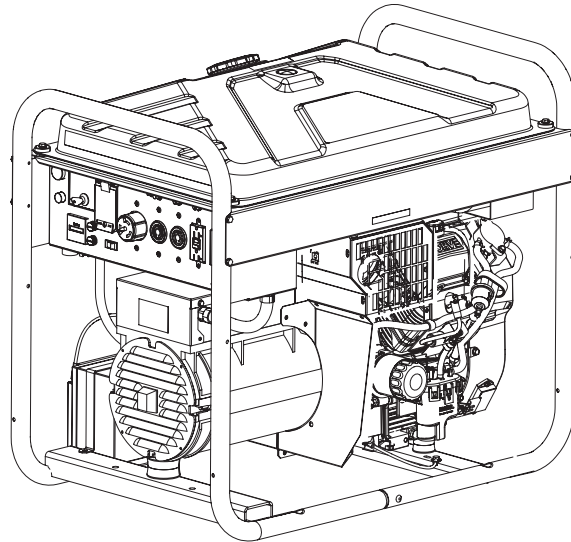


KOHLER®

PRO 12.3 EFI

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.


2	Safety
3	Specifications
6	Troubleshooting
9	Electrical System
17	Disassembly/Inspection and Service
22	Reassembly




Safety

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 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 Cleaning Solvents can cause severe injury or death. Use only in well ventilated areas away from ignition sources.
	Carburetor cleaners and solvents are extremely flammable. Follow cleaner manufacturer's warnings and instructions on its proper and safe use. Never use gasoline 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 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 engine is running.
	Never operate generator in rain or snow. Never touch generator with wet hands or electrical shock may occur.

	⚠ 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.

⚠ DANGER	
Using a generator indoors WILL 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.

Model	PRO12.3EFI
	PRO — Numerical Designation — Alpha Designation
Specification	PRO123EFI-3001
Serial	4323500328
	Year Manufactured Code — Factory Code
	<u>Code</u> <u>Year</u>
	43 2013
	44 2014
	45 2015

GENERAL SPECIFICATIONS¹

PRO 12.3 EFI

Overall Dimensions (L x W x H)	895 mm (35.2 in.) 570 mm (22.4 in.) 770 mm (30.3 in.)
Dry Weight	162 kg (306 lbs.)
AC Rated Power	10,500 Watt (120 Volts x 87.5 Amps) (240 Volts x 43.8 Amps)
AC Maximum Power	12,300 Watt (120 Volts x 102.5 Amps) (240 Volts x 51.3 Amps)
DC Rated Power	100 Watt (12 Volts x 8.3 Amps)
Fuel Tank	33.0 L (8.7 U.S. gal.)

TORQUE SPECIFICATIONS¹

PRO 12.3 EFI

Alternator Frame to Front Cover

Fastener	21.0 N·m (186 in. lb.)
----------	------------------------

Alternator Shield

Fastener	9.0 N·m (79 in. lb.)
----------	----------------------

Alternator Mount

Fastener	9.9 N·m (87 in. lb.)
----------	----------------------

Back Panel

Fastener	9.0 N·m (79 in. lb.)
----------	----------------------

Battery Bracket

Fastener	9.0 N·m (79 in. lb.)
----------	----------------------

Carbon Canister

Bracket Fastener	9.0 N·m (79 in. lb.)
Strap Fastener	9.0 N·m (79 in. lb.)

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

Specification

TORQUE SPECIFICATIONS¹

PRO 12.3 EFI

Control Panel

Fastener	9.0 N·m (79 in. lb.)
----------	----------------------

Engine Mount

Fastener	9.9 N·m (87 in. lb.)
----------	----------------------

Front Cover

Fastener	21.0 N·m (186 in. lb.)
----------	------------------------

Fuel Tank

Fastener	9.0 N·m (79 in. lb.)
----------	----------------------

Muffler Shield to Exhaust Studs

Retaining Nut	27.8 N·m (246 in. lb.)
---------------	------------------------

Muffler Shield

Fastener	9.0 N·m (79 in. lb.)
----------	----------------------

Rotor




Through Bolt	21.0 N·m (186 in. lb.)
--------------	------------------------

Side Rail






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						
Size	Property Class					Noncritical Fasteners Into Aluminum
						
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 windings 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 Specification

Unit	Ohms
Stator Winding	0.077
Rotor Winding	7.54
Exciter	0.44

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.

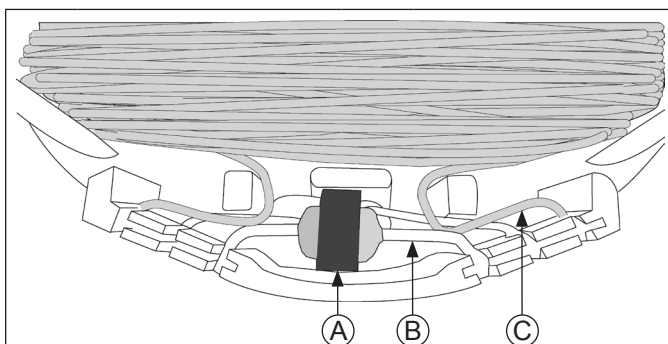
As rotor windings pass through magnetic flux of auxiliary winding, current flow is induced in rotor field windings. Diodes rectify this AC current flow to DC current flow which creates electromagnets at pole pieces on rotor. This rotor field then induces a voltage on stator windings. Just like a brush 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

- 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.
- 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.
- 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.
 - Using a screw driver, place it across both terminals of capacitor while unit is not running. This will discharge capacitor.
 - 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.
 - 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.
 - If meter maintains reading, indicating an open circuit or infinity, that means capacitor is open circuited. Capacitor is bad and should be replaced.
 - If meter goes to very low value and stays there, that means capacitor is short circuited. Capacitor is bad and should be replaced.
 - If capacitor checks out correctly then proceed to next step.
- 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.
 - 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.
 - Shut unit down and start it back up and see if output is good.
 - 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.
 - 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.

Troubleshooting

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 windings.
 - 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.

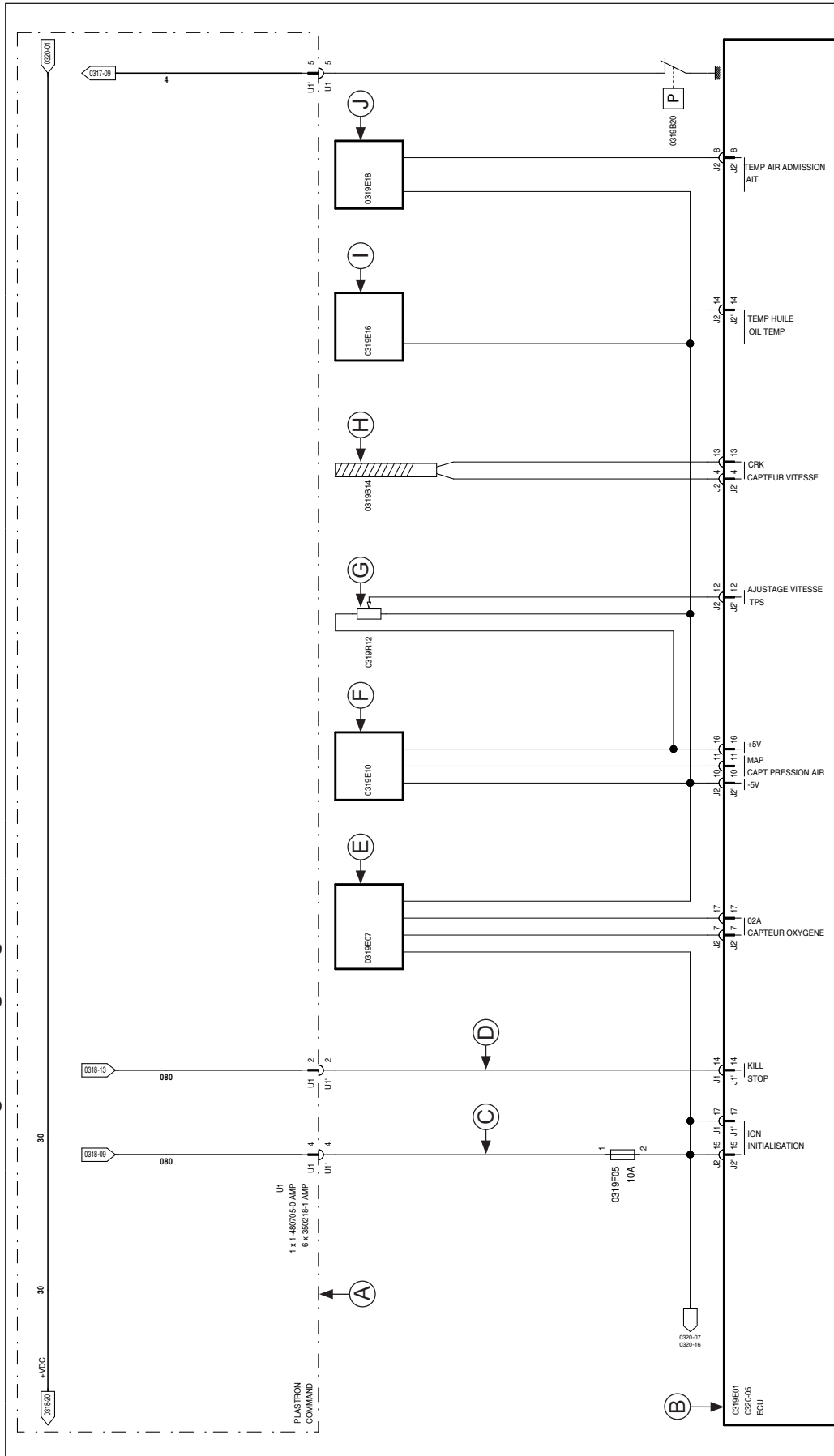
Alternator Can't Output Rated Power

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 stator and rotor 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.

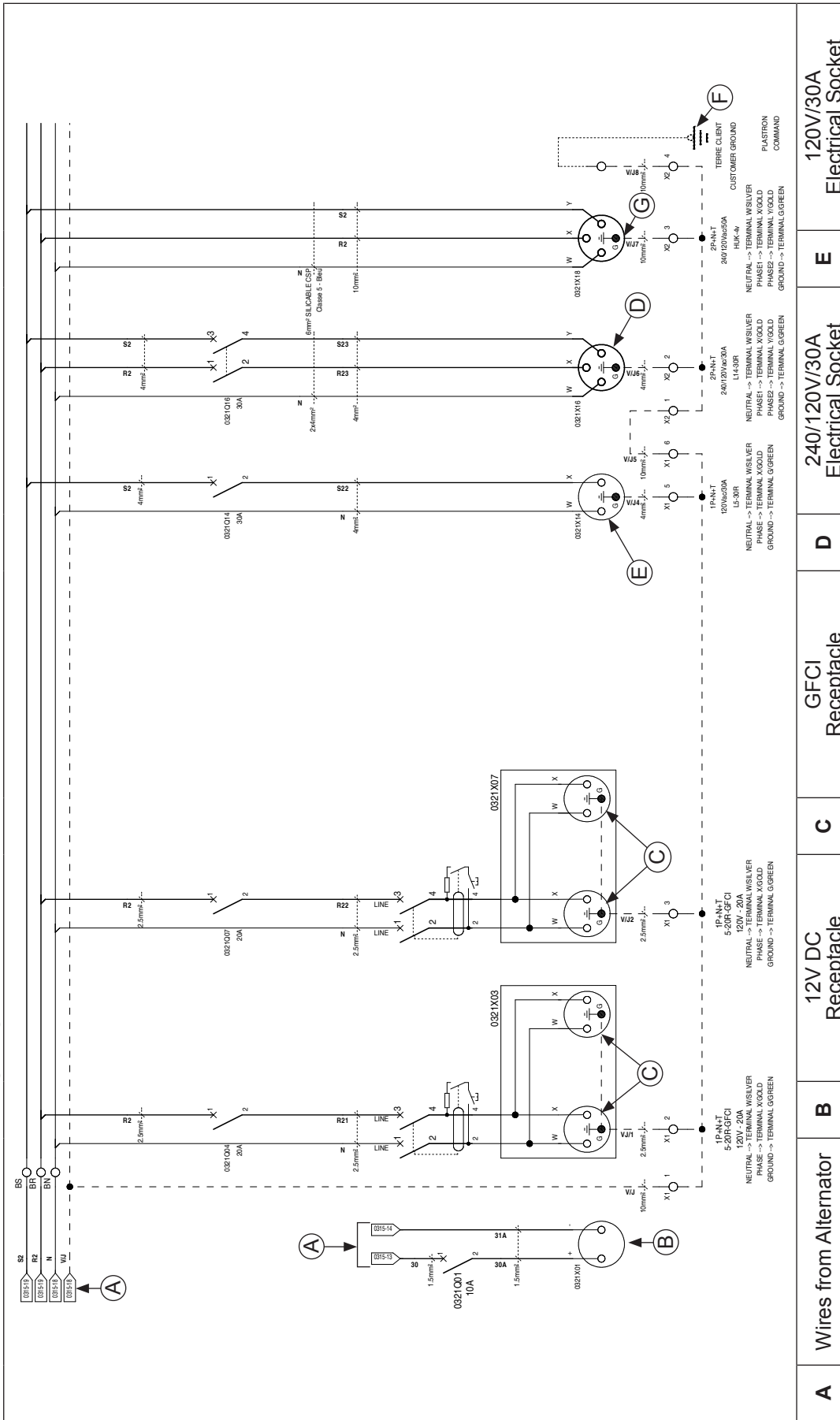
PRO 12.3 EFI Control Panel to Engine Wiring Diagram



A	Control Panel	B	ECU	C	Ignition	D	Kill Lead	E	Oxygen Sensor
F	Manifold Absolute Pressure Sensor	G	Throttle Position Sensor	H	Speed Sensor	I	Oil Temperature Sensor	J	Intake Air Temperature Sensor

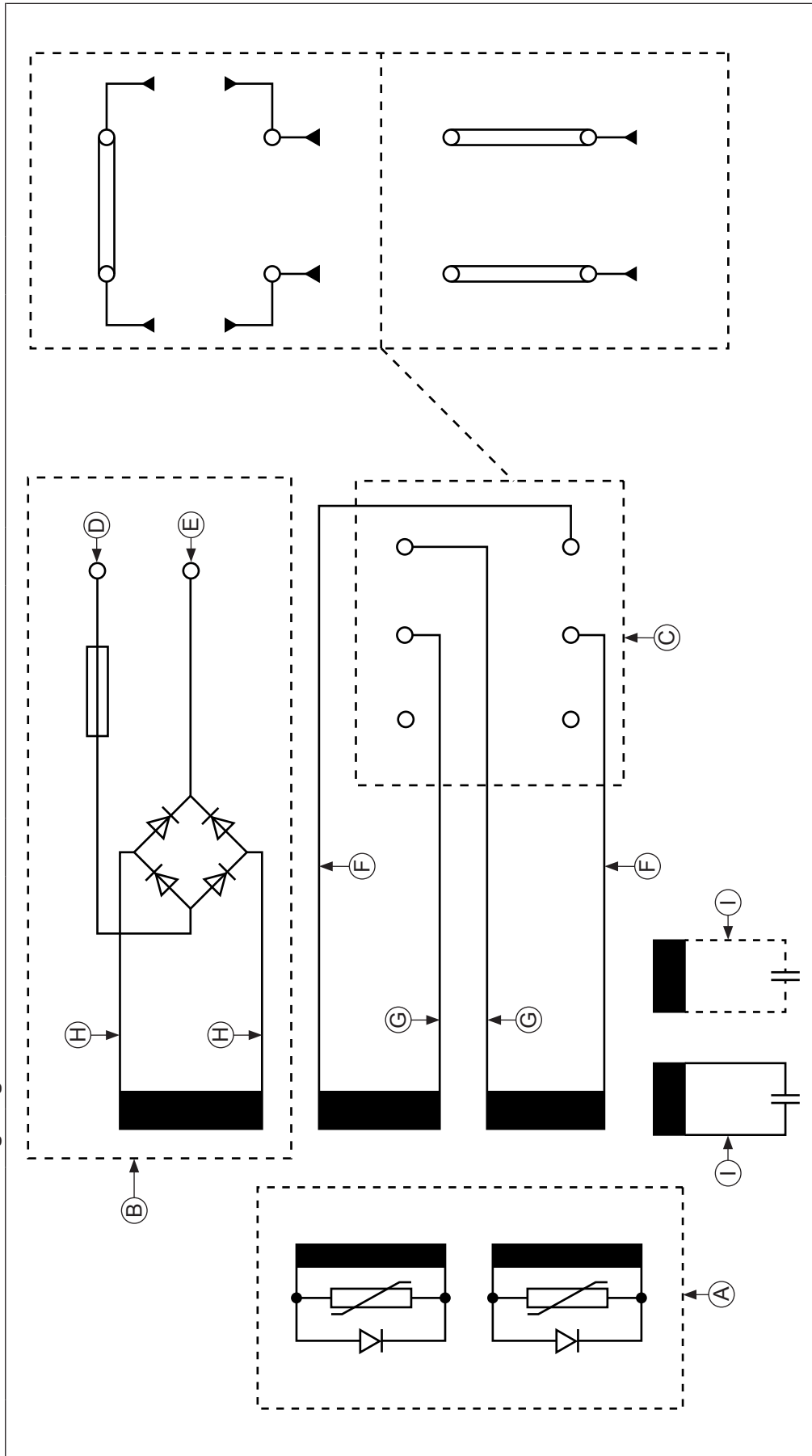
Electrical System

PRO 12.3 EFI Control Panel Wiring Diagram



A	Wires from Alternator	B	12V DC Receptacle	C	GFCI Receptacle	D	240/120V/30A Electrical Socket	E	120V/30A Electrical Socket
F	Ground Terminal	G	240/120V/50A Electrical Socket						

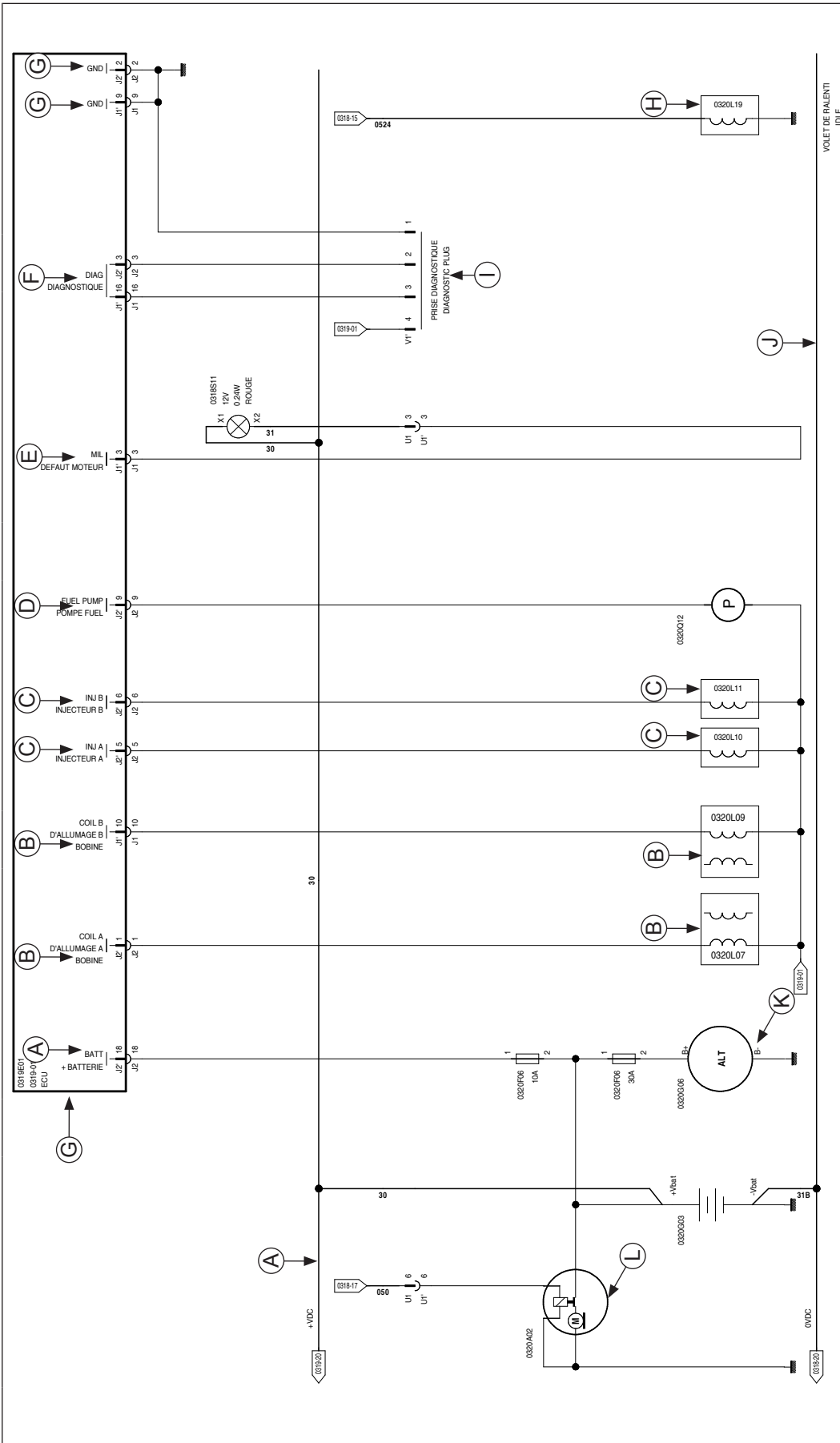
PRO 12.3 EFI Alternator Wiring Diagram



A	B	C	D	E	Positive
Rotor	12V DC	Alternator Box	D	Negative	
Black	White	Blue	I	Red Thin	
F	G	H			

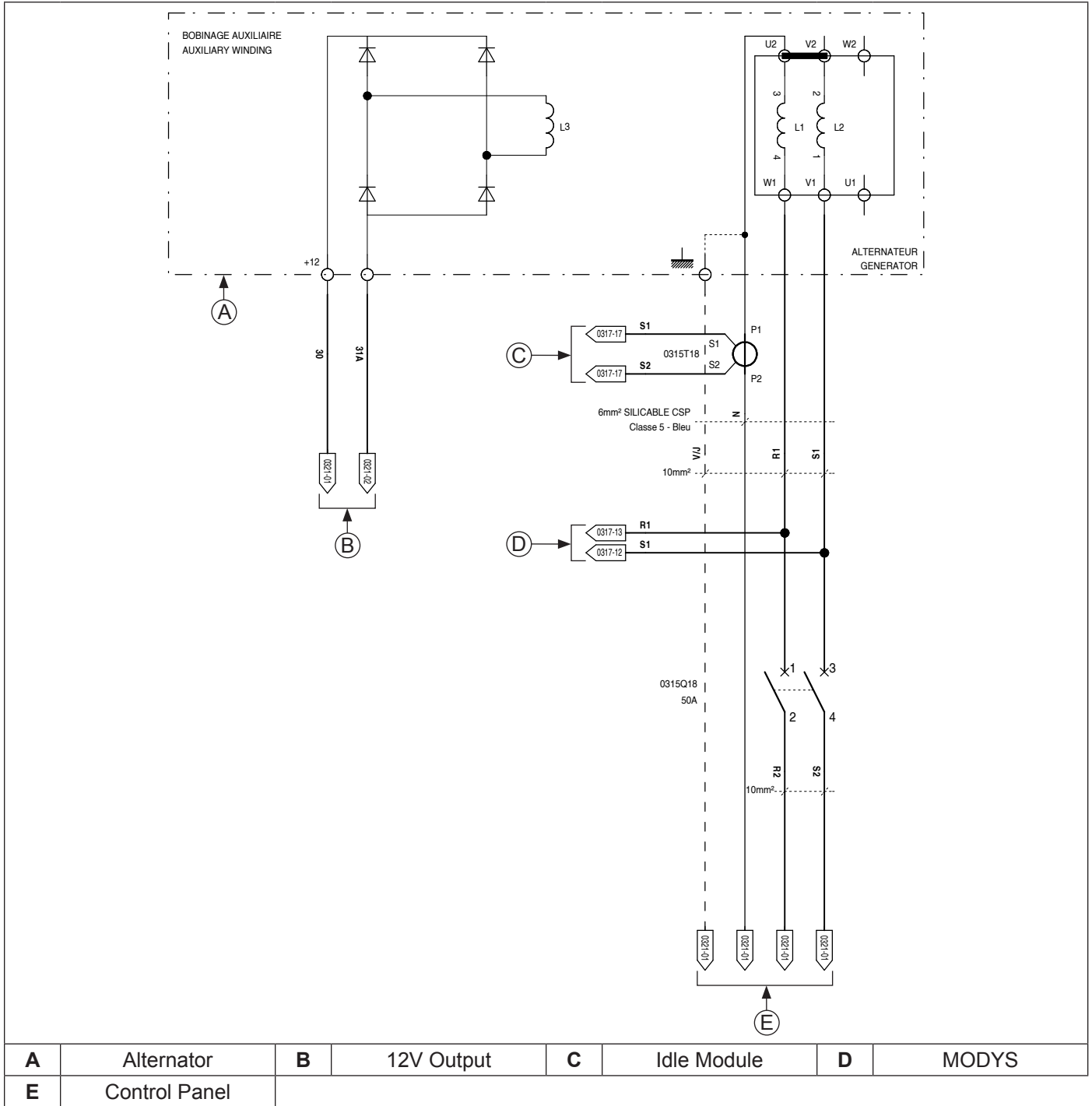
Electrical System

PRO 12.3 EFI Engine Output Wiring Diagram



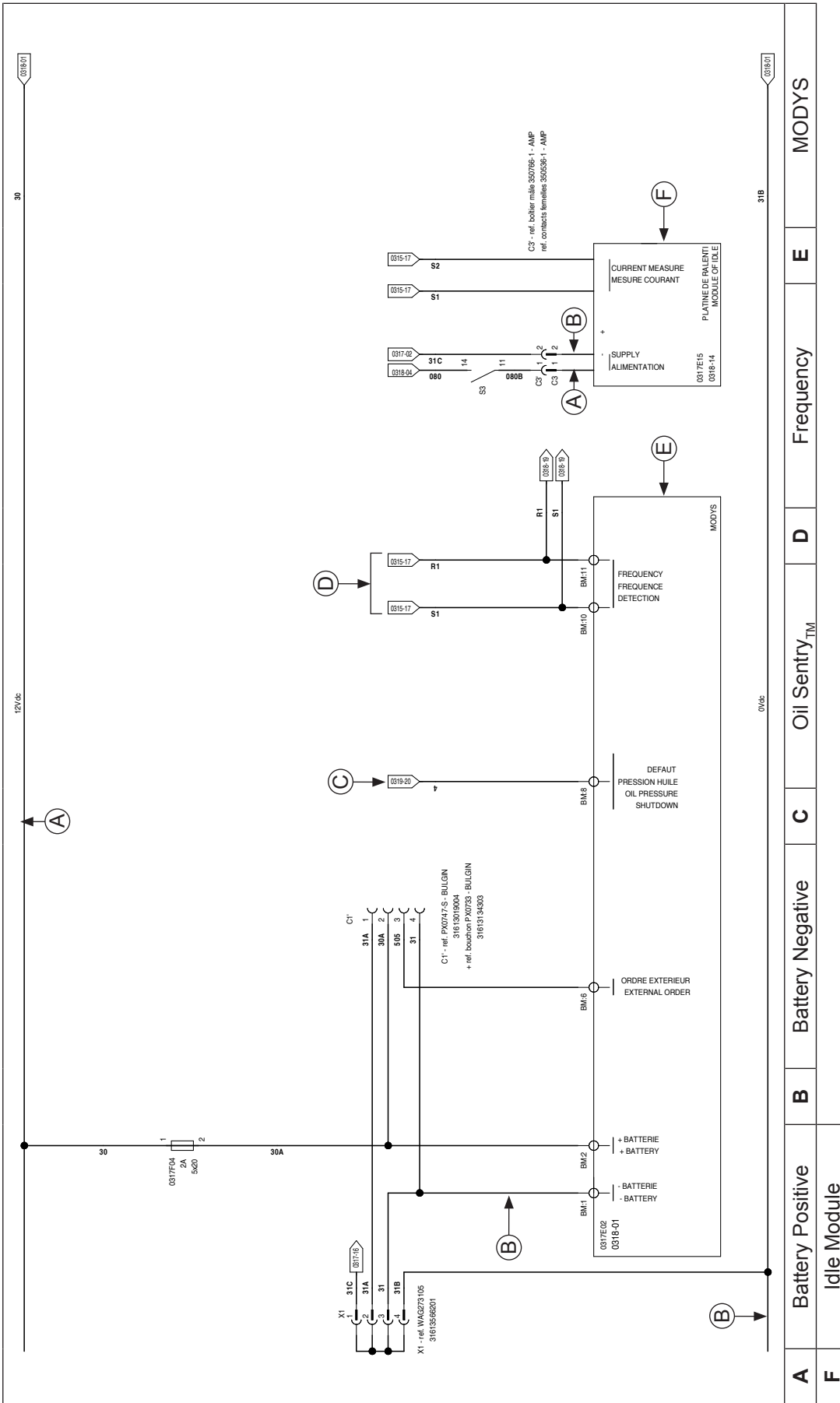
A	Battery Positive	B	Coil	C	Fuel Injector	D	Fuel Pump	E	Malfunction Indicator Light
F	Diagnostic	G	Ground	H	Idle Module	I	Diagnostic Plug	J	Battery Negative
K	Engine Alternator	L	Starter						

PRO 12.3 EFI Alternator Output Wiring Diagram



Electrical System

PRO 12.3 EFI MODYS Input Wiring Diagram



MODYS

Frequency

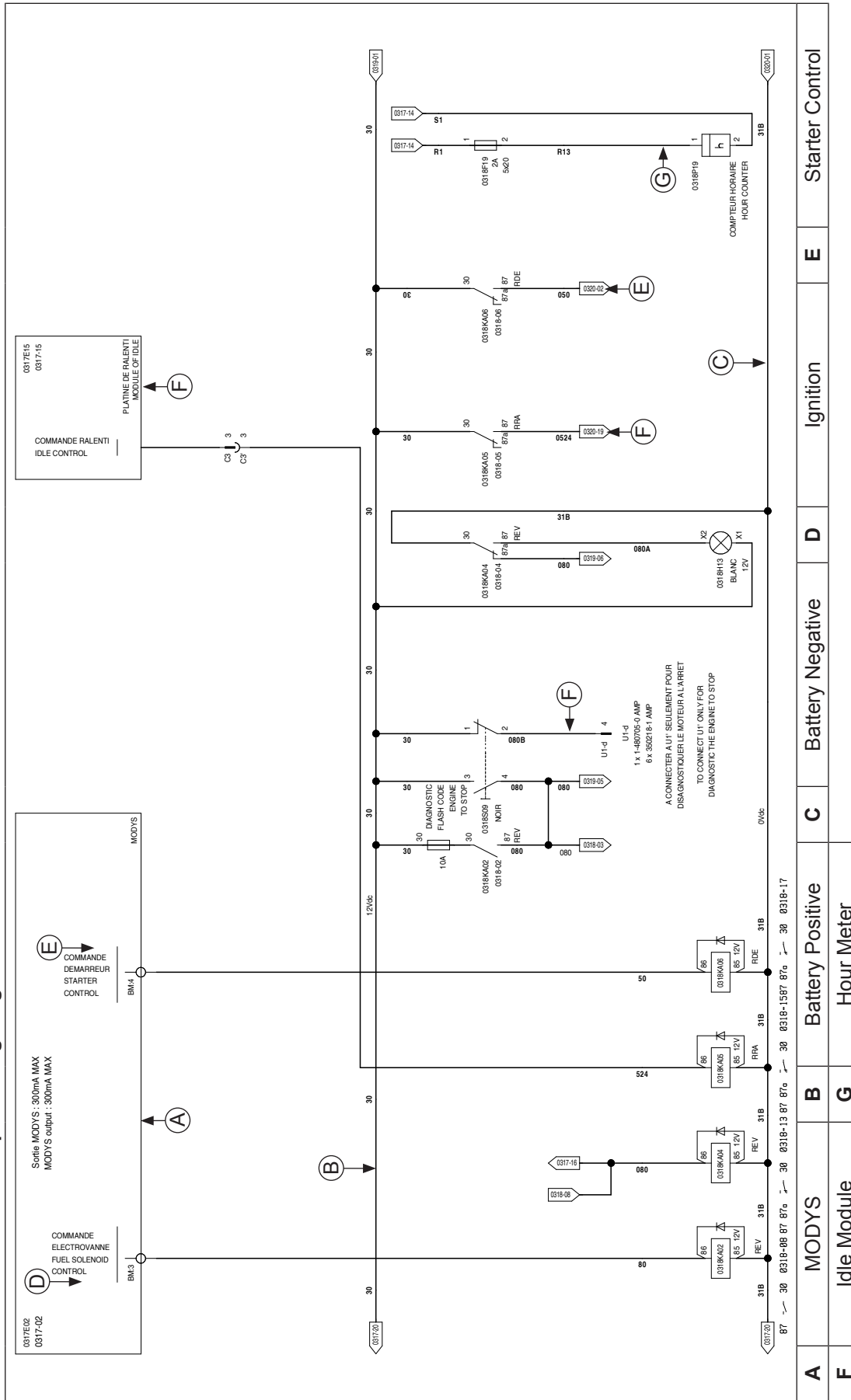
Oil Sentry™

Battery Negative




Battery Positive


Idle Module

PRO 12.3 EFI MODYS Output Wiring Diagram



Electrical System

  	⚠ WARNING	<p>Before working on engine or equipment, disable engine as follows: 1) Disconnect spark plug lead(s). 2) Disconnect negative (-) battery cable from battery.</p> <p>Do not allow children to operate generator.</p>
	<p>Accidental Starts can cause severe injury or death.</p> <p>Disconnect and ground spark plug lead(s) before servicing.</p>	

	⚠ CAUTION
	<p>Electrical Shock can cause injury.</p> <p>Do not touch wires while engine is running.</p>
<p>Never operate generator in rain or snow.</p> <p>Never touch generator with wet hands or electrical shock may occur.</p>	

Test Control Panel

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

Disassembly

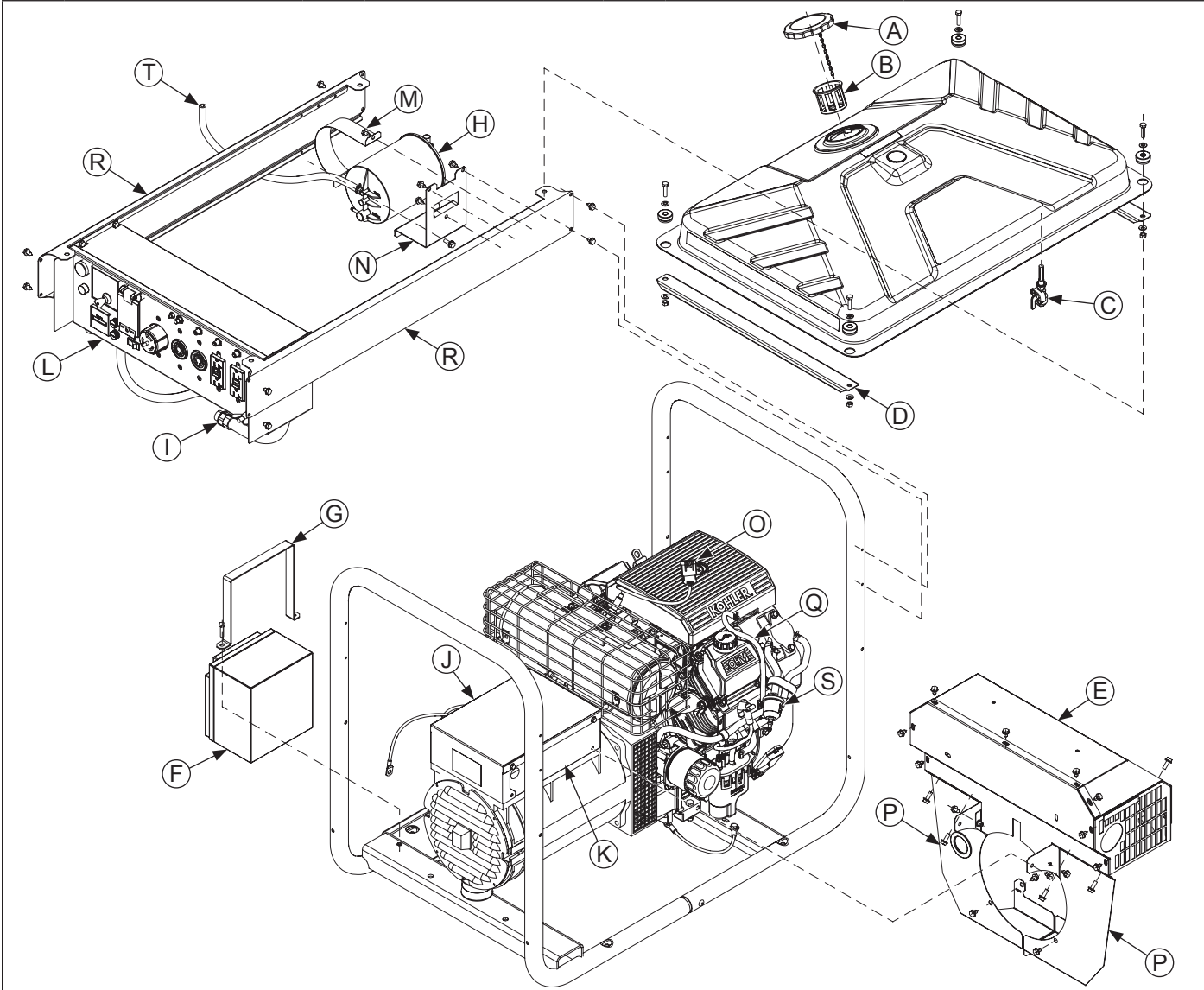
1. Remove screws securing alternator box cover to alternator box and remove alternator box cover.
2. Remove nuts securing alternator wires to wiring board inside alternator box.
3. Remove nut retaining pipe union to alternator box.
4. Replace alternator box cover to its original position.
5. Remove screws securing side rails to frame.
6. Lift side rails and control panel up from frame.
7. Remove screws securing back panel to control panel and remove back panel.
8. After disconnecting individual wires, remove control panel components.

Reassembly

NOTE: 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 back panel to control panel with screws. Torque to 9.0 N·m (79 in. lb.).
2. Secure side rails to frame with screws. Torque to 9.0 N·m (79 in. lb.).
3. Remove alternator box cover.
4. Guide wires from control panel into alternator box and place pipe union into alternator box.
5. Tighten nut to pipe union.
6. Place wire connectors onto wiring board.
7. Install nuts and tighten securely.
8. Replace alternator box cover and tighten securely with screws.

PRO 12.3 EFI Components



A	Fuel Tank Cap	B	Fuel Filter	C	Fuel Valve	D	Fuel Tank Support
E	Muffler Shield	F	Battery	G	Battery Bracket	H	Carbon Filter
I	Pipe Union	J	Alternator Box Cover	K	Alternator Box	L	Control Panel
M	Carbon Canister Strap	N	Carbon Canister Bracket	O	Oxygen Sensor Connector	P	Alternator Shield
Q	Fuel Hose	R	Side Rail	S	Fuel Filter	T	Carbon Canister Hose

Disassembly/Inspection and Service

  	 WARNING	<p>Before working on engine or equipment, disable engine as follows: 1) Disconnect spark plug lead(s). 2) Disconnect negative (-) battery cable from battery.</p> <p>Do not allow children to operate generator.</p>
	<p>Accidental Starts can cause severe injury or death.</p> <p>Disconnect and ground spark plug lead(s) before servicing.</p>	

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 Alternator Wires

	 CAUTION
	<p>Electrical Shock can cause injury.</p> <p>Do not touch wires while engine is running.</p>
<p>Never operate generator in rain or snow.</p> <p>Never touch generator with wet hands or electrical shock may occur.</p>	



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



1. Remove screws securing alternator box cover to alternator box and remove alternator box cover.
2. Remove nuts securing alternator wires to wiring board inside alternator box.
3. Remove nut retaining pipe union to alternator box.
4. Replace alternator box cover to its original position.

Remove Wire Connector to Engine

Disconnect 6 pin wire connector from control panel to engine.

Remove Fuel Tank

	 WARNING
	<p>Fuel can cause fires and severe burns.</p> <p>Do not fill fuel tank while engine is hot or running.</p>
<p>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.</p>	

	 WARNING
	<p>High Pressure Fluids can puncture skin and cause severe injury or death.</p> <p>Do not work on fuel system without proper training or safety equipment.</p>
<p>Fluid puncture injuries are highly toxic and hazardous. If an injury occurs, seek immediate medical attention.</p>	

1. Close fuel valve. Remove fuel hose from fuel filter. Transfer any remaining fuel into an approved container.
2. Disconnect fuel hose from fuel valve.
3. Disconnect hose to fuel tank from carbon canister.
4. Remove nuts, washers and fuel tank support from fuel tank, and remove fuel tank.

Remove Muffler Shield

NOTE: Muffler shield can be removed as an assembly. Disassembly of muffler shield is not necessary unless a part is cracked or bent.

1. Disconnect wire connector to engine from oxygen sensor.
2. Remove screws securing alternator shield to alternator box.
3. Remove screws securing alternator shields to front cover.
4. Remove screws attaching alternator shield to muffler shield.
5. Remove screws securing alternator shields together and remove alternator shields.
6. Remove screws securing muffler shield to muffler.
7. Remove nuts securing muffler shield to exhaust studs.
8. Remove muffler shield.

Remove Side Rails and Control Panel

NOTE: Removal of control panel from side rails is not necessary for servicing engine or alternator.

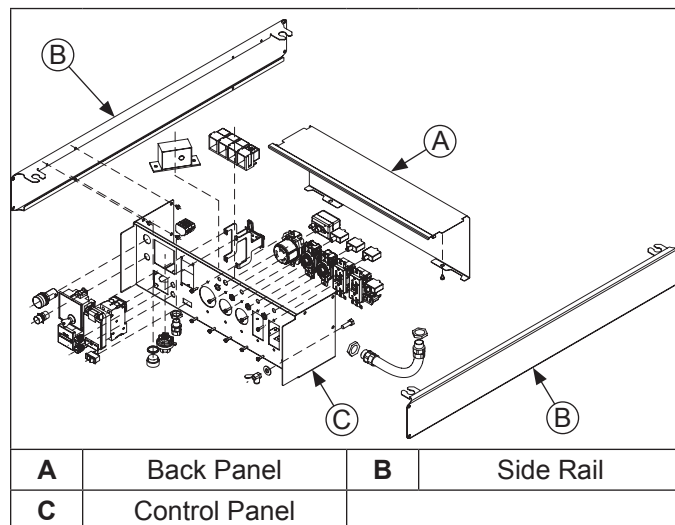
1. Remove screws securing side rails to frame.
2. Lift side rails and control panel up from frame.

Remove Carbon Canister

NOTE: Removal of carbon canister from side rail is not necessary unless either require service.

1. Remove screws securing carbon canister strap around carbon canister.
2. Remove carbon canister.
3. Remove screws securing carbon canister bracket to side rail.

PRO 12.3 EFI Control Panel & Side Rails



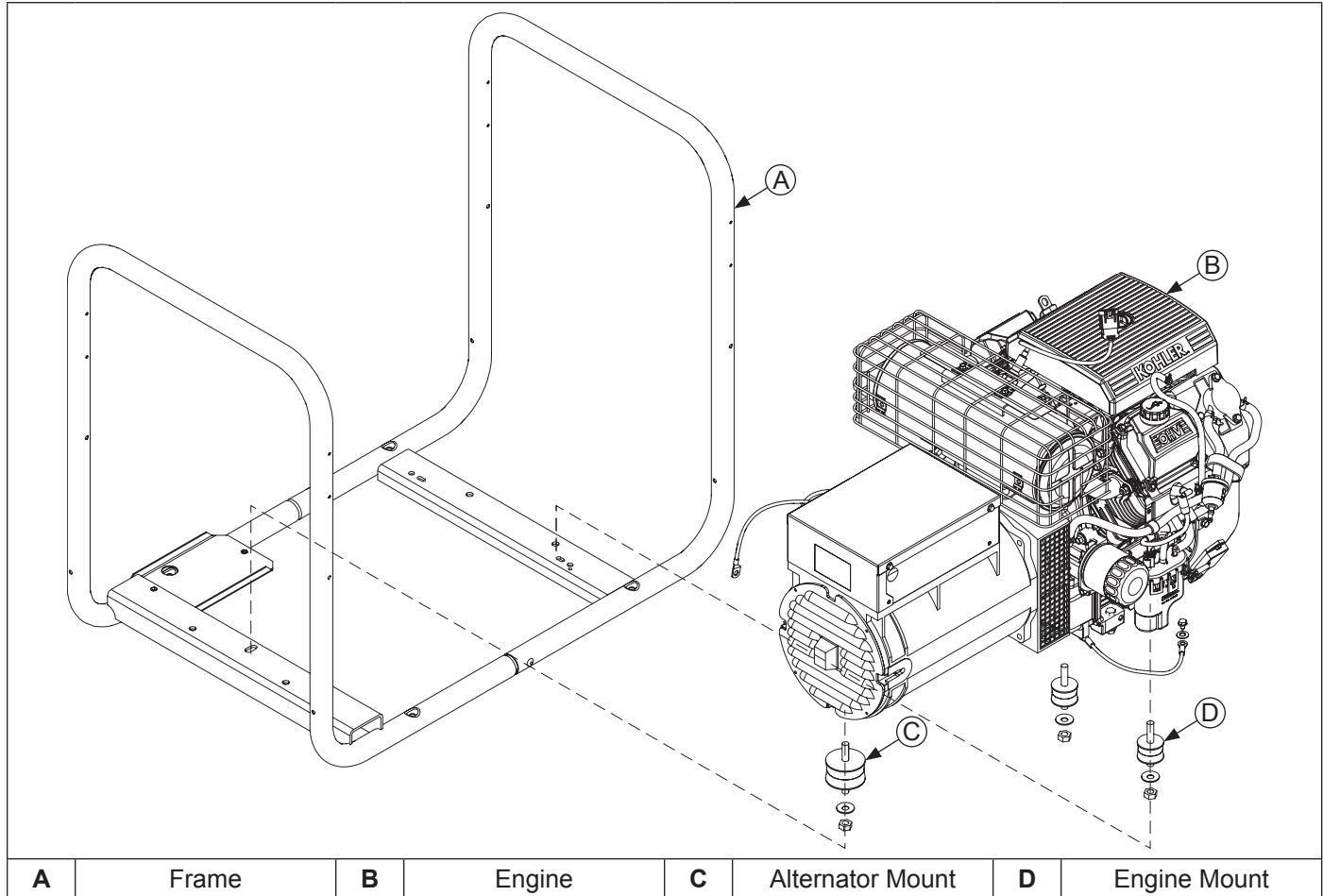
	CAUTION
	Electrical Shock can cause injury. Do not touch wires while engine is running.
Never operate generator in rain or snow. Never touch generator with wet hands or electrical shock may occur.	

Remove Control Panel from Side Rails

1. Remove screws securing back panel to control panel and remove back panel.
2. Remove screws securing control panel to side rails.

Disassembly/Inspection and Service

PRO 12.3 EFI Engine and Alternator

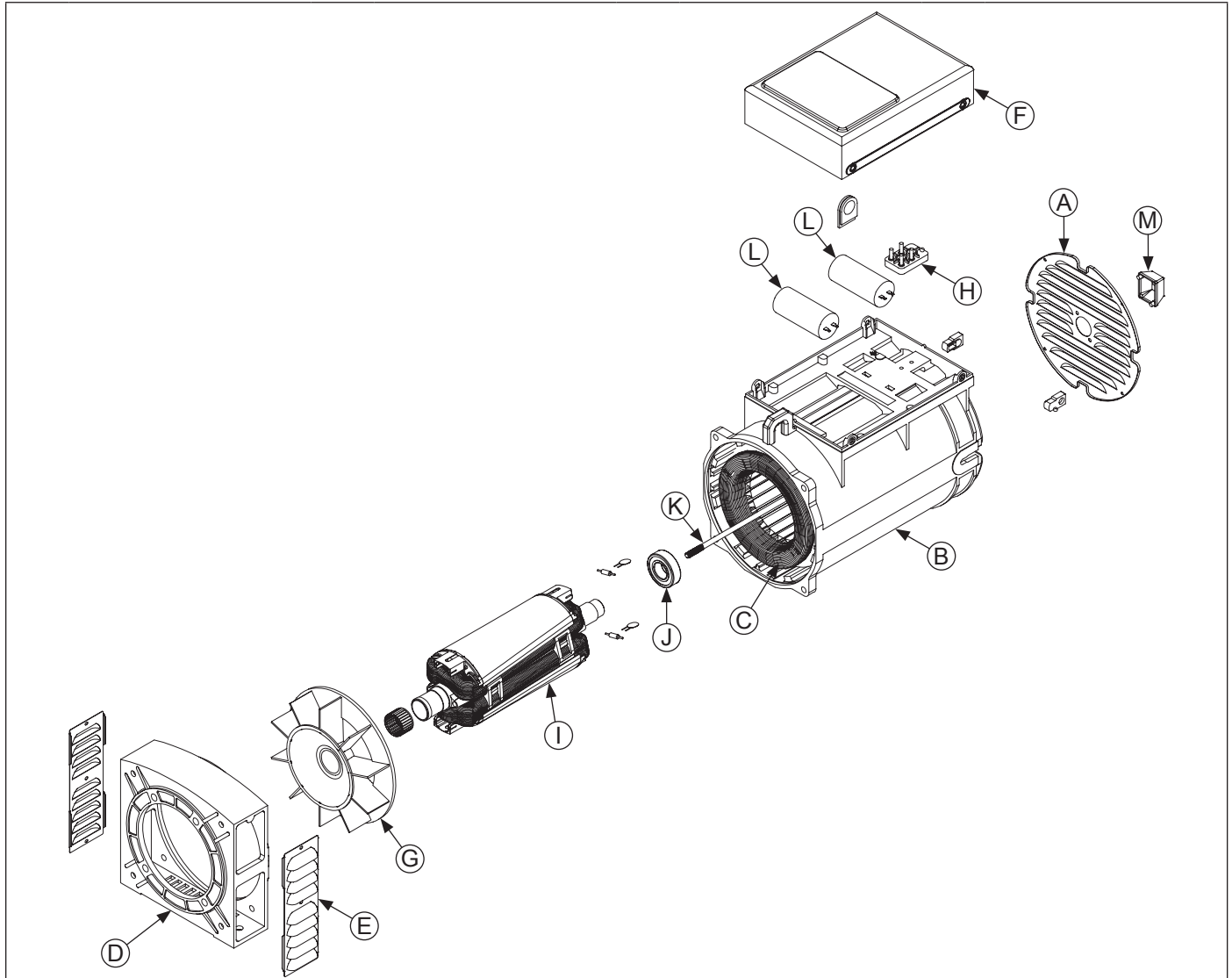


Remove Engine and Alternator

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 & Frame.

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

PRO 12.3 EFI Alternator



A	End Cover	B	Frame	C	Stator	D	Front Cover
E	Front Cover Shield	F	Alternator Box	G	Fan	H	Wiring Board
I	Rotor	J	Bearing	K	Through Bolt	L	Capacitor
M	Rubber Cap						

Remove Stator & Frame

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

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

1. Remove screws securing frame to front cover.
2. Slide stator and frame off rotor. Stator is very heavy. Using a hoist or hydraulic lift will make removal easier.
3. Inspect parts for cracks. Replace if cracked.

Remove Rotor

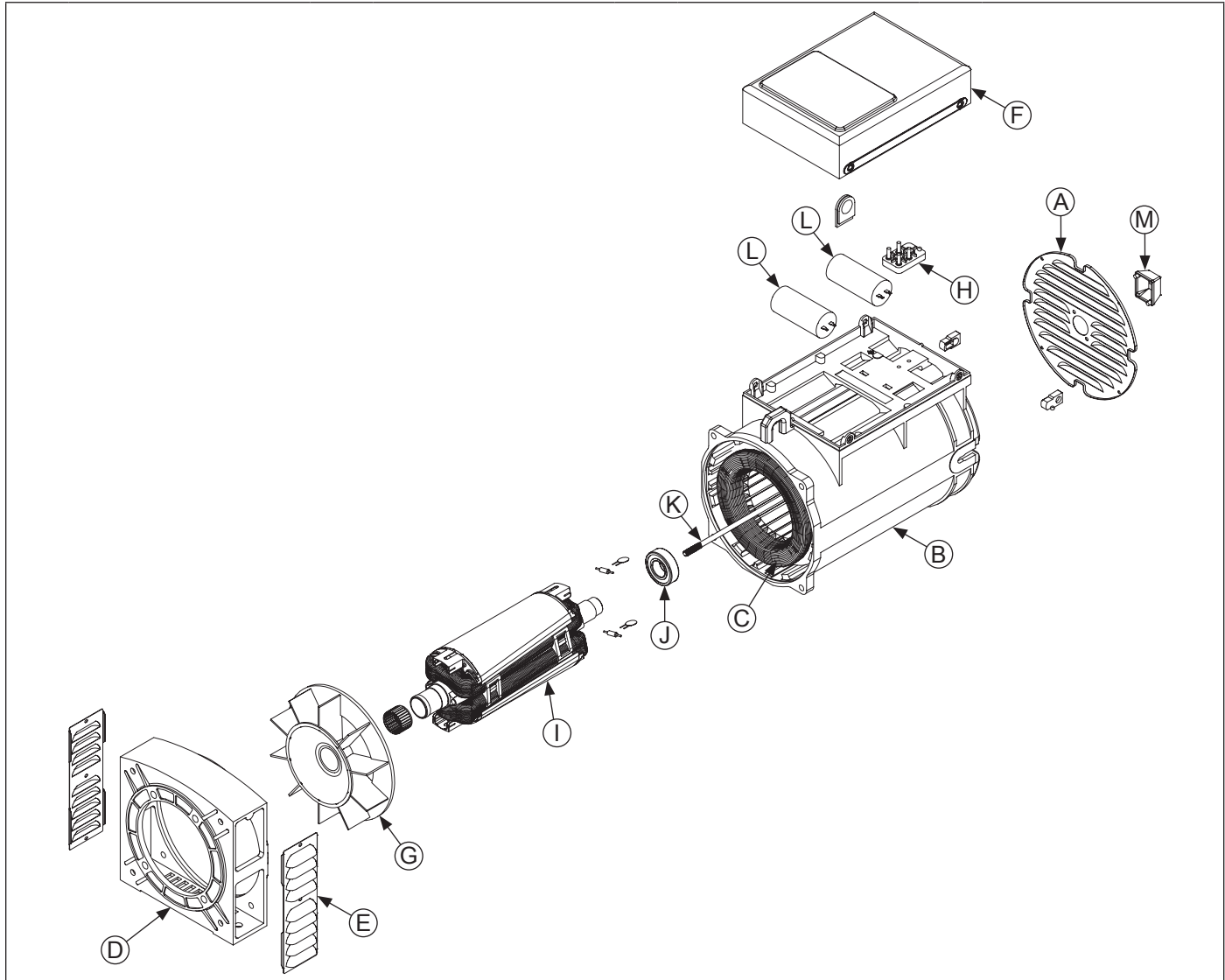
1. Loosen through bolt, but do not remove it.
2. Place a wooden block or similar material under rotor to support weight as rotor is removed.
3. With a rubber mallet, tap rotor a few times. Rotor should break free from engine shaft. Remove through bolt and remove rotor.
4. Inspect fan and rotor for cracks. Replace if cracked.

Remove Front Cover (if required)

1. Remove screws securing front cover, and remove front cover.
2. Inspect front cover for cracks. Replace if cracked.

Reassembly

PRO 12.3 EFI Alternator



A	End Cover	B	Frame	C	Stator	D	Front Cover
E	Front Cover Shield	F	Alternator Box	G	Fan	H	Wiring Board
I	Rotor	J	Bearing	K	Through Bolt	L	Capacitor
M	Rubber Cap						

Install Front Cover (if required)

Install front cover to engine main bearing cover with screws. Torque to 21.0 N·m (186 in. lb.).

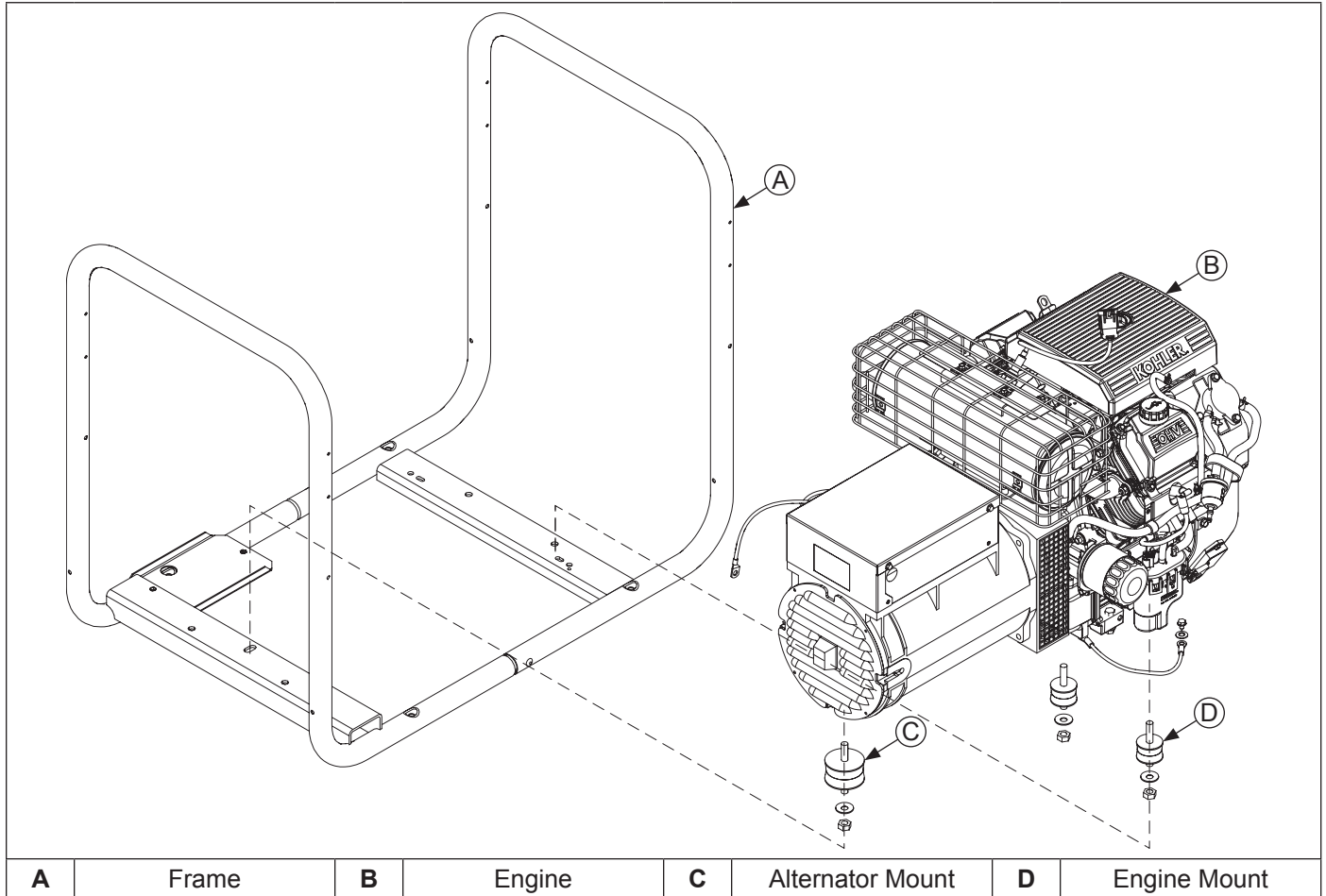
Install Rotor & Stator

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.

1. Place stator and frame on work surface with end cover down.

2. Gently guide rotor into stator, aligning bearing with bearing recess in back side of frame.
3. Install alternator to front cover with screws and washers. Using a hoist or hydraulic lift will make installation easier. Torque screws to 21.0 N·m (186 in. lb.).
4. Install through bolt and torque to 21.0 N·m (186 in. lb.).

PRO 12.3 EFI Engine and Alternator

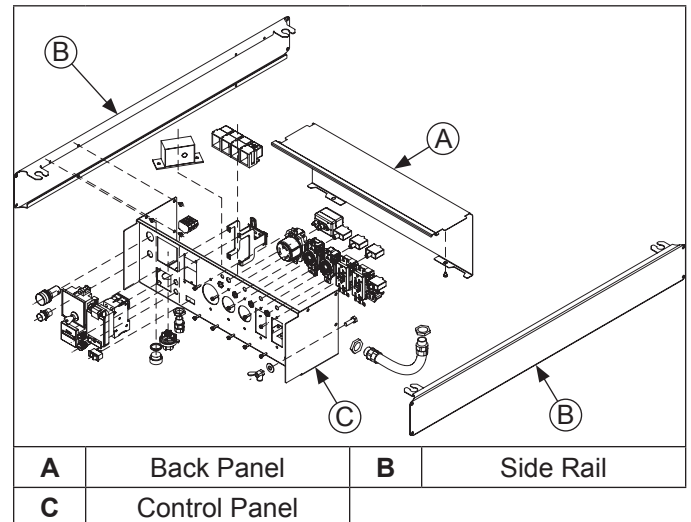


Install Engine and Alternator (if required)

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 9.9 N·m (87 in. lb.).

PRO 12.3 EFI Control Panel & Side Rails

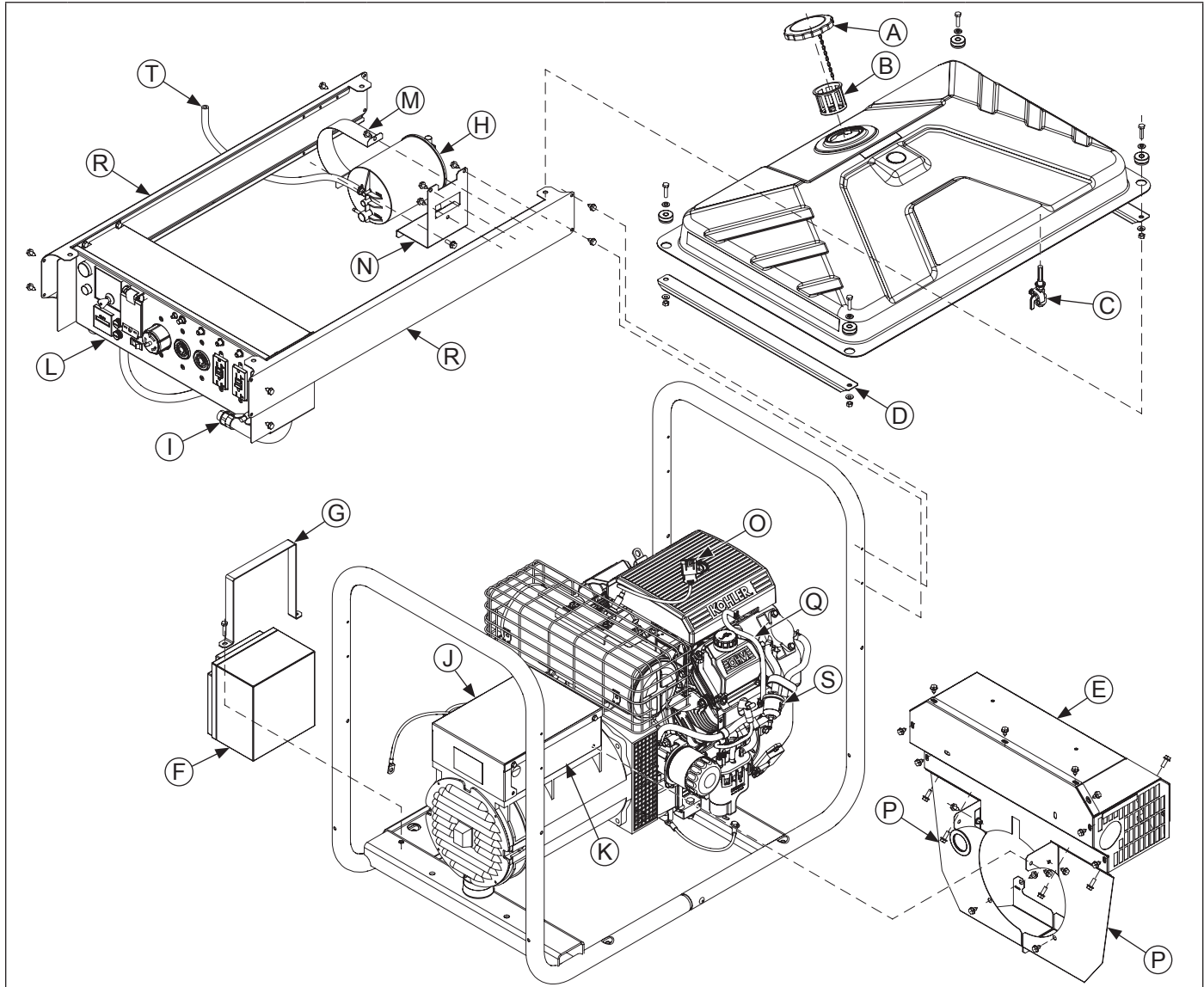


Install Control Panel to Side Rails

1. Install control panel to side rails with screws. Torque to 9.0 N·m (79 in. lb.).
2. Install back panel to control panel with screws. Torque to 9.0 N·m (79 in. lb.).

Reassembly

PRO 12.3 EFI Components



A	Fuel Tank Cap	B	Fuel Filter	C	Fuel Valve	D	Fuel Tank Support
E	Muffler Shield	F	Battery	G	Battery Bracket	H	Carbon Filter
I	Pipe Union	J	Alternator Box Cover	K	Alternator Box	L	Control Panel
M	Carbon Canister Strap	N	Carbon Canister Bracket	O	Oxygen Sensor Connector	P	Alternator Shield
Q	Fuel Hose	R	Side Rail	S	Fuel Filter	T	Carbon Canister Hose

Install Muffler Shield

NOTE: It may be necessary to install nuts and screws loosely to align all holes before torquing.

1. Install muffler shield over muffler and secure with nuts to exhaust studs. Torque to 27.8 N·m (246 in. lb.).
2. Secure muffler shield to muffler with screws. Torque to 9.0 N·m (79 in. lb.).
3. Install alternator shields to muffler shield and secure with screws. Torque to 9.0 N·m (79 in. lb.).
4. Secure alternator shields together with screws. Torque to 9.0 N·m (79 in. lb.).
5. Secure alternator shields to front cover. Torque to 9.0 N·m (79 in. lb.).
6. Secure alternator shields to alternator box. Torque to 9.0 N·m (79 in. lb.).
7. Connect oxygen sensor wire connector to engine.

Install Side Rails and Control Panel


NOTE: A clamping device or an assistant to hold assembly while installing will make process easier.


Secure side rails and control panel to frame with screws. Torque to 9.0 N·m (79 in. lb.).

Install Carbon Canister

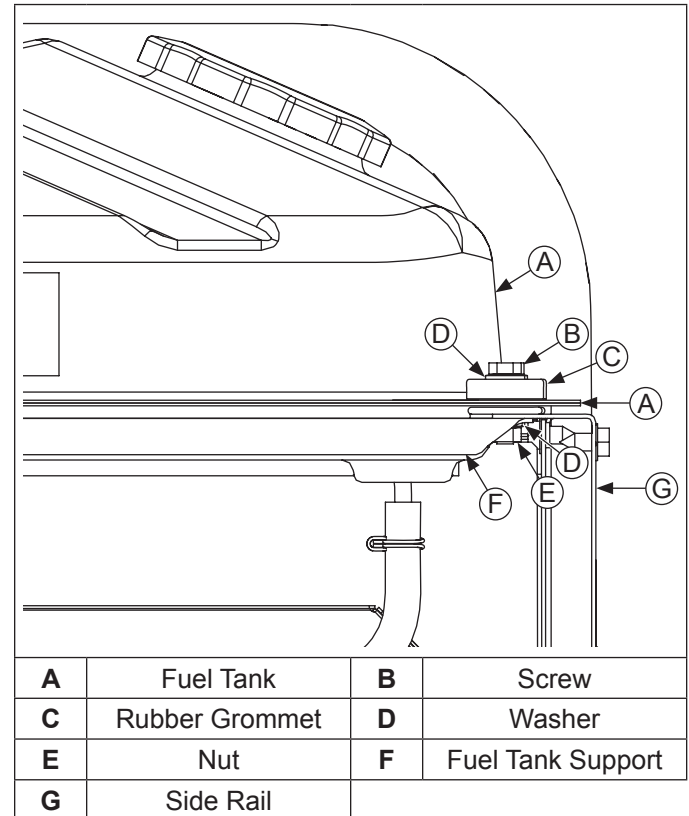
1. Secure carbon canister bracket to side rail with screws. Torque to 9.0 N·m (79 in. lb.).
2. Place carbon canister on bracket.
3. Install carbon canister strap to bracket and side rail with screws. Torque to 9.0 N·m (79 in. lb.).

Install Fuel Tank

	WARNING
	<p>Fuel can cause fires and severe burns. Do not fill fuel tank while engine is hot or running.</p>
<p>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.</p>	

	WARNING
	<p>High Pressure Fluids can puncture skin and cause severe injury or death. Do not work on fuel system without proper training or safety equipment.</p>
<p>Fluid puncture injuries are highly toxic and hazardous. If an injury occurs, seek immediate medical attention.</p>	

PRO 12.3 EFI Fuel Tank



NOTE: A clamping device or an assistant to hold assembly while installing will make process easier.

1. Place rubber grommets in mounting holes of fuel tank.
2. Place fuel tank on side rails.
3. Install screws through top of grommet with washer.
4. Place fuel tank support under side rail and align with screws.
5. Install nuts with washers under fuel tank support. Torque to 9.0 N·m (79 in. lb.).
6. Connect fuel hose to fuel valve from fuel filter and position hose clamps.
7. Connect hose from carbon canister to port underneath fuel tank and position hose clamp.

Connect Wire Harness to Engine

Connect 6 pin connector from engine to control panel.

Reassembly

Connect Alternator Wires



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. Remove alternator box cover.
2. Guide wires from control panel into alternator box and place pipe union into alternator box.
3. Tighten nut to pipe union.
4. Place wire connectors onto wiring board, following instructions written in disassembly.
5. Install nuts and tighten securely.
6. Replace alternator box cover and tighten 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. Secure battery bracket with screws and torque to 9.0 N·m (79 in. lb.).
4. Start generator following starting instructions.
5. Check for proper voltage at receptacles.



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