**Section 449.60 Pipe and Hose Installation**

In addition to the requirements established by Section 449.30, pipes and hoses installed on school buses for operation of an alternate fuel system shall comply with the following:

a) No fuel supply line shall pass through the driver or passenger's compartment.

b) The pressure relief device shall be fabricated so that in the event of stress, the pipe or adaptor will break away without impairing the function of the relief valve.

c) If installed, the adaptor connecting the piping system to the pressure relief device shall neither touch nor restrict any movable part of the pressure relief valve.

d) The relief valve discharge piping system (piping system) must not be reduced at any point from the relief valve to the point of release into the atmosphere.

e) The piping system shall be routed to minimize sharp elbows or bends. Installation of any commercially available piping installed to meet the manufacturer's specifications is acceptable. Any fittings that restrict the flow of discharge are prohibited. From the pressure relief device adaptor to the atmosphere, the minimum inside diameter of the piping must measure at least 3/4 of an inch.

f) The piping system shall neither block nor hamper the operation of any window or door. The piping system shall preserve widths of passageways, aisles and emergency exits.

g) Every portion of the piping system shall be gas tight (except the outlet) and shall be able to withstand forces from the discharge when the relief valve is in full open position. If for any reason the discharge outlet becomes blocked, the piping system must be capable of holding the full system pressure.

h) To facilitate the removal of accumulated water, a drain cock shall be installed at the lowest point of the piping system. The drain must be capable of being held open manually and close automatically to prevent expelling LPG if discharged through the relief valve. A weep hole, or other opening that may result in discharged LPG flaming beneath the bus is prohibited.

i) The portion of the piping system that leads upward to the atmosphere shall be installed either inside the passenger compartment, on the outside of the bus, or in the body wall between the inner and outer "skins" of the bus body.

1) Piping on the outside of the body shall be shielded below the window line to prevent "grabbing hold" or "hitching to." However, discharge piping that is located between the windshield and the vent window at the left front corner of the body need not be shielded.

2) Any portion of the piping system that is installed either inside the passenger compartment or inside the body wall shall consist of one piece originating below the bus floor and exiting outside the bus roof. Every hole where piping passes through the floor or roof shall be sealed.

j) The piping system must terminate above the eave lines of the bus body.

k) The outlet of the piping system shall be located at least 36 inches from the air inlet or outlet of a ventilator or similar device installed on or near the roof. A "similar device" includes the fresh air intake of a heating, ventilating or air conditioning system. It does not include a side window that opens near the roof.

l) A rain cap is required where the piping system exits into the atmosphere to minimize water or dirt from entering into either the relief valve or its discharge piping. Installation of any commercially available rain cap installed to meet the manufacturer's specifications is acceptable. The cap shall remain in place except when the relief valve operates. The cap shall be installed to minimize the entrance of water or dirt while the vehicle is in motion.

m) The discharge piping system on a special education school bus shall conform to all provisions of this Part.