

LP/NG FUEL INSTALLATION

The information in this instruction is offered to assist you in providing the proper vapor fuel supply for your engine. This information is only provided to advise you of the engine's requirements and the decisions you must make. In no case should this information be interpreted to conflict with any local, state or national code. If in doubt, always follow local codes.

DANGER: FIRE - PERSONAL INJURY -

All fuel lines must be installed by qualified fuel supplier.

OPERATING LOCATION

The engine-generator models covered in this manual were designed for portable use. **DO NOT INSTALL OR OPERATE THESE UNITS INDOORS.** The unit should be stored in a dry location. During a power outage move the unit outdoors to a flat dry location such as a driveway, concrete pad or sidewalk for use. We recommend installing the optional dolly kit or equivalent for ease of handling.

The fuel source should be as close as possible to the outdoor operating location. This will reduce the installation cost of fuel runs. Connect the fuel supply line to the inlet of the fuel demand regulator on the unit using a locally approved flexible fuel line (see table for recommended line size). **The pressure supplied to the demand regulator must be FOUR TO SIX OUNCES or 7 to 11 INCHES W.C.(water column).** The primary regulator at the fuel supply must be capable of delivering the proper volume of fuel at this pressure. Have your local fuel supplier install a protected fuel connection at the outside operating location. He should also install a lockable fuel shutoff valve at the connection point. Have your fuel supplier permanently install a flexible fuel line to the demand regulator on the engine generator set.

INSTALLING THE FUEL LINE

DANGER: PERSONAL INJURY

Units that are intended to be run unattended MUST have an electric fuel solenoid installed. This solenoid MUST be wired to AUTOMATICALLY turn off the fuel whenever the engine stops. See page 12 for additional information.

Unit location will determine the size of fuel line that is required to supply the engine with a constant fuel pressure. Refer to the tables below for fuel line size, and recommended tank size. For distances of 100 feet and over, a two regulator fuel system consisting of a primary 10-15# regulator at the tank and a 6 ounce secondary regulator installed about 10 feet from the generator. You need to run a 3/4 inch line or larger from the secondary regulator to the engine-generator set. When a two (2) stage regulator system is used, a fuel line size of 3/8 inch is generally adequate for distances up to 300 feet. The line size from the table below applies to the distance from the second regulator to the demand regulator. A positive fuel shut-off device must be installed in the fuel line close to the engine generator set. This may be either a lockable manual shut-off valve available from your local fuel installer, or a 12 volt DC fuel solenoid valve. This optional 12 volt DC valve is available through your local Winco dealer as part number 42942-000.

The fuel line used to connect the supply line to the demand regulator must be a locally approved flexible fuel line. Products used will vary in different regions depending on availability and local codes. Consult with your local fuel supplier to insure complete compliance with ALL codes.

1. Remove the pipe plug from the demand regulator.
2. Connect the flex fuel line to the demand regulator.

DANGER: PERSONAL INJURY

Do not use galvanized pipe in the fuel line runs. The galvanized coating will become eroded and flake off, causing possible obstruction or damage to the regulator or fuel valve. The obstruction could cause an inoperative engine or an explosive fuel leak.

Size of pipe required for generators operating on natural gas/ LP gas.

Length of Fuel Line	Fuel Line Size
Up to 25 Feet	3.4 inch Black Pipe
25 to 100 Feet	1 inch Black Pipe
Over 100 Feet	Not Recommended

*allow an additional 3 feet for each standard elbow. Do not use 'street ells' (restrictive)

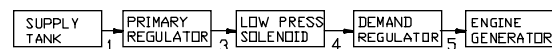
DANGER! - FIRE - PERSONAL INJURY -

Be careful when sealing gas joints. Excessive sealing compound can be drawn into the solenoid, regulator or carburetor causing an engine malfunction or dangerous fuel leak.

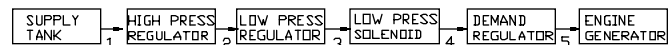
FUEL PRESSURE

Correct fuel pressure cannot be stressed enough. The most common cause for inoperative systems is an inadequate or incorrect fuel pressure. Power and performance of the engine is in direct relation to the correctness of the fuel system. Shown below is a block diagram of a typical L.P. or N.G. installation.

Single Regulator Fuel System



Two Regulator Fuel System



Reference numbers 1 through 4 in the block diagrams above are fuel lines supplied by customer.

Reference number 5 is already installed on your engine generator set.

Remember that whichever fuel delivery system or type of vapor fuel used, the fuel pressure at the demand regulator installed on the engine generator must be between 4 and 6 oz (7-11 inches of water column). Any lower pressure and the unit will starve for fuel under load. Any higher and the unit will 'flood' when attempting to start.

LP TANK SIZING

Once above the minimum acceptable size, the size of L.P. tank used will generally depend on how long you want the unit to run without re-filling. The tank sizes shown below are the smallest recommended tank sizes based on the outside temperature. Keep in mind the colder it gets the slower L.P. will vaporize. This is the reason for the larger tanks at low temperature. Minimum sizing is not based on running time.

Temp	60 deg F.	30 deg F.	0 deg F.	-20 deg F.
TF4500	30 gal	40 gal	100 gal	200 gal
TFM6000	40 gal	50 gal	125 gal	350 gal
TF9000	70 gal	80 gal	200 gal	700 gal

CHANGING FUEL TYPES

These engine generator sets are designed to run on three different fuels; gasoline, natural gas or LP vapor. They may be easily changed from one fuel to another.

FROM GASOLINE TO LP/NG

1. With the engine running turn off the gasoline fuel valve.
2. Run the engine until it runs out of fuel.
3. Remove the pipe plug from the demand regulator.
4. Install locally approved flexible fuel line.
5. Connect the LP/NG vapor fuel line.
6. Turn on the vapor fuel.
7. Start the engine.
8. Apply the load to the generator.
9. Adjust the fuel mixture valve to smooth the engine out.

Note: Operating on LP/NG vapor fuel for an extended period of time without liquid fuel in the carburetor may damage the carburetor float, and the needle seat assembly. If you plan to convert back to gasoline, we recommend the float and needle seat assembly be removed from the carburetor. (Consult a local engine supplier for assistance.)

FROM LP/NG TO GASOLINE

1. With the engine running turn off the LP/NG fuel supply.
2. Run the engine until it runs out of fuel.
3. Remove the flexible fuel line from the demand regulator.
4. Reinstall the pipe plug in the regulator. (use thread sealant sparingly)
5. Check to be sure the gasoline fuel valve is off.
6. Fill the gasoline fuel tank.
7. Turn on the gasoline fuel valve.
8. Start the engine.
9. Adjust the load jet on the carburetor as required to smooth the engine out.

NOTICE: TRI-FUEL STARTING

Tri-Fuel generators operating on vapor fuel, (either L.P. or NG) must be started using the electric start system provided. You cannot hand crank the unit fast enough to develop the proper vacuum to make the vapor fuel system work. In addition when starting on **VAPOR FUEL NEVER USE THE CHOKE.** Use of the choke will prevent the air and fuel from properly mixing.