

KOHLER[®] POWER SYSTEMS



INSTALLATION INSTRUCTIONS

4/5CKM and 4/5CKMR RV/Mobile (Nonextended-Shaft Units) LP Vapor Conversion Kit PA-227929

This kit allows for field conversion from a gasoline-fueled unit to a LP vapor-fueled unit. Installation involves removal of the fuel system components and wiring harness. Do not use this kit on extended-shaft units. Use this kit only on the following gasoline specs:

PA-101217

PA-101218

PA-101322

PA-101323

PA-101327

PA-101328



⚠ WARNING
Accidental starting.
Can cause severe injury or death.

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

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

⚠ WARNING

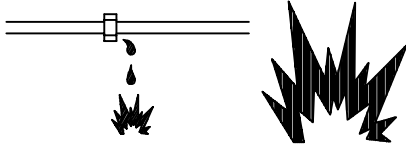


Fire.
Can cause severe injury or death.

Do not smoke or permit flame or spark to occur near fuel or fuel system.

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

⚠ WARNING



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

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

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



Explosive fuel vapors can cause severe injury or death. Take additional precautions when using the following fuels:

Gasoline—Store gasoline only in approved red containers clearly marked GASOLINE.

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

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

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

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

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

Installation

NOTE

The installation of this kit requires reusing some of the unit's existing hardware. When disassembling components, save all hardware unless stated otherwise.

NOTE

Do not use this kit on extended-shaft generator sets.

1. If removing the generator set from a coach, move the controller master switch to the STOP position. Disconnect the battery of the generator set, negative lead first. Disconnect the fuel lines, load leads, electrical leads, and exhaust system. Remove the generator set from the coach according to the procedure supplied by the coach manufacturer.

NOTE

Refer to Figure 2 and Figure 3 for generator component identification.

2. Remove the screws securing the hood to the generator. Remove the hood to expose the engine end of the generator.
3. Remove the hose clamp securing the air cleaner hose to the air cleaner.
4. Unclip the four snaps on the air cleaner cover to remove the air cleaner element and the air cleaner cover from the breather line connector.
5. Remove one screw on the engine breather cover to remove the breather tube and breather cover.
6. Remove the vacuum line and fitting between the choke and the intake manifold.
7. Apply pipe sealant to the pipe plug (X-75-23) and install into the intake manifold.
8. Remove the hose clamp securing the air cleaner hose to the carburetor.
9. Disconnect the leads (70A and N) from the electric choke.
10. Disconnect the lead (AD) from the antidieseling solenoid.
11. Disconnect the fuel line from the carburetor.

12. Disconnect the 6-pin connector (J9/P9) from the actuator assembly.
13. Remove the two nuts securing the carburetor to the intake manifold flange.
14. Remove the gasoline carburetor, deicing module, and actuator assembly from the studs protruding from the intake manifold (remove and save the stepper motor and mounting hardware from the actuator assembly).
15. Remove the four screws (X-794-3) from the controller cover.
16. Unplug the 15-pin connector at the left of the controller box.
17. Disconnect the two leads (P) from the 15-amp fuse.
18. Disconnect the 12-pin connector (J7/P7) at the governor board.
19. Disconnect the leads (N) at the controller ground.
20. Disconnect the lead (13) from the low-oil-pressure switch.
21. Disconnect the two magnetic-pickup leads (MP) and the ignition lead (72).
22. Remove the leads (P, 71, and CP—if battery charging) from the starter solenoid.
23. Disconnect the lead (CP) from the 25-amp circuit breaker (battery-charging units only).
24. Disconnect FP, FN, B1, and B2 leads.
25. If a battery-charging unit, disconnect leads (70).
26. Remove the screw (X-794-3) at the fuel line support located at the right side of the circuit breaker box.
27. Remove the two screws (X-67-115) securing the fuel pump to the controller mounting bracket.
28. Disconnect the 2-pin connector (J5/P5) containing the red and black fuel pump leads.
29. Remove the fuel pump, hose with fuel filter and bracket, and fuel line and discard.
30. Remove the 5-amp deicing fuse from the circuit breaker box.
31. Install the pipe nipple (X-220-6) into the solenoid assembly (A-278424). Install the gas regulator (239153) into the fuel outlet end of the solenoid assembly.

32. Apply pipe sealant to elbow (X-447-1) and install into the gas regulator in the upward position.

NOTE

Use pipe sealant on all pipe connections.

33. Remove the two screws from the gas regulator and mount the regulator bracket (278976) to the gas regulator.
34. Mount the regulator bracket to the top hole in the end bracket using screw (X-67-114 for the 5 kW or X-67-116 for the 4 kW).
35. Remove the existing low-limit thermostat from the intake manifold. Install screw (X-129-51) and washer (X-25-26). Apply thread sealant before inserting.
36. Remove the two studs from the intake manifold flange. Leave the gasket in place.
37. Mount the carburetor bracket (278953) to the intake manifold flange using two screws (X-55-30). Attach the stepper motor and throttle stop (278425) to the carburetor bracket using screws (X-49-38) to secure. See Figure 3, view B.
38. Mount the PTC gasket (278528), PTC assembly (278445), carburetor gasket (271030) and carburetor assembly (A-278955) to the actuator bracket on the intake manifold using screws (X-125-31) and washers (X-25-85).
39. Mount the elbow (X-6297-1) into the carburetor.

NOTE

The throttle pin of the carburetor should hit the stop of the actuator so that the carburetor throttle valve is in the full-open position.

40. Remove the set screw in the carburetor. Place the carburetor sleeve (278954) onto the carburetor and secure with the set screw.
41. Connect pipe tee (X-203-19) to the elbow.
42. Install pipe plug (X-75-41) into pipe tee.
43. Install connector (X-296-2) into pipe tee.
44. Connect the fuel line (227767) from the carburetor to the gas regulator. Torque nuts to 30 ft. lbs.

45. Connect the 15-pin connector end of the new wiring harness (227728) into the connector located at the left side of the controller box (J1/P1).
46. Connect the 12-pin connector (J7/P7) at the governor board.
47. Connect the two leads (P) to the 15-amp fuse.
48. Plug the 6-pin connectors (J9/P9) together at the actuator assembly.
49. Connect FP, FN, B1, and B2 leads of the wiring harness to the corresponding leads on the unit.
50. Plug the 2-pin connector (J20/P20) together (leads N and AD) at the antidiesel solenoid.
51. Connect the 2-pin connector (J5/P5) together (leads N and 70) at the fuel solenoid.
52. Connect the lead (13) to the low-oil-pressure switch.
53. Connect the two magnetic-pickup leads (MP) to the magnetic-pickup sensor.
54. Connect the ignition leads (72) together.
55. Connect the lead (70A) to the PTC plate.
56. Position the (P and CP—if battery charging) leads onto the positive terminal on the starter solenoid.
57. Position the lead (71) onto the smaller terminal on the starter solenoid.
58. If a battery-charging unit, connect the lead (CP) to the battery charging circuit breaker (25 amp) and connect the lead (70) to the battery charging board. If the unit does not have a battery charging option, simply tape the terminal ends of the leads (70 and CP) with electrical tape.
59. Install button plug (X-301-30) in opening in rear panel of circuit breaker box.
60. Connect remaining leads (N) of wiring harness to controller ground.
61. Place the air cleaner element inside the air cleaner base.
62. Install the pleated hose (278609) to the carburetor sleeve using the existing hose clamp to secure.
63. Install the air cleaner cover (227463) onto the air cleaner base.

64. Position the loose end of the pleated hose onto the air cleaner and secure with hose clamp (X-426-19).
65. Install fuel line hose (X-422-28) into the 0.605 diameter end of the nylon hose adapter (278805) and install into the breather line (227573).
66. Install the 0.572 diameter end of the hose adapter into the air cleaner cover and tighten with hose clamp (X-426-10). Reinstall the breather closure plate end of the breather line onto the engine (use existing hardware).
67. Secure the solenoid harness to an end bracket fin and overbolt using two cable ties (X-468-1).
68. Secure the engine wiring harness using cable tie (X-468-1).
69. Replace the controller cover using existing hardware.
70. Regap the spark plug. Gasoline models have a 0.025 in (0.64 mm) spark plug gap, LP vapor models have a 0.018 in. (0.46 mm) spark plug gap.
71. Place the decal (227841) on the controller cover.
72. Replace the generator hood using existing hardware.
73. Check all pipe joints for air leaks using a soapy water solution. Refer to *Specification—LP Vapor* following.
74. Reconnect the battery, negative lead last. Connect the fuel lines, load leads, remote leads, and exhaust system.

NOTE

Since converting this generator set from a gasoline-fueled unit to an LP vapor-fueled unit, retain this instruction sheet for future service parts ordering information. When placing a service parts order, include the generator specification number (found on the generator nameplate) and relay the information that the generator was converted from a gasoline- to an LP vapor-fueled unit.

NOTE

Be aware of reduced generator output (kW) as a result of converting to LP fuel.

Specification—LP Vapor

The LP-gas system consists of a shut-off fuel valve, a secondary regulator, and a carburetor that adjusts the mixture of fuel and air for proper combustion.

The gas and supply pressure should not exceed 6 oz. To check the inlet pressure, remove the plug on the fuel inlet of the gas regulator. Insert an ounce pressure

gauge or manometer. Adjust the pressure to 4-6 oz. or 7-11 inches water column, adjust inlet pressure on the primary regulator.

NOTE

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

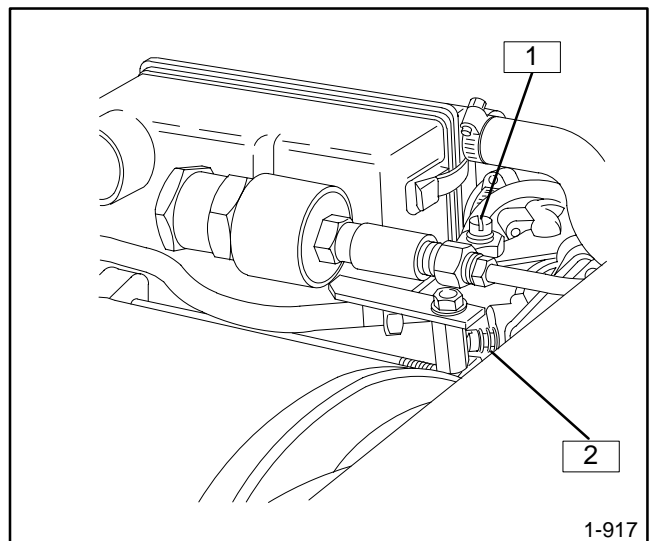
NOTE

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

LP Carburetor Adjustments

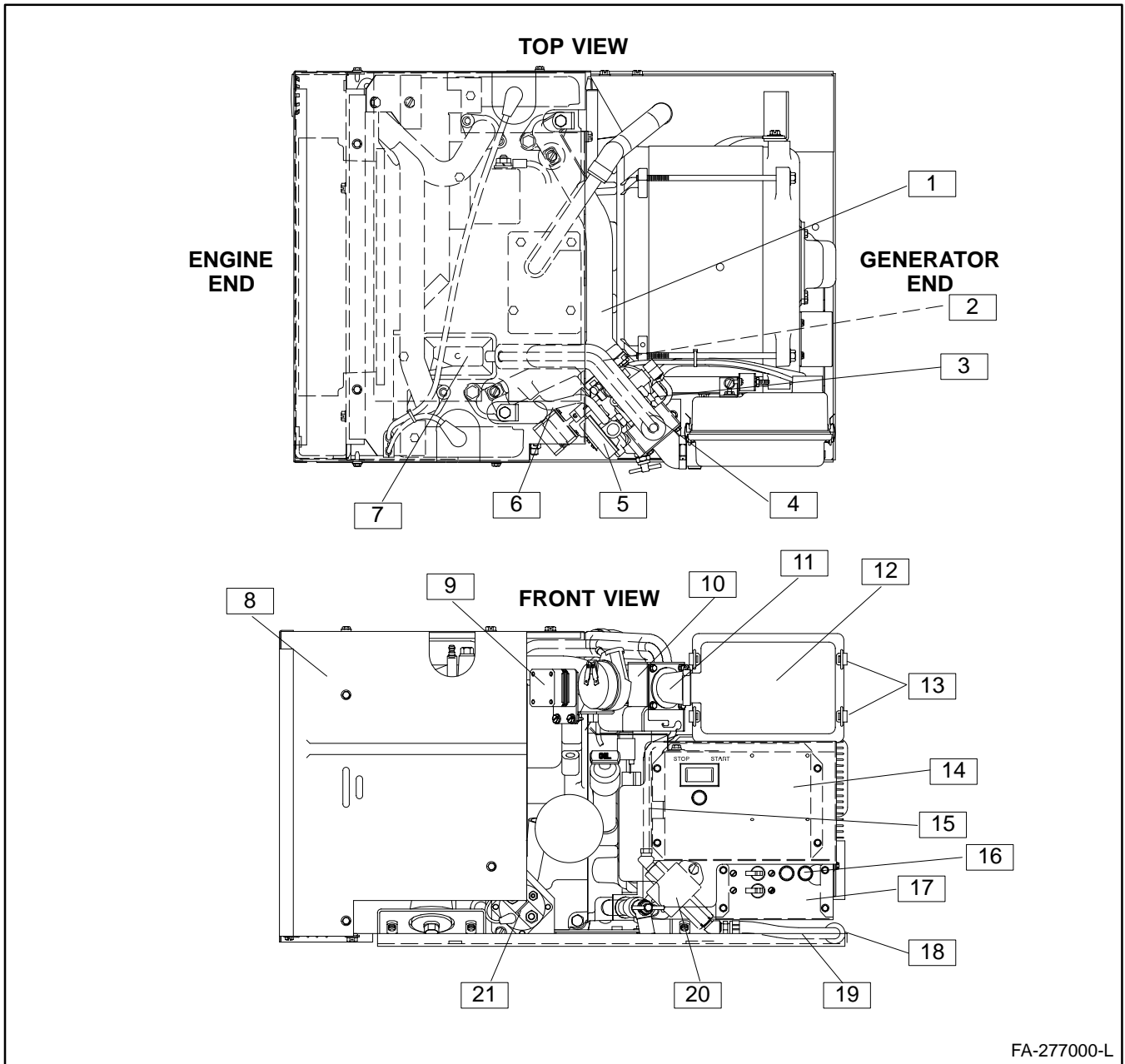
Main Fuel Mixture—For preliminary setting turn the *Main Fuel Valve* in a clockwise direction until it bottoms lightly (do not force), then back out 1 turn. With the engine thoroughly warmed up and running at rated rpm under full load, turn the *Main Fuel Valve* in until the engine slows down (lean setting)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

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



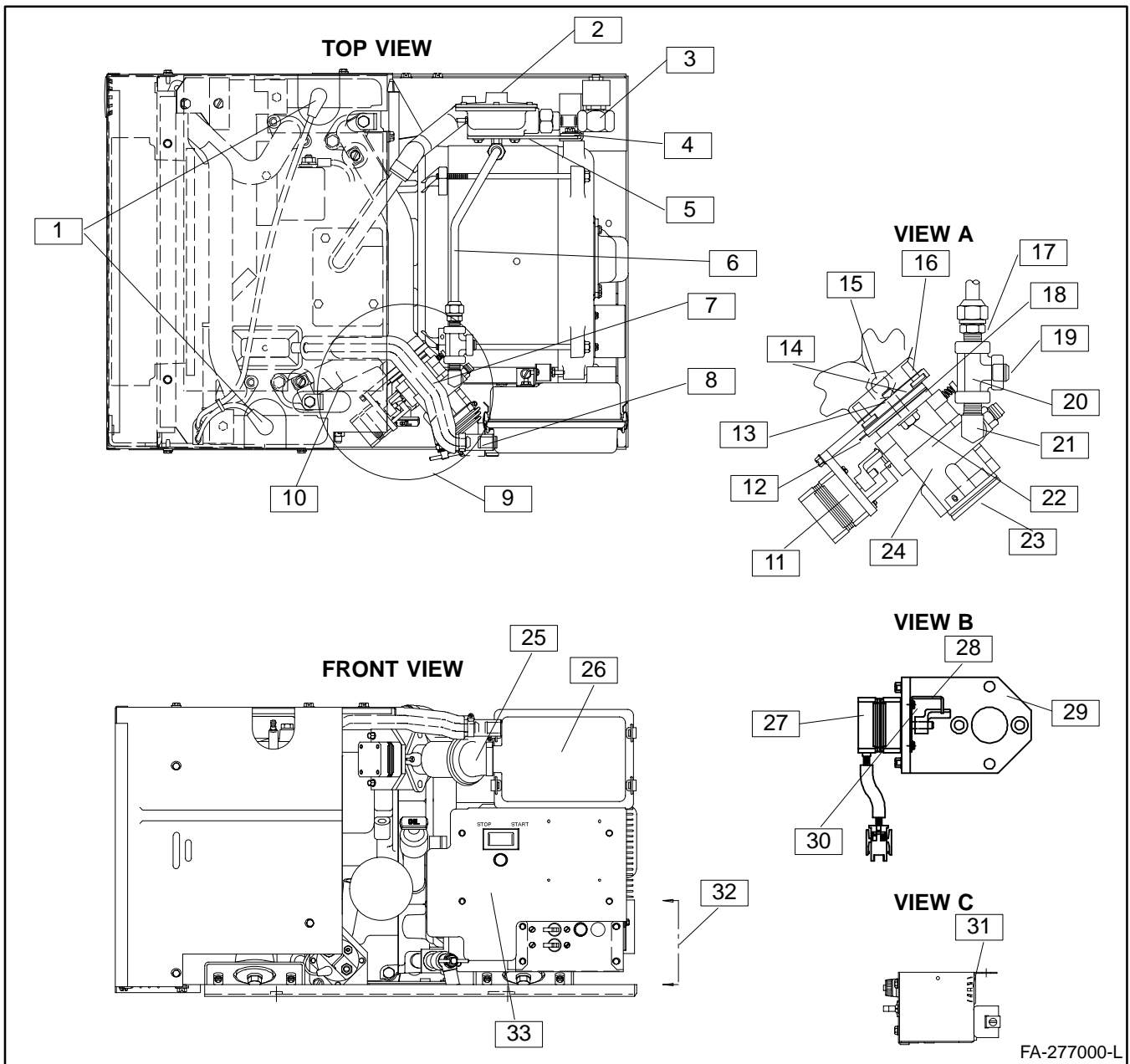
1. Main Fuel Adjustment
2. Idle Fuel Adjustment

Figure 1. LP Gas Carburetor Adjustments



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| <ul style="list-style-type: none"> 1. Intake Manifold 2. Low-Limit Thermostat 3. Carburetor 4. Breather Line 5. Choke 6. Vacuum Line 7. Breather Cover 8. Hood 9. Actuator Assembly 10. Deicing Module 11. Air Cleaner Hose | <ul style="list-style-type: none"> 12. Air Cleaner 13. Air Cleaner Snaps 14. Controller 15. Fuel Line 16. 5-Amp Deicing Fuse 17. Circuit Breaker Box 18. Fuel Filter 19. Hose 20. Fuel Pump 21. Starter Solenoid |
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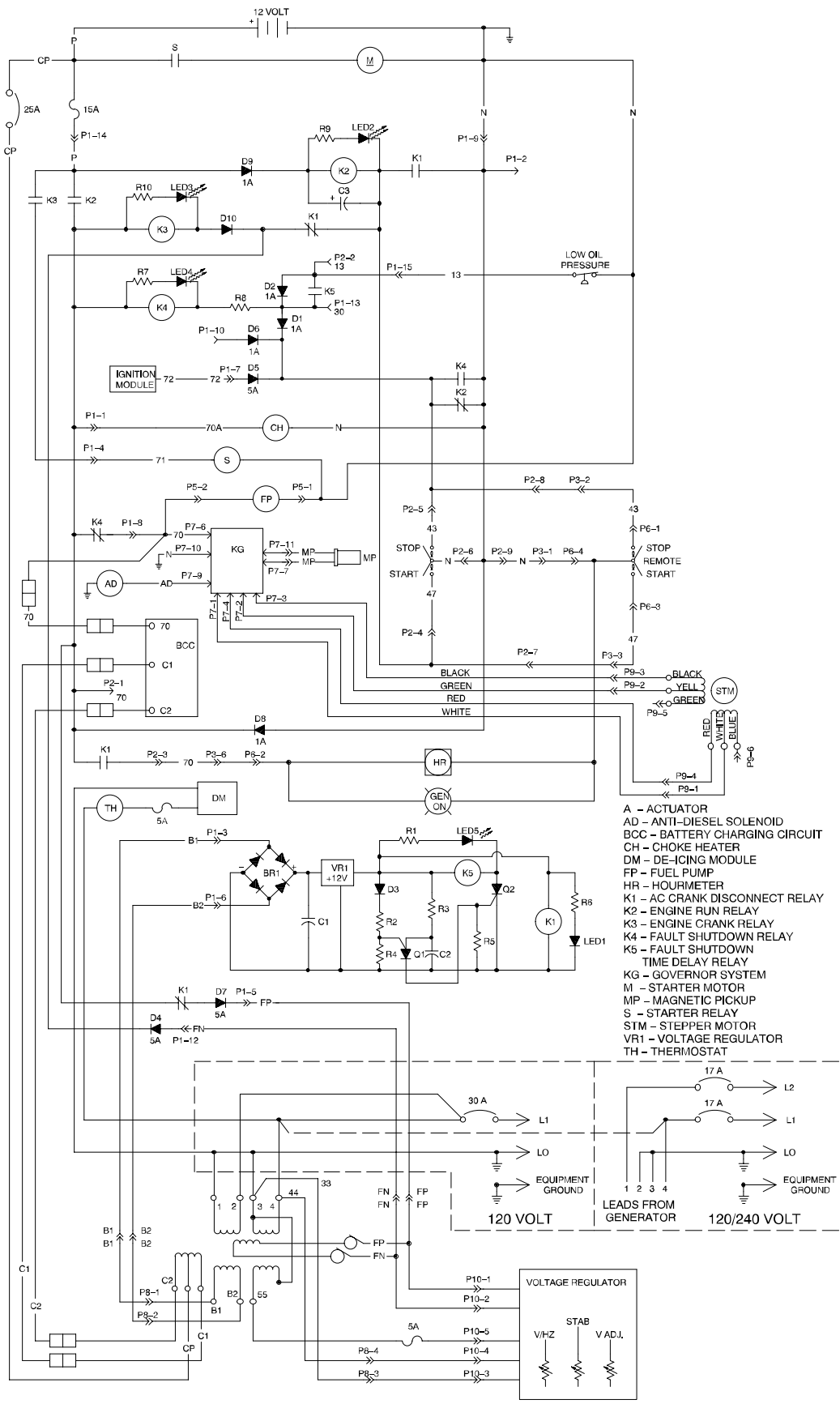
Figure 2. 4/5 kW Gasoline-Fueled Generator Set



FA-277000-L

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|---|---|
| <ol style="list-style-type: none"> 1. Regap spark plugs to 0.018 in. (0.46 mm) 2. Gas Regulator 239153 3. Solenoid Assembly A-278424
Pipe Nipple X-220-6 4. Screw X-67-114 (2) for 5 kW or
Screw X-67-116 (2) for 4 kW 5. Regulator Bracket 278976 6. Fuel Line 227767
Elbow X-447-1
Torque nuts to 30 ft. lbs. 7. Breather Line 227573 8. Hose Adapter 278805
Fuel Line Hose X-422-28
Hose Clamp X-426-10 9. See View A 10. Pipe Plug X-75-23 11. Actuator Assembly—See View B 12. PTC Assembly 278445 13. Gasket to engine leave in place. 14. Carburetor Gasket 271030 15. Remove thermostat.
Screw X-129-51
Washer X-25-26 | <ol style="list-style-type: none"> 16. Socket Head Screw X-55-30 (2) 17. Connector X-296-2 18. PTC Gasket 278528 19. Pipe Plug X-75-41 20. Pipe Tee X-203-19 21. Elbow X-6297-1 22. Screw X-125-31 (2)
Plain Washer X-25-85 (2) 23. Carburetor Sleeve 278954
Tighten set screw to secure carburetor sleeve. 24. Carburetor Assembly A-278955 25. Pleated Hose 278609
Host Clamp X-426-19 26. Air Cleaner Cover 227463 27. Stepper Motor 28. Throttle Stop 278425 29. Carburetor Bracket 278953 30. Screw X-49-38 (4) 31. Button Plug X-301-30 32. See View C 33. Decal 227841 |
|---|---|

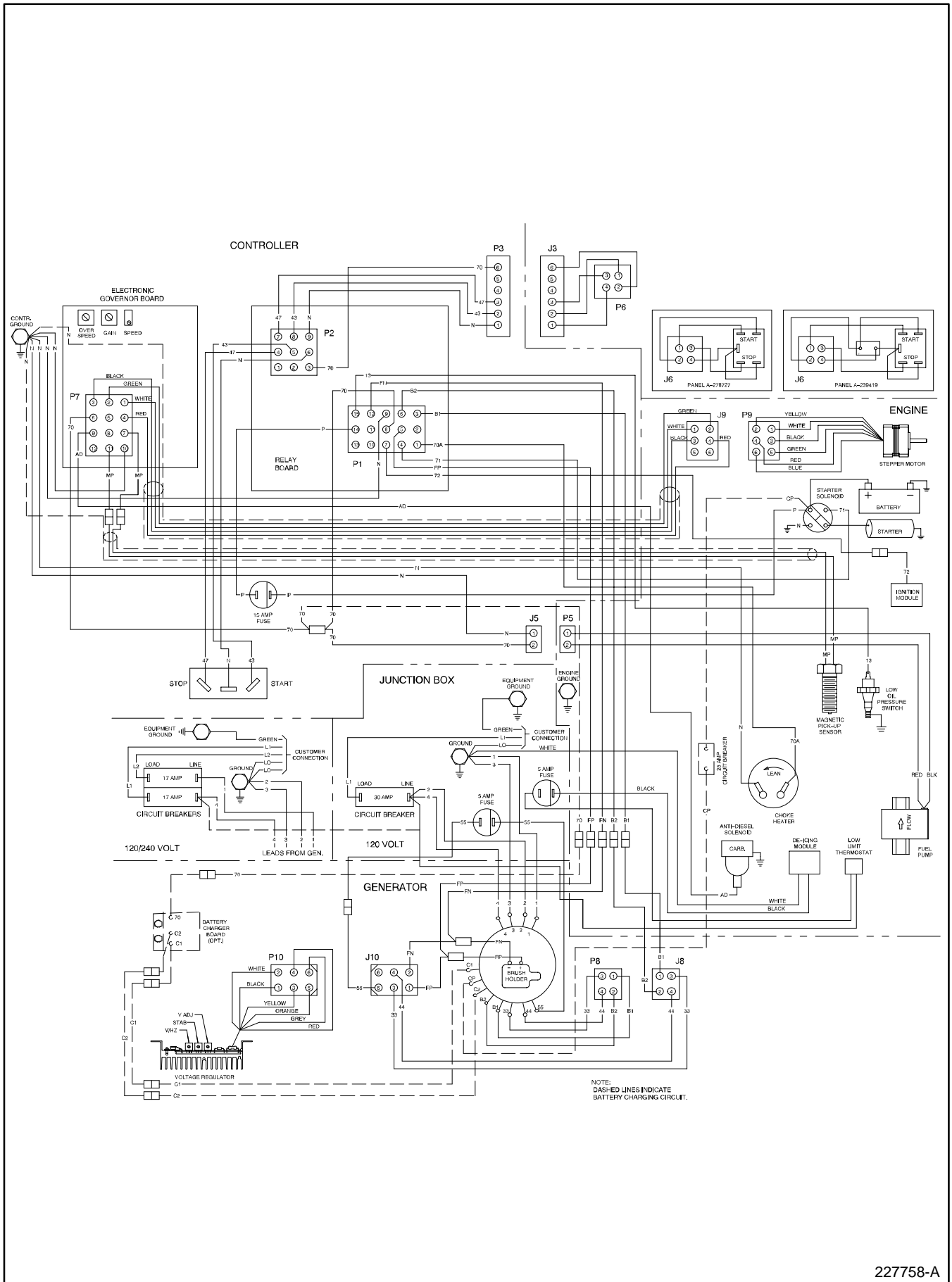
Figure 3. 4/5 kW LP Vapor-Fueled Generator Set



- A - ACTUATOR
- AD - ANTI-DIESEL SOLENOID
- BCC - BATTERY CHARGING CIRCUIT
- CH - CHOKE HEATER
- DM - DE-ICING MODULE
- FP - FUEL PUMP
- HR - HOURMETER
- K1 - AC CRANK DISCONNECT RELAY
- K2 - ENGINE RUN RELAY
- K3 - ENGINE CRANK RELAY
- K4 - FAULT SHUTDOWN RELAY
- K5 - FAULT SHUTDOWN TIME DELAY RELAY
- KG - GOVERNOR SYSTEM
- M - STARTER MOTOR
- MP - MAGNETIC PICKUP
- S - STARTER RELAY
- STM - STEPPER MOTOR
- VR1 - VOLTAGE REGULATOR
- TH - THERMOSTAT

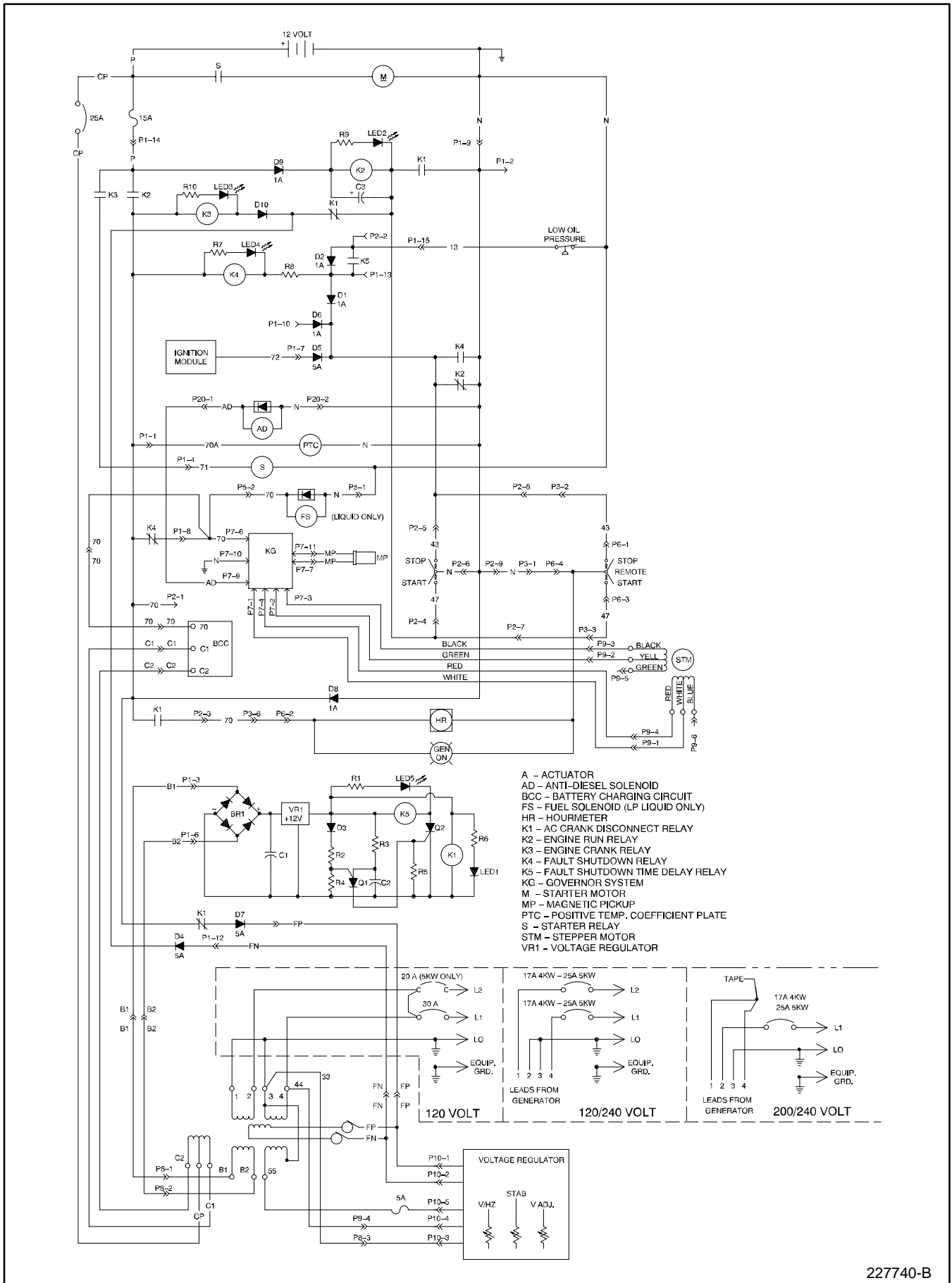
227758-A

Figure 4. Wiring Diagram—Schematic 4/5kW Gasoline



227758-A

Figure 5. Wiring Diagram—Point-to-Point Wiring 4/5 kW Gasoline



227740-B

Figure 6. Wiring Diagram—Schematic 4/5 kW LP Vapor

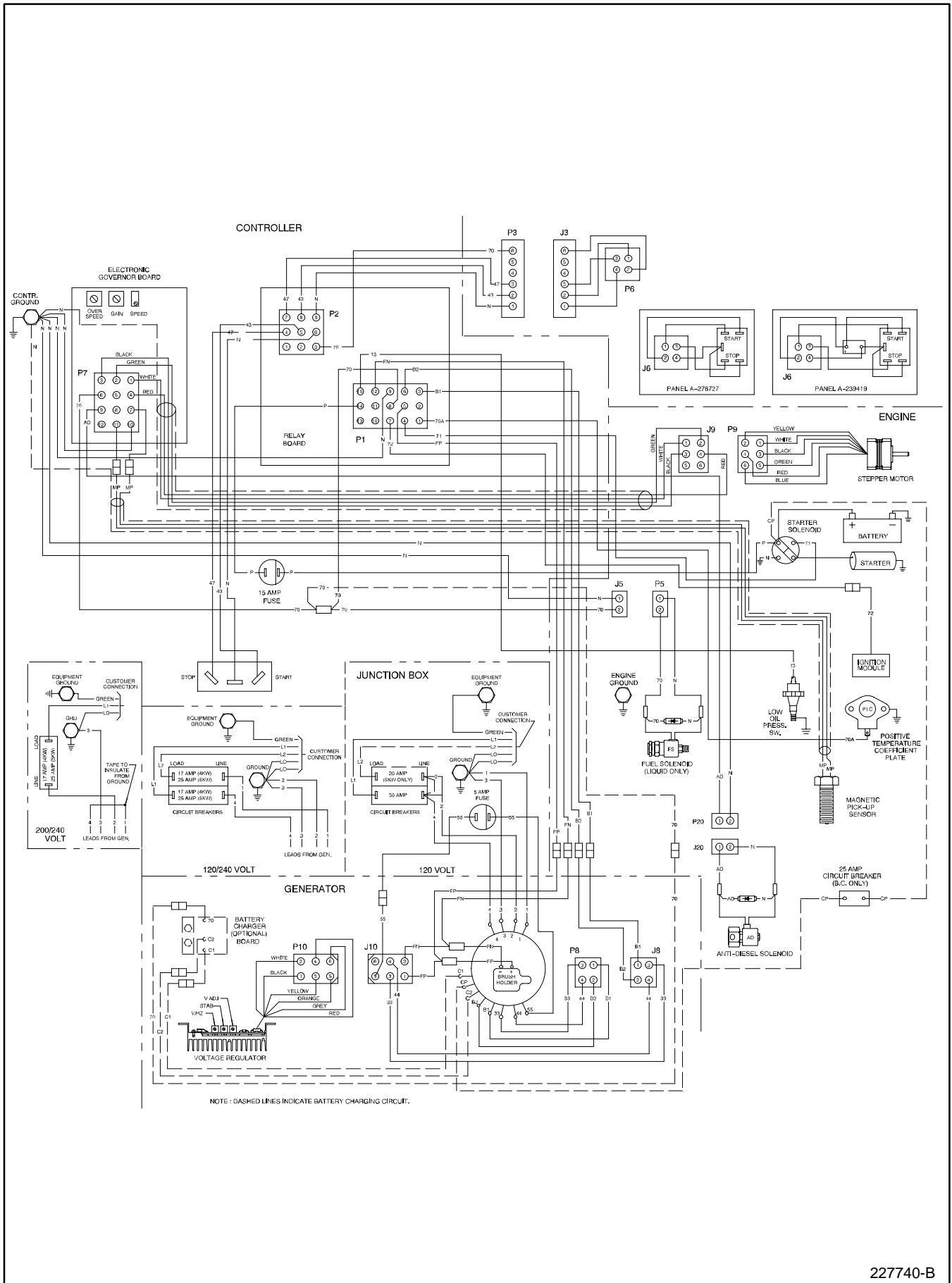


Figure 7. Wiring Diagram—Point-to-Point Wiring 4/5 kW LP Vapor

Parts List		
KIT PA-227929		
Qty.	Description	Part No.
1	Carburetor Assembly	A-278955
1	Solenoid Assembly	A-278424
1	Pipe Nipple 1/4 x 1-1/2	X-220-6
2	Plain Washer, 0.344 x 0.687 x 0.065	X-25-85
1	Elbow 5/8-18 x 1/4	X-447-1
2	Socket Head Screw 1/4-20 x 0.500	X-55-30
1	Pipe Plug	X-75-23
1	Gas Regulator	239153
1	Carburetor Gasket	271030
1	Engine Wiring Harness	227728
1	PTC Assembly	278445
1	PTC Gasket	278528
1	Carburetor Sleeve	278954
1	Regulator Bracket	278976
1	Fuel Line	227767
2	Self Tapping Screw (5 kW) 1/4-20 x 0.750 or Self Tapping Screw (4 kW) 1/4-20 x 0.625	X-67-114 X-67-116
1	Throttle Stop	278425
1	Carburetor Bracket	278953
2	H.C. Screw 5/16-18 x 0.88	X-125-31
1	H.C. Screw 1/2-20 x 0.75	X-129-51
1	Pipe Tee	X-203-19
1	Plain Washer 0.531 x 1.062 x 0.095	X-25-26
1	Connector 5/16-18 x 1/4	X-296-2
1	Button Plug	X-301-30
1	Fuel Line Hose	X-422-28
1	Hose Clamp 1.00 x 0.50	X-426-10
1	Hose Clamp 2.00 x 1.00	X-426-19
1	90 Degree Male Pipe Elbow	X-6297-1
1	Pipe Plug	X-75-41
1	Air Cleaner Cover	227463
1	Breather Line	227573
1	Pleated Hose	278609
1	Nylon Hose Adapter	278805
4	Screw	X-49-38
3	Cable Ties	X-468-1
1	Notice Decal	227841