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CLASSIFIED ADVERTISEMENTS

TROUBLESHOOTING LP-GAS SYSTEMS

by Wes Caughlan

Few GMC Motorhome owners realize that the LP-gas distribution system requires any more attention than turning a tank valve on before lighting a burner, and filling the tank once in a while. Proper operation of appliances such as the refrigerator and furnace depends heavily on proper function of the system, but it rarely gets any attention unless a problem with one of the appliances is obvious.

Over a year's time, a well-designed distribution system can be called upon to receive LP-gas vapor at pressures ranging from well over 200 psi to less than 10 psi. Nevertheless, the system will deliver LP-gas vapor steadily to one or more appliances operating simultaneously at a pressure of 11 inches WC (water column), with a variation of no more than plus or minus one inch WC. That's a demanding performance specification for any system because 11 inches WC is only 0.4 psi, and it should be checked at least once a year — particularly in the spring if the motorhome has been in storage all winter.

Gas pressure plus a number of other LP-gas distribution system checks can be made using a simple U-tube manometer that dates back to the 17th century when an Italian physicist named Torricelli learned that pressures could be accurately measured with a column of water. Torricelli found that the diameter of the column was unimportant as long as it did not get too small and permit capillary action to bias its height. The only problem with this form of pressure measurement was that it was cumbersome as pressures rose. Fifteen psi is the equivalent of over 34 feet of water column, and you would need a tall ladder to read it! On the other hand, when pressures are low, or you desire to measure fractional-psi pressures, a crude water column of almost any diameter is a very useful tool, and it is more accurate than even the finest gauges. In fact, such a water column is used to calibrate low-pressure gauges and check them for accuracy.

The water column most commonly used as a low-pressure measuring tool is the U-tube manometer. It is a slight refinement of the original Torricelli column in that it is more compact and easier to use, but it works the same. Instead of Toricelli's single column, the U-tube manometer has two vertical columns of the same diameter that oppose each other. Initially the water columns in the legs of the U are the same height because the pressure on each column is the same. When the pressure to be measured is applied to one leg, the water will drop and the water in the opposing leg will rise. The water column (WC) is the difference between the heights of the water columns in the legs of the U.

We prefer and recommend a U-tube manometer for measuring and monitoring LP-gas distribution system pressures, because we have found very few accurate gauges. Most gauges are Bourdon-tube gauges that are very fragile because the tube must be very sensitive to measure pressures less than one psi. The gauges are more convenient for the average serviceman, but they usually just get thrown into his toolbox along with the rest of his tools. Unfortunately, the first throw into the toolbox often ruins the gauge's calibration. Still, most servicemen rely exclusively on their gauge, and few check its calibration regularly. To top it all off, these low-pressure gauges are expensive, but you can build an always-accurate U-tube water manometer in about an hour with about $5 worth of local hardware store materials.

Such a homemade manometer consists of a piece of 1×6-inch pine lumber about two feet long, six feet of ⅜-inch clear plastic tubing and four electrical staples. Its feet can be just about anything that will hold it vertical, or it can be hung on the wall with a nail. To function properly, it simply needs to be vertical so the heights of the water columns in the legs of the U are the same prior to applying pressure. Horizontal lines drawn on the board one inch apart or a measuring tape will measure the

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