

Q: What should I look for when buying a boat with an Atomic 4 in the engine compartment?

A: The engine itself is only a part (admittedly the main part) of the power system within the boat. In many cases, and since boats powered by the Atomic 4 are as old as the engine, the things that effect reliability of the engine have more to do with dirty fuel tanks and supply lines, tattered and corroded electrical systems, and restricted or worn out exhaust systems. Therefore these items should be checked along with the engine.

Here are a few things that you can look for on the engine itself:

- 1) It's obviously very important to check on the maintenance history of the engine if one is available. The maintenance history, along with the ability to talk with the prior owner, can add insight to the findings of the following checks.
- 2) Check the exterior of the engine for signs of deep rust or scaling. Be especially critical of the alternator side of the block. In some cases; seals around water jacket side plates develop leaks, and given the limited access to that side of the engine on many boats, these leaks can go undetected for long periods of time, and deep scaling can result. In a few cases (fortunately very few), blocks have had to be scraped due to this scaling extending all the way through the block and into the crankcase.
- 3) The engine should be started and brought to a normal operating temperature of 160 to 170 degrees for raw water cooled engines, and approximately 180 to 190 degrees for fresh water cooled engines. It is best to run the engine in "forward" and under load. If you are checking the engine in the slip, it's OK to simply pull against the dock lines. Check for any unusual noises. Atomic 4s are known for running rather quietly and smoothly.
- 4) Check for fluid leaks. Be especially critical of any evidence of gasoline around the carburetor or fuel lines.
- 5) Check for normal oil pressure of 30 to 40 psi by around 1500 RPM; and 20 psi or above at idle. Pressure can drop lower if the engine is operated under load for several hours; however, oil pressure should always be 10 psi, or slightly above, per 1000 RPM .
- 6) Run the engine for a short time at maximum power to check for any unusual sounds, excessive smoke out of the exhaust, or fumes from blow-by in the cabin.
- 7) In neutral, the engine should accelerate quickly as you flick the throttle from idle to full throttle without hesitation. It's important that you do not allow the engine to actually reach full RPM during this check. This is simply an acceleration check. The RPM never needs to go much above 2000.

8) Shut the engine down and check the compression as soon as you can remove the spark plugs without burning your fingers. The combustion chamber volume in the heads of in-service Atomic 4s vary considerably, and compression can therefore vary from as low as 85 psi to as high as 120 psi, with the average being around 100 psi. Compression readings should have a maximum spread within 5 or 10 psi.

NOTE: If there is no compression gauge available, you can remove all the plugs and hold your thumb over each spark plug hole while someone runs the starter for a few seconds at each hole. As long as the compression is sufficient to blow past your thumb no matter how hard you press, it is quite normal.

9) While the spark plugs are removed, check for excessive carbon buildup or oiliness. Do not be too critical of a black velvet sootiness as long as the plugs are dry.

If you are buying a boat without the opportunity to actually run the engine, perform as many of the above checks as possible plus the following:

1) With the spark plugs removed, run the engine on the starter and check for oil pressure. Oil pressure at starter RPM will usually be around 20 psi.

2) Check the compression. With a cold engine, compression readings can be expected to vary much more than in a warm engine; and if the engine has not been run in quite a while, valves might be a bit sticky which will effect compression. These conditions are frequently not serious, and will clear up after the engine is started and given a Marvel Mystery Oil treatment (5 or 6 squirts of oil in each spark plug hole).