Q: How would I know if I have a fuel supply problem (as opposed to a carburetor problem), and how would I go about troubleshooting the supply system?

A: If your fuel supply is normal, after 15 or 20 seconds of cranking with the choke completely closed (3 or 4 five-second attempts), there should be raw fuel puddled in the bottom of the carburetor intake throat. If the
bottom of the intake throat remains dry, there is almost assuredly a problem within the fuel supply system.

Following are some of the common problem areas we've discovered in fuel supplies:

PUMP FUNCTION:

To check the function of a mechanical pump, remove the fuel line from the carburetor, and pump a couple pints of fuel through the pump, using the priming lever on the fuel pump. Catch the fuel in a clean glass container and check for any sign of turbidity coming in with the fuel. After the fuel clears, hold a finger over the end of the fuel line and work the priming lever again. The lever should feel limp after a couple of strokes as fuel builds up ahead of the diaphragm. Hold your finger over the line for 30 to 60 seconds (the longer the better), to be sure that the pump can hold pressure. If fuel pressure drops off after only a few seconds, the pump will more than likely need to be rebuilt.

To check the function of an electric pump, disconnect the fuel line as above, and then bypass the oil pressure safety switch (assuming that one is installed), and run the pump by turning the ignition switch to "on".

BLOCKAGE:

Common blockages within the fuel supply system are frequently found in the screens at the end of pickup tubes within the tank, spring loaded anti-siphon valves, and filters in need of a change.

AIR LEAKS:

We have recently learned that small leaks can exist within a fuel supply system that will not manifest as fuel leaks, but which will allow enough air to be drawn into the lines to cavitate fuel pumps by the suction created during normal operation. The high vapor pressure of gasoline exacerbates the problem of suction leaks by causing the air bubbles to enlarge somewhat after they form.

NOTE: Electrical pumps seem to be somewhat more sensitive to the effects of air in lines than do mechanical pumps, although we have one recent case of fuel starvation caused by a leak above the sediment bowl in a mechanical pump.

Boats with tanks located lower than the top of the engine and at distances greater than 5 or 6 feet are more at risk of shutdowns from fuel starvation from small leaks in the system, due to the fact that more suction is created within their systems. Leaks in the fuel supply systems of boats with tanks higher and very close to the engine would probably manifest as fuel leaks and quickly be detected.

Air can be also be introduced into fuel supply systems while changing filter elements, and/or other maintenance, which will cavitate pumps, usually after a few minutes of running. Again, electric pumps are more at risk than mechanical pumps, since electric pumps make very poor air compressors. It's sometimes possible to prime filters after an element change by working the priming lever of a well maintained mechanical pump, but electric pumps will frequently never prime until the air is removed in some other manner.

Installation of a rubber priming bulb between the tank and the primary fuel filter will enable you to prime the system after replacing a filter element (or other maintenance), as well as to pressurize the system to check for leaks. The bulb also provides a nice diagnostic tool when troubleshooting fuel problems in general, by providing a second method of producing fuel pressure. In normal operation, the fuel pump is able to draw fuel through the priming bulb with little or no measurable head loss being added.

These priming bulbs (commonly used in outboard fuel supplies) are available from West Marine for 1/4", 5/16" and 3/8" fuel hose. At approximately $12, they may represent the best value you'll ever encounter in terms of enhancing engine reliability.