

## SERVICE BULLETIN

Original Issue Date: 1/10

Model: **Natural Gas and LPG Models listed below**

Market: **Industrial and Residential/Commercial**

Subject: **Gaseous Fuel Conversion**

### Introduction

The models listed in Figure 2 are capable of operating on natural gas or liquified petroleum gas (LPG), except as noted in the table. This informational service bulletin describes the various gaseous fuel systems as well as the gaseous fuel conversion procedure. Fuel conversion should be considered part of the generator set installation, if needed, as this procedure is not covered under warranty. Changing fuel does not alter the emissions compliance of the generator set engine.

Some models also offer a dual fuel (DF) automatic changeover system, as shown in Figure 2.

Order a new nameplate after making the gaseous fuel conversion, which also automatically updates the factory service department log in the warranty system. Email [aftermarketparts@kohler.com](mailto:aftermarketparts@kohler.com) with your purchase order and provide the following information from the original nameplate and for the requested new nameplate; see Figure 1.

	Original Nameplate	Requested Nameplate
Model No.		
Specification No.		
Serial No.		
kW		
kVA		
Amps		
Volts		
Hz		
Fuel		

**Figure 1** Nameplate Request Data

	Fuel Options		
	NG	LP	DF
25/30REZG/B	X	X	X
35-125RES	X	X	X
38RCL/B*	X	X	
40/45REZG	X	X	X
45ERES	X	X	X
48RCL/A*	X	X	
50REZG/B/C	X	X	X
50ERES/B	X	X	X
60REZG/B	X	X	X
60RCL*	X	X	
80REZG	X	X	X
80REZGB/D†	X		
80RZG	X	X	X
80RZGB/D†	X		
80ERES/B/D†	X		
100REZG	X	X	
100REZGB/D	X	X	X
100RZG/D	X	X	X
100ERES	X	X	
100ERESB/D	X	X	X
125ERES/B/C	X	X	X
150ERESC	X	X	X
150RZG/B†	X		
150REZG/B†	X		
125/150REZGC	X	X	X
125/150RZGC	X	X	X
180-400REZX/B	X	X	X
180-400RZX/B	X	X	X

\* See the generator set installation manual for fuel conversion instructions.

† Not convertible.

**Figure 2** Natural Gas and LPG Models

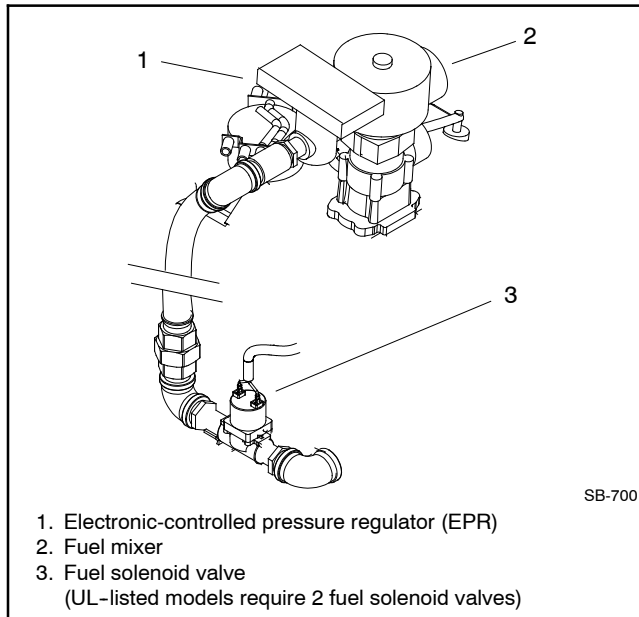
Routing	Service Manager	Sales Manager	Parts Manager	Technician No. 1	Technician No. 2	Technician No. 3	Return This to
Initial Here							

## Gaseous Fuel Systems

### Gaseous Fuel System Concept (Single Fuel)

The gaseous fuel system uses a fuel solenoid valve to control the fuel flow to the electronic-controlled pressure regulator (EPR). The generator set-mounted EPR reduces the fuel pressure as fuel passes to the fuel mixer. See Figure 1.

The fuel mixer controls the ratio of fuel to air under varying load and speed conditions. Because the fuel mixer receives fuel in a gaseous state, it does not have to vaporize the fuel.




**Figure 3** Gaseous Fuel System Components, Typical

### LPG Liquid Withdrawal Fuel System Concept

With the LPG liquid withdrawal fuel system, pressurized liquid LPG passes from the tank to a vaporizer. The vaporizer converts the liquid fuel to gas before sending it to the fuel EPR. The system also includes a fuel solenoid valve that shuts off the fuel flow when the engine stops.

## Natural Gas and LPG Conversion

Most models can operate on either natural gas or LPG fuel by performing the fuel conversion procedure. A hang tag on the fuel system may provide additional conversion setup information. Fuel conversion may decrease generator set output. Refer to the respective generator set spec sheet for ratings based on fuel selection.

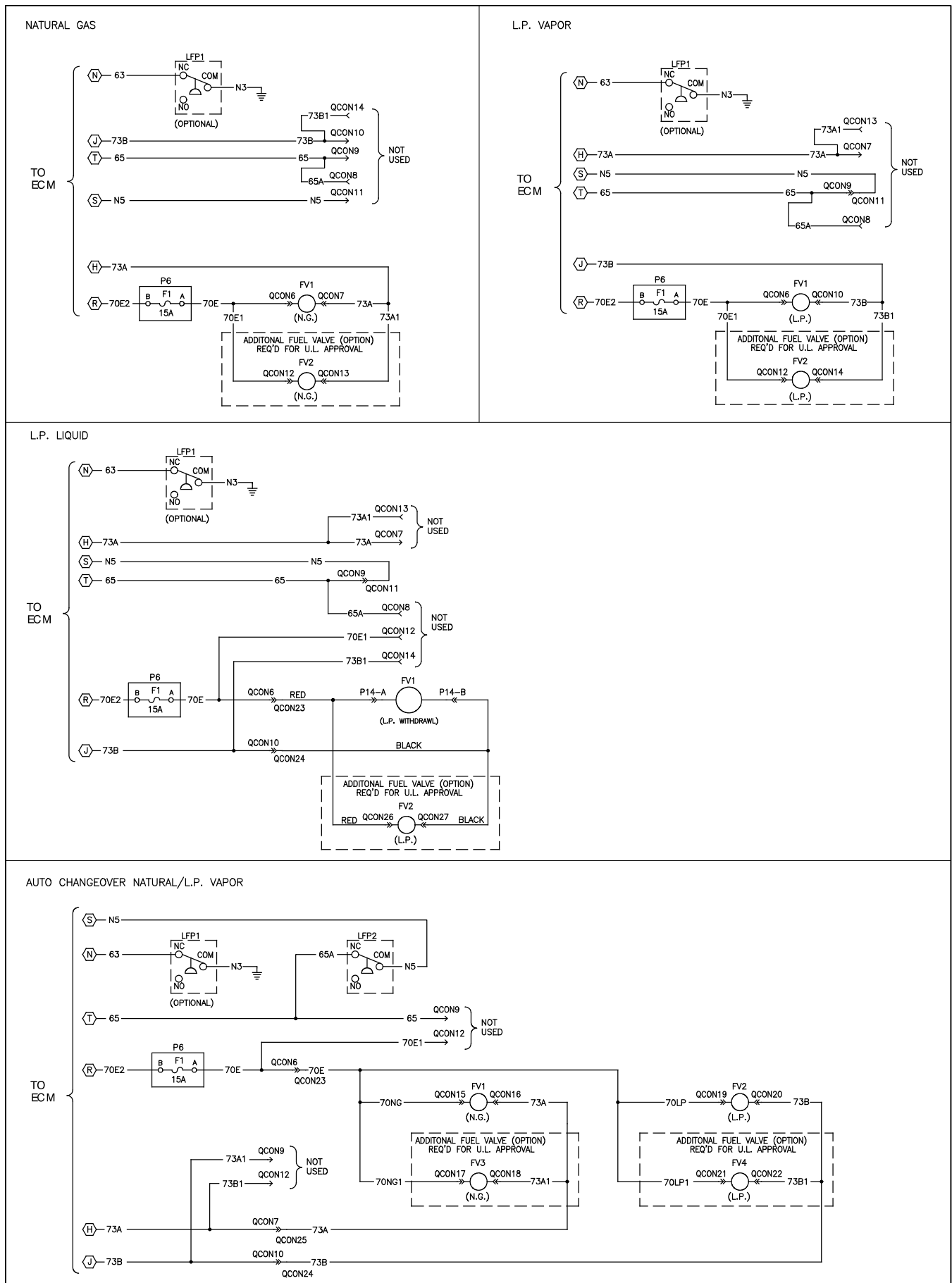
<b>⚠ WARNING</b>

<b>Accidental starting.</b> <b>Can cause severe injury or death.</b>
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.

**Disabling the generator set. Accidental starting can cause severe injury or death.** Before working on the generator set or equipment connected to the set, 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.

(Decision-Maker® 3+ and 550 Controllers)

**Disabling the generator set. Accidental starting can cause severe injury or death.** Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) Press the generator set off/reset button to shut down the generator set. (2) Disconnect the power to the battery charger, if equipped. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent the starting of the generator set by the remote start/stop switch.

(RDC, DC, RDC2, DC2, Decision-Maker® 3000, 3500 and 6000 Controllers)



**Figure 4** Gaseous Fuel Connections Wiring Diagram, Typical

To change the fuel type, change the electrical connections between the fuel system and the engine ECM. The engine ECM has fuel tables and spark advance curves programmed for both natural gas and LPG. The information shown below, in Figure 4, and in Figure 5 generally applies to all models and all fuels. Be sure to review the respective wiring diagram for your specific model for possible special applications.

#### Natural Gas Operation

- Disconnect lead 65 from lead N5.
- Disconnect lead 73B from the fuel solenoid valve.
- Connect lead 73A to the fuel solenoid valve.

#### LPG Vapor Operation

- Disconnect lead 73A from the fuel solenoid valve.
- Connect lead 65 to lead N5 (ground).

#### LPG Liquid Withdrawal Operation

- Disconnect lead 73A from the fuel solenoid valve.
- Connect lead 73B to the fuel solenoid valve (LPG liquid withdrawal).
- Connect lead 65 to lead N5 (ground).

#### Auto Changeover Natural Gas/LPG Vapor Operation

- Disconnect lead 65 from N5.
- Connect lead N5 to LFP2 relay common terminal.
- Connect lead 73A to the fuel solenoid valve (natural gas).
- Connect lead 73B to the fuel solenoid valve (LPG vapor).

Eng. ECM	Natural Gas	LPG Vapor	LPG Liquid	Auto Changeover
73A	QCON-7 (NG fuel solenoid valve)	not used		QCON-7 (NG fuel solenoid valve)
N5	not used	65	65	LFP2-COM
73B	not used	QCON-10 (LPG fuel solenoid valve)		
65	not used	N5	N5	not used
63	LFP1-NC low fuel pressure sensor (if used)			
70E2	P6-B (15 amp fuse)			

**Figure 5** Gaseous Fuel Electrical Connections

## Fuel System Changeover Kits (Dual Fuel)

### Automatic Changeover

A changeover fuel system kit provides automatic changeover from natural gas to LPG vapor. The primary and backup fuels each have a fuel solenoid valve. The primary fuel is natural gas; the backup fuel is LPG vapor. Before starting, both fuel solenoid valves are closed. When the generator set starts, the primary fuel solenoid valve opens. The primary fuel line has a pressure switch in series with a relay connected to the start/run circuit.

When the primary fuel pressure drops below 0.6 kPa (1.4 oz./in.<sup>2</sup>) or 6.4 cm (2.5 in.) water column, a relay opens the backup fuel solenoid valve and closes the primary fuel solenoid valve. When the primary fuel pressure rises above 0.6 kPa (1.4 oz./in.<sup>2</sup>) or 6.4 cm (2.5 in.) water column, the generator set uses the primary fuel.

Emissions certified models use a single electronic-controlled pressure regulator (EPR) for both fuels. A tee fitting connects both fuels together upstream of the EPR. During operation when using the secondary fuel, it is normal for a small amount of secondary fuel to seep back through the primary fuel solenoid valve. To counter this situation, one of two methods is used depending upon the generator set model: (1) a second solenoid valve (identical to the primary fuel solenoid valve) is installed in a reverse configuration on the primary fuel side or (2) a small vent line is installed between the primary fuel inlet and the air intake through a fuel solenoid valve.

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