

8.2.4 FUEL LINES

The following guidelines apply to supply and return lines between the fuel filter header and the tank(s) only.

These guidelines apply regardless of which fuel tank configuration is being used.

Do not modify or tamper with any fuel lines supplied with the engine.

Design

All lines should be in protected areas. These areas should be free from possible damage, and securely clipped in position to prevent chaffing from vibration. Take the necessary precautions to ensure that the inlet line connections are tight so air cannot enter the fuel system.

The careful selection of line routing cannot be overemphasized. Avoid excessively long runs.

Minimize the number of connections, sharp bends, or other features that could lead to air trapping, excessive resistance to flow, or waxing of fuel in cold conditions.

The supply and return lines must extend to the low level of useful tank volume. Extending the return line to this level prevents siphoning of fuel on the supply side back to the tank.

The fuel supply line must be above the bottom of the tank to ensure that dirt and sediments are not drawn into the fuel system. Allow 5% clearance volume above the bottom of the tank.

The supply and return lines must be well supported within the tank. Cracks on the supply side can cause the entrance of air and a subsequent loss of power. The supply and return lines must be separated by at least 12 in. inside the tank to prevent the possibility of air or hot fuel from the return line being discharged directly into the section line.

The supply line should be at the center of the tank to compensate for angular operation (see Figure 8-3).

Connections of fuel lines to the engine should be made through flexible hoses which accommodate the movement of the engine and vessel. Solid tubing cannot be directly connected to the engine supply or return connections. A minimum of 3 ft (1 m) of flexible hose should be used between the engine and vessel fuel lines.

Material

Fuel lines and hoses used in marine applications must meet the approval of all governing agencies.

The Series 60 petroleum and marine engines come equipped with USCG approved fuel lines. Some offshore applications may require the use of stainless steel braided hose. These components are not currently available from Detroit Diesel. Consult Detroit Diesel Application Engineering if fuel line modifications are required.

DDC does not approve the use of copper tubing because copper becomes brittle due to cold working when subjected to vibration.

Flexible hosing must be resistant to fuel oil, lubricating oils, mildew, and abrasion, and must be reinforced.

The lines must withstand a maximum suction of 20 in. Hg (67.54 kPa) without collapsing, a pressure of 100 psi (690 kPa) without bursting, and temperatures between -40°F (-40°C) and 300°F (149°C).

Size

The fuel supply lines should be SAE number 10 or larger. The return lines must be SAE number 6 or larger. Fuel line size on an engine will depend on the engine flow rate, length of line, number of bends, and the number and type of fittings. Larger fuel line sizes may be required when the fuel tanks are located farther than 10 ft (3 m) from the engine or when there are numerous bends in the system.

The determinant of fuel line size is the restriction measured at the inlet of the fuel pump. The maximum allowable inlet restriction, with a clean system, is 6 in.Hg (152 mm Hg) for all applications.

8.3 FUEL SELECTION

The quality of fuel used is a very important factor in obtaining satisfactory engine performance, long engine life, and acceptable exhaust emission levels. For information on fuel selection, refer to DDC publication 7SE270, "Lubricating Oil, Fuel and Filters."

 CAUTION:
To avoid injury from fire, contain and eliminate leaks of flammable fluids as they occur. Failure to eliminate leaks could result in fire.