



Intake Tester Use Instructions

- ♣ This Intake Tester was designed to be used with primarily vacuum as the inspection source. The use of regulated, positive air pressure is required to assist in detecting any leaks within the installation.
- ♣ Perform test on a cool engine.
- ♣ Slacken / remove both intake pushrods prior to start of the test.
- ♣ With both intake valves closed and the machines' intake manifold installed, mount the Intake Tester.
- ♣ Snug the Tester mounting bolts. In this case, "snug" can be defined as tightening the mounting bolts until a sharp rise in torque is felt. There is no need to tighten the mounting bolts beyond the point where the Tester bottoms against the intake flange.
- ♣ Use a hand-held vacuum pump (like a Mity-Vac™) equipped with a reference gage. Fit a short length of tubing (less than 2 inches) to the vac and fit a small tapered adapter nipple to the other end of the tubing. Plug the end of the nipple with your finger and draw the pump down to about 20 inches. Inspect reference gage needle for stability. If the needle indicates a vacuum decay, inspect your pump assembly for the cause. The hand pump must hold a vacuum with no decay to provide accurate results. (Sometimes it helps to install a zip tie on the tubing over the pump nipple; the pump nipple sometimes has casting flash and can cause a small leak at the interface between the tubing and nipple.)
- ♣ With a known-good vacuum pump and reference gage, attempt to draw a vacuum of **15 inches** into the intake system as the first test. The little tapered fittings from the vac fit nicely into the air QD fitting on the Tester.
 - A. In a machine fitted with quality intake valve seals, good guides, a quality valve job, and a quality intake installation; it is not uncommon to see the intake system hold 15+ inches of vacuum for several minutes.
 - B. If the machine has "unsealed" valves, some vacuum decay is to be expected. This is from the clearance between the valve guide and the valve stem. An integral intake system will draw down to at least 15 inches of vacuum. A 15 second rate of decay from 15 inches vacuum to zero (atmospheric pressure) is acceptable. Obviously, any longer period of time for the decay is also acceptable.

If you achieve results similar to either A or B, then your intake system is integral and the pushrods can be reinstalled and readjusted. (Now might be a good time to double check the exhaust pushrod adjustment and ignition timing of the machine as well, if you are motivated.)

If the system draws down, but has a rapid decay, or cannot attain 15 inches of vacuum, or if the system does not draw down *at all*; there is a leak somewhere and positive pressure is needed to test further.

- C. Proceed to apply positive, regulated air pressure of about **15psig** to the test plate. You don't need much more pressure than that to test the intake system.
 - D. If no evidence of an external leak is present while charged with positive pressure, remove pressure and reference the "Additional Inspections" section to inspect for worn valves, seats, and guides.
- ♣ If you don't own a vacuum pump, just test with positive pressure following steps C and D. It just takes longer to inspect the system using positive pressure only.
 - ♣ In some instances, just listening and feeling for the leak will pinpoint it in lieu of a bubble test. Pull the spark plugs and listen for any air escaping past the intake valves into the combustion chamber.



- ♣ Bubble testing is just plain messy. Be advised that some soapy water solutions are caustic; good practice is to remove any residue promptly as it can corrode metals. Rinse area with fresh water and dry immediately after testing.
- ♣ Spray bottles seem to give inaccurate results. A lab-style squeeze bottle or turkey-baster work the best for applying the leak solution to the system. Remember to shake the dispenser before applying the solution so that it is “active” when it hits the surface being inspected. Check all areas for possible leakage if the joints prove integral. Castings can leak, pan rocker screws can break into the intake tract, supports loosen, valves lose the seal against the seat, nipple rivets are notorious, etc.
- ♣ Obviously- a giant leak isn’t going to make bubbles, but will just sputter solution everywhere. A slight leak will cause the solution to make bubbles. Teeny-tiny little bubbles (like in beer foam) are the effect of applying the solution to the surface- unless they keep on developing in the same spot- then that’s also an indication of a leak.
- ♣ Use the correct spacers to take up the O-ring gland void and to space the manifold on installations where the large rubber band seals are being used with spigots that are cut for O-rings. If the gland “gap” is not filled in, no matter what clamp (and clamping pressure) you apply, the rubber band seal is gonna leak something terrible.
- ♣ Rubber band seals seem to be a more robust, durable seal vs. O-rings *in the long run*. O-rings seal just as well as rubber bands when done right, though.
- ♣ O-rings are easier to install, especially on pans and converted knucks. If you are just plain stubborn and like winning, rubber bands can be installed on those engines with both heads on.
- ♣ Split clamps work ok; marine grade T-bolt clamps are better. Be patient with both during install. Split clamps sometimes need to be lightly filed on the parting surfaces to get the correct clamp-up.
- ♣ **Always** have a carburetor support, installed in such a manner that the support does not cause distortion upon your nice, tight intake system.
- ♣ Torque is a relative term unless you actually use a torque wrench. The intake system needs to be tight and secure, but it doesn’t need to be impact wrenched on there.
- ♣ The rubber band or O-ring should be installed dry. A lubricant may cause it swell and become less dense, causing an eventual leak.

Additional Inspections

- ♣ With all pushrods adjusted, and the engine rotated so that one cylinder has the intake valve open and its exhaust valve closed, **50psig** positive pressure can be applied to the Tester. (Depending on piston position, you may need to have an assistant hold the engine in this position.) You can then check that cylinder for:
 - ✓ Spark plug and boss for leakage (spark plug installed- bubble test for integrity or cracks)
 - ✓ Exhaust valve and seat for integrity (listen thru exhaust pipe- no air escaping is good)
 - ✓ Piston ring condition (listen thru breather – *some* air escaping is normal)
 - ✓ Cylinder integrity (a big whooshing sound from the breather and oil tank vent probably indicate your little leaky manifold got critically lean and there is damage to that cylinder / piston/ rings)
 - ✓ Opposite cylinder- intake valve and seat integrity (that cylinder spark plug removed, listen at plug boss – no air escaping is good)

Rotate to opposite cylinder, same valve configuration as above, and repeat tests.

Thanks for purchasing one!