

Leak Checker

Leak checker gauge assembly as shown in photo above includes regulator, manifold fittings, master leak gauge, inlet pressure supply gauge, inlet and outlet quick disconnects, and a 2 meter connection hose assembly with quick disconnects. Part number 89164-10000



A leak tester or leak checker is a way of measuring the size of a

hole or an orifice. The hole could be any shape and this device would measure the amount of air it would flow and this can be compared with a percentage of leak to any other hole. You measure the amount of flow the hole has, not just the size. Some holes of the same size will flow different amounts based on the inlet and outlet shape or the internal finish. By using a **high quality** regulator, and a .040 orifice as a standard restrictor you can make your own leak checker. See the diagram for the configuration of the device. Once you have a leak checker it can be used to analyze the condition of the piston rings. It can be used to compare nozzles and jets to ensure that the .095 nozzle or jet is larger than the .094 that is in the fuel system.... (they aren't always !) You can use them to set the barrel valve spool rotation position to measure how much fuel the engine is getting at idle and at prelaunch position. Once you have a leak checker you will find a lot of uses for the device. There are a lot of poor quality leak testers in use because of inexpensive general application regulators and or bad calibration. Most of the best leak checkers are "homemade" as the builder understands what he wants. The people who just buy one don't really understand how important a high quality regulator is for accuracy needed. There is two ways to check the accuracy of a leak checker. One check the calibration (80% leak @ .080 orifice) this will read 20 psi (on a 100 psi gauge) with a .080 orifice on the end of the leak checker hose. Two is to zero the gauge on the leak checker (100 psi) and then move the knob on the regulator **ANY** movement of the knob **MUST** result in movement on the gauge needle. If the knob can be moved **any** amount then this is a "dead band" in the regulator indicating a cheap regulator which will result in inaccurate percentage readings even if it can be calibrated to (80@ 80). Ask yourself how much inaccuracy you are willing to live with. Do you check the clearances in the engine with a tape measure or a micrometer? The people who make them for resale are trying to make a product at a price and as such don't usually use the highest quality components. Simply purchasing a name brand and expensive leak checker is no guarantee of accuracy, you purchasing a high quality regulator and gauges will give you this guarantee. The "brains" of a leak tester is the regulator and the gauge. Cheap gauges and regulator will not give you good, quality repeatable information. I prefer to use a 5" dial on a **instrument quality** 100 psi gauge. All leak testers have a jet or nozzle between the regulator and the gauge. The quality of the drill on the jet will determine the scale on the reading. This doesn't matter a lot unless you start comparing your information with someone else. The standard **calibration** is that you will flow 80% leak with a .080 jet in the end of the leak tester hose. This is usually achieved with a .040 nozzle inside the leak tester. I use one of our standard .040 main jets to achieve this. (An Enderle will do as well) this has a 7/16 unf thread and can therefore be replaced and adjusted to achieve the calibration of 80% leak with a .080

orifice. I have done some research and found high quality hardware so you can build your own leak checker that will provide you with very high quality information.

It is a good idea to "leak" your jets when you change them if you are making small changes because a lot of the time you will find a bigger (or smaller) jet will not flow more (or less) fuel. You think you are changing from a .105 to a .106 jet to lean the engine back just one step and the .106 will leak less than the .105 and the engine will be richer and give you false information. Another scenario is you will fiddle a port nozzle one or two steps and think you are making a difference and the change will be larger than you expect or there is no change at all. If you "leak" your jets and nozzles when you change them you will know the changes you are making are real. Also the most obvious application for a "leak checker" is checking the condition of the cylinders on the engine to evaluate the ring and valve seal. I recommend the use of the air filter with the instrument quality regulator since the instrument quality regulator has a *very* small sensor port which "looks" at the system pressure constantly and signals the changes to the regulator so it can adjust to maintain the correct pressure. If a small bit of rust or debris from inside the air line lodges in this port the regulator cannot "see" the pressure so it will know to adjust itself. In drag racing we continually look at smaller and smaller bits of time and more detail. It is imperative to have accurate information on what we are doing. If you check the clearances inside the engine you do so with a micrometer not a tape measure. You do this so you have very accurate information why you not do this for your "tune up" as well. Cheap regulators and gauges are not accurate and as such they give you information that is not accurate. Consider what happens if today you leak your barrel valve at 65% and it is really 70% the car runs good and you take the fuel system apart for maintenance and you set the barrel valve back at 65% but this time it really is 60% and the car starts shaking. You don't think it is the fuel system because it is all back where you had it before- or so you think! Now you are chasing the clutch, blower, tires and so forth to solve this problem. Now just how cheap was that regulator and gauge?

As far as the hoses and quick disconnects go use commonly available ones so interchangeability with other racers is good. Make sure the quick disconnects are reasonably high flow so they do not interfere with the leak readings at high flow situations. I do recommend using a cheap pressure gauge on the inlet side just to ensure that you have a minimum of 100 psi on the inlet. If the pressure drops below 100 psi on the inlet then you have lost your zero calibration and will get inaccurate leak percentages. Most air compressors will not kick on until about 90 psi and if you are expecting the line pressure to stay above the 100 psi level to keep your calibration you need to know you are out of range. For my leak checker I purchased a complete range of every type of air quick connect available and made adaptors to connect to my air connections so I can hook up to anyone's air line to do a leak check.

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Accessories

- * Quick disconnect connection to -3 adapter (for flowing nozzles) 89164-10011
 - * Quick disconnect connection to -6 adapter
(for leaking small barrel valves and air popping -6 fuel system poppet cans... 89164-10012
 - * Quick disconnect connection to -8 adapter
(for leaking large barrel valves and air popping -8 fuel system poppet cans... 89164-10014
- To leak check your engine use one of the following:
- * Quick disconnect to small spark plug adapter 89164-10021
 - * Quick disconnect to large/short spark plug adapter 89164-10022
 - * Quick disconnect to large/long spark plug adapter 89164-10023
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- * Quick disconnect to Enderle jet thread. Allow the flowing of main jets to check the flow rate of the jet. Install a .080 jet and it becomes a calibration checking tool for the standard of .080 jet must flow 80% leak as a standard. 89164-10040

Leak checker components

- 89164-10001 Air line filter to .3 microns (not shown)
- 89164-10002 Bracket-connects filter to regulator and has a mounting flange (not shown)
- 89164-10003 Regulator (laboratory quality instrument regulator)
- 89164-10004 Gauge inlet pressure
- 89164-10005 Leak percentage gauge (Master gauge-laboratory quality)