KOHLER POWER SYSTEMS

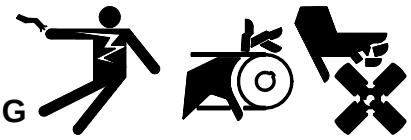
TT-923
INSTRUCTIONS
3/93

LP Vapor Conversion Kit PA-227821 for 4/5CKM, and 4/5CKMR RV/Mobile (Non-extended-Shaft) Generator Sets

This kit is intended to convert a gasoline-fueled unit to an LP vapor-fueled unit. Installation involves removal of the fuel system components and wiring harness. This kit is not to be used on extended-shaft units. Use this kit only on the following specs:

PA-101203
PA-101206
PA-101207
PA-101208
PA-101302
PA-101304
PA-101306
PA-101307
PA-101308
PA-101309
PA-101310
PA-101311
PA-101320
PA-101321

⚠ WARNING



Accidental starting.
Can cause severe injury or death.
Disconnect battery cables before working on generator set (negative lead first and reconnect it last).

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

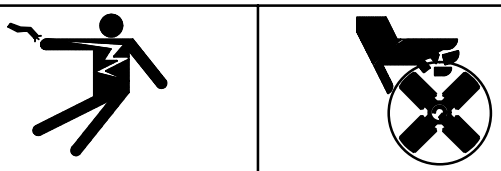
⚠ WARNING

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. When removing fuel line or carburetor, use a proper container to catch all fuel.

⚠ 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.

⚠ WARNING

Explosive fuel vapors.
Can cause severe injury or death.

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

Explosive fuel vapors can cause severe injury or death. All fuels are highly explosive in a vapor state. Use extreme care when handling, storing, and using fuels. Store fuel in a well-ventilated area away from spark-producing equipment and out of the reach of children. Never add fuel to the tank while the engine is running since spilled fuel may ignite on contact with hot parts or from ignition spark. Do not smoke or permit flame or spark to occur near potential sources of spilled fuel or fuel vapors. Keep fuel lines and connections tight and in good condition—don't replace flexible fuel lines with rigid lines. Flexible sections are used to avoid breakage due to vibration. Additional precautions must be taken when using the following fuels:

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

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

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

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

(LP Vapor Gas Models only.)

Parts Listing

Description	Qty.	Part No.
Carburetor Assembly	1	A-278955
Solenoid Assembly	1	A-278424
Screw 5/16-18 x 1	2	X-125-5
Pipe Nipple 1/4 x 1 1/2	1	X-220-6
Plain Washer .344 x .687 x .065	2	X-25-85
Elbow 5/8-18 x 1/4	2	X-447-1
Socket Head Screw 1/4 20 x .500	2	X-55-30
Pipe Plug	1	X-75-23
Gas Regulator	1	239153
Air Cleaner Base	1	246495
Carburetor Gasket	1	271030
Engine Wiring Harness	1	278297
PTC Assembly	1	278445
PTC Gasket	1	278528
Carburetor Sleeve	1	278954
Regulator Bracket	1	278976
Fuel Line	1	278991
Self Tapping Screw 1/4 20 x .750	2	X-67-114
Ground Strap	1	230857
Cable Tie	3	X-468-1
Decal	1	227841
Throttle Stop	1	278425
Carburetor Bracket	1	278953

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

This kit is not intended for extended-shaft generator sets.

Installation

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 1 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 pleated 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 the two screws securing the air duct to the engine closure plate. Remove the air duct and the black heat duct tube. Replace the two screws into the engine closure plate. (Discard air duct and black heat duct tube.)
6. Remove one screw on the engine breather cover to remove the breather tube and breather cover.
7. Remove the vacuum line and fitting between the choke and the intake manifold.
8. Apply pipe sealant to the pipe plug (X-75-23) and install into the intake manifold.
9. Remove the hose clamp securing the pleated hose to the carburetor.
10. Remove the air cleaner base.
11. Disconnect the leads (70 and N) from the electric choke.
12. Disconnect the lead (AD) from the antidieseling solenoid.
13. Disconnect the lead (70) from the PTC (Positive Temperature Coefficient) assembly.
14. Disconnect the fuel line from the carburetor.
15. Disconnect the 6-pin connector (J9/P9) from the actuator assembly which contains leads M1, M2, M3, and M4.
16. Remove the two nuts securing the carburetor to the intake manifold flange.
17. Remove the gasoline carburetor and actuator assembly from the studs protruding from the intake manifold (remove and save the stepper motor and mounting hardware from the actuator assembly).
18. Remove the four screws (X-794-3) from the controller cover.
19. Unplug the 20-pin and 2-pin connectors at the left of the controller box.
20. Disconnect the lead (13) from the low-oil-pressure switch.
21. Disconnect the two magnetic pickup (MP) leads and the ignition lead (72).
22. Remove the leads (P and 71) from the starter solenoid.
23. Disconnect FP, FN, B1, and B2 leads.
24. Remove the screw (X-794-3) at the fuel line support located at the right side of the circuit breaker box.
25. Remove the two screws (X-67-115) securing the fuel pump to the controller mounting bracket.
26. Disconnect the 2-pin connector (J5/P5) containing the red and black leads at the fuel pump.

27. Remove the fuel pump, hose w/fuel filter & bracket, and fuel line and discard.

28. Remove the two screws (X-6216-1) securing the drip tray.

29. 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.

30. 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.

31. Remove the two screws from the gas regulator and mount the regulator bracket (278976) to the gas regulator.

32. Remove the screw and star washer from the generator end bracket to remove the ground strap. Remove the nut, ground lug, and green hazard ground lead securing the other end of the ground strap to the generator tray. Remove and discard ground strap.

33. Mount the regulator bracket to the top hole in the end bracket using screw (X-67-114).

34. Secure the new ground strap (230857) using screw (X-67-114) and star washer into the bottom hole in the end bracket.

35. Position the ground strap onto the stud in the generator tray and replace the hazard ground lead, ground lug, and nut.

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 existing hardware to secure. See Figure 2 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-125-5) and washers (X-25-85).

39. Mount the elbow (X-447-1) into the carburetor.

40. 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.

41. Remove the set screw in the carburetor. Place the carburetor sleeve (278954) onto the carburetor and secure with the set screw.

42. Connect the fuel line (278991) from the carburetor to the gas regulator.

43. Connect the 20-pin connector end of the new wiring harness (278297) into the connector located at the left side of the controller box (J4/P4).

44. Plug the 6-pin connectors (J9/P9) together at the actuator assembly.

45. Connect FP, FN, B1, AND B2 leads of the wiring harness to the corresponding leads on the unit.

46. Plug the 2-pin connector (J20/P20) together (lead N & AD) at the fuel solenoid.

47. Connect the lead (13) to the low-oil-pressure switch.

48. Connect the two magnetic pickup (MP) leads together.

49. Connect the ignition leads (72) together.

50. Connect the lead (70) to the PTC Assembly.

51. Position the (P and CP) leads onto the positive terminal on the starter solenoid.

52. Position the lead (71) onto the smaller terminal on the starter solenoid.

53. If the unit is equipped with a battery charging option, connect the lead (CP) to the battery charging circuit breaker 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.

54. Remount the new air cleaner base (246495) to the controller using existing hardware to secure.

55. Place the air cleaner element inside the air cleaner base.

56. Install the pleated hose to the carburetor sleeve using the existing hose clamp to secure.

57. Replace the air cleaner cover onto the air cleaner base.

58. Position the loose end of the pleated hose onto the air cleaner and secure with existing hose clamp.

59. Reassemble the connector end of the breather line into the air cleaner and tighten with existing hose clamp. Reinstall the breather closure plate end of the breather line onto the engine (use existing hardware).

60. Secure the solenoid harness to an end bracket fin and over bolt using two cable ties (X-468-1).

61. Secure the engine wiring harness using cable tie (X-468-1).

62. Replace the controller cover using existing hardware.

63. 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.

64. Place the decal (227841) on the controller cover.

65. Replace the generator hood using existing hardware.

66. Reconnect the battery, negative lead last. Connect the fuel lines, load leads, remote leads, and exhaust system.

NOTE

Since this generator set has been converted from a gasoline-fueled unit to an LP vapor-fueled unit, retain this instruction sheet for 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.

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 six ounces. 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 ounces or 7-11 inches water column, inlet pressure is adjusted on the primary regulator.

NOTE

If a removable fuel container is used as a fuel source, fuel leakage during a container change must be prevented by the use of 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 container 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.

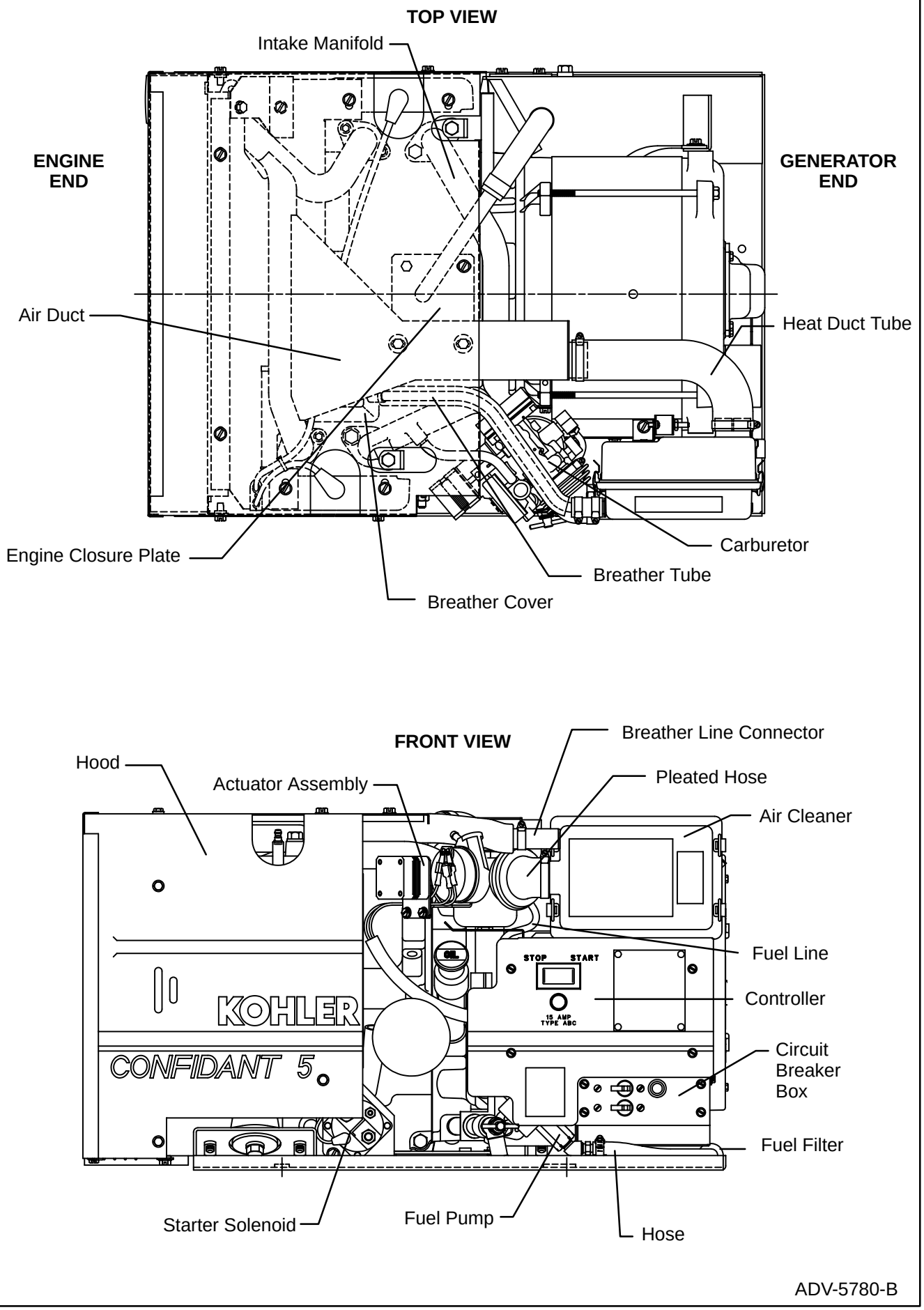


Figure 1. 4/5kW Gasoline Fueled RV Generator Set.

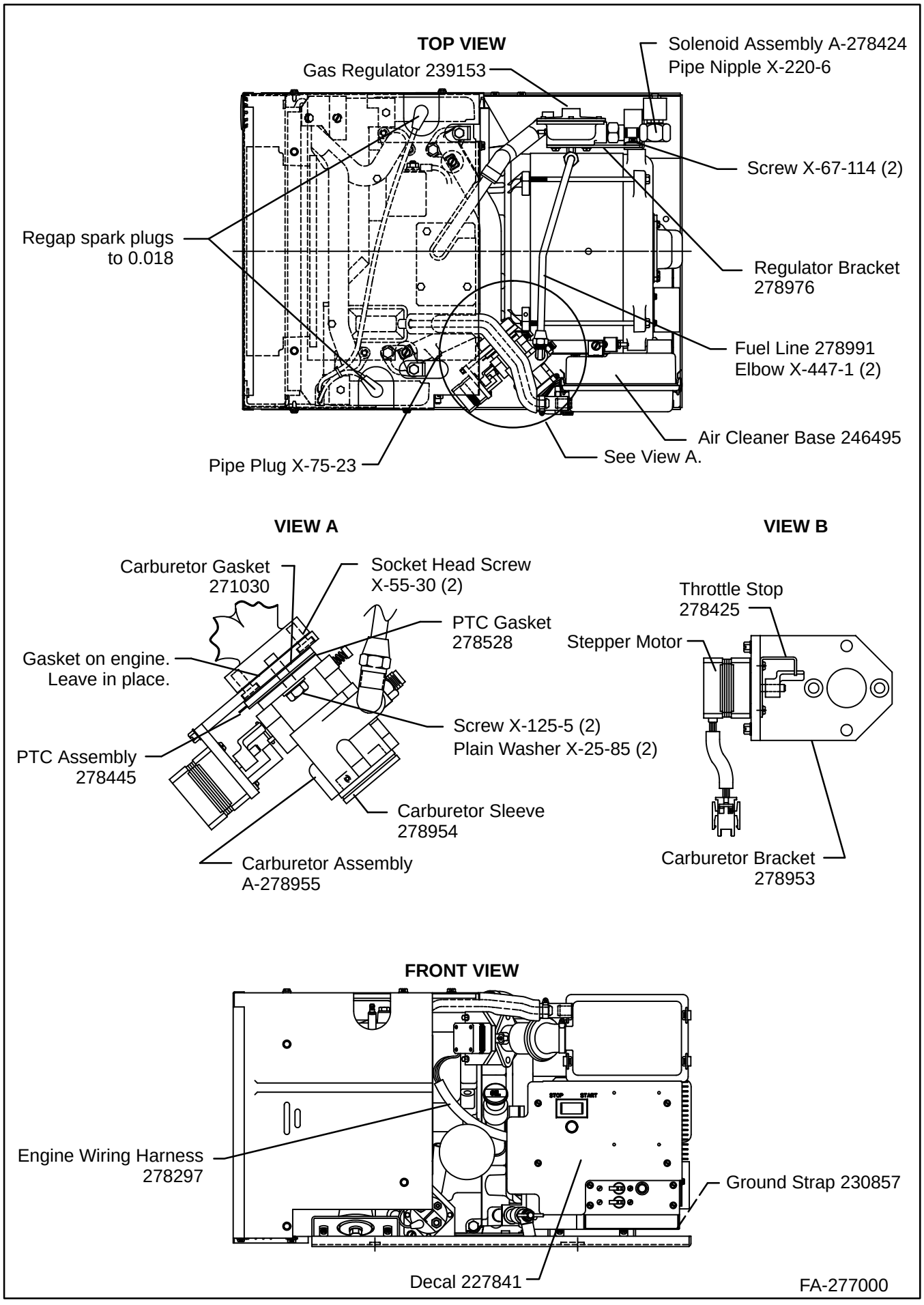


Figure 2. 4/5kW LP Vapor Fueled RV Generator Set.

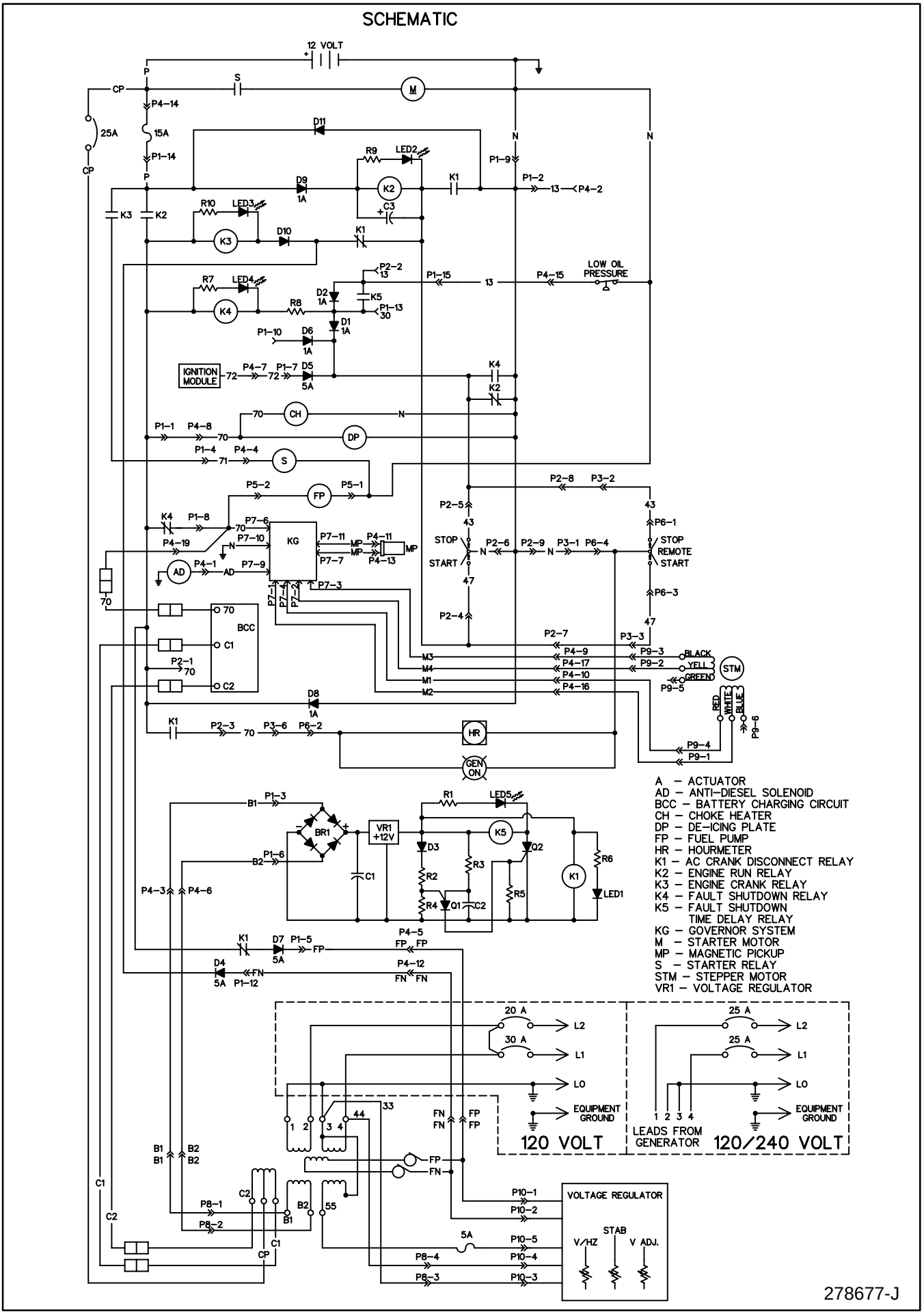


Figure 3. Wiring Diagram - Schematic 4/5kW RV Gasoline.

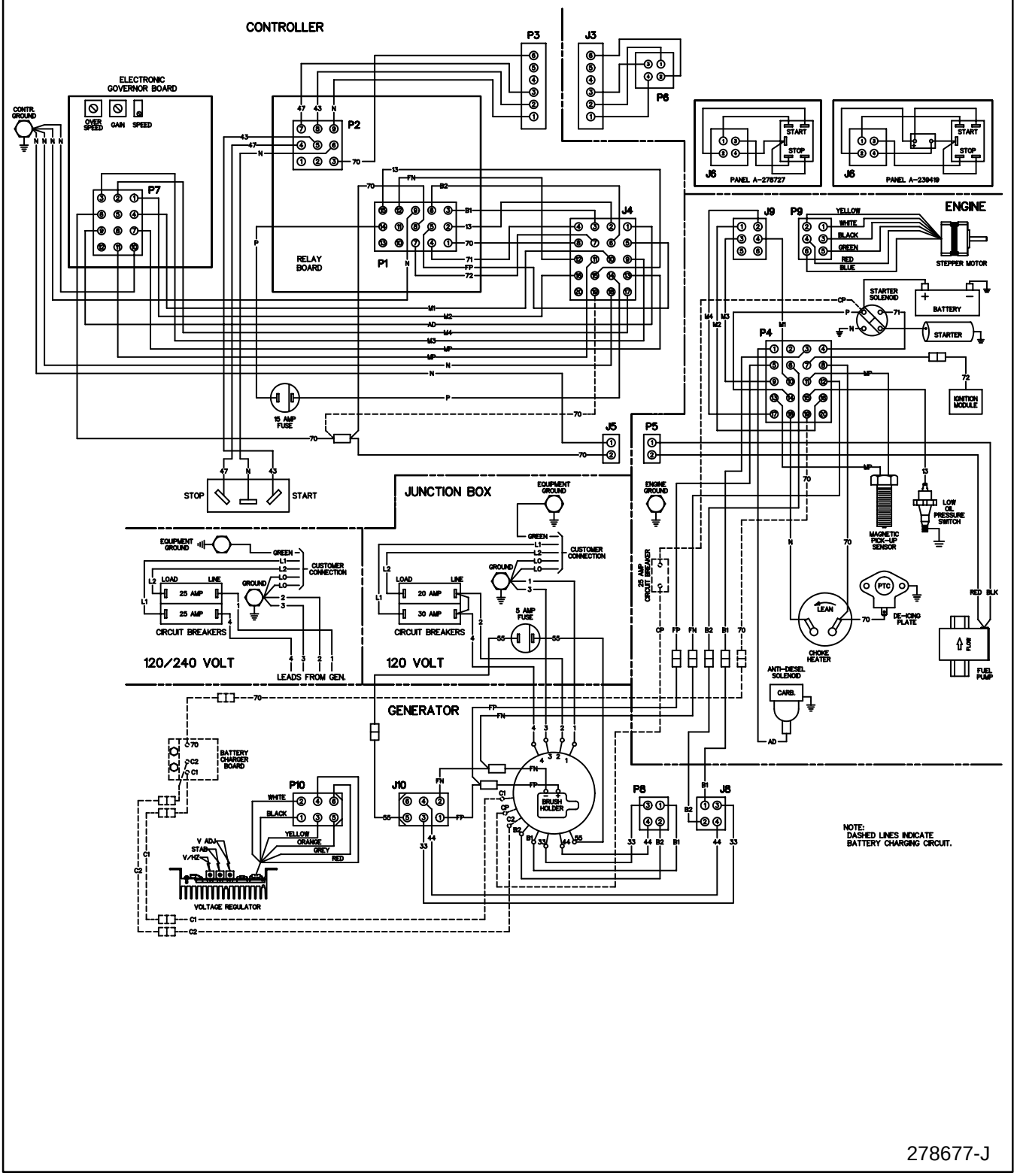


Figure 4. Wiring Diagram - Point-to-Point Wiring 4/5kW RV Gasoline.

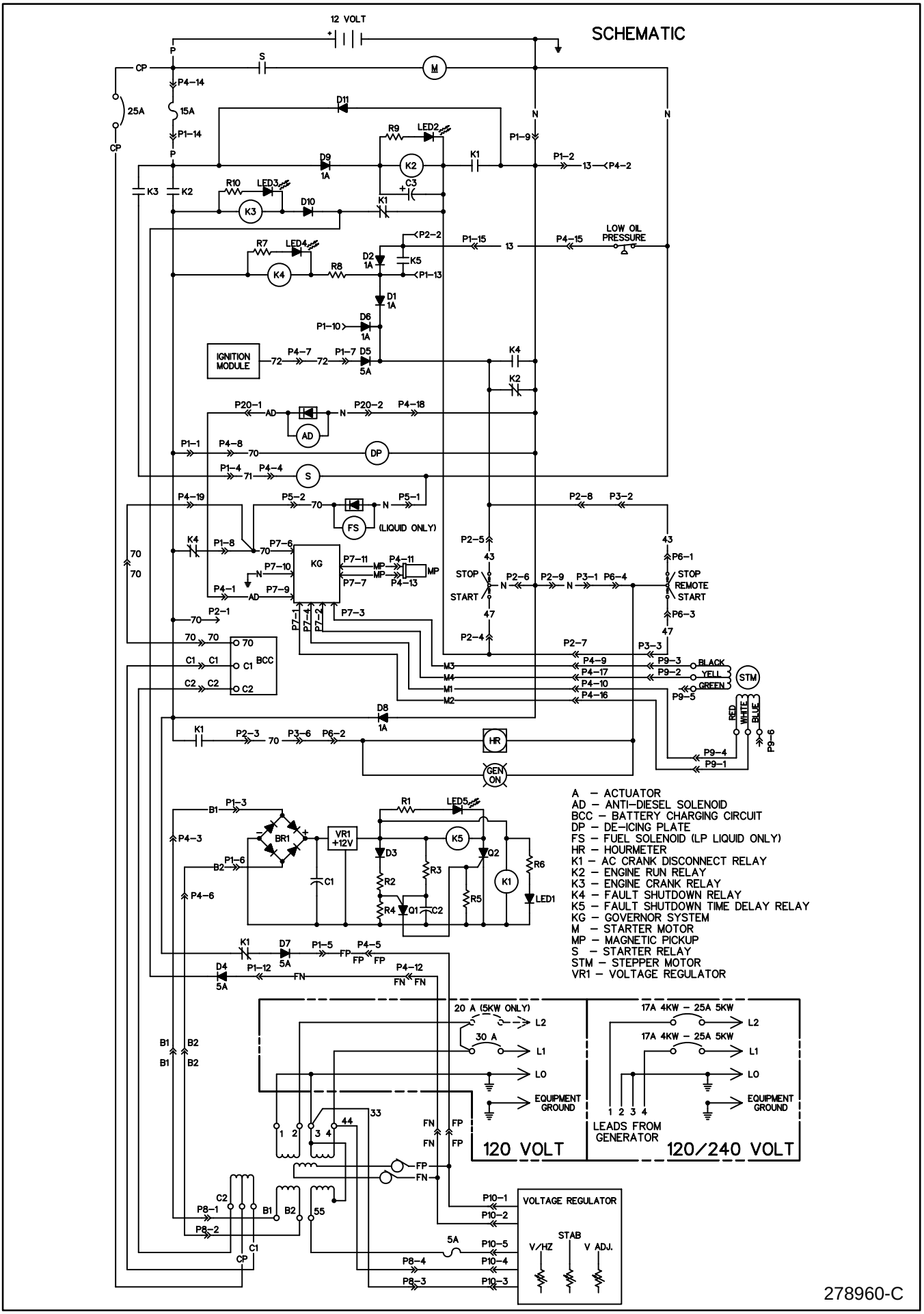


Figure 5. Wiring Diagram - Schematic 4/5kW RV LP Vapor.

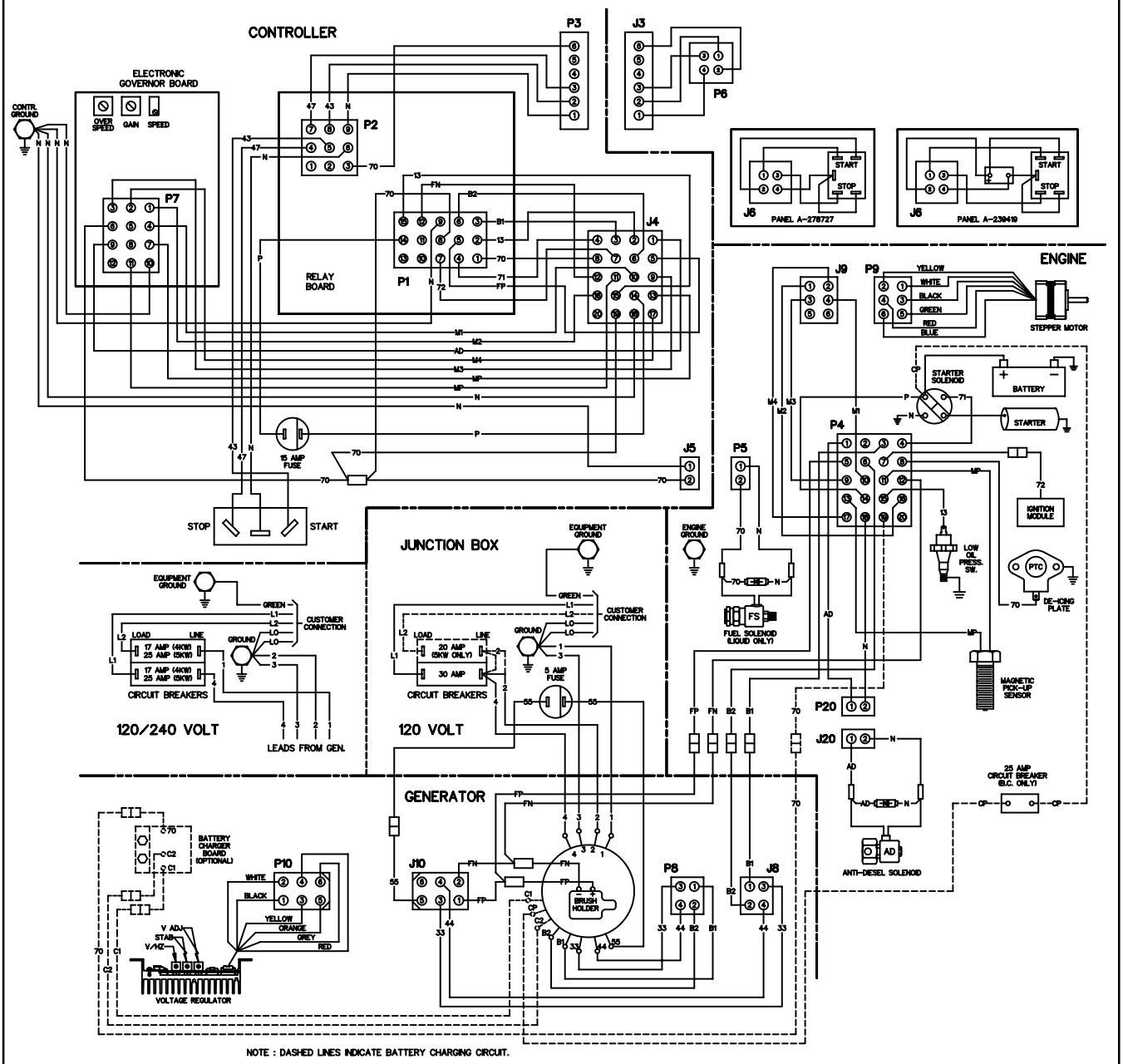


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Figure 6. Wiring Diagram - Point-to-Point Wiring 4/5kW RV LP Vapor.