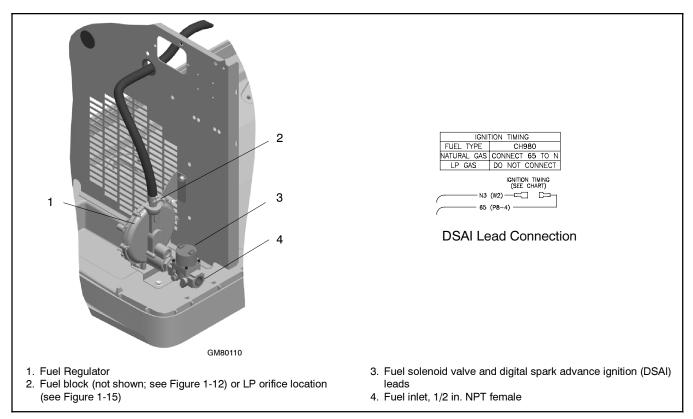
Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery. **Disabling the generator set.** Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.





Explosive fuel vapors. Can cause severe injury or death.

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





1.7.1 Fuel Conversion, 14RESA/RESAL

Two fuel connections on the fuel block allow fieldconversion between natural gas and LP vapor. The fuel metering valves are factory-set and sealed to comply with applicable emission standards and to provide the best possible hot and cold starting.

Note: Do not adjust the factory-sealed fuel-metering adjustments on the fuel block. Changing the fuel-metering adjustments may violate federal or state laws.

Use the following procedure to convert from natural gas (NG) to LP vapor. The procedure includes moving the fuel connection from the natural gas to the LP port, plugging the natural gas port, and disconnecting the leads for the digital spark advance ignition (DSAI). See Figure 1-11 for the fuel system component locations.

Procedure to convert from NG to LP, 14RESA/RESAL

- 1. Press the OFF button on the generator set controller.
- 2. Disconnect the power to the battery charger.
- 3. Disconnect the generator set engine starting battery, negative (-) lead first.
- 4. Turn off the fuel supply.
- 5. Remove the hose clamp and fuel hose from the hose fitting in the fuel block. See Figure 1-12.
- 6. Remove the hose fitting from the natural gas outlet port in the fuel block. See Figure 1-12.
- 7. Remove the plug from the LP port in the fuel block. See Figure 1-12.
- 8. Clean the plug with a dry cloth or brush, apply fresh pipe sealant, and install the plug into the natural gas outlet port.
- 9. Clean the hose fitting with a dry cloth or brush, apply fresh pipe sealant to the threads, and install the fitting into the LP port.

Note: Do not adjust the fuel metering valves.

- 10. Slide the hose onto the hose fitting and secure it with the clamp.
- 11. Disconnect the DSAI leads for LP. The DSAI leads are located near the fuel solenoid valve. See Figure 1-11.
- 12. Connect and turn on the new fuel supply.

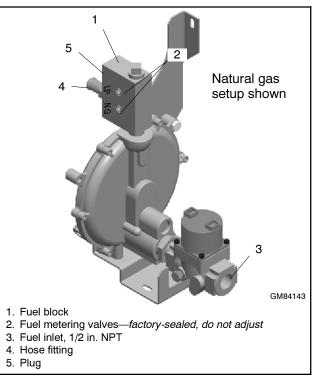


Figure 1-12 Fuel Block, 14RESA/RESAL

- 13. Reconnect the generator set engine starting battery leads, negative (-) lead last.
- 14. Reconnect power to the battery charger.
- 15. Start the generator set by pressing the RUN button on the generator set controller.
- 16. Check for leaks using a gas leak detector.
- 17. Run the generator set and check the operation.
- 18. Press the OFF button to to shut down the generator set.

Conversion from LP to Natural Gas

To convert from LP vapor to natural gas, follow the fuel conversion procedure above, moving the hose fitting to the natural gas port and plugging the LP port. Connect the DSAI leads for natural gas. See Figure 1-13.

Fuel	DSAI Leads 65 and N		
Natural Gas	Connect lead 65 to N		
LP	Disconnect		

Figure 1-13 DSAI Connection

1.7.2 Fuel Conversion, 20RESA/RESAL

For LP vapor fuel, an orifice is used in the fuel line. The unit is typically shipped set up for natural gas, with the loose orifice tied near the fuel solenoid valve. To convert to LP vapor, install the orifice and disconnect the spark advance leads as described below. See Figure 1-15 for the fuel system component locations.

Procedure to Convert from NG to LP, 20RESA/RESAL

- 1. Press the OFF button on the generator set controller.
- 2. Disconnect the power to the battery charger.
- 3. Disconnect the generator set engine starting battery, negative (-) lead first.
- 4. Turn off the fuel supply.
- 5. Remove the hose clamp and fuel hose from the hose fitting. See Figure 1-15.
- 6. Insert the orifice into the hose fitting. See Figure 1-15.
- 7. Slide the hose onto the hose fitting and secure it with the clamp.
- 8. Disconnect digital spark-advance module (DSAI) leads 65 and N5 for LP. The DSAI leads are located near the fuel solenoid valve. See Figure 1-11.
- 9. Connect and turn on the new fuel supply.
- 10. Reconnect the generator set engine starting battery leads, negative (-) lead last.
- 11. Reconnect power to the battery charger.
- 12. Start the generator set by pressing the RUN button on the generator set controller.
- 13. Check for leaks using a gas leak detector.
- 14. Run the generator set and check the operation.
- 15. Press the OFF button to shut down the generator set.

Conversion from LP to Natural Gas

To convert from LP vapor to natural gas, remove the fuel orifice and connect the DSAI leads together.

Fuel	DSAI Leads 65 and N		
Natural Gas	Connect lead 65 to N		
LP	Disconnect		

Figure 1-14 DSAI Connections

Rating

Converting the fuel will change the generator set rating. See the generator set specification sheet for ratings with natural gas and LP. Order a new nameplate with the updated rating and fuel information from an authorized distributor/dealer, if necessary. Provide the following information from the original nameplate:

kVA

Amps

Volts

Hz

- Model Number
- Spec Number
- Serial Number
- Fuel (original and new)
- kW

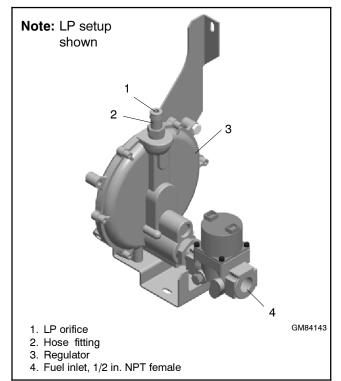
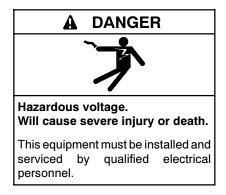


Figure 1-15 Fuel Regulator and LP Orifice, 20RESA/RESAL

1.8 Electrical Connections



Grounding electrical equipment. Hazardous voltage can cause severe injury or death. Electrocution is possible whenever electricity is present. Ensure you comply with all applicable codes and standards. Electrically ground the generator set, transfer switch, and related equipment and electrical circuits. Turn off the main circuit breakers of all power sources before servicing the equipment. Never contact electrical leads or appliances when standing in water or on wet ground because these conditions increase the risk of electrocution.

Electrical backfeed to the utility. Hazardous backfeed voltage can cause severe injury or death. Install a transfer switch in standby power installations to prevent the connection of standby and other sources of power. Electrical backfeed into a utility electrical system can cause severe injury or death to utility personnel working on power lines.

NOTICE

Canadian installations only. For standby service connect the output of the generator set to a suitably rated transfer switch in accordance with Canadian Electrical Code, Part 1.

Have an authorized distributor/dealer or a licensed electrician make the following electrical connections. The electrical installation must comply with the National Electrical Code[®] (NEC) class 1 wire designation and all applicable local codes. Canadian installations must comply with the Canadian Electrical Code (CEC) and applicable local codes.

1.8.1 Grounding

Ground the generator set. The grounding method must comply with NEC and local codes. Connect the grounding strap to the generator set ground lug, terminal GND inside the controller compartment.

Generator sets are shipped with the generator neutral bonded (connected) to the generator ground in the junction box. The requirement for having a bonded (grounded) neutral or ungrounded neutral is determined by the type of installation. At installation, the neutral can be grounded at the generator set or lifted from the ground stud and isolated if the installation requires an ungrounded neutral connection at the generator. The generator set will operate properly with the neutral either bonded to ground or isolated from ground at the generator.

Various regulations and site configurations including the National Electrical Code (NEC), local codes, and the type of transfer switch used in the application determine the grounding of the neutral at the generator. NEC Section 250 is one example that has a very good explanation of the neutral grounding requirements for generators.

1.8.2 Electrical Lead Entry

Drill or punch holes in the enclosure for the electrical conduit in the locations shown in Figure 1-16. A full-scale dimensioned template for the hole locations is printed in Appendix B. See page 41.

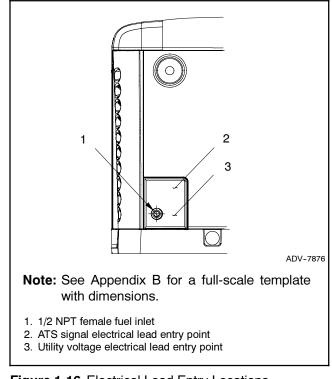


Figure 1-16 Electrical Lead Entry Locations

1.8.3 Field-Connection Terminal Block

The generator set is equipped with a field-connection terminal block located in the air inlet area near the junction box. Leads have been factory-installed from the junction box to the terminal block for easy field wiring.

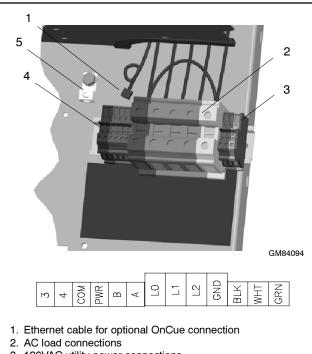
See the dimension drawing in Section 1.5 for the terminal block location. See Figure 1-17 for terminal block details. Refer to the terminal block decal for connections and cable sizes. Also see Section 2, Wiring Diagrams.

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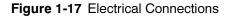
Route AC leads through flexible conduit. Ensure that the leads and conduit do not interfere with the operation of the generator set or obstruct the service areas. Route low-voltage communication leads through separate conduit.

Procedure

- 1. Drill holes for the conduit fittings. See Figure 1-16 and Appendix B for the recommended electrical inlet locations. Feed the cables through the openings.
- 2. Connect the leads from the transfer switch emergency source lugs to the L1 and L2 connections on the generator set terminal block.
- 3. Connect the neutral (L0) and ground (GRD) leads from the ATS and the main panel to the corresponding connection points on the terminal block. See Section 1.8.1, Grounding.
- 4. Connect utility power leads to the terminal block connections labelled Utility. Connect to a circuit that is supplied by the utility source and backed up by the generator. The power source must be GFCI protected. See Section 1.8.4 for more information about the utility power requirement.
- 5. For connection of optional transfer switches, the programmable interface module (PIM), and/or a load control module (LCM), see Section 1.8.5.
- 6. If the OnCue Home Generator Management System will be used with the generator set, run category 5E network cable from the generator set to the customer's router or modem.
 - **Note:** Installation of the network cable at the time of generator set installation is highly recommended. Installing the Ethernet cable now will make connection much easier if you choose to add OnCue later.
 - a. Route the network cable with other low-voltage signal wiring (for example, the RBUS communication leads or engine start leads to the transfer switch), in separate conduit from the AC load leads. If the network cable is longer than 100 meters (328 ft.), use a repeater or switch.
 - b. Use an RJ45 inline coupler to connect the Ethernet cable to the cable in the customer connection box. See Figure 1-17. The inline coupler is included with the OnCue kit.



- 3. 120VAC utility power connections
- 4. Low voltage communication and engine start connections
- 5. Ground connection for communication cable shield.



1.8.4 Power Supply

120 VAC, 60 Hz power must be supplied to the generator set location for the battery charger (integral to the RDC2 and DC2 controllers) and the optional accessories shown in Figure 1-18. The power source must be GFCI protected. The power to the accessories must be available at all times, i.e. the circuit must be powered by the utility source and backed up by the generator.

Be sure to disconnect power at the distribution panel before making the connections. Connect power leads to the utility power connection points on the terminal block. See Section 1.8.3 and the wiring diagrams in Section 2 for connection details.

	Power Requirement, Max.			
Equipment	Watts	Amps	Volts	
Battery charger (standard, integral to RDC2 controller)	120	1	120	
Carburetor heater (optional)	37	0.33	100	
Battery heater (optional)	110	0.92	120	
Fuel regulator heater (20RESA/RESAL only)	60	0.50	120	

Figure 1-18 Power Requirements

1.8.5 Transfer Switch Connection

Connect the ATS or remote start/stop switch. Connect the load leads from the generator set to the Emergency source lugs on the ATS. Route low-voltage communication leads through separate conduit. All connections must comply with applicable state and local codes.

Note: Do not use the Kohler[®] Model RRT transfer switch with the 14/20RESA or 14/20RESAL generator set.

Communication connections for a Kohler[®] Model RXT transfer switch:

See Figure 1-19. Use Belden #9402 or equivalent 20 AWG shielded, twisted-pair cable to connect P10-1

through P10-4 on the transfer switch interface module to the generator set terminal block TB1 connections A, B, PWR, and COM.

See Section 1.8.6 for the maximum cable length.

Note: Connections 3 and 4 on the generator set are not used with the Model RXT transfer switch.

Engine start connection for other transfer switches or a remote start/stop switch:

Connect the engine start leads from the transfer switch or remote start switch to terminals 3 and 4 on the terminal block. See Figure 1-20. Route the engine start leads through separate conduit from the AC power and load leads.

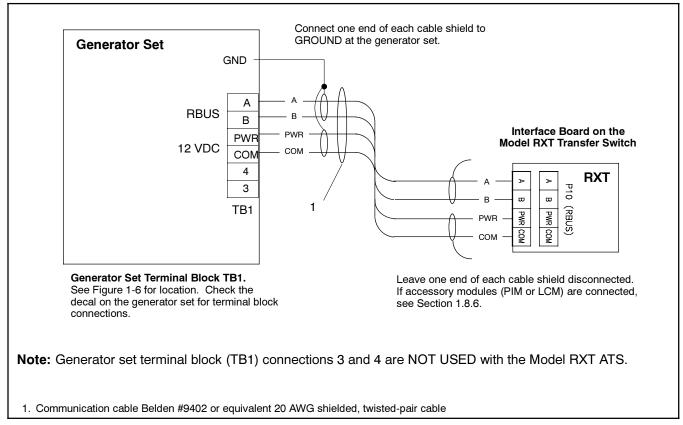


Figure 1-19 Model RXT Transfer Switch Communication Connection to Generator Set Terminal Block

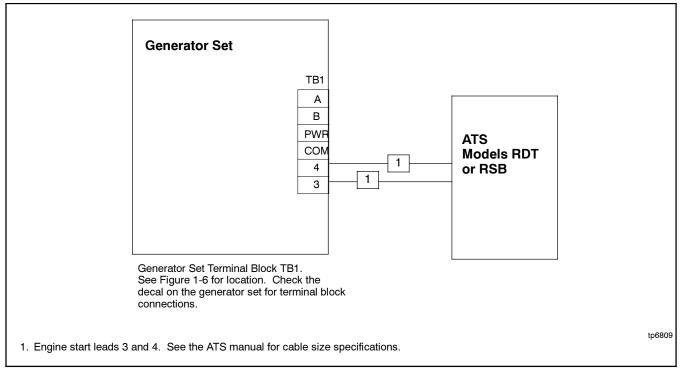


Figure 1-20 Engine Start Connections with Transfer Switch Models RDT or RSB

1.8.6 System Connections with Accessory Modules

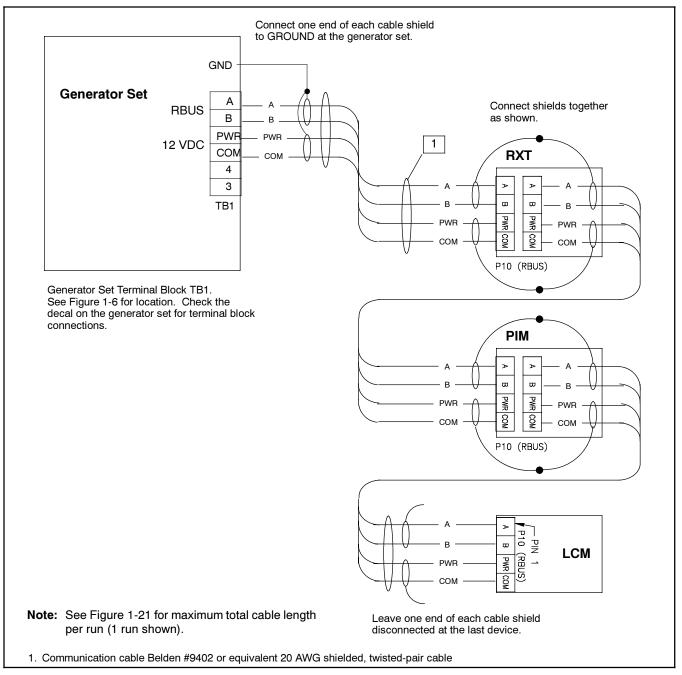
See Figure 1-22 through Figure 1-26 for connection options with up to three accessory modules. Accessory modules can include one Model RXT transfer switch, one programmable interface module (PIM), and/or one load control module (LCM).

See Figure 1-21 for the maximum total cable length with 1, 2, or 3 accessory modules per cable run.

- Use Belden #9402 (4-conductor) or equivalent 20 AWG shielded, twisted-pair cable. Note the shield connections shown in Figure 1-22.
- Belden #8723 (2-conductor) shielded twisted-pair cable can be used for connections A and B, and #12-14 AWG wire can be used for the COM and PWR connections. The maximum total cable length is the value shown for #12 or #14 AWG wire in Figure 1-21.

	Maximum length per run, meters (ft.) Number of Modules (ATS, PIM, and LCM) per Run				
Cable (TB1-PWR and COM)	1 Module	2 Modules	3 Modules		
Belden #9402 or equivalent 20AWG	61 (200)	31 (100)	21 (67)		
14 AWG	152 (500)	152 (500)	122 (400)		
12 AWG	152 (500)	152 (500)	152 (500)		

Figure 1-21 Total Cable Lengths with Accessory Modules Connected in Series (daisy-chain)





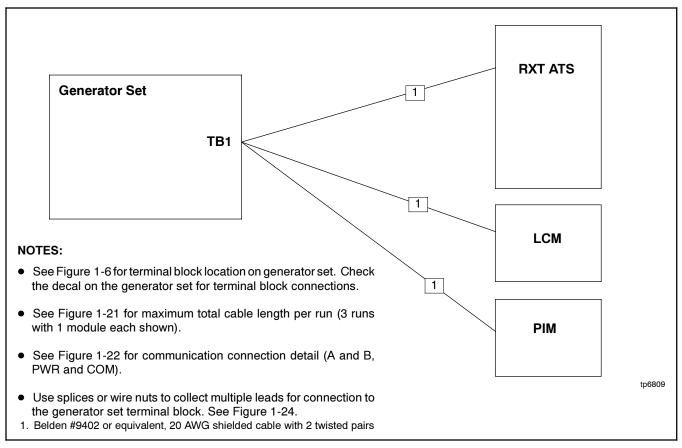


Figure 1-23 Accessory Module Connections (three cable runs with one module each)

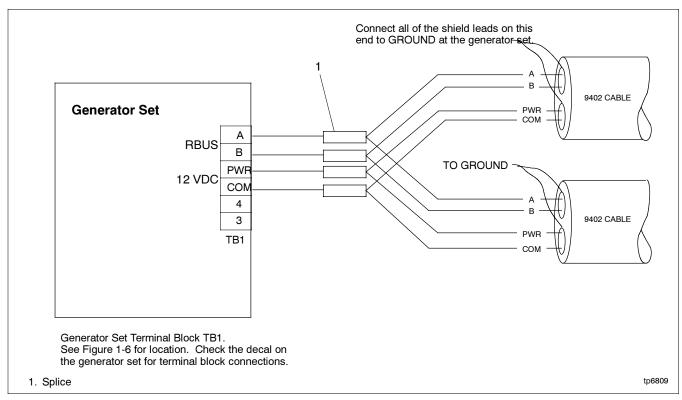


Figure 1-24 Multiple Connections to the Generator Set

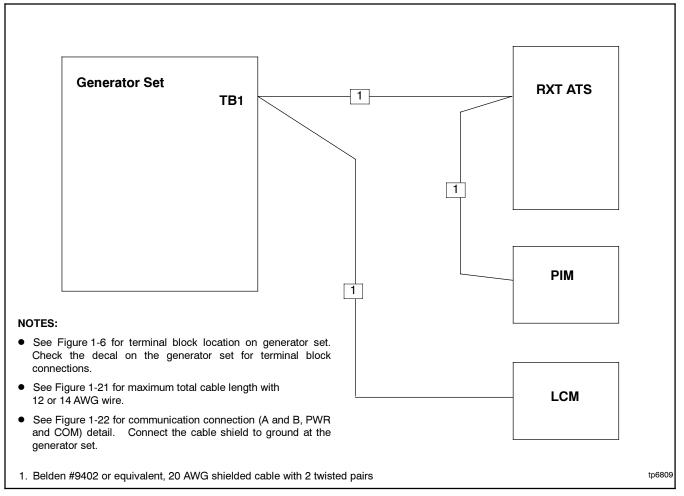


Figure 1-25 Accessory Module Connections (two cable runs with one and two modules shown)

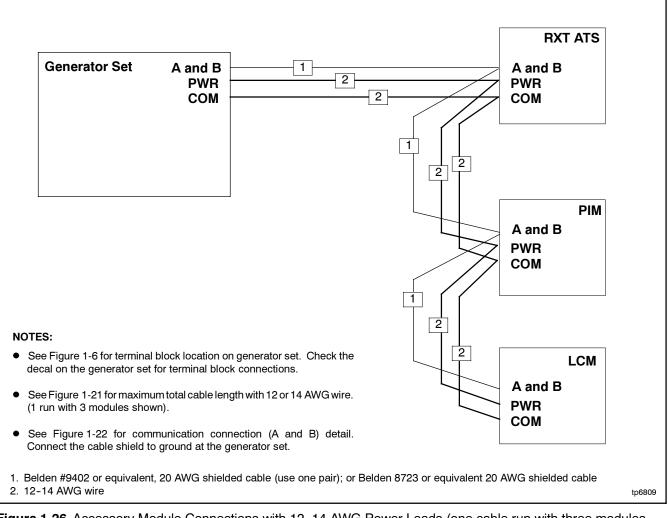


Figure 1-26 Accessory Module Connections with 12-14 AWG Power Leads (one cable run with three modules shown)

1.8.7 Connect Optional Programmable Interface Module (PIM)

The optional programmable interface module (PIM) provides two programmable inputs and six dry contact outputs, four of which are programmable. See TT-1584 for PIM installation and connection instructions.

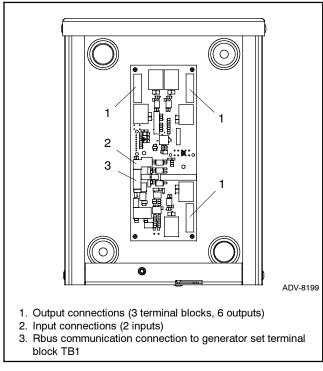


Figure 1-27 Optional PIM

The default settings for the inputs and outputs are shown in Figure 1-28. To change the input and output settings, use a personal computer running Kohler[®] SiteTech software. See TP-6701, SiteTech Software Operation Manual, for instructions.

A personal computer running Kohler[®] OnCue[™] software can be used to actively control PIM outputs. See the OnCue Software Operation Manual for instructions.

PIM Connection	Factory Default Setting
Input 1	None
Input 2	None
Output 1 (Relay 1)	Run
Output 2 (Relay 2)	Common Fault
Output 3 (Relay 3)	Low Battery Voltage (Program- mable)
Output 4 (Relay 4)	Not in Auto (Programmable)
Output 5 (Relay 5)	Cooldown (Programmable)
Output 6 (Relay 6)	Normal Source Failure (Program- mable)

Figure 1-28 PIM Inputs and Outputs

1.8.8 Connect Optional Load Control Module (LCM)

The optional load control module (LCM) provides an automatic load management system to comply with Section 702.5 of NEC 2008. Refer to TT-1574, provided with the LCM, for installation and connection instructions. The installer is responsible for ensuring that the power system installation complies with all applicable state and local codes.

The load control module automatically manages up to six residential loads. Four power relays are provided for management of non-essential secondary loads, and two relays are available to control two independent air conditioner loads.

Two kits are available with either a prewired harness for load relay connection, or a terminal block. The prewired harness requires installation of the LCM within 2 feet of the distribution panel.



Figure 1-29 Optional Load Control Module (LCM) (shown with optional pre-wired harness)





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

Wear protective goggles and clothing. Battery acid may cause blindness and burn skin.



Can cause severe injury or death. Relays in the battery charger cause arcs or sparks.

Locate the battery in a well-ventilated area. Isolate the battery charger from explosive fumes.

Battery electrolyte is a diluted sulfuric acid. Battery acid can cause severe injury or death. Battery acid can cause blindness and burn skin. Always wear splashproof safety goggles, rubber gloves, and boots when servicing the battery. Do not open a sealed battery or mutilate the battery case. If battery acid splashes in the eyes or on the skin, immediately flush the affected area for 15 minutes with large quantities of clean water. Seek immediate medical aid in the case of eye contact. Never add acid to a battery after placing the battery in service, as this may result in hazardous spattering of battery acid.

Battery acid cleanup. Battery acid can cause severe injury or death. Battery acid is electrically conductive and corrosive. Add 500 g (1 lb.) of bicarbonate of soda (baking soda) to a container with 4 L (1 gal.) of water and mix the neutralizing solution. Pour the neutralizing solution on the spilled battery acid and continue to add the neutralizing solution to the spilled battery acid until all evidence of a chemical reaction (foaming) has ceased. Flush the resulting liquid with water and dry the area.

Battery gases. Explosion can cause severe injury or death. Battery gases can cause an explosion. Do not smoke or permit flames or sparks to occur near a battery at any time, particularly when it is charging. Do not dispose of a battery in a fire. To prevent burns and sparks that could cause an explosion, avoid touching the battery terminals with tools or other metal objects. Remove all jewelry before servicing the equipment. Discharge static electricity from your body before touching batteries by first touching a grounded metal surface away from the battery. To avoid sparks, do not disturb the battery charger connections while the battery is charging. Always turn the battery charger off before disconnecting the battery connections. Ventilate the compartments containing batteries to prevent accumulation of explosive gases.

Battery short circuits. Explosion can cause severe injury or death. Short circuits can cause bodily injury and/or equipment damage. Disconnect the battery before generator set installation or maintenance. Remove all jewelry before servicing the equipment. Use tools with insulated handles. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery. Never connect the negative (-) battery cable to the positive (+) connection terminal of the starter solenoid. Do not test the battery condition by shorting the terminals together.

Connecting the battery and the battery charger. Hazardous voltage can cause severe injury or death. Reconnect the battery correctly, positive to positive and negative to negative, to avoid electrical shock and damage to the battery charger and battery(ies). Have a qualified electrician install the battery(ies).

Use a 12-volt group 51 battery with a minimum rating of 500 cold cranking amps at 0° F. The generator set uses a negative ground with a 12-volt engine electrical system. See Figure 1-30 for battery connections. Make sure that the battery is correctly connected and the terminals are tight.

Note: The generator set will not start and circuit board damage may occur if the battery is connected in reverse.

See the dimension drawing in Section 1.5 for the engine starting battery location on the air intake side of the generator set. Standard battery cables provide easy connection to the battery.

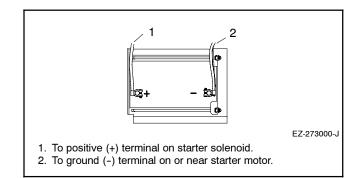


Figure 1-30 Typical Battery Connection

Use the following procedure to install and connect the battery.

Battery Installation Procedure

- 1. Ensure that the starting battery is fully charged before placing the battery in service.
- 2. Clean the battery posts and/or adapters if necessary.
- 3. Install the battery post adapters, if needed.
- 4. Place the battery in the housing.
- 5. Connect the positive (+) lead to the engine starting battery.
- 6. Connect the negative (-) lead to the engine starting battery.

Refer to the generator set operation manual and the battery manufacturer's instructions for battery maintenance instructions.

When power is applied to the RDC2/DC2 controller (that is, when the battery is connected), you will be prompted to set the date and time, and then to set the exerciser. See Section 1.12 and the generator set operation manual for instructions.

If the battery is disconnected for service or replacement, the exercise settings on the RDC2/DC2 controller are lost. Set the exerciser after installing and connecting the battery. See Section 1.12, Set Exerciser.

1.10 Generator Set Accessories

Have accessories installed by an authorized distributor/ dealer or a licensed electrician. Follow the installation instructions provided with each kit. Use separate conduit for AC and DC leads to reduce the possibility of electrical interference. Verify that the leads and conduit do not interfere with the operation of the generator set or obstruct the service areas. Verify that the electrical installation complies with the National Electrical Code (NEC) and all applicable local codes. See Section 2, Wiring Diagrams, for more information regarding generator set electrical connections.

1.10.1 Regulator Heater

The regulator heater kit is designed for Model 20RESA and 20RESAL generator sets. The regulator heater kit is recommended in addition to the carburetor heater for reliable engine starting in temperatures below $-18^{\circ}C$ (0°F). See Figure 1-31 for heater specifications.

Regulator Heater	
Heater rating	120 VAC, 60 W
Thermostat	4°C/13°C (40°F/55°F) Snap action
Pad diameter	127 mm (5 in.)
Cord length	610 mm (24 in.)

Figure 1-31 Regulator Heater Specifications

The regulator heater requires a source of 120 VAC power. The generator set is equipped with one 120 VAC receptacle. The kit includes an outlet splitter for powering the regulator heater and an optional carburetor heater. The circuit should be ground fault protected.

To install the regulator heater kit, follow the instructions in TT-1569, provided with the kit. Figure 1-32 shows the installed regulator heater kit.

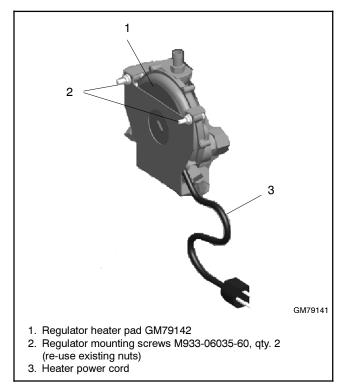


Figure 1-32 Installed Regulator Heater Kit (for 20RESA/RESAL)

1.10.2 Carburetor Heater

An optional carburetor heater is recommended for improved cold starting in locations where the ambient temperature drops below $0^{\circ}C$ ($32^{\circ}F$). The carburetor heater prevents condensation and carburetor icing. The heater turns on when the temperature at the thermostat falls below approximately $4^{\circ}C$ ($40^{\circ}F$) and turns off when the temperature rises above approximately $16^{\circ}C$ ($60^{\circ}F$). The carburetor heaters are shown in Figure 1-33.

To install the carburetor heater, follow the instructions provided with the kit. Figure 1-34 shows the installed carburetor heater kit installed for a 14 kW generator set. Figure 1-35 shows the location for the carburetor heater kit on a 20 kW generator set.

The heater thermostat is installed in the cord. Figure 1-33 shows the location of the thermostat on the power cord. The heater power cord and thermostat are located in the generator set housing air intake area/ battery compartment.

Note: Do not place the heater thermostat inside the generator set engine compartment. The thermostat must be exposed to the ambient air.

The heater requires a continuous source of power. Plug the carburetor heater into the 120 VAC receptacle provided.

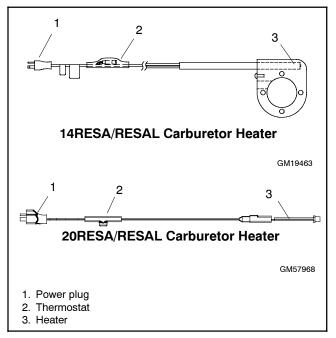
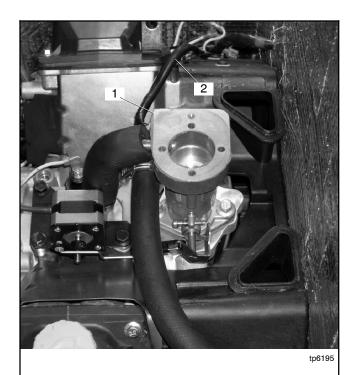
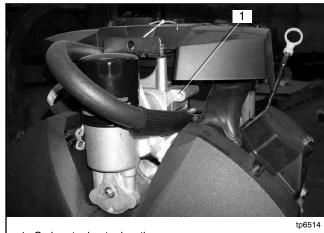


Figure 1-33 Carburetor Heaters



Carburetor heater (air cleaner removed to show heater)
Carburetor heater power cord





1. Carburetor heater location

Figure 1-35 20RESA/RESAL Carburetor Heater Location on Engine (bulkhead removed to show heater location)

1.10.3 OnCue Home Generator Management System

The OnCue[®] Home Generator Management System allows monitoring and control of your generator set from a personal computer located in your home or at other remote locations. OnCue can also be configured to send email or text message notifications in the event of a generator set fault. See TP-6796, OnCue Software Operation Manual, for software instructions.

The OnCue system is available separately as a loose kit. Use category 5E network cable to connect the RDC2 controller to the customer-supplied Ethernet router and cable or DSL modem. Route the cable with other low-voltage signal wiring (for example, the RBUS communication leads or engine start leads to the transfer switch), in separate conduit from the AC load leads. If the network cable is longer than 100 meters (328 ft.), use a repeater or switch.

Recommended: Use a laptop computer to verify the network connection before connecting to the generator set.

Checking the network connection

- 1. Check for and turn OFF any wireless connections to the laptop.
- 2. Connect the network cable to the laptop. Connect the other end of the network cable to the customer's router or modem.
- 3. Verify the Internet connection by opening your web browser and going to www.kohlerpower.com or another website.
- 4. After verifying the connection through the network cable, disconnect the network cable from the laptop and turn the laptop wireless connections back on.

Connect to the Ethernet cable in the customer connection area of the generator set. See Figure 1-36. Use an RJ45 inline coupler, provided with the OnCue kit, to connect the customer's Ethernet cable to the cable in the customer connection box.

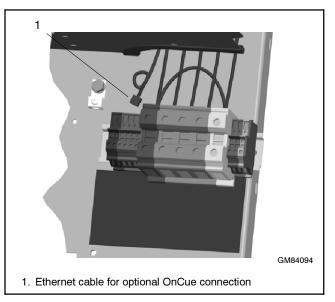


Figure 1-36 Network Connection for OnCue

1.11 Prestart Installation Check

Review the entire installation section. Inspect all wiring and connections to verify that the generator set is ready for operation. Check all items in the following Prestart Checklist.

Prestart Checklist

Air Cleaner. Check that a clean air cleaner element is installed to prevent unfiltered air from entering the engine. See the generator set operation manual for instructions.

Air Inlets. Check for clean and unobstructed air inlets.

Battery. Check for tight battery connections. Consult the battery manufacturer's instructions regarding battery care and maintenance.

Enclosure. Check that all enclosure panels and internal baffling are in place.

Exhaust System. Check for exhaust leaks and blockages. Check the muffler condition.

- Inspect the exhaust system components for cracks, leaks, and corrosion. Check for tight exhaust system connections.
- Check for corroded or broken metal parts and replace them as needed.
- Check that the exhaust outlet is unobstructed.

Oil Level. Maintain the oil level at or near, not over, the full mark on the dipstick.

Operating Area. Check for obstructions that could block the flow of cooling air. Keep the air intake area clean. Do not leave rags, tools, or debris on or near the generator set.

1.12 Set the Exerciser

Set the exerciser to automatically run the generator set on the desired day and time every week or every two weeks. See the generator set Operation Manual for detailed descriptions of the unloaded and loaded exercise operation.

1.12.1 RDC2 Controller

When power is applied to the RDC2 controller (when the battery or the utility power for the battery charger is

connected), you will be prompted to set the date and time, and then to set the exerciser.

The first setting will flash. Press the Up and Down arrow buttons to change the setting. Press Select to save the setting and move on to the next. Repeat until the date, time, and exercise are set and the controller display shows the main menu. See the generator set Operation Manual for more detailed instructions to set the date and time and set the exerciser.

Press AUTO to place the generator set controller into automatic mode.

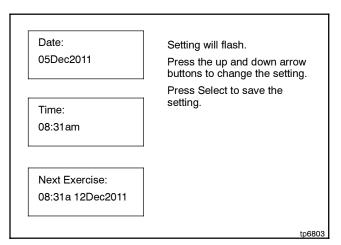


Figure 1-37 Set Time, Date, and Exercise (RDC2)

1.12.2 DC2 Controller

To set the exerciser on the DC2 controller, first press AUTO to place the controller into automatic (standby) mode. Then press and hold the Exercise button. The generator set will start and run a 20-minute unloaded cycle exercise. The generator set will run automatically for 20 minutes at the same time every 7 days. See the generator set Operation Manual for more information.

1.12.3 Loaded Exercise

In order to set a loaded exercise using the RDC2 or DC2 controller, a Kohler[®] Model RXT transfer switch must be connected. See the generator set operation manual for instructions to set a loaded exercise.

To set a loaded exercise on a generator set connected to a transfer switch other than a Model RXT, use the transfer switch controller to set the exercise. Refer to the transfer switch operation manual for instructions. Figure 2-1 lists the wiring diagram numbers and page numbers.

Wiring Diagram Description	Drawing Number	Page
Schematic Diagram	ADV-8164	36
Point-to-Point Wiring Diagram	GM81217	37

Figure 2-1 Wiring Diagrams and Schematics

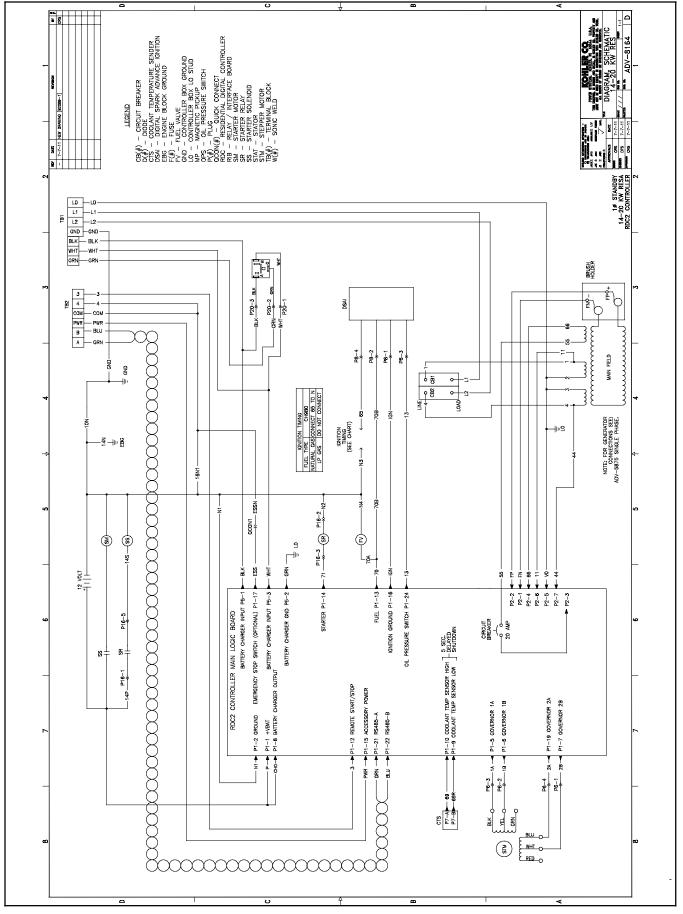


Figure 2-2 Schematic Diagram, ADV-8164

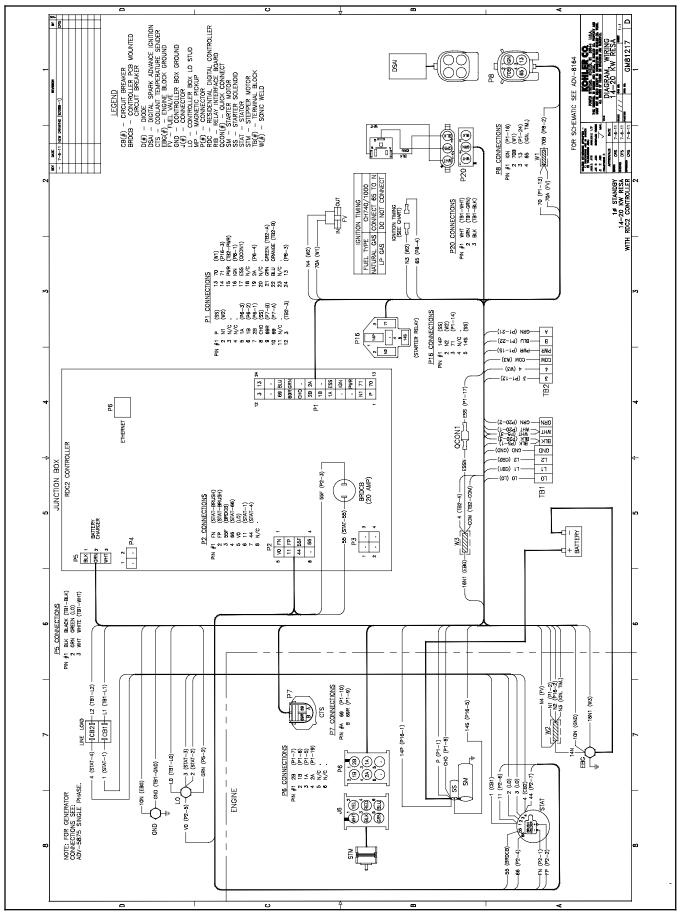


Figure 2-3 Point-to-Point Wiring Diagram, GM81217

Notes

The following list contains abbreviations that may appear in this publication.

		5 that
A, amp	ampere	cfm
ABDC	after bottom dead center	CG
AC	alternating current	CID
A/D	analog to digital	CL
ADC	advanced digital control;	cm
	analog to digital converter	CMO
adj.	adjust, adjustment	
ADV	advertising dimensional	com
A I	drawing	coml
Ah	amp-hour	Coml
AHWT	anticipatory high water temperature	conn.
AISI	American Iron and Steel	cont.
AISI	Institute	CPVC
ALOP	anticipatory low oil pressure	crit.
alt.	alternator	CSA
Al	aluminum	OT
ANSI	American National Standards	CT
/ 1101	Institute (formerly American	Cu
	Standards Association, ASA)	cUL
AO	anticipatory only	CUL
APDC	Air Pollution Control District	COL
API	American Petroleum Institute	cu. in
approx.	approximate, approximately	CW.
APU	Auxiliary Power Unit	CWC
AQMD	Air Quality Management District	cyl.
AR	as required, as requested	D/A
AS	as supplied, as stated, as	DAC
	suggested	dB
ASE	American Society of Engineers	dB(A)
ASME	American Society of	DC
	Mechanical Engineers	DCR
assy.	assembly	deg.,
ASTM	American Society for Testing	dept.
	Materials	dia.
ATDC	after top dead center	DI/EC
ATS	automatic transfer switch	DIN
auto.	automatic	DIN
aux.	auxiliary	
avg.	average	DIP
AVR	automatic voltage regulator	DPD
AWG	American Wire Gauge	DPST
AWM	appliance wiring material	DS
bat.	battery	DVR
BBDC	before bottom dead center	E ² PR
BC	battery charger, battery	
	charging	
BCA	battery charging alternator	_
BCI	Battery Council International	E, em
BDC	before dead center	ECM
BHP	brake horsepower	
blk.	black (paint color), block	EDI
blk. htr.	(engine) block heater	EFR
BMEP	brake mean effective pressure	e.g.
	· · · · · · · · · · · · · · · · · · ·	EG
bps	bits per second	EGSA
br. BTDC	brass	EIA
Btu	before top dead center British thermal unit	LIA
Btu/min.	British thermal units per minute	EI/EC
C	Celsius, centigrade	EMI
cal.	calorie	emiss
CAN	controller area network	eng.
CARB	California Air Resources Board	EPA
CARD CAT5		
CAIS	Category 5 (network cable) circuit breaker	EPS
CC	crank cycle	ER
cc	cubic centimeter	ES
CCA	cold cranking amps	
CCA CCW.	counterclockwise	ESD
CEC	Canadian Electrical Code	est.
cert.	certificate, certification, certified	E-Sto
cfh	cubic feet per hour	etc.
0111		

cfm	cubic feet per minute
CG	center of gravity
	o ,
CID	cubic inch displacement
CL	centerline
cm	centimeter
CMOS	complementary metal oxide
0	substrate (semiconductor)
	communications (port)
com	u ,
coml	commercial
Coml/Rec	Commercial/Recreational
conn.	connection
cont.	continued
	chlorinated polyvinyl chloride
CPVC	
crit.	critical
CSA	Canadian Standards
	Association
CT	current transformer
Cu	copper
cUL	Canadian Underwriter's
COL	
	Laboratories
CUL	Canadian Underwriter's
	Laboratories
cu. in.	cubic inch
CW.	clockwise
CMC	city water-cooled
cyl.	cylinder
D/A	digital to analog
DAC	digital to analog converter
dB	decibel
dB(A)	decibel (A weighted)
DC	direct current
DCR	direct current resistance
deg., °	degree
dept.	department
dia.	diameter
DI/EO	dual inlet/end outlet
DIN	Deutsches Institut fur Normung
	e. V. (also Deutsche Industrie
	Normenausschuss)
DIP	dual inline package
DPDT	double-pole, double-throw
DPST	double-pole, single-throw
DS	disconnect switch
DVR	digital voltage regulator
E ² PROM,	EEPROM
,	electrically-erasable
	programmable read-only
	memory
E omor	emergency (power source)
E, emer.	
ECM	electronic control module,
	engine control module
EDI	electronic data interchange
EFR	emergency frequency relay
e.g.	for example (exempli gratia)
EG	electronic governor
	Electrical Constating Systems
EGSA	Electrical Generating Systems
	Association
EIA	Electronic Industries
	Association
EI/EO	end inlet/end outlet
EMI	electromagnetic interference
emiss.	emission
eng.	engine
EPA	Environmental Protection
	Agency
EPS	emergency power system
ER	emergency relay
ES	engineering special,
-0	engineered special
ESD	
ESD	electrostatic discharge
est.	estimated
E-Stop	emergency stop
etc.	et cetera (and so forth)

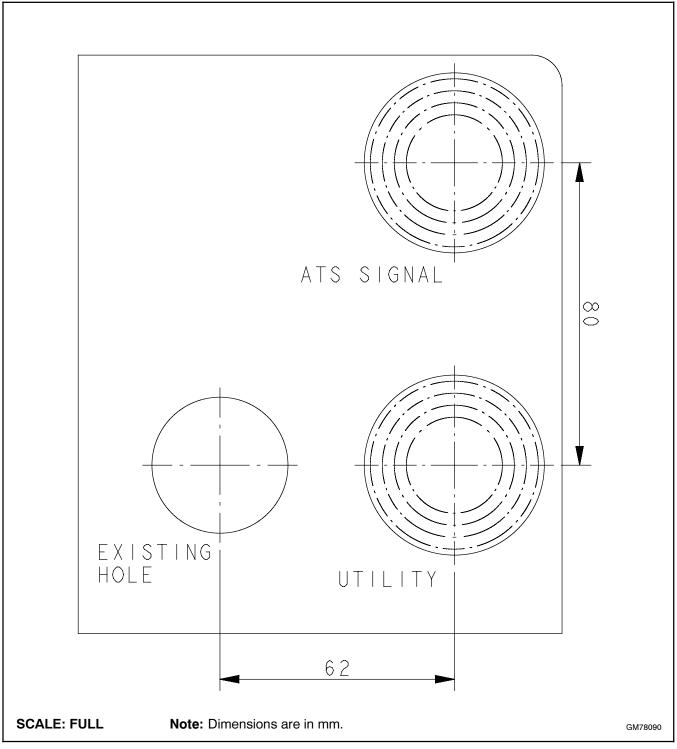
exh.	exhaust
ext.	external
F	Fahrenheit, female
FHM	flat head machine (screw)
fl. oz.	fluid ounce
flex.	flexible
freq.	frequency
FS	full scale
ft. ft. lb.	foot, feet
ft./min.	foot pounds (torque) feet per minute
ftp	file transfer protocol
g	gram
ga.	gauge (meters, wire size)
gal.	gallon
gen.	generator
genset	generator set
GFI	ground fault interrupter
GND, 🕀	ground
gov.	governor
gph	gallons per hour
gpm	gallons per minute
gr.	grade, gross
GRD	equipment ground
gr. wt.	gross weight
	height by width by depth
HC	hex cap
	high cylinder head temperature
HD HET	heavy duty high exhaust temp., high
11-1	engine temp.
hex	hexagon
Hg	mercury (element)
нй	hex head
HHC	hex head cap
HP	horsepower
hr.	hour
HS	heat shrink
hsg.	housing
HVAC	heating, ventilation, and air conditioning
HWT	high water temperature
Hz	hertz (cycles per second)
IBC	International Building Code
IC	integrated circuit
ID	inside diameter, identification
IEC	International Electrotechnical
	Commission
IEEE	Institute of Electrical and
IMS	Electronics Engineers improved motor starting
in.	inch
in. H ₂ O	inches of water
in. Hg	inches of mercury
in. lb.	inch pounds
Inc.	incorporated
ind.	industrial
int.	internal
int./ext.	internal/external
I/O	input/output
IP	internet protocol
ISO	International Organization for
	Standardization
J	joule
JIS k	Japanese Industry Standard kilo (1000)
ĸ K	kelvin
kA	kiloampere
KB	kilobyte (2 ¹⁰ bytes)
KBus	Kohler communication protocol
kg	kilogram
0	5

kg/cm ²	kilograms per square
L avaa	centimeter
kgm kg/m ³	kilogram-meter
kg/m ³ kHz	kilograms per cubic meter kilohertz
kJ	kilojoule
km	kilometer
kOhm, k Ω	kilo-ohm
kPa	kilopascal
kph	kilometers per hour
kV	kilovolt
kVA	kilovolt ampere kilovolt ampere reactive
kVAR kW	kilowatt
kWh	kilowatt-hour
kWm	kilowatt mechanical
kWth	kilowatt-thermal
L	liter
LAN	local area network
LxWxH	
lb. Ibm/ft ³	pound, pounds pounds mass per cubic feet
LCB	line circuit breaker
LCD	liquid crystal display
LED	light emitting diode
Lph	liters per hour
Lpm	liters per minute
LOP	low oil pressure
LP	liquefied petroleum
LPG LS	liquefied petroleum gas left side
Lo	sound power level, A weighted
LWL	low water level
LWT	low water temperature
m	meter, milli (1/1000)
Μ	mega (10 ⁶ when used with SI
m ³	units), male cubic meter
m ³ /hr.	cubic meters per hour
m ³ /min.	cubic meters per minute
mÁ	milliampere
man.	manual
max.	maximum
MB	megabyte (2 ²⁰ bytes)
MCCB	molded-case circuit breaker
MCM meggar	one thousand circular mils megohmmeter
MHz	megahertz
mi.	mile
mil	one one-thousandth of an inch
min.	minimum, minute
misc.	miscellaneous
MJ	megajoule
mJ mm	millijoule millimeter
mOhm, mΩ	
MOhm, Mg	
MOV	metal oxide varistor
MPa	megapascal
mpg	miles per gallon
mph MS	miles per hour
MS ms	military standard millisecond
m/sec.	meters per second
m/sec. mtg.	mounting
MTU	Motoren-und Turbinen-Union
MW	megawatt
mW	milliwatt
μF	microfarad
N, norm.	normal (power source)
NA nat. gas	not available, not applicable natural gas
NBS	National Bureau of Standards

NC NEC NEMA	normally closed National Electrical Code National Electrical
NFPA	Manufacturers Association National Fire Protection Association
Nm NO no., nos. NPS	newton meter normally open number, numbers National Pipe, Straight
NPSC NPT	National Pipe, Straight-coupling National Standard taper pipe thread per general use
NPTF NR ns	National Pipe, Taper-Fine not required, normal relay nanosecond
OC OD OEM	overcrank outside diameter original equipment manufacturer
OF opt. OS OSHA	overfrequency option, optional oversize, overspeed Occupational Safety and Health
OV oz.	Administration overvoltage ounce
p., pp. PC PCB pF	page, pages personal computer printed circuit board picofarad
PF ph., ∅ PHC	power factor phase Phillips® head Crimptite®
PHH PHM PLC	(screw) Phillips® hex head (screw) pan head machine (screw) programmable logic control
PMG pot ppm	permanent magnet generator potentiometer, potential parts per million
PROM	programmable read-only memory pounds per square inch
psig pt. PTC PTO	pounds per square inch gauge pint positive temperature coefficient
PVC qt. qty.	power takeoff polyvinyl chloride quart, quarts quantity
R rad.	replacement (emergency) power source radiator, radius
RAM RBUS	random access memory RS-485 proprietary communications
RDO ref. rem.	relay driver output reference remote
Res/Coml RFI RH RHM	Residential/Commercial radio frequency interference round head round head machine (screw)
rly. rms rnd.	relay root mean square round
RO ROM rot.	read only read only memory rotate, rotating
rpm RS RTDs	revolutions per minute right side Resistance Temperature
	Detectors

RTU	remote terminal unit
RTV	room temperature vulcanization
RW	read/write
SAE	Society of Automotive Engineers
scfm	standard cubic feet per minute
SCR	silicon controlled rectifier
s, sec.	second
SI	Systeme international d'unites,
SI/EO	International System of Units
SI/EO sil.	side in/end out silencer
SMTP	simple mail transfer protocol
SN	serial number
SNMP	simple network management
CDDT	protocol
SPDT SPST	single-pole, double-throw single-pole, single-throw
spec	specification
specs	specification(s)
sq.	square
sq. cm	square centimeter
sq. in.	square inch
SMS	short message service
SS std.	stainless steel standard
stu. stl.	steel
tach.	tachometer
ТВ	terminal block
TCP	transmission control protocol
TD	time delay
TDC TDEC	top dead center time delay engine cooldown
TDEN	time delay emergency to
10211	normal
TDES	time delay engine start
TDNE	time delay normal to
TDOE	emergency time delay off to emergency
TDOL	time delay off to normal
temp.	temperature
term.	terminal
THD	total harmonic distortion
TIF	telephone influence factor
tol. turbo.	tolerance turbocharger
typ.	typical (same in multiple
., .	locations)
UF	underfrequency
UHF	ultrahigh frequency
UIF UL	user interface Underwriter's Laboratories, Inc.
	unified coarse thread (was NC)
UNF	unified fine thread (was NF)
univ.	universal
URL	uniform resource locator
US	(web address)
UV	undersize, underspeed ultraviolet, undervoltage
V	volt
VAC	volts alternating current
VAR	voltampere reactive
VDC	volts direct current
	vacuum fluorescent display
VGA VHF	video graphics adapter very high frequency
W	watt
WCR	withstand and closing rating
w/	with
wo	write only
w/o	without
wt. xfmr	weight transformer

Use the full-scale drawing in Figure 3 to mark the openings for the electrical conduit, if desired. See Section 1.8.2 for more information.





Notes



KOHLER CO. Kohler, Wisconsin 53044 Phone 920-457-4441, Fax 920-459-1646 For the nearest sales/service outlet in the US and Canada, phone 1-800-544-2444 KohlerPower.com

Kohler Power Systems Asia Pacific Headquarters 7 Jurong Pier Road Singapore 619159 Phone (65) 6264-6422, Fax (65) 6264-6455

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