

3. Connect the propane test device into the system at the outlet of the regulator and reattach the low-pressure hose to the test device.
4. Connect the manometer to the test device.
5. Fully open the service valve on the propane container and bubble test all the connections at the regulator, the test device, the manometer, and the low-pressure hose leading to the manifold system downstream.
6. Slowly open the valve for the orifice fitting on the test device.
7. Slowly open the valve for the manometer connection on the test device and note the pressure measurement.
8. Slowly adjust the pressure to obtain 11.0 water column inches on the manometer.
9. Once stabilized at 11.0 inches of water column, close the orifice valve on the test device, and immediately note the rise in pressure due to regulator lock-up.
10. If the lock-up pressure does not exceed 14.0 water column inches within three or four minutes, the regulator is deemed good and now adjusted properly.
11. Turn off the service valve on the propane container fully.
12. Remove the propane test device and reconnect all fittings.
13. Open the service valve on the container.
14. Bubble test all fittings that were "opened" and reconnected, verifying no leaks were created when removing the test device. The system is now ready for appliance operation.

Note: Temperature differences in a propane piping system can cause lock-up measurements to vary. The pressure will rise when the temperature rises and decrease as the piping system cools. The temperature of both the ambient air and the distribution piping need to be approximately the same and a uniform

temperature must be maintained throughout testing. If an RV is driven into an enclosed and heated service bay after spending time in a very cold climate, the technician must allow for the temperature difference to equalize before conducting the above operating pressure test.

Timed Pressure Drop Test

A third test the pro technicians perform is the timed pressure drop test. Conducting a timed pressure drop test will verify, with 100% certainty, if a leak exists anywhere in the system. This test should be performed whenever the propane odorant is detected, if any doubt exists, and at least annually.

Theoretically, the timed pressure drop test can be conducted at any point downstream of the regulator, but before the appliances. For me

Conducting a timed pressure drop test will verify, with 100% certainty, if a leak exists anywhere in the system.

personally, I conduct this test right after the operating pressure test and the regulator lock-up test, while the propane test device is still connected into the system.

For our purposes here, I'll use a cooktop burner to explain the process for an independently-conducted, timed pressure drop test since it can be performed safely, without the need to open the system (disconnect any fitting). Wait a minute, Doc! Didn't you earlier state that some appliances might have an internal regulator that further reduces the 11.0 inches of water column pressure once it enters the appliance? True, I did state that, but the timed pressure drop test is used only to determine IF a leak is present. It is actually

conducted at a pressure below the previously set 11.0 inches anyway. Here's how the pros do it (or should be doing it):

1. Verify the propane container(s) and all appliances are turned completely off.
2. Gain access to the cooktop and remove one of the burners.
3. Connect the manometer directly to the burner orifice hood at the closed burner valve.
4. Fully open the service valve on the propane container.
5. Slowly open the burner valve that the manometer is attached to, pressurizing the manometer. Leave this burner valve open.
6. Turn off the service valve on the propane container fully, once again.
7. Slowly open a second burner on the cooktop and reduce the measurement on the manometer to about 8.0 inches of water column.

Note: Reducing the pressure to 8.0 inches of water column removes the lockout condition of the propane regulator.

8. Once reduced pressure is indicated on the manometer (nominally 8.0 inches of water column), make note of the exact measurement and wait three minutes. No pressure drop should be indicated during the three-minute test.
9. If no drop in pressure is measured, the system is 100% leak-free. If the pressure rises substantially, the service valve on the propane container may be faulty and further troubleshooting is in order. If the pressure rises only slightly, it could be the effects of thermal expansion in the system and the timed pressure drop test should be conducted again.
10. If the pressure drops any at all, there is a leak somewhere in the system and further troubleshooting is in order.
11. Once the leak(s) are located and

rectified, the timed pressure drop test is performed again to verify no leaks remain.

12. Once verified no leaks exist, close the manometer burner valve, remove the manometer and reinstall the cooktop burner, returning the system to full operation.

Locating Propane Leaks

If the timed pressure drop test detected any pressure drop, however slight, during the three-minute test, there is a leak somewhere in the system. The pro tech will now troubleshoot further and pinpoint exactly which component is leaking. It could be a loose flare nut, a faulty tubing flare, deteriorated thread sealant, a hole in a flexible hose, or a faulty component in an appliance.

The first thing the tech will do is eliminate the appliances as the leak source. It is possible, in some instances, to have propane leak "through" an internal appliance valve even though that appliance was turned off. The pros will disconnect the flare connection at each appliance, one at a time and plug the tubing with a flare plug. It will be necessary to conduct a timed

pressure drop test after plugging off each appliance, one at a time. Pro technicians will have the various sizes of flare plugs and caps to use when isolating propane leaks. If the leak is eliminated after disconnecting the furnace, for instance, it can be deduced the problem lies somewhere inside the furnace.

Professional RV service technicians conduct a timed pressure drop test to determine IF a leak exists and use either an electronic leak detector or leak detection fluid to determine WHERE the leak(s) are located. Opening the service valve on the container once again pressurizes the system and the tech will literally have to test each connection in the system to determine the culprit(s).

RV owners can also check each fitting and connection by using a bubble test. Start at the service valve on the propane container and test each fitting and connection throughout the propane system. It is not necessary to purchase a special leak detection solution as in the photo directly below. Simple dish soap diluted with water, or better yet, a bottle of children's blowing bubbles works extremely well. Avoid using dish soap that contains

ammonia or chlorine products.

If bubbles appear around any fitting after a few seconds, try tightening that fitting. Always use a backup wrench when tightening any propane fitting. Daub a little more solution to verify the leak has been eliminated. Also, while going through the system, fitting by fitting, keep a sharp nose for the unmistakable presence of the propane odorant. Many times your nose will determine the culprit fitting before even applying the soap bubbles. Once you think all leaks have been rectified, have a certified technician perform one final timed pressure drop test to verify no leaks exist. You're good to go!

Remember, RVing is more than a hobby, it's a lifestyle! 🏠

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Professional RV technicians keep a variety of different size flare plugs and caps (above) to use when locating propane leaks. RV owners can check for propane leaks by spraying a soapy solution on fittings (left) to see if bubbles appear. Avoid using solutions that contain ammonia or chlorine products because these can damage fittings.