



Vacuum Gauge & Fuel Pump Tester P/N MV5511

Always read instructions carefully prior to use.

General Description

The Mityvac Vacuum Gauge & Fuel Pump Tester can provide very useful diagnostic and test information to the automotive technician. This information is helpful in determining both the general condition of the engine, as well as how specific engine components are performing. As with any diagnostic or test procedure, you should rely on information from multiple sources to determine the cause of the condition.

NOTE: When performing vacuum tests, the range and movement of the needle pointer on the dial face of the gauge are more important than specific numerical values.

Important things to note when interpreting vacuum gauge readings:

- How does the pointer needle move? (Erratic, smooth, bouncing, etc.)
- In what direction does the pointer needle move?
- Is the movement normal or does it vary?

NOTE: It is recommended to perform a compression test prior to performing a vacuum test. Poor compression can result in erroneous vacuum test readings Use Mityvac® Compression Testers P/N MV5520 or MV5525 to perform test.

Safety Precautions:

- Always use eye protection when performing tests.
- Always keep hands and test equipment away from moving engine parts.
- Always apply parking brake of vehicle prior to performing diagnostic tests.

Normal idle vacuum usually ranges between 16"-22" Hg. However, on late model engines, lower and less steady vacuum readings are becoming more common due to changes in engine design. Altitude will also have an affect on numerical values. The following section will provide procedures and examples of the readings taken with the MityVac® Vacuum Gauge and Fuel Pressure Tester.

Vacuum Tests

A. Cranking Vacuum Test:

1. Connect the vacuum gauge to a manifold vacuum source (vacuum port), using the provided tubing and adapters.
2. Temporarily disable the vehicle's ignition system.
 - a) On vehicles with standard distributors, disconnect the coil wire (high tension lead) from the distributor cap and secure it to a suitable ground or disable the ignition by disconnecting the positive (BAT) terminal from the ignition coil.
 - b) On vehicles with distributorless ignition, disable the ignition system by removing the electronic ignition (control) module fuse or disconnect the crank angle sensor.

NOTE: Refer to the appropriate service manual to determine which fuse or component to temporarily remove or disconnect.

- c) Make sure the throttle plates are completely closed.
- d) Crank the engine over with the starter motor. *Note: An engine in good operating condition should produce 2" - 4"Hg. This reading should remain steady for at least ten seconds.*
- e) If the needle pointer fluctuates sharply, perform a compression test to assist in determining the mechanical condition of the engine.

B. Engine Running Test:

1. Start engine. Allow engine to run at idle speed.
2. Connect the vacuum gauge to a manifold vacuum source (vacuum port) using the provided tubing and adapters.
3. If the engine is in good condition, the gauge reading should be steady, indicating between 18"-22" Hg. *Note: This number will decrease 1" for every 1000 feet above sea level.*

C. Burned or Leaking Valves:

At idle, burned or leaking valves will be indicated by a sharp drop of 1"-7" Hg. in the gauge reading, followed by a return to the previous value. This will occur at regular intervals, as the defective valve tries to close and seal.

D. Sticking Valves:

1. A sticking valve will be indicated by a rapid, intermittent drop of between 1" - 4" Hg in the gauge reading. The movement of the needle pointer will look distinctively different from a burned or leaking valve.
2. A sticking valve can be pinpointed by applying a light-weight or penetrating oil to each valve guide. When oil is

applied to the valve guide of the sticking valve the condition will temporarily disappear.

E. Weak or Broken Valve Springs:

Weak valve springs are indicated by rapid fluctuations of the needle pointer at idle (10"-21" Hg). Fluctuations will increase with engine speed. A broken valve spring will cause the needle to fluctuate rapidly at regular intervals as the valve attempts to close and seat.

F. Worn Valve Guides

The gauge reading will be lower than normal and will fluctuate rapidly over a range of approximately 3" of Hg. As the engine speed increases, the pointer needle will become steady.

G. Leaking Piston Rings

1. Low but steady vacuum reading at idle (usually 12"-16" of Hg.)
2. As the throttle is opened then released, the vacuum reading should drop to 0 then recover to approximately 21" of Hg as the engine decelerates. Note: Normal decelerating vacuum reading is between 23"-25" of Hg.
3. If this gauge reading is noted, a compression test should be performed. Use Mityvac Compression Testers P/N MV5520 or MV5525 to perform test.

H. Blown Head Gasket

With the engine running at idle speed, a blown head gasket will be indicated by a gauge reading fluctuation between a normal and low. The needle pointer will drop sharply approximately 10" of Hg each time the affected cylinder reaches firing position.

I. Exhaust Restriction Test

1. Note gauge reading at idle and compare to readings for burnt/leaking valves or late timing. Readings should be about normal.
2. Watch needle pointer of gauge as engine speed is increased to approximately 2500 RPM. If vacuum reading increases over 10" of Hg, the exhaust system **is not** restricted.
3. If the needle pointer drops toward zero as RPM increases, either the exhaust system is restricted or an over active EGR valve is causing the problem.
4. Test the EGR Valve with the Mityvac® Automotive Test Kits- P/N MV7000 or MV6810. If the EGR is **good** the exhaust system **is** restricted.

J. Intake Manifold/Carburetor Leaks

If there are any leaks in the induction system (between throttle body and the intake port of the cylinder head(s)), the needle pointer of the gauge will be approximately 3"-9" Hg **below** normal but will remain steady.

K. Late Ignition or Valve Timing

An extremely low but steady vacuum reading at idle indicates late valve or ignition timing, or a uniformly close setting of valve train lash. The needle pointer will remain at about 12" and go no higher. Additional tests should be performed to determine which problems, if any affect the engine. Refer to manufacturers diagnostic and repair procedures.

L. Incorrect Air-Fuel Mixture

When the needle pointer on the gauge drifts slowly back and forth at idle, over a range of 4"-5" of Hg the fuel mixture is too rich. When the proper fuel mixture is achieved, a high, steady level of vacuum will be observed on the gauge. An irregular drop will indicate a lean fuel mixture over the same range.

Fuel Pump Testing

- **CAUTION: USE care when testing the fuel pump. Use shop towels to catch any spilled fuel.**
- **DO NOT allow fuel to spill onto hot engine parts.**
- **DO NOT perform any test on the fuel system in the vicinity of an open flame.**
- **ALWAYS wear eye protection.**
- **ALWAYS have an approved fire extinguisher on hand when testing or repairing the fuel system.**

A. Vacuum Test (Mechanical Pumps)

1. Disconnect the fuel inlet line from the fuel pump.
2. Connect the gauge hose to the fuel pump inlet.
3. Start engine, run engine at a fast idle of 10 seconds, then allow engine to idle.
4. Observe needle pointer on gauge. A good fuel pump should develop a steady, 13"-17" of Hg.
5. Shut off engine. Vacuum reading should remain for at least 1 minute.

B. Pressure Test (Carbureted Vehicles)

1. Disconnect fuel line inlet at carburetor. This is the pump outlet line and should be disconnected from the carburetor.
2. Connect the gauge hose to this line.
3. Start the engine, allow engine to run at idle. *Note: the fuel in the carburetor bowl should be sufficient to perform this test.*
4. Note pressure reading from fuel pump and record reading. Compare pressure reading to manufacturer's specifications found in the appropriate service manual.

NOTE: If the Manufacturer's specifications are not readily available, a gauge reading of between 4-6 PSI is acceptable for most carbureted engines. When testing smaller displacement engines expect readings to be slightly lower. If pressure readings are outside of the range listed above refer to the manufacturer's specifications prior to replacing the fuel pump.

LIMITED WARRANTY

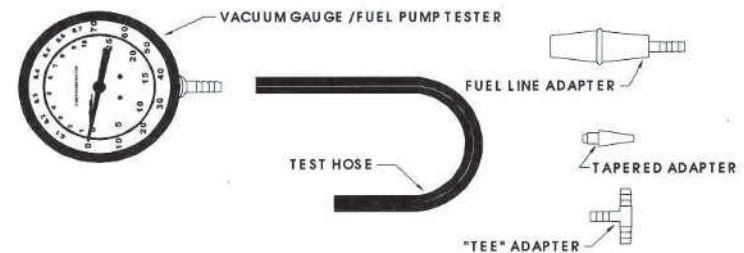
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Product Diagrams & Contents



CAUTION!

TO AVOID PERSONAL INJURY AND/OR VEHICLE DAMAGE:

While some precautions are specified in this manual, and should be noted to avoid personal injury or vehicle damage, it is not possible for these cautions to cover all conceivable ways in which service or testing might be done, or all possible hazardous consequences of each way, nor could Lincoln possibly know or investigate all such ways. It is therefore the responsibility of anyone using this manual or any other Mityvac® product, to satisfy him or herself completely that neither personal safety nor vehicle safety will be jeopardized by the service methods selected. Any such injury or damage is entirely the user's responsibility. This device is not to be used in any manner on the human body.

Contacting Lincoln Industrial Corp.

For information regarding this product or any product in the Mityvac product line, please call numbers listed below Monday-Friday between the hours of 8:00AM and 5:00PM Central Time.
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Section - MV81 Page - 1

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