

INSTALLATION INSTRUCTIONS

Issue Date: **2/96**
 Model: **4/5CKM/CKMR (with LP Liquid-Withdrawal Fuel System)**
 Market: **RV**
 Subject: **LP Fuel Regulator Relocation Service Kits
 227969, 227975, 227980, and 227981**

Use this kit to relocate the primary and secondary fuel regulators to a vertical position to allow any accumulated contaminants to drain from the primary fuel regulator. After kit installation, service the unit every 50 hours of operation by draining the contaminants from the collection pipe into a suitable container and disposing of them in an environmentally safe manner.

Servicing 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. Catch all fuel in a suitable container when removing fuel line or carburetor.



**Accidental starting.
 Can cause severe injury or death.**

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

Disabling generator set. 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 the generator set or connected equipment. The generator set can be started by the remote start/stop switch unless this precaution is followed.



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

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

Fuel system. 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 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. Use flexible sections to avoid breakage caused by vibration. Do not operate generator set in the presence of fuel leaks, fuel accumulation, or sparks. Repair systems before resuming generator set operation


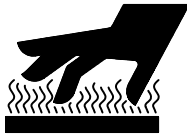
Explosive fuel vapors can cause severe injury or death. Take additional precautions when using the following fuels:

⚠ WARNING
<p>Fire. Can cause severe injury or death.</p> <p>Do not smoke or permit flame or spark to occur near fuel or fuel system.</p>

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

Draining fuel system. 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.

LP liquid withdrawal fuel leaks. Explosive fuel vapors can cause severe injury or death. Fuel leakage can cause an explosion. Check LP liquid withdrawal gas fuel system for leakage using a soap-water solution with fuel system test pressurized not less than 90 psi (621 kPa). Do not use soap containing ammonia or chlorine in test solutions, since the soap will not bubble and will not allow an accurate leakage test.

 WARNING

Hot engine and exhaust system. Can cause severe injury or death.
Do not work on generator set until it is allowed to cool.

Servicing exhaust system. Hot parts can cause severe injury or death. Do not touch hot engine parts. An engine becomes hot while running and exhaust system components become extremely hot.

Installation

1. Move the controller start/stop switch to the STOP position.
2. Disconnect the generator set starting battery, (-) lead first. and allow the generator set to cool.
3. Before removing the generator set from a coach, disconnect the fuel lines, load leads, remote start leads, and exhaust system. Remove the generator set from the coach according to the procedure supplied by the coach manufacturer.
4. Remove the screws securing the hood to the generator set. Remove the hood and outlet screen to expose the generator set engine end.
5. *5 kW units only*—Drain the oil from the unit (see the Operation Manual for procedure). Remove the oil tank hose from the oil tank. Remove and discard the oil tank. Save mounting hardware.

6. *5 kW units only*—Install the oil tank (227963) in the same position as the old oil tank using existing hardware. Reconnect the oil tank hose to the oil tank.
7. Disconnect the fuel lines from both the primary and secondary fuel regulators.
8. Disconnect the secondary fuel regulator mounting bracket from the generator. Save the mounting hardware.

NOTE

On previously operated generator sets, inspect the condition of the primary and secondary fuel regulators. Clean or replace regulators as needed.

9. Remove the entire fuel regulator assembly from the generator set.
10. Disconnect the antidiesel solenoid from the primary and secondary fuel regulators. Keep the pipe nipples in place on both sides of the solenoid.
11. Save the primary fuel regulator with the street elbow and condensation hose attached. See Figure 1.
12. Disconnect the condensation hose from the hose connector.
13. Remove the hose connector from the street elbow.
14. Remove the street elbow from the primary fuel regulator and discard the street elbow.
15. Install the hose connector into the primary fuel regulator and attach the condensation hose. See Figure 3.
16. Disconnect the secondary fuel regulator from the mounting bracket. Save the mounting hardware and the secondary fuel regulator. Discard the mounting bracket.
17. Disconnect and remove the secondary fuel regulator fuel line connected to the carburetor.
18. Connect the fuel line (227943 or 227944) to the carburetor. Torque the fuel line nut to 30 ft. lbs. (40.7 Nm).
19. Cut a drain hole in the generator tray. See Figure 2 for hole location and size.
20. Mount the fuel regulator bracket (227945) to the generator using existing hardware.

NOTE

Assemble the major components prior to installing the regulator assembly on the generator set.

NOTE

Use pipe sealant on all pipe connections, do not use any type of tape. Use care to prevent excess pipe sealant from entering pipe. Foreign material trapped inside pipe may damage fuel regulators.

21. Connect the reducer bushing (X-202-30) to the bottom of the primary regulator.
22. Install the pipe nipple (X-220-6) between the reducer bushing (X-202-30) and the pipe tee (X-203-19). See Figure 3.
23. Connect the pipe (X-220-13) to the bottom of the pipe tee. Connect the pipe cap (X-268-3) to the base of the pipe. See Figure 3.
24. Connect the antidiesel solenoid (with the pipe nipple attached) to the pipe tee.
25. Connect the other end of the antidiesel solenoid (with the pipe nipple attached) to the street elbow (EH-2248).
26. Attach the existing secondary regulator to the street elbow.
27. Secure the secondary regulator to the mounting bracket using existing hardware. Do not yet final tighten the hardware.
28. Secure the primary regulator to the mounting bracket using two tapping screws (X-67-60) and two #8 washers. Do not yet final tighten the hardware.
29. Align all components as shown in Figure 3 and final tighten.
30. Connect the street elbow (EH-2248) and fuel fitting (X-6290-2) to the top of the primary fuel regulator.

31. Connect the fuel line (227942) from the primary fuel regulator to the existing fuel line. Secure with the existing clip. Torque fuel line connections to 15 ft. lbs. (20 Nm). See Figure 3.
32. Connect the fuel line from the carburetor to the elbow (X-447-1).
33. Install the elbow to the back of the secondary fuel regulator. Reposition the elbow to accept the fuel line. Torque the nut on the fuel line to 30 ft. lbs. (40.7 Nm).
34. Disconnect the fuel line at the fuel shutoff solenoid. See Figure 1.
35. Loosen fuel valve bracket to connect the restricted pipe adapter (227941) to the fuel shutoff solenoid.
36. Secure fuel valve bracket.
37. Reattach the fuel line to the fuel shutoff solenoid.
38. Check all pipe joints for air leaks.
39. Replace the generator hood and outlet screen using existing hardware.
40. *5 kW units only*—Replace engine oil. See the Operation Manual for type and quantity.

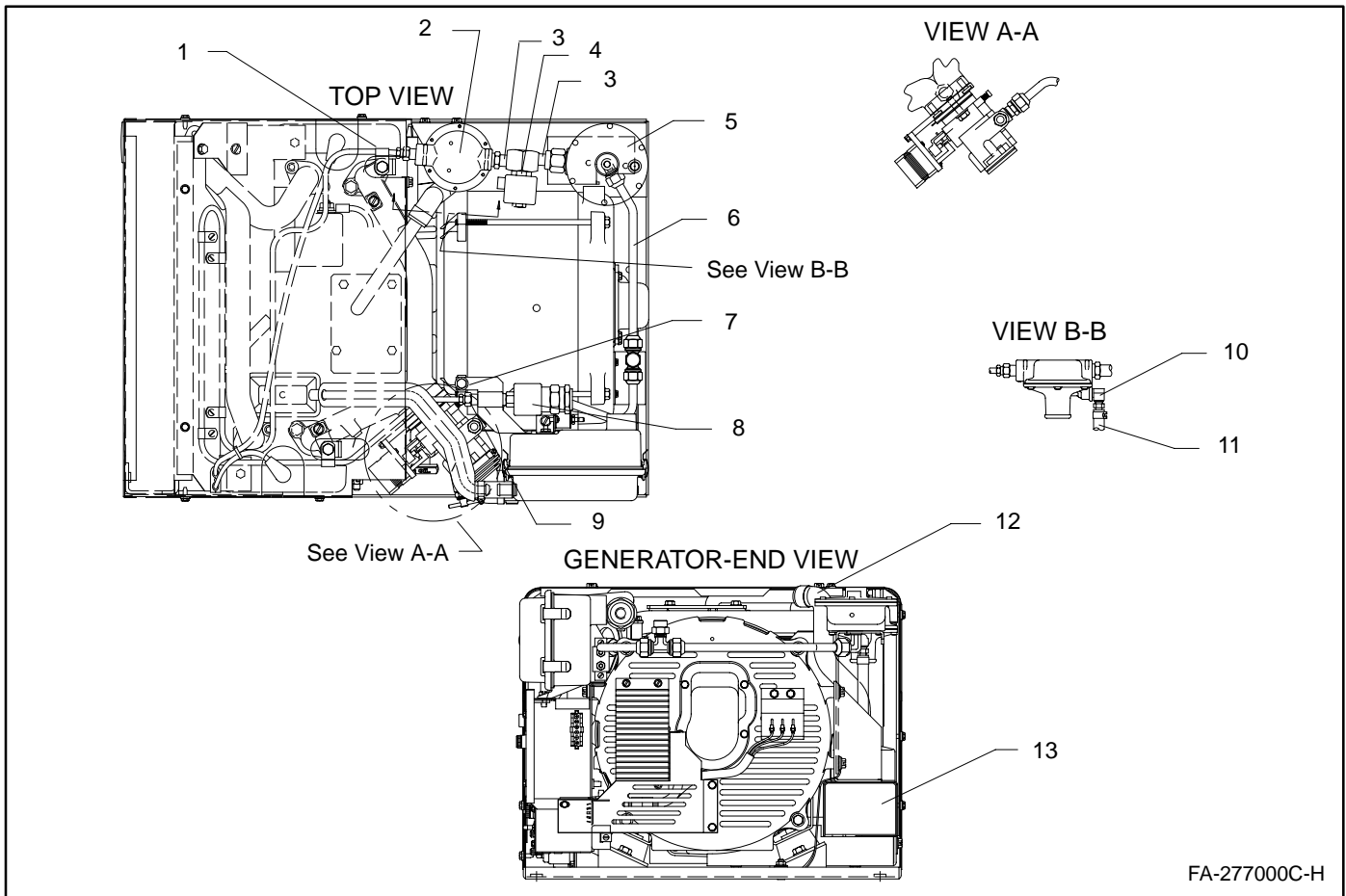
NOTE

Since this kit supplies a smaller oil tank, reduce the quantity of oil listed in the Operation Manual by approximately 2 oz.

41. Reinstall the generator set in the coach. Connect the fuel lines, load leads, remote start leads, and exhaust system.
42. Reconnect the generator set starting battery, negative (–) lead last.

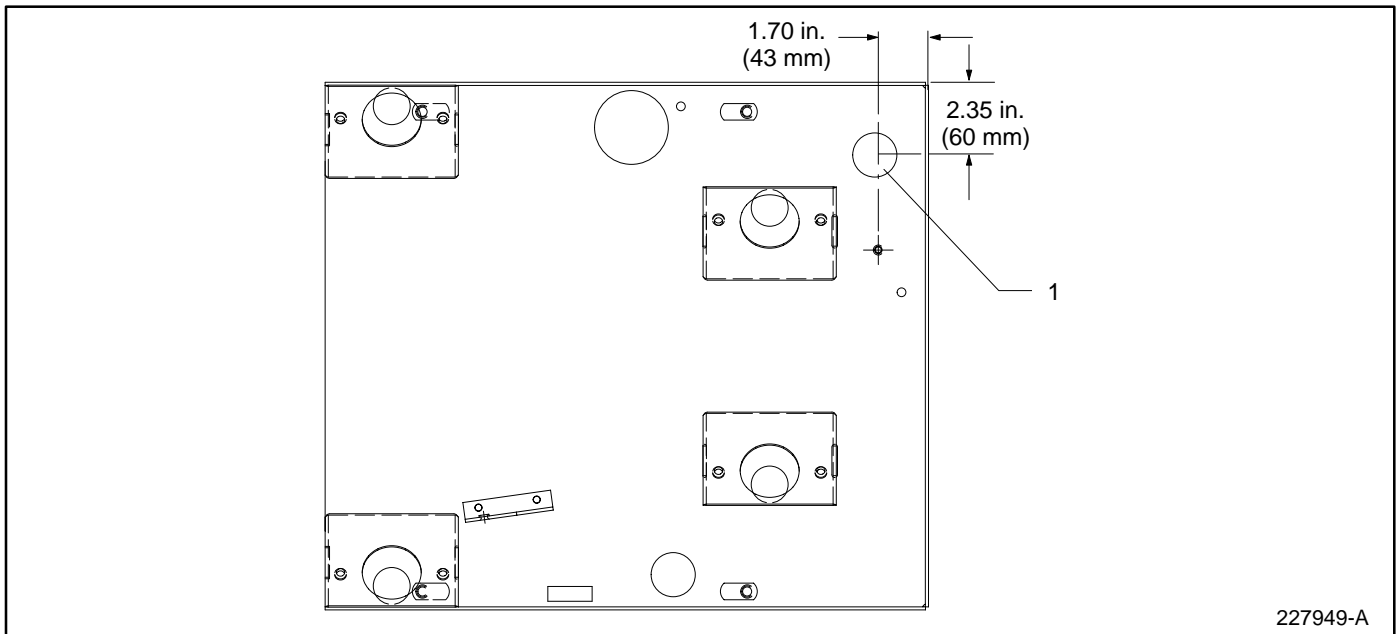
Regulator Relocation Kit

Parts List				
Kits: 227969, 227975, 227980, 227981			Unique Parts	
Qty.	Description	Common Parts	227969,227980	227975,227981
2	Elbow, street 1/4	EH-2248		
1	Bushing, reducer	X-202-30		
1	Tee, pipe	X-203-19		
1	Pipe	X-220-13		
1	Nipple, pipe 1/4 x 1 1/2	X-220-6		
1	Cap, pipe	X-268-3		
1	Elbow, 5/8-18 x 1/4	X-447-1		
1	Fitting, fuel	X-6290-2		
2	Screw, tapping 8-32 x 1/2	X-67-60		
1	Adapter, restricted	227941		
1	Line, primary fuel	227942		
1	Line, fuel		227943	227944
1	Bracket, regulator	227945		
1	Tank, oil (Kits 227969 & 227975 only)		227963 (Kit 227969)	227963 (Kit 227975)



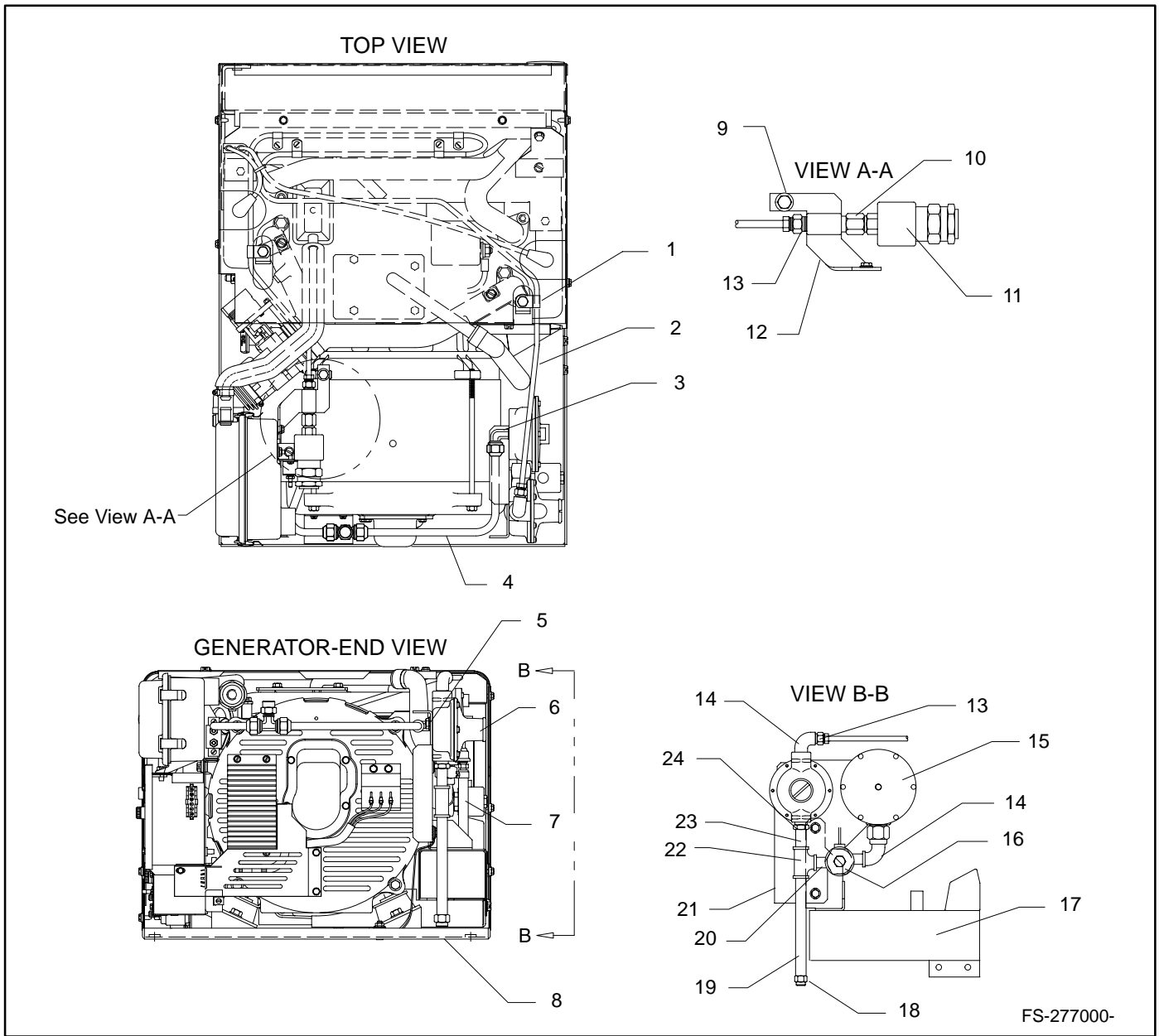
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|--------------------------------------|-------------------------------------|
| 1. Clip | 8. Fuel solenoid assembly |
| 2. Primary fuel regulator | 9. Fuel fitting |
| 3. Pipe nipple (1/4 x 7/8) | 10. Street elbow (1/8 x 1/8) |
| 4. Fuel solenoid assembly | 11. Fuel line |
| 5. Secondary fuel regulator | 12. Oil tank hose (5 kW units only) |
| 6. Fuel line | 13. Oil tank (5 kW units only) |
| 7. Fuel valve bracket, spacer, screw | |

Figure 1. LP Liquid-Withdrawal Unit with Fuel Regulators Mounted in Original Horizontal Position



1. Drill 1.5 in. diameter hole in skid for LP bleed line

Figure 2. Floor Cutout Location



1. Use existing clip
2. Primary fuel line (227942). Torque nuts to 15 ft. lbs.
3. Elbow (X-447-1)
4. Fuel line (227943 standard generator or 227944 extended-shaft generator). Torque nuts to 30 ft. lbs.
5. Tapping screw (X-67-60 qty. 2), #8 washer (qty. 2)
6. Use existing primary fuel regulator
7. Use existing hose and fittings. Route to drain hole and secure with tie wrap
8. Drill 1.5 diameter hole in skid for LP bleed line—see Figure 2
9. Use existing spacer and hex flange screw
10. Restricted adapter (227941)
11. Use existing fuel solenoid assembly

12. Use existing fuel valve bracket
13. Fuel fitting (X-6290-2)
14. Street elbow 1/4 (EH-2248)
15. Use existing secondary fuel regulator
16. Use existing valve
17. Oil tank (227963)—5 kW units only
18. Pipe cap (X-268-3)
19. Pipe (X-220-13)
20. Use existing pipe nipples (2)
21. Regulator bracket (227945)
22. Pipe tee (X-203-19)
23. Pipe nipple (X-220-6)
24. Reducer bushing (X-202-30)

Figure 3. LP Liquid-Withdrawal Unit with Primary and Secondary Fuel Regulators Mounted in Vertical Position