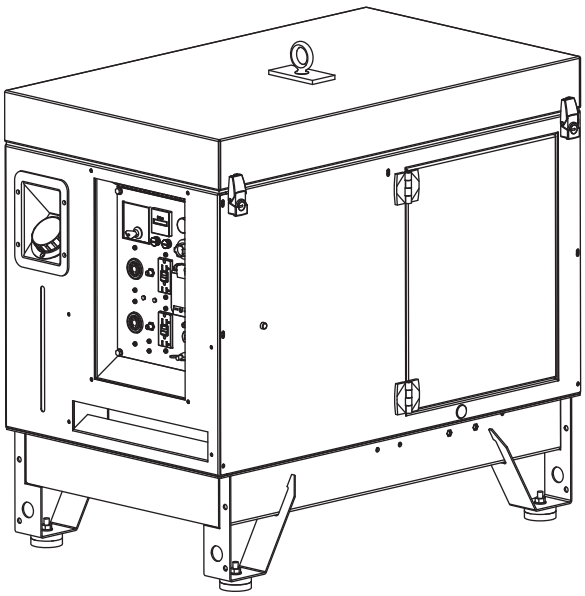
KOHLER®

PRO 5.4 DES

Generator Service Manual



IMPORTANT: Read all safety precautions and instructions carefully before operating equipment.

Ensure equipment is stopped and level before performing any maintenance or service.

For all engine related maintenance, disassembly and reassembly, refer to service manual of engine powering this equipment.

SAFETY PRECAUTIONS

⚠ **DANGER:** A hazard that will result in death, serious injury, or substantial property damage.

⚠ **WARNING:** A hazard that could result in death, serious injury, or substantial property damage.

⚠ **CAUTION:** A hazard that could result in minor personal injury or property damage.

NOTE: is used to notify people of important installation, operation, or maintenance information.

⚠ WARNING

Fuel can cause fires and severe burns.

Do not fill fuel tank while generator is hot or running.

Fuel is flammable and its vapors can ignite. Store fuel only in approved containers, in well ventilated, unoccupied buildings. Do not fill fuel tank while engine is hot or running, since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start engine near spilled fuel. Never use fuel as a cleaning agent.

⚠ WARNING

High Pressure Fluids can puncture skin and cause severe injury or death.

Do not work on fuel system without proper training or safety equipment.

Fluid puncture injuries are highly toxic and hazardous. If an injury occurs, seek immediate medical attention.

⚠ WARNING

Rotating Parts can cause severe injury.

Stay away while generator is in operation.

Keep hands, feet, hair, and clothing away from all moving parts to prevent injury. Never operate generator with covers, shrouds, or guards removed.

⚠ WARNING

Accidental Starts can cause severe injury or death.

Disconnect and ground spark plug lead(s) before servicing.

Before working on generator or equipment, disable engine as follows: 1) Disconnect spark plug lead(s). 2) Disconnect negative (–) battery cable from battery.

Do not allow children to operate generator.

⚠ WARNING

Hot Parts can cause severe burns.

Do not touch generator while operating or just after stopping.

Never operate generator with heat shields or guards removed. Do not modify generator.

Place generator in a place where pedestrians or children are not likely to touch generator.

Be sure to carry generator only by its carrying handles.

⚠ CAUTION

Electrical Shock can cause injury.

Do not touch wires while generator is running.

Never operate generator in rain or snow.

Never touch generator with wet hands or electrical shock may occur.

⚠ WARNING

Hazardous Voltage.

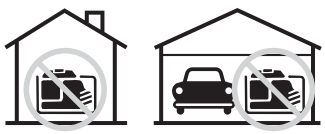
Backfeed to utility system can cause property damage, severe injury, or death.

Never plug a portable generator directly into a building outlet.

If generator is used for standby power, have a certified, licensed electrician install an automatic transfer switch to prevent inadvertent interconnection of standby and normal sources of supply.

⚠ DANGER

Using a generator indoors CAN KILL YOU IN MINUTES.
Generator exhaust contains carbon monoxide.
This is a poison you cannot see or smell.

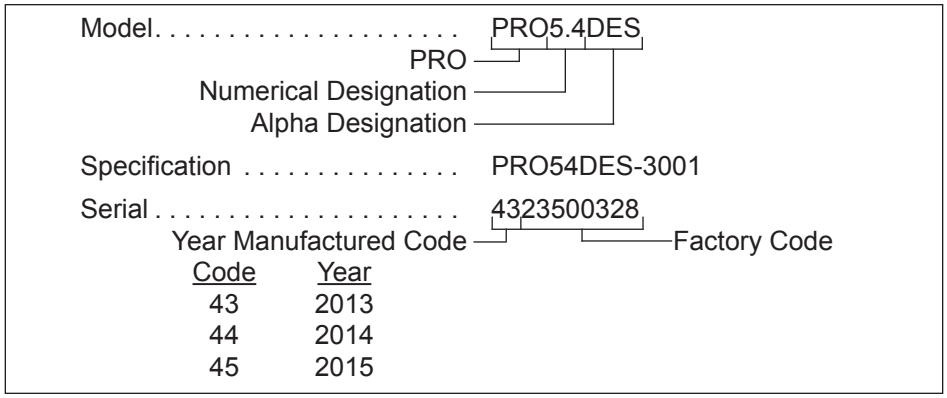


NEVER use inside a home or garage, EVEN IF doors and windows are open.

Only use OUTSIDE and far away from windows, door, and vents.

IDENTIFICATION NUMBERS

Kohler identification numbers (model, specification and serial) should be referenced for efficient repair, ordering correct parts, and engine replacement.



GENERAL SPECIFICATIONS[1]	PRO 5.4 DES	
Overall Dimensions (L x W x H)	990 mm (39.0 in.) 615 mm (24.2 in.) 960 mm (37.8 in.)	
Dry Weight	198 kg (437 lbs.)	
AC Rated Power	4700 Watt	(120 Volts x 39.2 Amps) (240 Volts x 19.6 Amps)
AC Maximum Power	5400 Watt	(120 Volts x 45.0 Amps) (240 Volts x 22.5 Amps)
DC Rated Power	100 Watt (12 Volts x 8.3 Amps)	
Fuel Tank	30.2 L (8 gal.)	

TORQUE SPECIFICATIONS[1]	PRO 5.4 DES
Alternator Mount	
Fastener	13.6 N·m (120 in. lb.)
Back Panel	
Fastener	9.0 N·m (79 in. lb.)
Battery Clamp	
Fastener	9.0 N·m (79 in. lb.)
Battery Tray	
Fastener to Lifting Ring Frame	9.0 N·m (79 in. lb.)
Fastener to Upper Alternator Baffle	9.0 N·m (79 in. lb.)
Control Panel	
Fastener	9.0 N·m (79 in. lb.)
Control Panel Frame	
Fastener	9.0 N·m (79 in. lb.)
Cover	
Fastener	9.0 N·m (79 in. lb.)

[1] Values are in Metric units. Values in parentheses are English equivalents.

Specifications

TORQUE SPECIFICATIONS[1]	PRO 5.4 DES
Door Panel	
Fastener	9.0 N·m (79 in. lb.)
End Cover	
Fastener	4.0 N·m (35 in. lb.)
Engine Adapter	
Fastener	27.1 N·m (240 in. lb.)
Engine Baffle	
Fastener	9.0 N·m (79 in. lb.)
Engine Mount	
Fastener	13.6 N·m (120 in. lb.)
Exhaust Pipe	
Fastener	9.0 N·m (79 in. lb.)
Front Panel	
Fastener	9.0 N·m (79 in. lb.)
Isolator Mount	
Fastener	47.5 N·m (35 ft. lb.)
Lifting Ring Frame	
Fastener	9.0 N·m (79 in. lb.)
Lower Alternator Baffle	
Fastener	9.0 N·m (79 in. lb.)
Muffler	
Fastener	9.0 N·m (79 in. lb.)
Muffler Shield	
Fastener	9.0 N·m (79 in. lb.)
Rear Cover	
Fastener	21.0 N·m (186 in. lb.)
Rotor	
Through Bolt	21.0 N·m (186 in. lb.)
Side Panel	
Fastener	9.0 N·m (79 in. lb.)
Stator Assembly to Engine Adapter	
Fastener	21.0 N·m (186 in. lb.)
Upper Alternator Baffle	
Fastener	9.0 N·m (79 in. lb.)

[1] Values are in Metric units. Values in parentheses are English equivalents.

GENERAL TORQUE VALUES

English Fastener Torque Recommendations for Standard Applications				
	Bolts, Screws, Nuts and Fasteners Assembled Into Cast Iron or Steel			Grade 2 or 5 Fasteners Into Aluminum
Size	Grade 2	Grade 5	Grade 8	
Tightening Torque: N·m (in. lb.) ± 20%				
8-32	2.3 (20)	2.8 (25)	—	2.3 (20)
10-24	3.6 (32)	4.5 (40)	—	3.6 (32)
10-32	3.6 (32)	4.5 (40)	—	—
1/4-20	7.9 (70)	13.0 (115)	18.7 (165)	7.9 (70)
1/4-28	9.6 (85)	15.8 (140)	22.6 (200)	—
5/16-18	17.0 (150)	28.3 (250)	39.6 (350)	17.0 (150)
5/16-24	18.7 (165)	30.5 (270)	—	—
3/8-16	29.4 (260)	—	—	—
3/8-24	33.9 (300)	—	—	—
Tightening Torque: N·m (ft. lb.) ± 20%				
5/16-24	—	—	40.7 (30)	—
3/8-16	—	47.5 (35)	67.8 (50)	—
3/8-24	—	54.2 (40)	81.4 (60)	—
7/16-14	47.5 (35)	74.6 (55)	108.5 (80)	—
7/16-20	61.0 (45)	101.7 (75)	142.5 (105)	—
1/2-13	67.8 (50)	108.5 (80)	155.9 (115)	—
1/2-20	94.9 (70)	142.4 (105)	223.7 (165)	—
9/16-12	101.7 (75)	169.5 (125)	237.3 (175)	—
9/16-18	135.6 (100)	223.7 (165)	311.9 (230)	—
5/8-11	149.5 (110)	244.1 (180)	352.6 (260)	—
5/8-18	189.8 (140)	311.9 (230)	447.5 (330)	—
3/4-10	199.3 (147)	332.2 (245)	474.6 (350)	—
3/4-16	271.2 (200)	440.7 (325)	637.3 (470)	—

Metric Fastener Torque Recommendations for Standard Applications						
	Property Class					Noncritical Fasteners Into Aluminum
Size	4.8	5.8	8.8	10.9	12.9	
Tightening Torque: N·m (in. lb.) ± 10%						
M4	1.2 (11)	1.7 (15)	2.9 (26)	4.1 (36)	5.0 (44)	2.0 (18)
M5	2.5 (22)	3.2 (28)	5.8 (51)	8.1 (72)	9.7 (86)	4.0 (35)
M6	4.3 (38)	5.7 (50)	9.9 (88)	14.0 (124)	16.5 (146)	6.8 (60)
M8	10.5 (93)	13.6 (120)	24.4 (216)	33.9 (300)	40.7 (360)	17.0 (150)
Tightening Torque: N·m (ft. lb.) ± 10%						
M10	21.7 (16)	27.1 (20)	47.5 (35)	66.4 (49)	81.4 (60)	33.9 (25)
M12	36.6 (27)	47.5 (35)	82.7 (61)	116.6 (86)	139.7 (103)	61.0 (45)
M14	58.3 (43)	76.4 (56)	131.5 (97)	184.4 (136)	219.7 (162)	94.9 (70)

Torque Conversions	
N·m = in. lb. x 0.113	in. lb. = N·m x 8.85
N·m = ft. lb. x 1.356	ft. lb. = N·m x 0.737

Troubleshooting

TROUBLESHOOTING GUIDE

When troubles occur, be sure to check simple causes which, at first, may seem too obvious to be considered. For example, a starting problem could be caused by an empty fuel tank.

Some general common causes of generator troubles are listed below. Use these to locate causing factors.

Condition	Possible Cause	Solution
No AC output	Circuit breaker in OFF position.	Switch circuit breaker to ON.
	Circuit protector popped out.	Press circuit protectors.
	Engine not operating at rated RPM.	Adjust engine running at normal operating temperature to 3600 ± 100 RPM.
	Circuit breaker or receptacles faulty.	Test for voltage at circuit breaker and receptacles.
	Stator is faulty.	Test for voltage and resistance.
Alternator can't output rated power	Engine not operating at rated RPM.	Adjust engine running at normal operating temperature to 3600 ± 100 RPM.
	Overload condition.	Calculate electrical power required by electric appliances (in watts). Reduce total wattage of connected electric devices within application range.
	Appliance is faulty.	Repair faulty appliance.
Alternator excitation failure	Engine not operating at rated RPM.	Adjust engine running at normal operating temperature to 3600 ± 100 RPM.
	Faulty capacitor.	Check and replace.
	Faulty windings.	Check windings resistance.
High no load voltage	Engine not operating at rated RPM.	Adjust engine running at normal operating temperature to 3600 ± 100 RPM.
	High capacity of capacitor.	Check and replace.
Low no load voltage	Engine not operating at rated RPM.	Adjust engine running at normal operating temperature to 3600 ± 100 RPM.
	Faulty rotor diodes.	Check and replace.
	Worn windings.	Check winding resistance.
	Low capacity of capacitor.	Check and replace.
Proper voltage at no load but low voltage at load	Engine not operating at rated RPM.	Adjust engine running at normal operating temperature to 3600 ± 100 RPM.
	Overload condition.	Calculate electrical power required by electric appliances (in watts). Reduce total wattage of connected electric devices within application range.
	Short-circuited rotor diodes.	Check and replace.
Proper voltage in no load conditions but high voltage at load	Engine not operating at rated RPM.	Adjust engine running at normal operating temperature to 3600 ± 100 RPM.
Unstable voltage	Loose contacts.	Check connections.
	Uneven rotation.	Check for uniform rotation speed.
Noisy alternator	Worn bearings.	Replace.
	Faulty coupling.	Check and repair.

Alternator Specifications

Unit	Ohms
Stator Winding	0.280
Rotor Winding	4.80
Exciter	0.76

Theory for Capacitor-Excited Generator

On a brushless, capacitor-excited generator, rotor slip rings are replaced with a diode. Diode also provides current limiting and surge protection for diodes. A large capacitor is connected across an auxiliary winding of stator. On start-up, residual magnetism from rotor iron provides a sufficient enough magnetic field to induce a current flow in auxiliary winding and capacitor circuit.

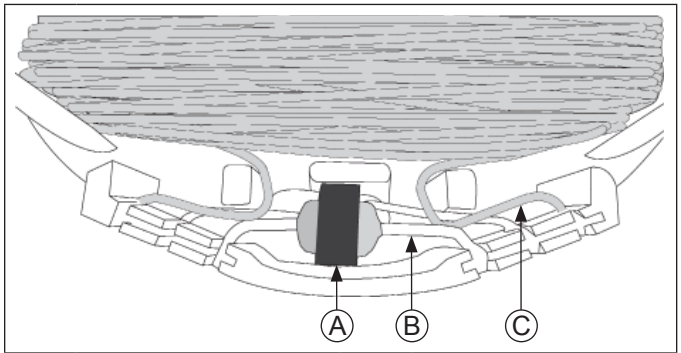
As rotor windings pass through magnetic flux of auxiliary winding, current flow is induced in rotor field windings. Diodes rectify this AC current flow to DC current flow which creates electromagnets at pole pieces on rotor. This rotor field then induces a voltage on stator windings. Just like a brush type alternator, revolving field generator voltages from both stator coils are "in phase" to each other. Therefore total output voltage is multiplied by 2 and voltage is induced in each stator winding.

As customer load is increased, more current is induced in rotor, increasing field strength of rotor. This in turn increases current in auxiliary winding and capacitor circuit. As rotor windings pass through increased flux of auxiliary winding a larger current flow is induced in rotor field windings. Diodes rectify this increased AC current to DC. Voltage induced on stator main windings is increased thus providing voltage regulation as customers load changes.

Capacitor-excited generators rely on residual magnetism in rotor in order to build voltage on startup. Residual magnetism can be lost during assembly/disassembly and generator will fail to build voltage. It can be restored (reflashed) by placing an AC potential across capacitor winding. This will induce a rectified current flow in rotor winding to re-magnetize poles of rotor. An AC voltage of 30-100 volts can be used to reflash rotor.

Troubleshooting a Capacitor-Excited Generator

Rotor with Diode



A	Diode	**B**	Cut Diode for Testing
C	Rotor Winding		

No or Low Output Voltage

1. Engine speed set too low. Needs to be set for 3600 RPM at no load. Adjust if necessary. If speed is correct proceed to next step.
2. Disconnect stator exciter leads from capacitor and measure resistance between exciter leads. Compare to value in table. Also check resistance from each exciter lead to ground. If out of specification or shows resistance to ground then replace stator. If within specification proceed to next step.
3. Measure µF (microfarad) value of capacitor with appropriate meter. If meter will not measure µF value of capacitor, you can use an analog or digital ohmmeter and verify if capacitor will charge and discharge.
   a. Using a screw driver, place it across both terminals of capacitor while unit is not running. This will discharge capacitor.
   b. Remove exciter wires from capacitor. Set meter to check resistance. If meter has a range setting, set it to RX1. With leads of meter apart, your meter should read infinity or open circuit. Place meter leads across terminals of capacitor. Meter should read infinity or open circuit, drop from a high resistance value down to a low resistance value, then start climbing back up to a high resistance value.
   c. Reverse your meter leads on capacitor. Reading should go from a high resistance value down to a low resistance value, then climb back up to a high value.
      1. If meter maintains reading, indicating an open circuit or infinity, that means capacitor is open circuited. Capacitor is bad and should be replaced.
      2. If meter goes to very low value and stays there, that means capacitor is short circuited. Capacitor is bad and should be replaced.
   d. If capacitor checks out correctly then proceed to next step.
4. With capacitor disconnected, try flashing exciter winding by momentarily applying 30-100 VAC to stator exciter wires while unit is not running. Reconnect capacitor and try running unit.
   a. If there is still no output then apply a small amount of load to unit, for instance 60 watts, when trying to start unit. If output occurs then let unit run for a while.
   b. Shut unit down and start it back up and see if output is good.
      1. If unit has no output, it could mean rotor will not hold residual magnetism and may need to be replaced. Normally if rotor is good and has some residual magnetism, then you will at least get some residual output voltage from main stator leads of about 3-6 VAC.
      2. If you get 0 output voltage from main stator leads, stator checks out good, and diodes are good on rotor, then rotor is bad. Do not replace rotor until remaining steps have been followed.

5. Isolate all main stator leads and measure resistance across each winding and check each main stator lead to ground. Compare readings to values in Alternator Specifications table.
   a. If winding resistance is out of specification or a resistance to ground is measured then replace stator.
      1. Use an insulation tester on main stator windings and verify reading is 500K Ohm or higher.
      2. If insulation tester shows low resistance to ground then replace alternator.
   b. If stator tests pass, proceed to next step.
6. Cut wire on 1 side of each diode.
   a. Use a meter set to diode test and check each diode.
   b. If a diode tests bad, replace diode. If diodes pass test, proceed to next step.
      1. Note polarity stripe of diode. Cut other wire of diode and remove bad diode.
      2. Solder in a new diode paying attention to polarity stripe on diode.
7. Measure resistance value of rotor winding with rotor leads disconnected from diodes.
   a. Compare resistance reading to value in Alternator Specifications table.
   b. Check resistance from each rotor lead to rotor shaft.
      1. If resistance of winding is not in specification or measures resistance from either rotor lead to rotor shaft, then replace alternator.
      2. If rotor checks out fine, solder diode wires and proceed to next step.
8. There is no way to check for a running short or open circuit in rotor winding. If previous tests pass:
   a. Replace capacitor.
   b. If replacing capacitor doesn't restore voltage, replace alternator.

High Output Voltage

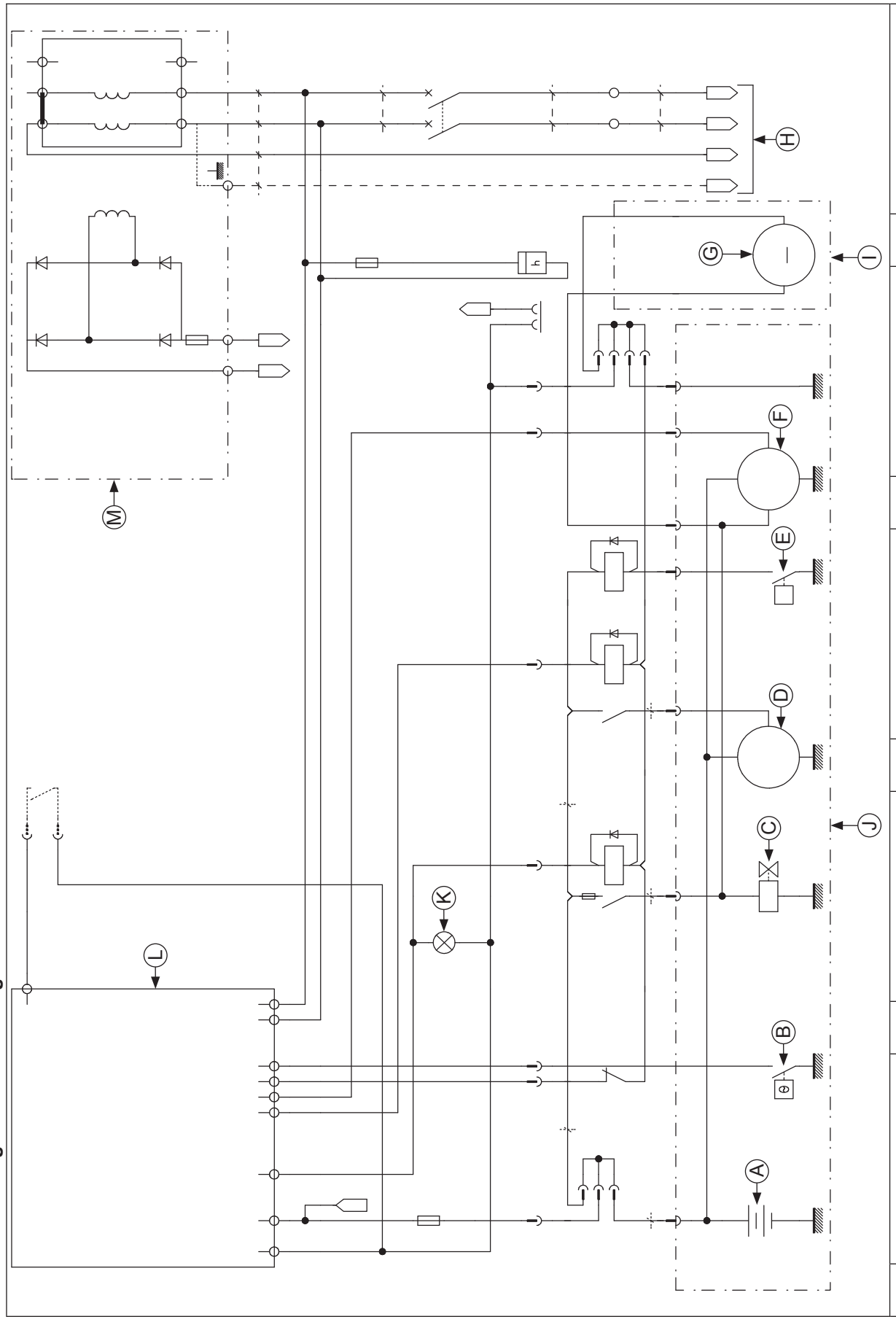
1. Verify engine speed is not too high. Adjust no load speed to 3600 RPM if needed. If speed is correct proceed to next step.
2. Since there is no voltage sensing circuit on a capacitor-excited generator:
   a. Verify value of capacitor is correct according to Alternator Specifications table.
   b. If a larger capacitor is used, output voltage will be higher than it is supposed to be. Install correct value of capacitor if found to be wrong.
   c. If capacitor is correct then proceed to next step.
3. Check:
   a. Resistance values of all stator windings and rotor winding.
   b. Resistance from stator leads to ground.
   c. Diodes are good.
      1. Cut wire on 1 side of each diode from rotor.
      2. Use a meter set to diode test and check each diode.
   d. Resistance from rotor leads to rotor shaft.
4. Replace:
   a. Any component that does not meet specifications in Alternator Specifications table.
   b. If diodes are found to be open or shorted.
      1. Note polarity stripe of diode. Cut other wire of diode and remove bad diode.
      2. Solder in a new diode paying attention to polarity stripe on diode.
   c. Any windings have resistance to ground.
5. If previous tests pass:
   a. Solder diode wires that were cut.
   b. Replace capacitor.
   c. If replacing capacitor doesn't restore voltage, replace alternator.

Alternator Can’t Output Rated Power

1. Verify that engine speed at full load is at 3600 RPM.
   a. At no load it should be at 3600 RPM. Adjust engine speed if needed.
   b. If engine speed drops below 3600 RPM before full load is achieved, then troubleshoot engine for lack of power.
   c. If speed is correct proceed to next step.
2. Take a current reading of all loads and add together and multiply by output voltage to confirm that total wattage of load being applied does not exceed rating of generator.
   a. Reduce load if exceeding rating of generator.
   b. If loading is not an issue, proceed to next step.
3. Use a load bank and apply load, watch output voltage of unit as load is increased.

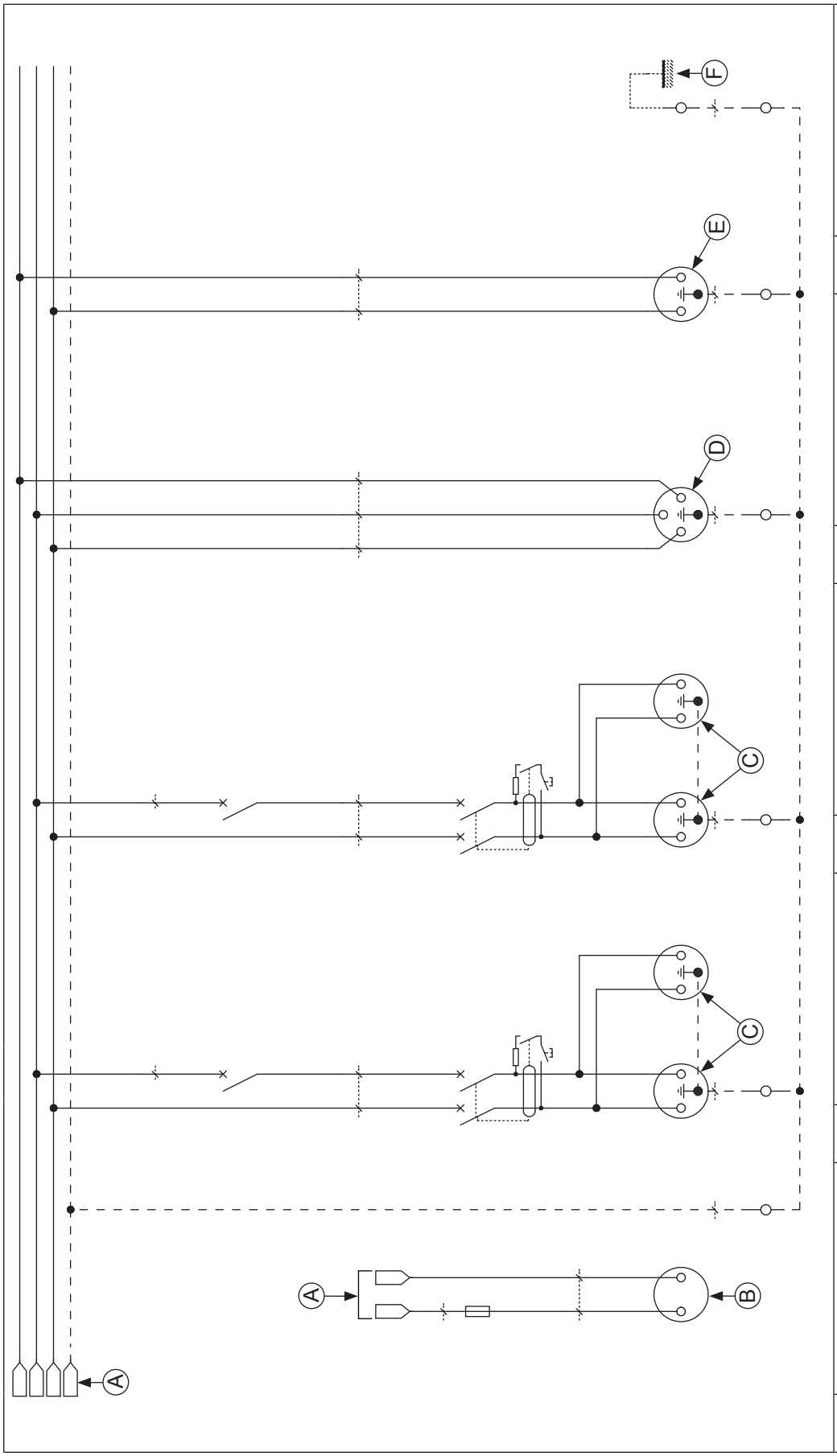
   If output voltage starts dropping and engine speed has not dropped below 3600 RPM:
   a. Check resistances of all stator and rotor windings. If resistance readings do not meet specification, replace defective alternator.
   b. Use an insulation tester on rotor and stator windings and verify readings are 500K Ohm or higher. Replace defective alternator.
   c. If a diode tests bad, replace diode. If diodes pass test, proceed to next step.
      1. Note polarity stripe of diode. Cut other wire of diode and remove bad diode.
      2. Solder in a new diode paying attention to polarity stripe on diode.
4. If previous tests pass:
   a. Replace capacitor.
   b. If replacing capacitor doesn't restore voltage, replace diodes.
   c. If replacing diodes doesn't restore voltage, replace alternator.

PRO 5.4 DES Engine Electrical Diagram

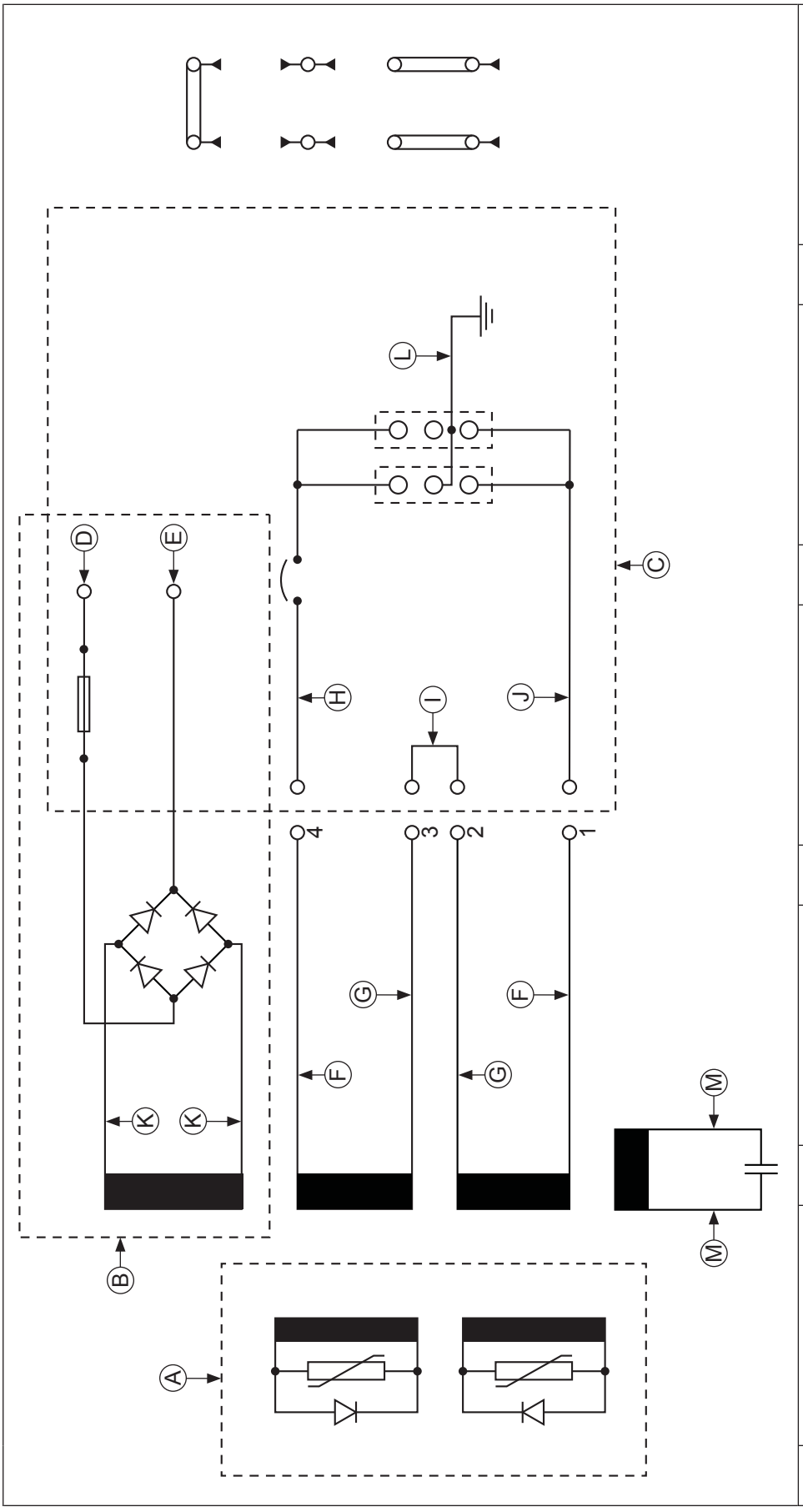


A	Starter Battery	B	Oil Temperature Sensor	C	Solenoid Valve	D	Starter Motor	E	Oil Pressure Switch
F	Alternator (Engine)	G	Voltage Regulator	H	Wires to Control Panel	I	Exterior of Engine	J	Engine
K	Pilot Light	L	MODYS	M	Alternator				

PRO 5.4 DES Control Panel Wiring Diagram



PRO 5.4 DES Alternator Wiring Diagram



A	Rotor	B	12V DC	C	Rear Cover	D	Negative	E	Positive
F	Black	G	White	H	Green	I	Yellow	J	Red
K	Blue	L	Yellow/Green	M	Red Thin				

Electrical System

⚠ WARNING

Accidental Starts can cause severe injury or death.

Disconnect and ground spark plug lead(s) before servicing.

Before working on engine or equipment, disable engine as follows: 1) Disconnect spark plug lead(s). 2) Disconnect negative (–) battery cable from battery.

Do not allow children to operate generator.

⚠ CAUTION

Electrical Shock can cause injury.

Do not touch wires while generator is running.

Never operate generator in rain or snow.

Never touch generator with wet hands or electrical shock may occur.

Test Control Panel

Remove control panel from control panel frame. Test each component and wiring.

Disassembly

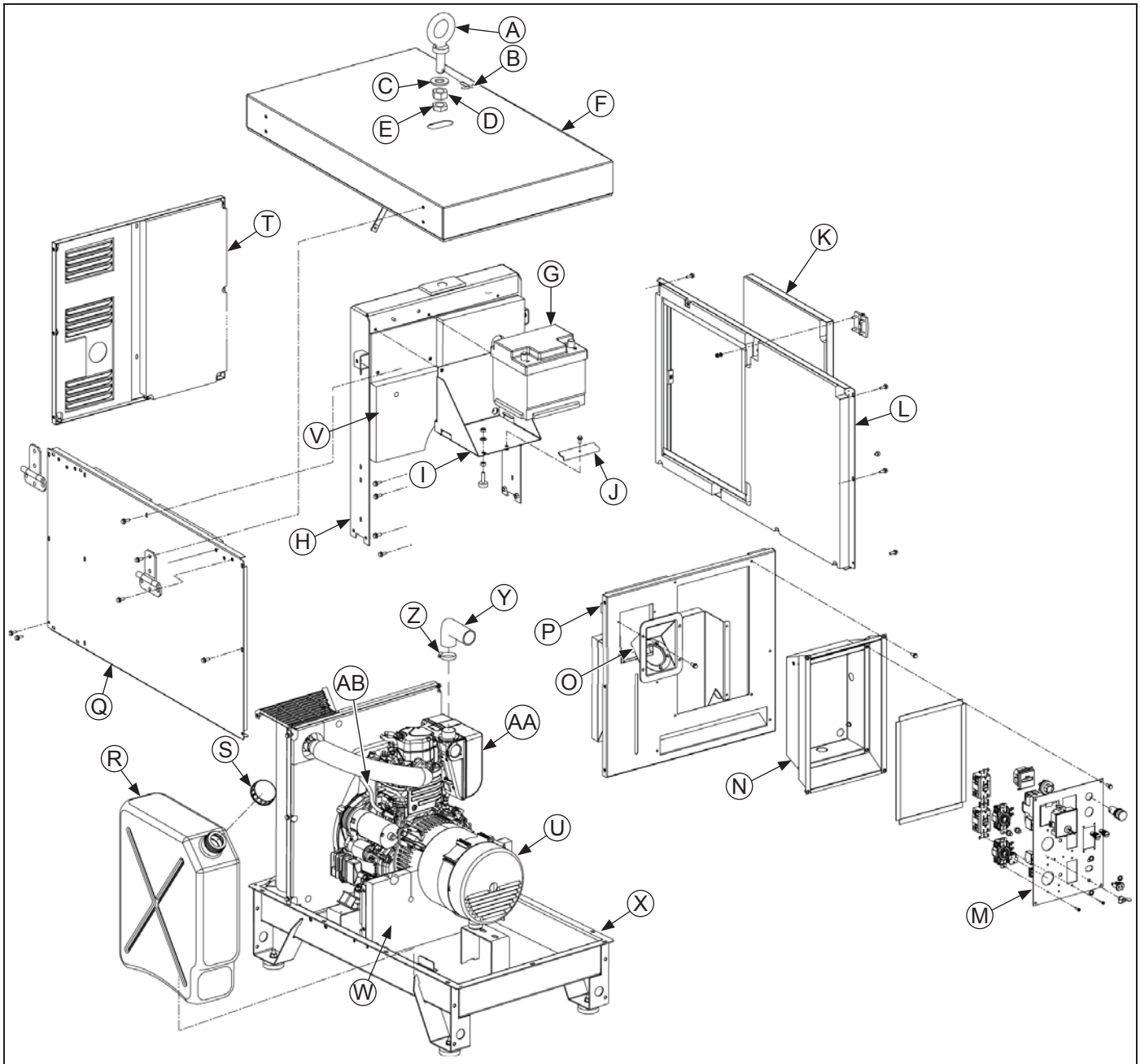
1. Remove end cover and disconnect wire terminals.
2. Remove control panel.
3. After disconnecting individual wires, remove control panel components.

Reassembly

NOTE: Circuit diagrams provide colored wires used for easy identification. To replace wires, use heat-resistant type wires (permissible temperature range 75°C (167°F) or over) and same gauge of wire that is removed.

1. Install receptacles, circuit breakers, sockets, switches, etc. on control panel.
2. Connect wires to control panel components.
3. Assemble wire terminals to wiring board.
4. Assemble end cover to rear cover. Torque screws to 4.0 N·m (35 in. lb.).
5. Attach control panel and control box to frame.

PRO 5.4 DES Components



A	Lifting Ring	**B**	Cotter Pin	**C**	Washer	**D**	Nut
E	Jam Nut	**F**	Cover	**G**	Battery	**H**	Lifting Ring Frame
I	Battery Tray	**J**	Battery Clamp	**K**	Door	**L**	Door Panel
M	Control Panel	**N**	Control Panel Frame	**O**	Fuel Tank Shroud	**P**	Front Panel
Q	Side Panel	**R**	Fuel Tank	**S**	Fuel Tank Cap	**T**	Back Panel
U	Alternator Cover	**V**	Upper Alternator Baffle	**W**	Lower Alternator Baffle	**X**	Retention Container
Y	Intake Air Tube	**Z**	Hose Clamp	**AA**	Air Cleaner	**AB**	Return Fuel Hose

⚠ WARNING

Accidental Starts can cause severe injury or death.

Disconnect and ground spark plug lead(s) before servicing.

Before working on engine or equipment, disable engine as follows: 1) Disconnect spark plug lead(s). 2) Disconnect negative (–) battery cable from battery.

Do not allow children to operate generator.

Be sure to memorize location of individual parts when disassembling generator so that generator can be reassembled correctly. Tag disassembled part with necessary information to facilitate easier and smoother reassembly.

For more convenience, divide parts into several groups and store them in boxes.

To prevent screws from being misplaced or installed incorrectly, replace them temporarily to their original position.

Handle disassembled parts with care; clean them before reassembly using a neutral cleaning fluid.

Remove battery before disassembling generator.

Be sure to attach foam rubber linings inside covers on their original position when reassembling generator. When deformation or damage of foam rubber lining is found, replace it with new part. Failure to do so will result in poor performance and durability of generator.

Tie wires and fuel hoses using cable ties as they were in original configuration.

When installing screws, hand tighten at first before using tools to avoid cross threading and potentially breaking rivet nuts loose from frame.

Remove Cover

1. With cover open, remove screws securing grounding cable and remove cable. Close cover.
2. Remove screws securing cover.
3. Remove cover.

Remove Side Panel

1. Remove all screws securing side panel.
2. Remove side panel.

Remove Back Panel

1. Remove all screws securing back panel.
2. Remove back panel.

Remove Door Panel

1. Remove all screws securing door panel.
2. Remove door panel.

Remove Battery Tray

NOTE: Removal of battery tray is not necessary for servicing engine or alternator.

1. Remove screws securing battery tray to lifting ring frame and upper alternator baffle.
2. Remove battery tray.

Remove Intake Air Tube

1. Loosen hose clamp securing intake air tube to alternator baffle.
2. Remove intake air tube from air cleaner and upper alternator baffle.

Remove Lifting Ring Frame

NOTE: Lifting ring frame and upper alternator baffle are secured together with screws. Unless either need replacing, disassembly is not necessary.

1. Remove screws securing lifting ring frame to retention container and lower alternator baffle.
2. Remove return fuel hose from fuel tank and pull through upper alternator baffle. Transfer any remaining fuel into an approved container.
3. Remove lifting ring frame and upper alternator baffle as an assembly.

Remove Upper Alternator Baffle

NOTE: Removal of upper alternator baffle from lifting ring frame is not necessary for servicing engine or alternator.

1. Remove screws securing upper alternator baffle to lifting ring frame.
2. Remove upper alternator baffle from lifting ring frame.

Remove Lifting Ring

NOTE: Removal of lifting ring is not necessary for servicing engine or alternator.

1. Remove cotter pin.
2. Remove jam nut, nut and washer.
3. Remove lifting ring.

Remove Front Panel

⚠ CAUTION

Electrical Shock can cause injury.

Do not touch wires while engine is running.

Never operate generator in rain or snow.

Never touch generator with wet hands or electrical shock may occur.

NOTE: Removal of control panel and control panel frame from front panel is not necessary for servicing engine or alternator.

NOTE: When removing front panel, write down wire colors and locations to aid in reassembly.

1. Remove screws securing control panel frame to front panel. Lay control panel frame in generator to allow access to alternator.
2. Disconnect 9 pin connector from engine to control panel.
3. Loosen screws securing alternator cover. Twist alternator cover slightly and remove alternator cover.
4. Disconnect 2 wire terminals from alternator cover to rectifier.
5. Remove screw securing ground wire to rear cover.
6. Disconnect 4 pin connector from alternator cover to alternator.
7. Remove both control panel frame with wire harness and alternator cover as an assembly.
8. To access inside control panel, remove screws securing control panel frame to control panel.
9. Remove fuel tank cap.
10. Remove screws securing front panel and remove front panel.
11. Replace fuel tank cap.

Remove Fuel Tank

⚠ WARNING

Fuel can cause fires and severe burns.

Do not fill fuel tank while engine is hot or running.

Fuel is flammable and its vapors can ignite. Store fuel only in approved containers, in well ventilated, unoccupied buildings. Do not fill fuel tank while engine is hot or running, since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start engine near spilled fuel. Never use fuel as a cleaning agent.

⚠ WARNING

High Pressure Fluids can puncture skin and cause severe injury or death.

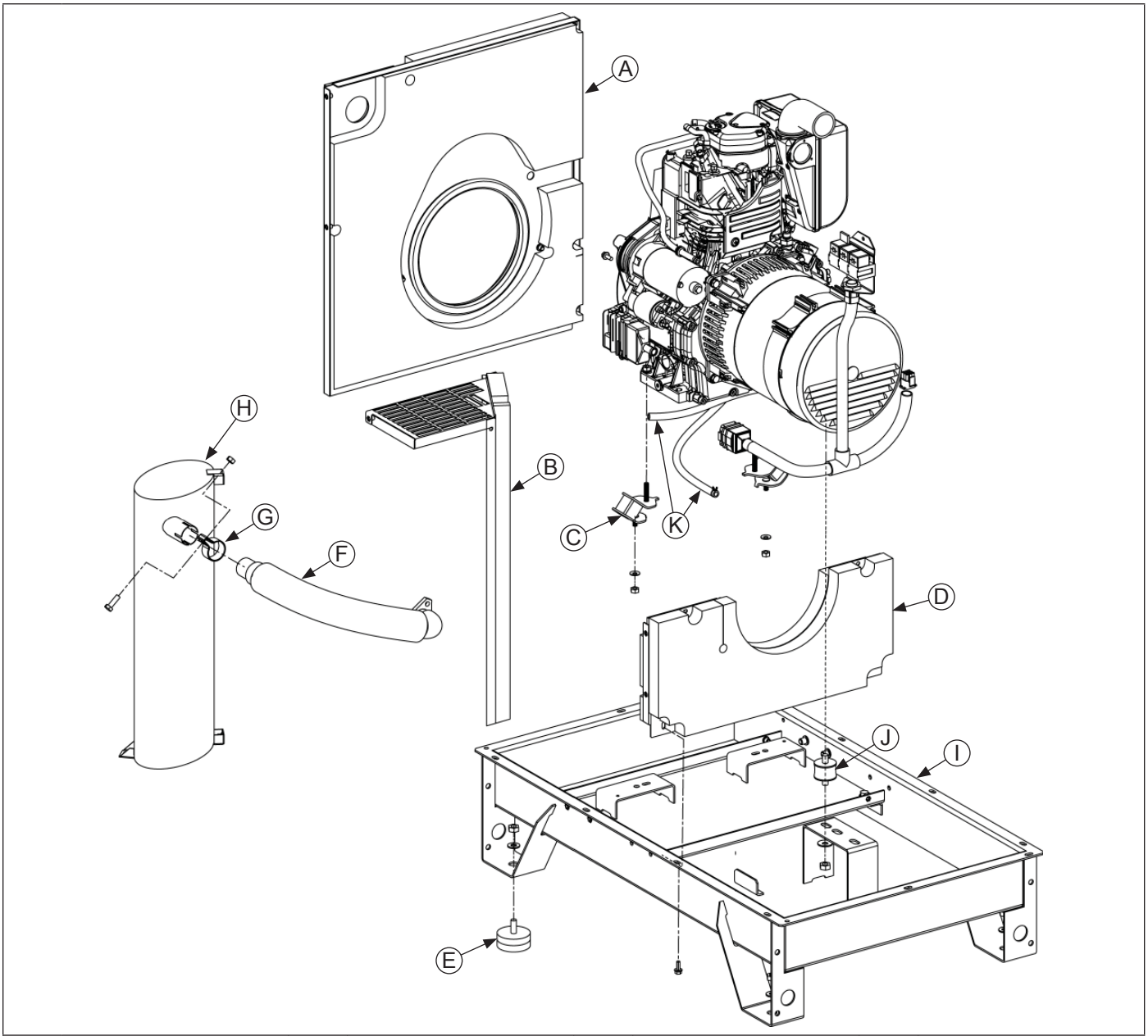
Do not work on fuel system without proper training or safety equipment.

Fluid puncture injuries are highly toxic and hazardous. If an injury occurs, seek immediate medical attention.

NOTE: Transfer any remaining fuel into an approved container.

1. Close fuel valve and remove fuel hoses from top and bottom of fuel tank.
2. Lift out fuel tank and place in a well ventilated area.

PRO 5.4 DES Components



A	Engine Baffle	**B**	Muffler Shield	**C**	Engine Mount	**D**	Lower Alternator Baffle
E	Isolator Mount	**F**	Exhaust Pipe	**G**	Muffler Clamp	**H**	Muffler
I	Retention Container	**J**	Alternator Mount	**K**	Fuel Hose		

Remove Muffler and Muffler Shield

1. Remove screws securing muffler to muffler shield.
2. Loosen muffler clamp.
3. Remove muffler.
4. Remove screws securing muffler shield to engine baffle.
5. Remove muffler shield.
6. Remove screws securing exhaust pipe to engine, and remove exhaust pipe.

Remove Engine and Alternator

At this point engine and alternator can be removed as a unit to further disassemble or alternator can be removed from engine for disassembly. To remove engine and alternator as a unit, follow next few steps, otherwise continue to Remove Stator.

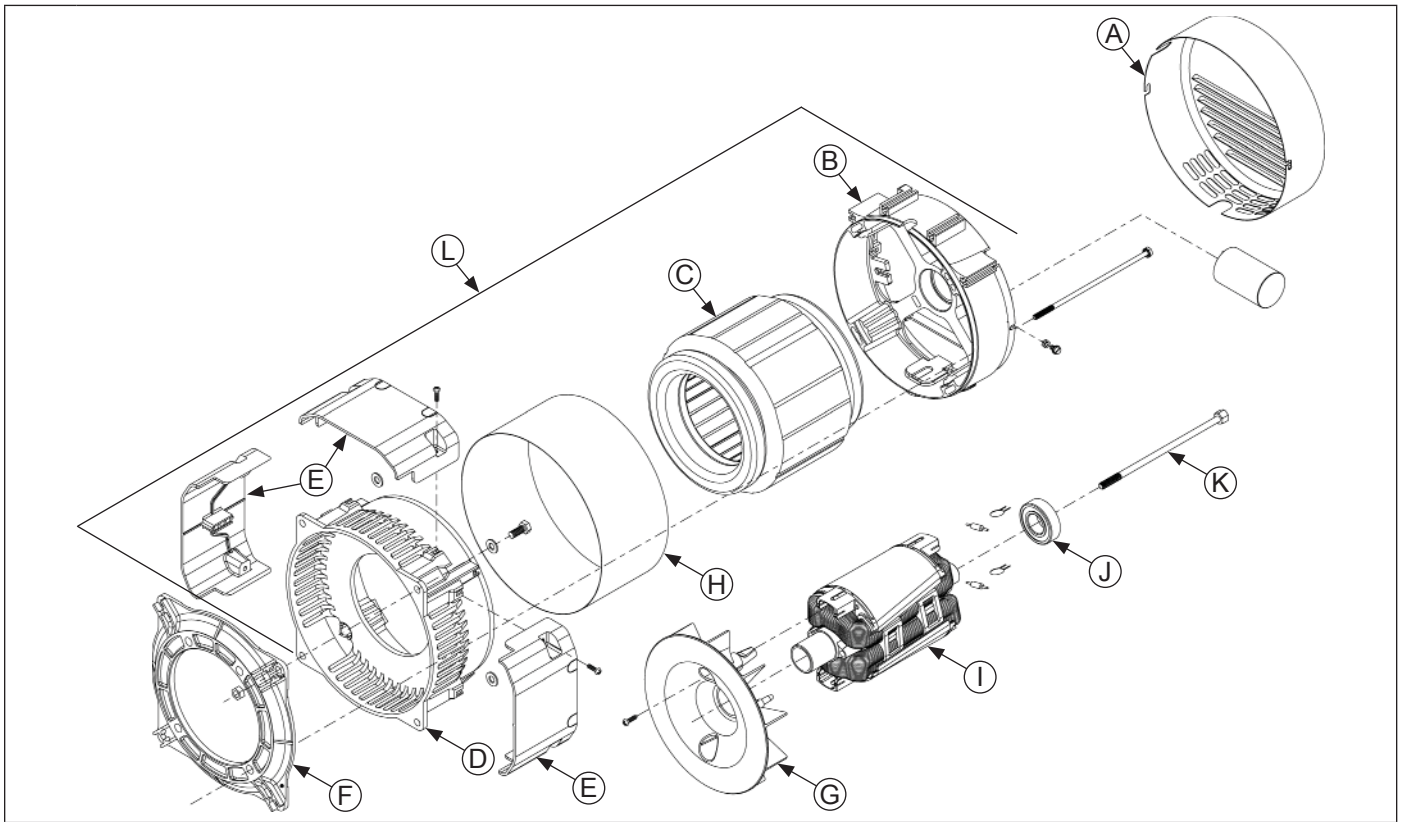
1. Remove nuts securing engine mounts.
2. Remove nut securing alternator mount.
3. Lift engine and alternator off retention container.

Remove Isolator Mounts (if required)

NOTE: Removal of isolator mounts is not necessary for servicing engine or alternator.

Remove nuts and washers securing isolator mounts, and remove isolator mounts.

PRO 5.4 DES Alternator



A	End Cover	**B**	Rear Cover	**C**	Stator	**D**	Front Cover
E	Front Cover Shield	**F**	Engine Adapter	**G**	Fan	**H**	Stator Cover
I	Rotor	**J**	Bearing	**K**	Through Bolt	**L**	Stator Assembly

Remove Stator

NOTE: Take care not to damage stator coil and rotor coil when removing/installing them.

NOTE: Place stator core side down. Do not set stator on coil end. Coils may be damaged.

NOTE: Stator is heavy; be prepared to handle weight to maneuver for inspection and service.

NOTE: If disassembling stator assembly, draw a line or mark on front cover, stator cover and rear cover for proper alignment in reassembly.

1. Remove through bolt from rotor.
2. Loosen alternator mount on rear cover and remove.
3. Remove screws securing front cover to engine adapter. Use a gear puller to remove stator assembly. Stator assembly will be heavy.
4. Replace through bolt into rotor, but do not tighten.
5. Stator assembly can be disassembled further:
   a. Place stator assembly vertically with front cover down on work surface.
   b. Remove screws from rear cover and remove rear cover, stator cover and stator.
6. Inspect parts for cracks. Replace if cracked.

Remove Rotor

1. Place a wooden block or similar material under rotor to support weight as rotor is removed.
2. With a rubber mallet, tap rotor a few times. Rotor should break free from engine shaft. Remove through bolt and remove rotor.
3. Inspect fan and rotor for cracks. Replace if cracked.

Remove Engine Adapter (if required)

1. Remove screws securing engine adapter, and remove engine adapter.
2. Inspect engine adapter for cracks. Replace if cracked.

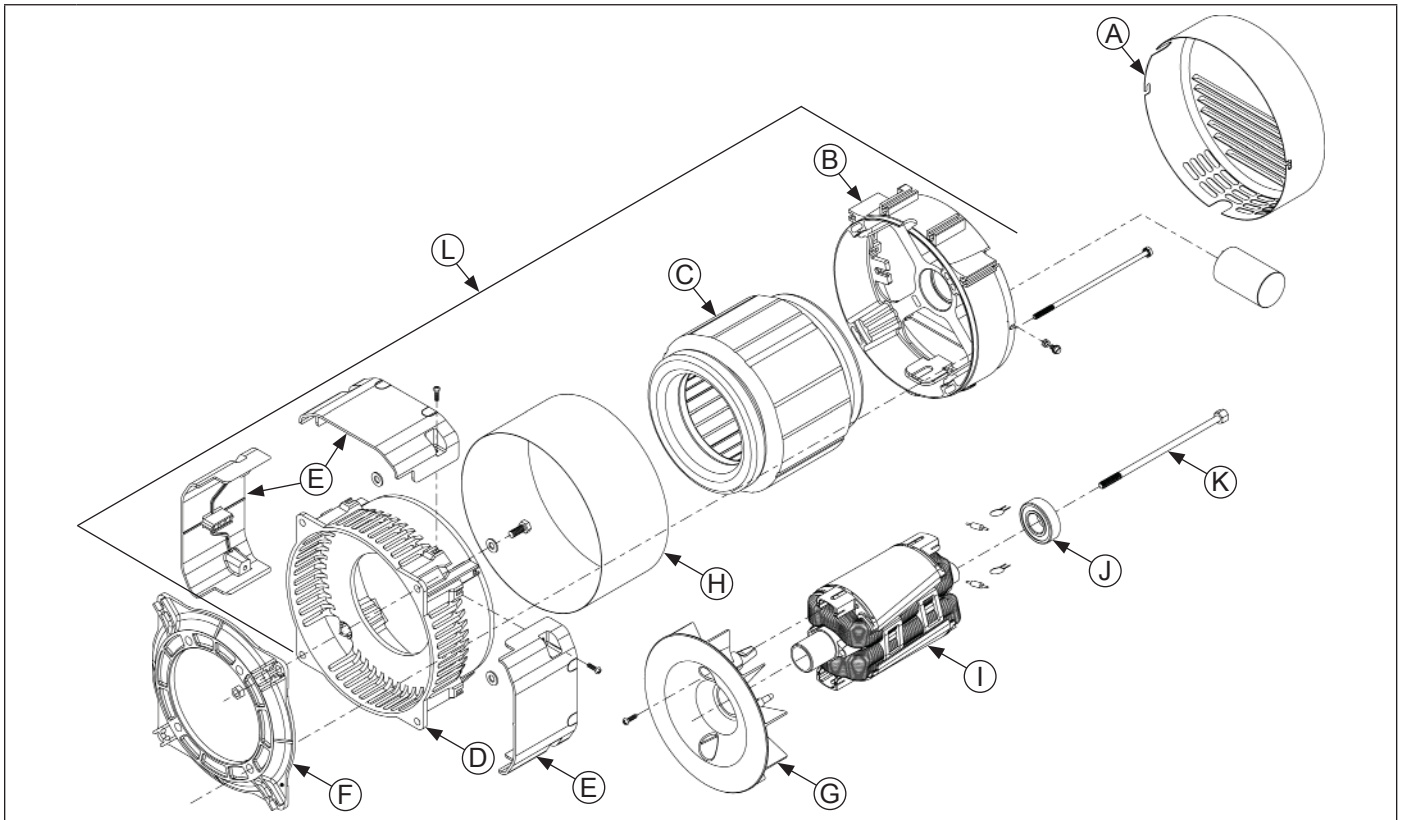
Remove Engine Baffle

1. Remove screws securing engine baffle and pull fuel hose through engine baffle.
2. Tilt slightly away from engine to dislodge retractable starter and remove engine baffle.

Remove Lower Alternator Baffle

1. Remove screws securing lower alternator baffle and pull fuel hose through lower alternator baffle.
2. Tilt slightly away from engine and remove lower alternator baffle.

PRO 5.4 DES Alternator



A	End Cover	**B**	Rear Cover	**C**	Stator	**D**	Front Cover
E	Front Cover Shield	**F**	Engine Adapter	**G**	Fan	**H**	Stator Cover
I	Rotor	**J**	Bearing	**K**	Through Bolt	**L**	Stator Assembly

If alternator was removed from engine, and engine was not removed, it may be necessary to perform Install Lower Alternator Baffle before installing alternator.

Install Engine Adapter (if required)

Install engine adapter to engine main bearing cover with screws. Torque to 27.1 N·m (240 in. lb.).

Install Rotor

NOTE: Before installing rotor make sure crankshaft taper and rotor are clean, dry, and completely free of any lubricants. Presence of lubricants can cause rotor to be over stressed and damaged when screw is torqued to specifications.

Mount rotor to engine shaft. Torque through bolt to 21.0 N·m (186 in. lb.).

Install Stator

NOTE: Install front cover, stator and rear cover as an assembly. If previously disassembled, reassemble before installing.

If stator assembly was disassembled:

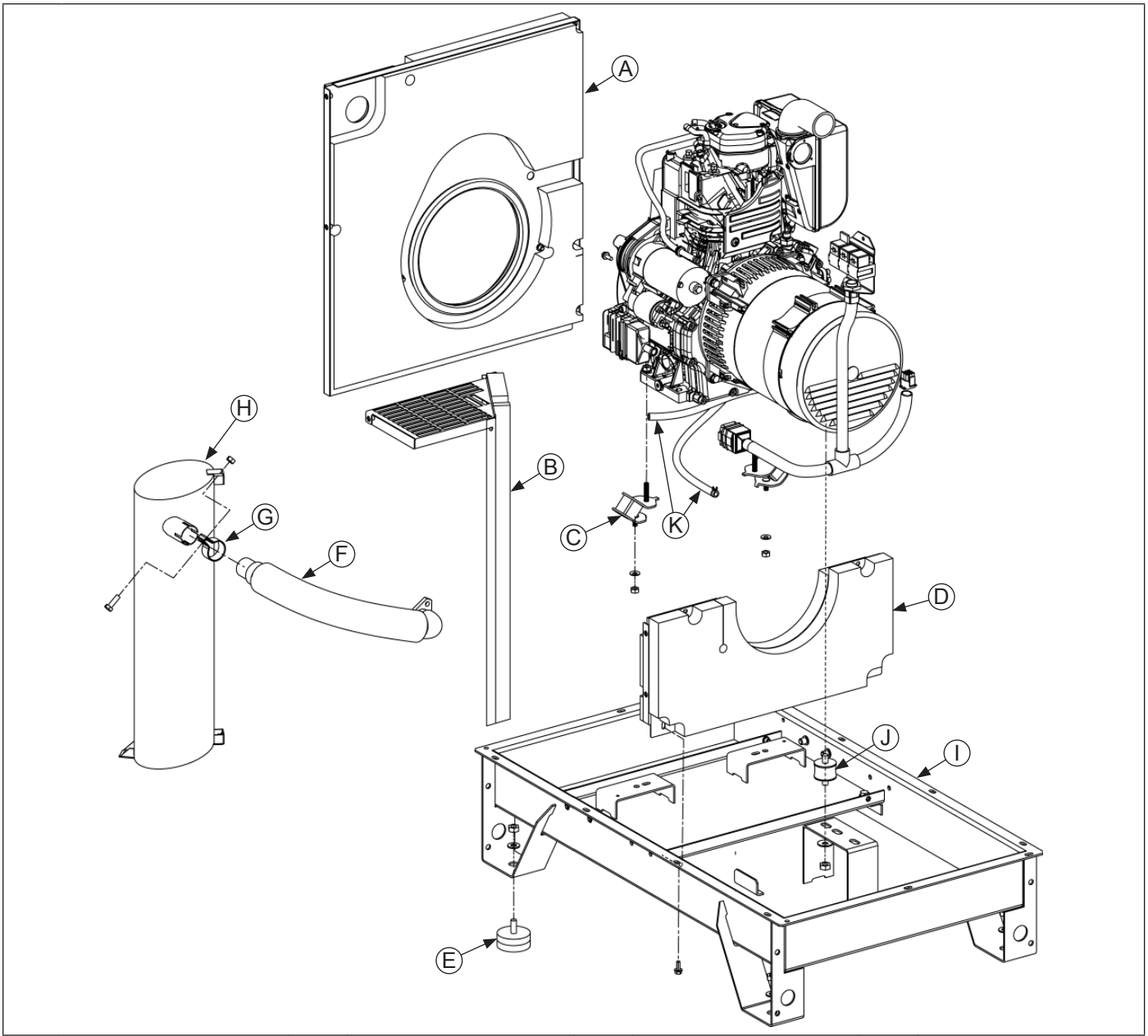
1. Place front cover on work surface with engine side down.
2. Place stator on front cover with wires up.
3. Place stator cover over stator and seat into front cover.
4. Place rear cover on stator, seating stator cover into rear cover. Pull wires through rear cover.
5. Install screws into rear cover and torque to 21.0 N·m (186 in. lb.).
6. Push electrical connectors on capacitor making sure a good connection is made.
7. Position alternator mount onto rear cover and tighten securely.
8. Install stator assembly to engine adapter with screws, washers and nuts. Torque screws to 21.0 N·m (186 in. lb.).

If stator assembly was not disassembled:

1. Install stator assembly to engine adapter with screws, washers and nuts. Torque screws to 21.0 N·m (186 in. lb.).

Reassembly

PRO 5.4 DES Components



A	Engine Baffle	**B**	Muffler Shield	**C**	Engine Mount	**D**	Lower Alternator Baffle
E	Isolator Mount	**F**	Exhaust Pipe	**G**	Muffler Clamp	**H**	Muffler
I	Retention Container	**J**	Alternator Mount	**K**	Fuel Hose		

Install Isolator Mounts (if required)

Install isolator mounts to retention container with washers and nuts. Torque to 47.5 N·m (35 ft. lb.).

Install Lower Alternator Baffle

1. Position lower alternator baffle in retention container.
2. Push fuel hose through lower alternator baffle.
3. Install screws securing lower alternator baffle and torque screws to 9.0 N·m (79 in. lb.).

Install Engine and Alternator (if required)

If engine and alternator were removed as a unit in disassembly, install engine and alternator.

1. Lower engine and alternator, positioning engine mounts and alternator mount.
2. Install nuts securing mounts and torque to 13.6 N·m (120 in. lb.).

Install Engine Baffle

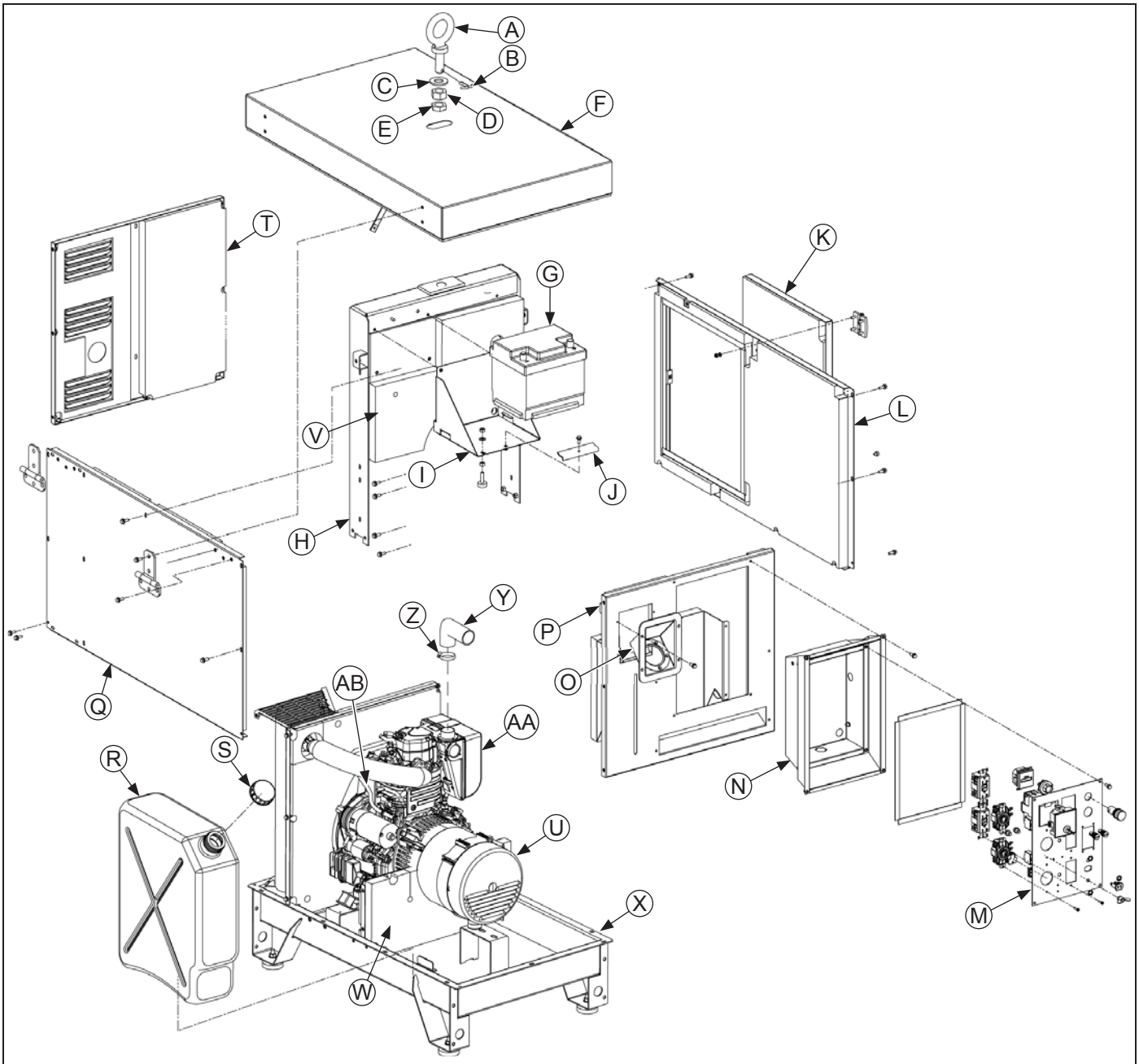
1. Position engine baffle in front of retractable starter and tilt towards engine to fit around retractable starter.
2. Push fuel hose through engine baffle.
3. Install screws securing engine baffle and torque screws to 9.0 N·m (79 in. lb.).

Install Muffler and Muffler Shield

1. Install exhaust pipe and secure with screws to engine. Torque to 9.0 N·m (79 in. lb.).
2. Install muffler shield and secure with screws. Torque to 9.0 N·m (79 in. lb.).
3. Install muffler to muffler shield and secure with screws. Torque to 9.0 N·m (79 in. lb.).
4. Position muffler clamp and tighten securely.

Reassembly

PRO 5.4 DES Components



A	Lifting Ring	**B**	Cotter Pin	**C**	Washer	**D**	Nut
E	Jam Nut	**F**	Cover	**G**	Battery	**H**	Lifting Ring Frame
I	Battery Tray	**J**	Battery Clamp	**K**	Door	**L**	Door Panel
M	Control Panel	**N**	Control Panel Frame	**O**	Fuel Tank Shroud	**P**	Front Panel
Q	Side Panel	**R**	Fuel Tank	**S**	Fuel Tank Cap	**T**	Back Panel
U	Alternator Cover	**V**	Upper Alternator Baffle	**W**	Lower Alternator Baffle	**X**	Retention Container
Y	Intake Air Tube	**Z**	Hose Clamp	**AA**	Air Cleaner	**AB**	Return Fuel Hose

Install Fuel Tank

⚠ WARNING

Fuel can cause fires and severe burns.

Do not fill fuel tank while engine is hot or running.

Fuel is flammable and its vapors can ignite. Store fuel only in approved containers, in well ventilated, unoccupied buildings. Do not fill fuel tank while engine is hot or running, since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start engine near spilled fuel. Never use fuel as a cleaning agent.

1. Place fuel tank on retention container.
2. Connect fuel hoses to top and bottom of fuel tank and position hose clamps.

Install Front Panel

⚠ CAUTION

Electrical Shock can cause injury.

Do not touch wires while engine is running.

Never operate generator in rain or snow.

Never touch generator with wet hands or electrical shock may occur.

1. Place control panel into control panel frame and secure with screws. Torque to 9.0 N·m (79 in. lb.).
2. Connect 9 pin connector from engine to control panel.
3. Connect 4 pin connector from alternator cover to alternator.
4. Connect 2 wire terminals from alternator cover to rectifier.
5. Secure ground wire with screw and washer to rear cover.
6. Align alternator cover notches to rear cover screws and press on. Turn slightly to lock in and tighten screws.
7. Remove fuel tank cap.
8. Align front cover and fuel tank, press fuel tank neck through rubber seal of front cover.
9. Replace fuel tank cap.
10. Secure front panel with screws and torque to 9.0 N·m (79 in. lb.).
11. Secure control panel frame to front panel with screws. Torque screws to 9.0 N·m (79 in. lb.).

Install Intake Air Tube

Position intake air tube onto air cleaner and secure with hose clamp.

Install Lifting Ring (if required)

1. Install lifting ring into lifting ring frame.
2. Install washer, nut and jam nut. Tighten jam nut to nut.
3. Insert cotter pin and bend ends.

Install Upper Alternator Baffle (if required)

1. Install upper alternator baffle to lifting ring frame.
2. Secure upper alternator baffle with screws and torque to 9.0 N·m (79 in. lb.).

Install Lifting Ring Frame

1. Place lifting ring frame in position on retention container.
2. Connect intake air tube.
3. Secure lifting ring frame with screws and torque to 9.0 N·m (79 in. lb.).

Install Battery Tray

Secure battery tray to lifting ring frame and upper alternator baffle with screws. Torque to 9.0 N·m (79 in. lb.).

Install Door Panel

NOTE: When installing door panel, it may be necessary to loosen front panel to align screw holes properly. If cross threading occurs, it may cause rivet nut to break loose.

Install door panel to retention container and secure door panel with screws and torque to 9.0 N·m (79 in. lb.).

Install Back Panel

NOTE: When installing back panel, it may be necessary to loosen door panel to align screw holes properly. If cross threading occurs, it may cause rivet nut to break loose.

Install back panel to retention container and secure back panel with screws and torque to 9.0 N·m (79 in. lb.).

Install Side Panel

NOTE: When installing side panel, it may be necessary to loosen front and back panels to align screw holes properly. If cross threading occurs, it may cause rivet nut to break loose.

Install side panel to retention container and secure side panel with screws and torque to 9.0 N·m (79 in. lb.).

Reassembly

Install Cover

1. Position cover on generator and secure to side panel with screws and torque to 9.0 N·m (79 in. lb.).
2. Install ground cable to cover and generator and tighten securely with screws.

Generator is now completely reassembled. Before starting or operating engine, be sure to follow steps below.

1. Make sure all hardware is tightened securely.
2. Turn on fuel supply.
3. Install battery and secure with battery clamp. Secure battery clamp with screw and torque to 9.0 N·m (79 in. lb.).
4. Start generator following starting instructions.
5. Check for proper voltage at receptacles.