



Service Manual

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Generator Set

BGE (Spec F-P)
NHE (Spec E-P)

Supplement 965-1060
Date: 11-95
Insert with-
Title: BGE/NHE Service Manual
Number (Date): 965-0528 (9-94)

PURPOSE

This Supplement supercedes Supplement 965-1055. It transmits the revisions to the Service Manual necessary for covering all **Spec M** generator sets: gasoline fueled and LPG fueled. Note that the nameplate on a Spec M generator set will have the statement: "This engine meets 1995-1998 California emissions regulations for ULGE engines."

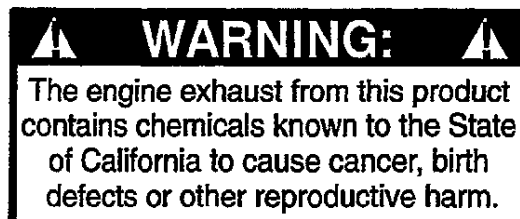
To satisfy California emissions regulations Spec M generator sets have internal engine modifications and precision-manufactured carburetors with tamper-resistant fuel mixture jets and tamper-resistant LPG demand regulators. It should therefore be noted that fuel mixture and LPG lock-off pressure adjustments should not be attempted. Nor should the carburetor or LPG demand regulator be overhauled. Instead, a malfunctioning carburetor or LPG demand regulator should be replaced (see TROUBLESHOOTING ENGINE PRIMARY SYSTEMS in Section 6).

⚠WARNING *Unauthorized modifications or replacement of fuel, exhaust, air intake or speed control system components that affect engine emissions are prohibited by law in the State of California.*

Modification, removal or replacement of the generator set label is also prohibited.

SERVICE MANUAL 965-0528 REVISIONS

1. **Insert this Supplement in its entirety under the front cover of the manual.** (Discard any copy of Supplement 965-1055.)
2. On **Page 1-1** write: "See Operator's Manual for fuel and engine oil recommendations and Periodic Maintenance."
3. On **Page 2-1** write: "For Spec M and later, ignition timing (non-adjustable) is 12° BTDC."
4. On **Page 5-4** write: "See Page S-2 of Supplement 965-1060 for instructions on how to purge LPG and disconnect the genset from RV systems." Cross out the instructions under the subheadings *LP-Gas (Propane) Purging Procedure* and *Disconnecting Set from RV Systems* on Page 5-4.
5. On **Page 6-15** under the heading GOVERNOR, write: "See Supplement 965-1060 for Spec M and Later."
6. On **Page 6-17** under the heading FUEL SYSTEM-GASOLINE, write: "See Supplement 965-1060 for Spec M and Later."
7. On **Page 6-25** under the heading FUEL SYSTEM—LPG LIQUID WITHDRAWAL, write: "See Supplement 965-1060 for Spec M and Later."
8. On **Page 6-31** under the heading FUEL SYSTEM—LPG VAPOR WITHDRAWAL, write: "See Supplement 965-1060 for Spec M and Later."



Disconnecting Set from RV Systems (All Specs)

1. First disconnect the negative (-) battery cable from the battery and then disconnect the battery cables from the genset.

⚠WARNING Sparks and high current could cause fire and other damage to the battery, battery cables and vehicle if the loose ends of cables connected to the battery touch. Always disconnect the negative (-) battery cable from the battery before disconnecting the battery cables from the genset.

2. Disconnect the remote control wiring harness connector at the genset.
3. Disconnect the generator output wiring and conduit from the power distribution panel or box on the vehicle. Tag all wires to make reconnections easier.
4. Disconnect the exhaust tailpipe from the outlet of the muffler and then remove the muffler. See EXHAUST SYSTEM under *Engine Subsystems*.
5. Disconnect the fuel line from the genset. Follow the applicable instructions depending on the fuel.

⚠WARNING Gasoline and LPG (liquefied petroleum gas) are flammable and explosive and can cause severe personal injury or death. Do not smoke if you smell gas or gasoline or are near fuel tanks or fuel-burning equipment or are in an area sharing ventilation with such equipment. Keep flames, sparks, pilot lights, electrical arcs and arc-producing equipment and all other sources of ignition well away.

Gasoline Fueled Gensets: Disconnect the fuel line from the genset and securely plug the end of the fuel line to prevent leakage or an accumulation of explosive gasoline vapor.

LPG Fueled Gensets: Close the fuel shutoff valve(s) at the LPG container(s) and move the vehicle outside and away from below-grade spaces where LPG could accumulate. To purge the fuel line and genset as much as pos-

sible, run the genset (if it starts) until it runs out of fuel with the LPG valve(s) closed.

⚠WARNING LPG is flammable and explosive and can cause asphyxiation. NFPA 58, Section 1.6 requires all persons handling LPG to be trained in proper handling and operating procedures.

LPG “sinks” when it escapes into the air and can accumulate in explosive concentrations. Before disconnecting the LPG fuel line, close the fuel shutoff valve(s) at the LPG container(s) and move the vehicle outside and away from pits or basements or other below-grade spaces where LPG could accumulate.

For LPG liquid-withdrawal systems (see Figure S-6) push the regulator priming button while cranking for 10 seconds to purge some of the remaining LPG. Then loosen the threaded flexible fuel supply hose connector at the fuel filter on the genset just enough to hear gas escaping. Unthread the connector when no more gas is heard escaping. Finally, cap the end of the fuel supply hose with a 1/4 inch NPTF pipe cap to prevent fuel from escaping if someone inadvertently opens the shutoff valve(s) at the LPG container(s).

⚠WARNING Large volumes of LPG can be released in the process of disconnecting a liquid-withdrawal type of LPG supply system. Before disconnecting LPG fuel connections, make sure the the fuel shutoff valve(s) at the LPG container(s) are closed and that the vehicle is outside and away from pits or basements or other below-grade spaces where LPG could accumulate.

For LPG vapor-withdrawal gensets (see Figure S-10) disconnect the gas supply hose at the carburetor and the fuel solenoid shutoff valve leads at the control box on the genset. If the pressure regulator/solenoid valve assembly is also to be removed, cap the end of the fuel supply line with a threaded pipe cap to prevent fuel from escaping if someone inadvertently opens the shutoff valve(s).

FUEL SYSTEM (BEGINNING SPEC M)

The carburetor mixes air and fuel in the correct proportion for good performance. The governor operates the throttle to maintain a nearly constant engine speed (frequency) as the load varies. Figure S-1 is representative of most of the fuel system parts. LPG (liquified petroleum gas) systems do not use an air preheater or choke and have different fuel connections. See Automatic Choke, Fuel Pump and LPG System Components in this section for details of the other parts of the fuel system.

⚠ WARNING Gasoline and LPG are flammable and explosive and can cause severe personal injury or death. Do not smoke if you smell gas or gasoline vapors or are near fuel tanks or fuel-burning equipment or are in an area sharing ventilation with such equipment. Keep flames, sparks, pilot flames, electrical arcs and switches and other sources of ignition well away.

⚠ WARNING LPG is flammable and explosive and can cause asphyxiation. NFPA 58, Section 1.6 requires all persons handling LPG to be trained in proper handling and operating procedures.

Air Cleaner Assembly

Disassembly:

1. Remove the crankcase breather hose and air preheater hose (gasoline gensets only) from the air cleaner housing.
2. Remove the air cleaner housing center capscrew and lift off the housing and air filter.
3. Remove the three capscrews that secure the air cleaner adapter to the carburetor and lift off the adapter. (One of the screws is inside the throat of the adapter.)

Reassembly: Reassembly is the reverse of disassembly. Use a new gasket between the adapter and the carburetor.

⚠ CAUTION Take care not to cross-thread the inside adapter mounting screw.

Carburetor And Intake Manifold Assembly

Disassembly:

1. Remove the air cleaner assembly.
2. Disconnect the fuel line and governor rod from the carburetor.

⚠ WARNING Large volumes of LPG can be released in the process of disconnecting a liquid-withdrawal type of LPG supply system. See Disconnecting Set from RV Systems (Page S-2) for the proper procedures and precautions.

3. Remove the intake manifold capscrews, the carburetor air preheater (gasoline gensets only) and the carburetor and intake manifold as an assembly. On LPG gensets equipped for liquid withdrawal, it will first be necessary to disconnect the fuel vaporizer (the tube wrapped around the exhaust manifold) at both ends, remove the pressure regulator, disconnect the vaporizer line from its support bracket and rotate the vaporizer line out of the way.

⚠ WARNING Bending the fuel vaporizer tubing can weaken it to the point that it can crack allowing LPG under high pressure to escape, resulting in possible severe personal injury or death.

4. Remove the two intake manifold gaskets and cover the intake ports to prevent loose parts from accidentally entering the ports.
5. Unbolt the carburetor from the intake manifold.

Reassembly: Reassembly is the reverse of disassembly. Use new gaskets between the intake manifold and the engine and between the intake manifold and the carburetor. Do not use sealer on the gaskets. Tighten all fasteners according to Assembly Torques.

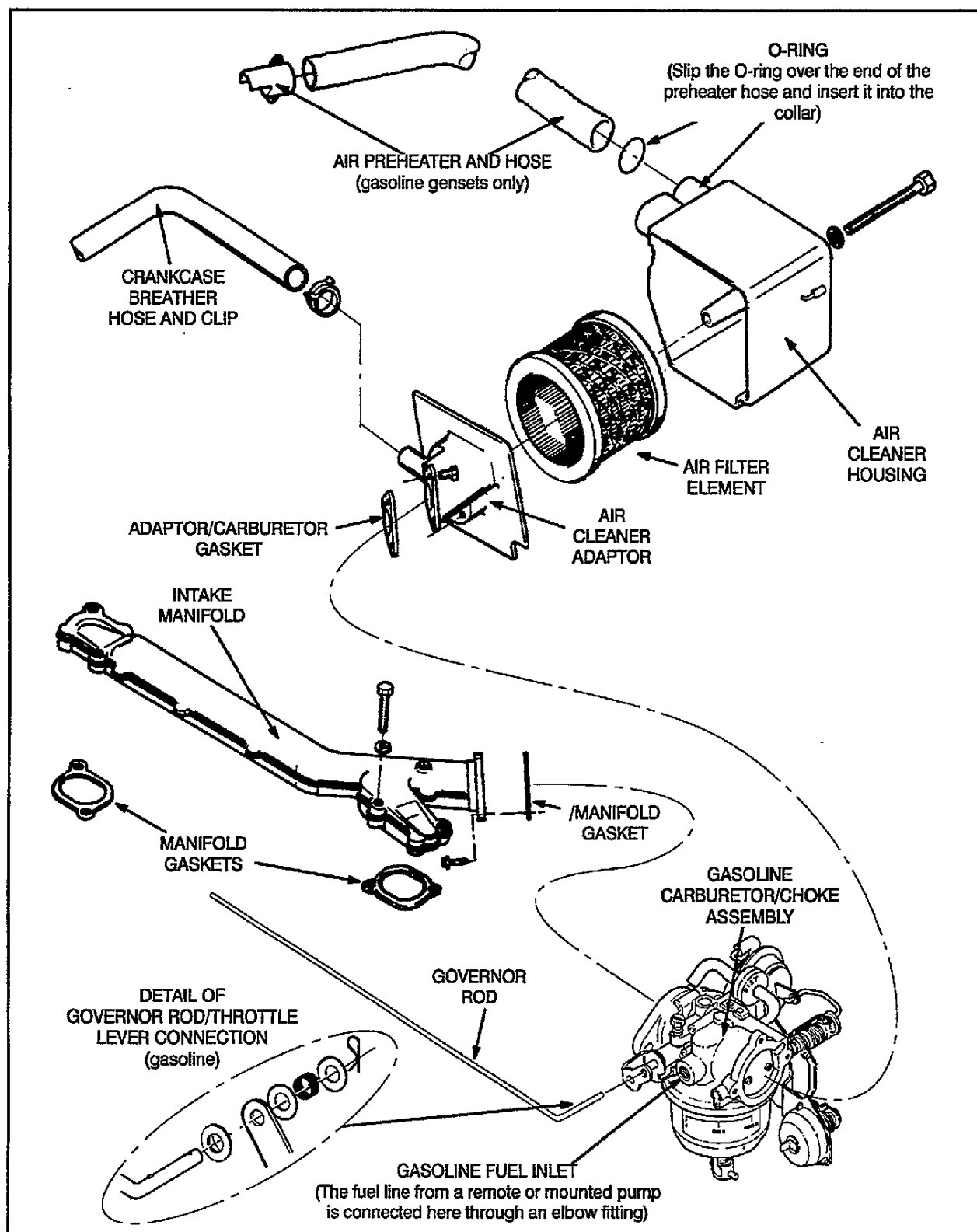


FIGURE S-1. TYPICAL FUEL SYSTEM

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