Vacuum Tester - Lo Gauge

INSTRUCTIONS FOR USE

CONNECTING

This Vacuum Tester should be connected to the inlet manifold of the engine. Virtually all cars have one or other connection or pipe already in place that can easily be adapted for this purpose. Often a suitable small bore pipe can be found that leads from the inlet manifold to the air filter housing or carburetor. The connector to a brake servo can also be used, though in this case the car should not be driven on the road with the tester attached, since the adaptors provided are not suitable for road going connections to the brake servo pipe. The connector to the distributor (for ignition vacuum advance) is suitable provided that the pipe leads to the engine manifold (though it is not necessarily suitable if it leads to the carburetor).

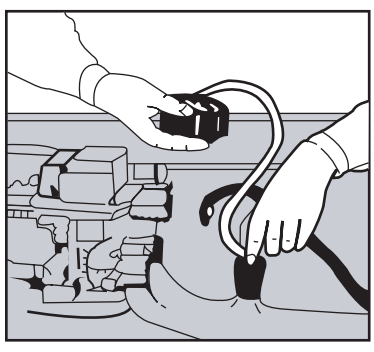

FIGURE 2
Connecting to the manifold

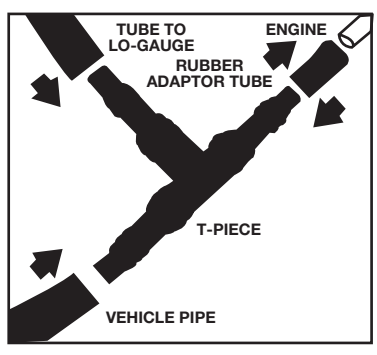

FIGURE 2
Connecting to the vacuum pipe

To test the suitability of a particular connection, "blip" the throttle with the gear in neutral and the engine running at idle, when the pointer should rapidly swing from one to the other of the "throttle blip" indications on the scale, and back to the idle position. If the pointer does not move as described, then the vacuum tester is not connected directly to the engine manifold: check intervening pipes for pressure regulating valves or reducing valves, or that the pipe does not lead to the carburetor venturi.

FIGURE 3
Throttle blip test

DIAGNOSIS OF ENGINE FAULTS

The Tester measures the manifold vacuum. Any engine fault that reduces the efficiency of the engine will also reduce the manifold vacuum. This is because an inefficient engine requires more petrol in order to generate the same power as an efficient engine, and in using more petrol the engine also draws in more air, hence reducing the manifold vacuum.

To use the tester for engine fault diagnosis, ensure that the engine is fully warmed up (preferably take the car for a short drive), install the tester as described above, and set the engine idle speed as recommended by the car manufacturer. For best results, it is important that the idle speed is accurately set using a tachometer.
If no idle speed is given set the idle rpm to 850 rpm. The tester will then be indicating the manifold vacuum (i.e: fuel) required to provide the power to maintain the engine at the set idle speed.

The reading on the tester should be in the green sector of the scale (between 18 and 22 ins Hg). Different cars give slightly different readings within this band. The reading should be as high as readings made on previous occasions when the engine was known in good condition. The higher the reading the better.

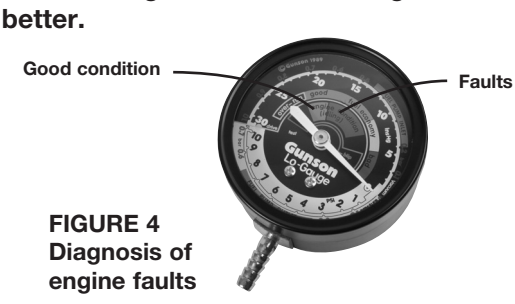

FIGURE 4
Diagnosis of engine faults

Carry out any required engine maintenance to ensure that the reading is as high as possible within the green sector, but ensure that all measurements are made at the same engine rpm.
Keep a note of the measured vacuum readings on a chart for future reference and comparison. Faults which cause a low engine idle vacuum reading are:-

- **Spark misfires (poor spark plugs, leads, ignition systems**
- **Poor engine compression, including leaking or sticking valves and leaking head gaskets**
- **Mixture too weak or much too rich**
- **Ignition too advanced or too retarded**
- **Incorrect valve timing**
- **Blocked air filter/exhaust**

NB Certain faults, such as sticking valves, leaking exhaust valves, leaking head gaskets may be indicated by a jerky movement of the pointer.

TURBO CARS

The Vacuum Tester can be used for measuring turbo boost pressure up to +0.75 bar and for testing most turbo wastegate operating pressures.

PETROL PUMP TESTING

The Vacuum Tester can be easily used for testing the suction (inlet vacuum) and delivery (outlet pressure) of fuel pumps in cases where poor engine starting or sudden engine cut-out indicate a possible fuel pump fault. The scale of Lo Gauge indicates acceptable levels of pressure and suction. And manufacturer supplied data can be used if available (see vehicle's handbook)

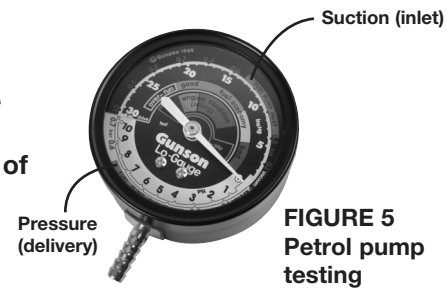

FIGURE 5
Petrol pump testing

MAINTENANCE

The tester should give many years of trouble free service.
If roughly treated or dropped the pointer may be dislodged from the zero reading. To reset the pointer, remove the dial bezel and carefully prise off and re-position the pointer, using a small screwdriver blade as a lever.

NOTES: Traditionally, the level of vacuum is measured in inches of mercury (abbreviated to ins.Hg). This is a carry-over from the days when a column of mercury was used to measure vacuum. Increasingly, the motor trade is standardizing on the unit of bar to measure pressure and other units commonly in use are millibar (1000 mbar=1br) and pounds per square inch (psi). A useful conversion is that atmospheric pressure equals 1.013 bar, 1013 mbar, 14.69psi and that pure vacuum is 29.9 ins.Hg. These units are shown on the dial of the tester.