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## INSTALLATION INSTRUCTIONS

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Original Issue Date: 2/99  
 Model: 35RZ  
 Market: Industrial  
 Subject: Fuel Vaporizer Kit ES-37771

Use the following instructions to convert a LP vapor fuel system to a LP liquid withdrawal fuel system.

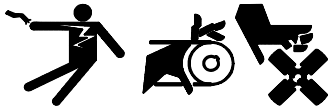
Installation of the Fuel Vaporizer kit must comply with these installation instructions. Failure to install the fuel vaporizer per these installation instructions may result in poor generator set performance and affect the generator set warranty.

With the LP liquid withdrawal fuel system, LP fuel in liquid form is directed under pressure from the tank to a vaporizer. The vaporizer converts the fuel from a liquid to a gaseous state and then the LP vapor is drawn off to the carburetor. The system also includes a fuel valve which shuts off the fuel flow when the engine is stopped.

Observe the following safety precautions while installing the kit.

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### ⚠ WARNING



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

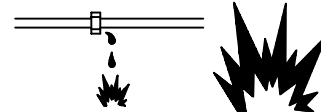
Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

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**Disabling the generator set. Accidental starting can cause severe injury or death.** Before working on the generator set or connected equipment, disable the generator set as follows:  
 (1) Move the generator set master switch to the OFF position.  
 (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

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### ⚠ WARNING



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

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

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**The fuel system. Explosive fuel vapors can cause severe injury or death.** Vaporized fuels are highly explosive. Use extreme care when handling and storing fuels. Store fuels 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 because spilled fuel may ignite on contact with hot parts or from sparks. Do not smoke or permit flames or sparks to occur near sources of spilled fuel or fuel vapors. Keep the fuel lines and connections tight and in good condition. Do not replace flexible fuel lines with rigid lines. Use flexible sections to avoid fuel line breakage caused by vibration. Do not operate the generator set in the presence of fuel leaks, fuel accumulation, or sparks. Repair fuel systems before resuming generator set operation.

**LP liquid withdrawal fuel leaks. Explosive fuel vapors can cause severe injury or death.** Fuel leakage can cause an explosion. Check the LP liquid withdrawal gas fuel system for leakage by using a soap and water solution with the fuel system test pressurized to at least 90 psi (621 kPa). Do not use a soap solution containing either ammonia or chlorine because both prevent bubble formation. A successful test depends on the ability of the solution to bubble.

## Installation

1. Place the generator set master switch in the OFF position.
2. Disconnect the power to the battery charger, if equipped.
3. Disconnect the generator set engine starting battery(ies), negative (-) lead first.

4. Turn off the fuel supply to the generator set.
5. With the engine and radiator cool, drain the coolant into a suitable container. Dispose of all waste materials, (engine oil, fuel, coolant, etc.) in an environmentally safe manner. Contact local authority for procedures.

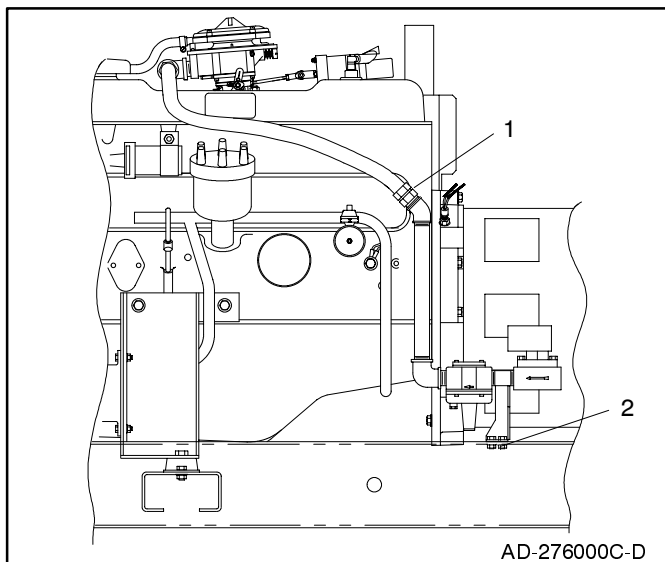
#### NOTE

The drain valve is located on the radiator bottom and/or on the side of the engine crankcase.

#### NOTE

Apply pipe sealant to the male threads of all components before installation.

6. Disconnect the fuel supply line connected to the gas valve assembly.
7. Disconnect the gas valve two-pin connector.
8. Disconnect and remove the flexible fuel line from the carburetor and the connection near the pressure regulator. See Figure 1.
9. Remove the hardware securing the fuel valve bracket to the generator set skid.

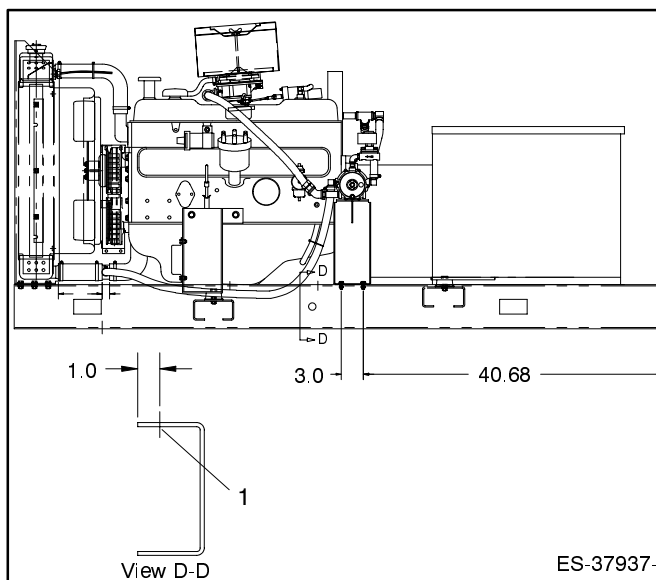


1. Flexible fuel line disconnect point
2. Fuel valve bracket mounting hardware

**Figure 1. LP Vapor Fuel System**

10. Drill two 0.344 in. (8.74 mm) diameter holes in the generator set skid for the converter mounting bracket. See Figure 2 for the dimensions and locations.
11. Secure the gas convertor (256903) to the gas convertor bracket (326606) using 1/4-20 x 0.625 in. screws (X-465-2) and plain washers (X-25-40). See Figure 2.

12. Secure the gas convertor bracket to the generator set skid using 5/16-18 x 0.750 in. screws (X-125-3), washers (X-25-85), and 5/16-18 spirallock nuts (X-6210-7). See Figure 2.

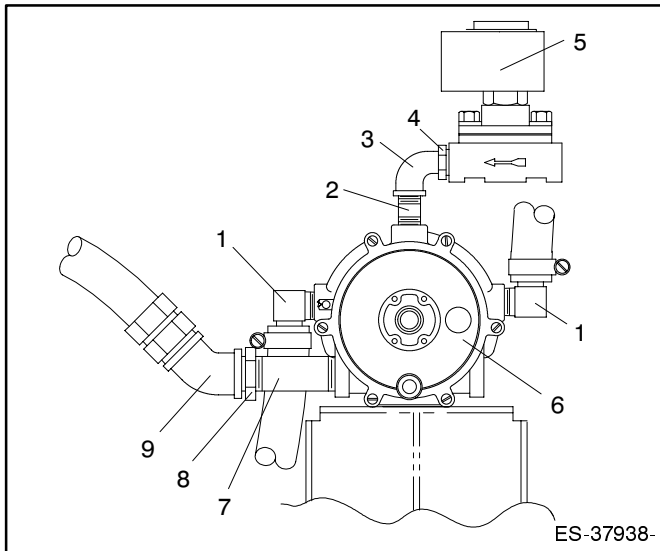


1. Two 0.344 in. (8.74 mm) diameter mounting holes

**Figure 2. Fuel Vaporizer Installation**

13. Apply pipe sealant to the threads of one 90° elbow hose connector (X-391-2) and install in the left side converter water inlet. See Figure 3. Position the elbow down.
14. Apply pipe sealant to the threads of the second 90° elbow hose connector (X-391-2) and install in the right side converter water outlet. See Figure 3. Position the elbow up.
15. Apply pipe sealant to the threads of the 1/4 x 1.5 in. pipe nipple (X-220-6) and install in the top of the converter.
16. Apply pipe sealant to the exposed threads of the pipe nipple installed in step 15.
17. Thread the 1/4 in. street elbow (X-211-6) onto the pipe nipple. Position the elbow as shown in Figure 3.
18. Apply pipe sealant to the 1/4 x 3/8 in. reducer bushing (X-202-30) and install in the street elbow installed in step 17.
19. Apply pipe sealant to the exposed threads of the reducer bushing installed in step 18 and install the fuel solenoid (326070). Position the fuel solenoid as shown in Figure 3.
20. Apply pipe sealant to the threads on one end of the 1/2 x 3.0 in. pipe nipple (X-209-11) and thread the pipe nipple into the gas convertor left side vapor outlet. See Figure 3.
21. Apply pipe sealant to the exposed threads of the pipe nipple installed in step 20 and install the reducer bushing (X-202-41).

22. Apply pipe sealant to the exposed threads of the reducer bushing installed in step 21 and install the 3/4 in. 45° elbow (X-225-8). Position the elbow as shown in Figure 3.
23. Apply pipe sealant to the threads of the flexible fuel line (276395) and connect the fuel line to the carburetor and the converter 45° elbow.

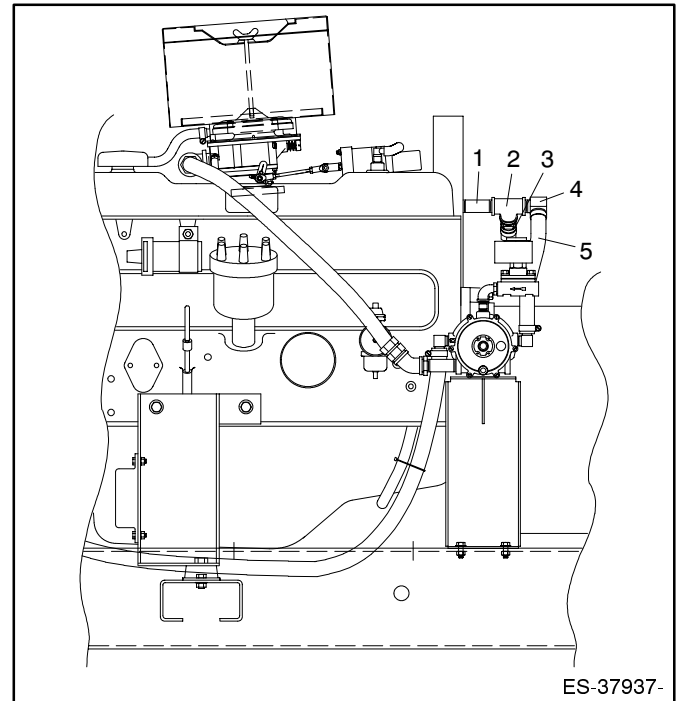


1. 90° elbow hose connector (X-391-2)
2. Pipe nipple 1/4 x 1.5 in. (X-220-6)
3. Street elbow 1/4 in. (X-211-6)
4. Reducer bushing 1/4 x 3/8 in. (X-202-30)
5. Solenoid (326070)
6. Converter (256903)
7. Pipe nipple (X-209-11)
8. Reducer bushing 1/2 x 3/4 (X-202-41)
9. 45° elbow 3/4 in. (X-225-8)

**Figure 3. Converter Assembly**

24. Disconnect the block heater outlet hose from the back of the cylinder head.
25. Remove the hose connector from the freeze plug adapter. Save the hose connector for installation later.
26. Apply pipe sealant to the threads of the 1/2 x 4.0 in. pipe (X-209-18) and install the pipe in the freeze plug adapter where the hose connector was removed. See Figure 4.
27. Apply pipe sealant to the exposed threads of pipe installed in step 26 and install the 1/2 in. pipe tee (X-203-13). Position the pipe tee as shown in Figure 4.
28. Apply pipe sealant to the threads of the elbow hose connector (X-391-19) and install the connector in the end of the pipe tee. Position the elbow hose connector as shown in Figure 4.
29. Connect one end of the 1.0 ft. (0.3 m) hose (X-312-48) to the elbow hose connector installed in step 28. Secure the hose to the hose connector with a hose clamp (X-426-10). Place the hose clamp 0.25 in. (6 mm) from the end of the hose and tighten.

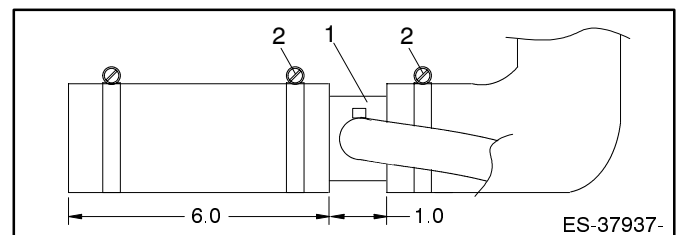
30. Apply pipe sealant to the threads of the hose connector removed in step 25 and install the connector in the pipe tee. See Figure 4.
31. Secure one end of the block heater outlet hose to the hose connector installed in step 30. Secure the hose to the hose connector with a hose clamp. Place the hose clamp 0.25 in. (6 mm) from the end of the hose and tighten.



1. Pipe 1/2 x 4.0 in. (X-209-18)
2. Pipe tee 1/2 in. (X-203-13)
3. Hose connector removed from cylinder head
4. Elbow hose connector (X-391-19)
5. Hose 1 ft. (0.3 m) (X-312-48)

**Figure 4. Fuel Vaporizer Installation**

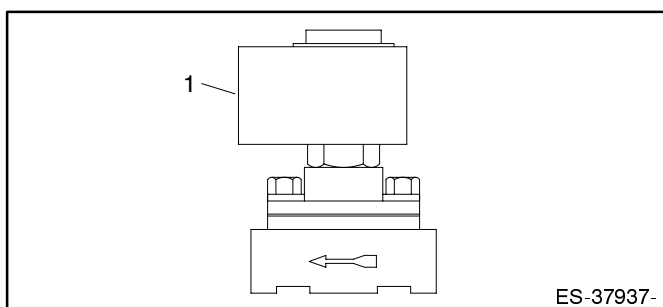
32. Disconnect and remove the lower radiator hose from the engine and radiator.
33. Cut a 1 in. (25.4 mm) section out of the lower radiator hose. See Figure 5 for location.
34. Secure the hose connector (275581) in the lower radiator hose with hose clamps (X-426-6). Position the hose connector as shown in Figure 5.
35. Reinstall the lower radiator hose to the engine and radiator. Secure the hose with hose clamps.



1. Hose connector (275581)
2. Hose clamps (X-426-6)

**Figure 5. Lower Radiator Hose**

36. Connect one end of the 4.3 ft. (1.3 m) hose (X-312-57) to the 90° hose connector on the left side of the converter. See Figure 3. Secure the hose to the hose connector with a hose clamp (X-426-6). Place the hose clamp 0.25 in. (6 mm) from the end of hose and tighten.
37. Connect the opposite end of the hose connected in step 36 to the hose connector in the lower radiator hose. Secure the hose to the hose connector with a hose clamp (X-426-6). Place the hose clamp 0.25 in. (6 mm) from the end of the hose and tighten.
38. Cut the two-pin connector from the harness formerly connected to the gas valve assembly. Crimp customer supplied terminals to the leads.
39. Connect the leads disconnected from the gas valve to the fuel solenoid. See Figure 6.



1. Electrical connections

**Figure 6. Fuel Solenoid**

40. Connect the fuel supply line to the fuel solenoid.
41. Turn on the fuel supply to the generator set and test the connections for leaks. Turn off the fuel supply and correct leaks, if required. Turn on the fuel supply.
42. Check that the generator master switch is in the OFF position.
43. Reconnect the generator set engine starting battery, negative (-) lead last.
44. Reconnect the power to the battery charger, if equipped.

## LP Liquid Withdrawal Kit

Parts List		
Kit: ES-37771		
Qty.	Description	Part Number
2	Washer, plain ID=0.531	X-25-40
2	Washer, plain ID=0.344	X-25-85
2	Screw, hex cap 5/16-18 x 0.750 in.	X-125-3
1	Bushing, reducer 1/4 x 3/8 in.	X-202-30
1	Bushing, reducer 1/2 x 3/4 in.	X-202-41
1	Tee, pipe 1/2 in.	X-203-13
1	Nipple, pipe 1/2 x 3 in.	X-209-11
1	Pipe 1/2 x 4.0 in.	X-209-18
1	Elbow, street 1/4 in.	X-211-6
1	Nipple, pipe 1/4 x 1 1/2 in.	X-220-6
1	Elbow, 45°	X-225-8
1	Hose, length=12.5 in.	X-312-48
1	Hose, length=52 in.	X-312-57
1	Connector, hose elbow	X-391-19
2	Connector, hose	X-391-2
4	Clamp, hose (1.0 in. max)	X-426-10
2	Clamp, hose (2.5 in. max)	X-426-6
2	Screw, hex cap 1/4-20 x 0.625 in.	X-465-2
2	Nut, spiralock 5/16-18	X-6210-7
1	Converter	256903
1	Connector, hose	275581
1	Line, flexible fuel	276395
1	Solenoid	326070
1	Bracket, converter mounting	326606