

One of the most serious Atomic 4 troubleshooting scenarios, is the appearance of water in your crankcase (evidenced by milky oil), water in one of your combustion chambers, or steam coming out with the engine exhaust. The big concern in all these cases is that a breach or crack has occurred in one of the water jackets in your block, head, or manifold.

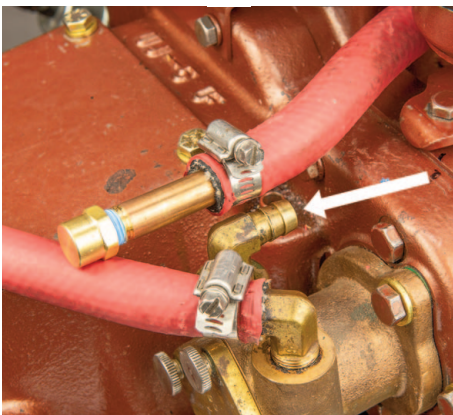
This kit has been designed to provide you with the self-help ability to test and confirm such a crack. The kit includes a small hand pump to provide the necessary test pressure so you can perform the following steps whether you're in your slip or at anchorage.

Note: Since any loose clamp or brass fittings can leak and give a faulty test result, it is important to make sure all cooling hose clamps and water jacket fittings are tight before starting the below steps. Do not drain your engine coolant for this test.

Block and cylinder head pressure test (separate from the manifold):

- Disconnect the 1/2" hose that runs from the water jacket T fitting to the flange pump fitting (arrow), and insert the kit plug in the open end of the hose. Clamp with the existing hose clamp (photo 1).
- Disconnect 1/2" cooling crossover hose from the manifold (this hose runs from the manifold (arrow) to the thermostat housing). Insert kit gauge assembly in the manifold end of hose and clamp with existing clamp. Attach hand pump to Schrader valve and lock in place by pulling up on the pump valve locking lever (photo 2).
- Pump and pressurize the block/head water jacket while watching the gauge. Stop pumping when the pressure reaches approx. 20 psi. Remove pump from Schrader valve by pushing down on pump valve locking lever. Make a note of the pressure. Let the block/head under pressure for approximately 20 minutes. If the pressure holds, the block and head are free of leaks (photo 3). If the gauge shows a noticeable drop in pressure, you have a leak. Using a small screwdriver release the pressure by pushing in on the Schrader valve.
- Remove kit plug from water pump hose and reattach to flange pump hose fitting. Reconnect the crossover cooling hose to manifold, your test is complete. If you are pressure testing the manifold, proceed to next steps.

1



Flange pump cooling hose removed from water pump hose fitting (arrow) and kit plug inserted.

2



Cooling crossover hose disconnected from manifold hose barb (arrow), kit gauge assembly installed in hose, hand pump attached to Schrader valve, ready to pump.

3



Hand pump removed, block/head holding pressure after pumping.

Manifold pressure test:

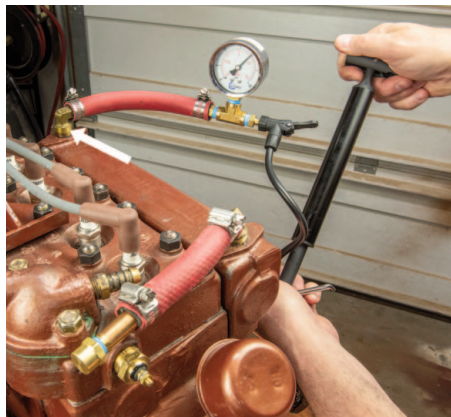
- Disconnect the 1/2" crossover cooling hose from the thermostat housing (this hose runs from the manifold to the thermostat housing). Insert the kit plug in the thermostat housing end of this hose. Clamp use existing hose clamp (photo 4).
- Disconnect the 1/2" cooling hose that runs from the opposite end of the manifold to the exhaust. Using the short piece of hose in the kit, connect the kit gauge assembly to the manifold hose fitting (arrow). Clamp using the existing hose clamp, or the spare clamp included in the kit, attach hand pump to Schrader valve and lock in place. (photo 5).
- Pump and pressurize the manifold water jacket while watching the gauge. Stop when the pressure reaches approx. 20 psi. Remove pump from Schrader valve. Make a note of the pressure. Let the manifold under pressure for approximately 20 minutes. If the pressure holds, the manifold is free of leaks (photo 6). If the gauge shows a noticable drop in pressure, you should remove the manifold and replace it. Using a small screwdriver release the pressure by pushing in on the Schrader valve.
- Remove kit hose and gauge assembly, remove kit plug and reattach all cooling hoses, the test is complete.

4



Kit plug installed in crossover cooling hose at thermostat housing end.

5



Kit hose installed with gauge assembly at manifold, hand pump attached, pressurizing manifold.

6



Hand pump removed, manifold holding pressure after pumping.

Interpreting results:

In our experience, cracks in the water jacket are not very subtle, but usually large enough to be unmistakable. This means that if you find yourself struggling to determine whether the pressure gauge is actually decreasing or not, that particular water jacket is probably not leaking. Moreover, leak rates (particularly in combustion chambers) are usually large enough to be audible with spark plugs removed. In cases where a leak cannot be determined to be in the block or in the head, removal of the manifold and retesting the block and head will usually reveal the source of the leak by noting coolant flowing out of one of the valve ports (usually one of the exhaust ports). If you confirm a crack in your cylinder head, it should be removed and replaced. Unfortunately, repairing cracks in the block's water jacket is not practical.

