EXH-02, Wastegate Testing

Introduction

If you're reading this, you're probably considering testing the wastegate because you're experiencing a low charging system pressure. In other words, you will car will not achieve full boost from the turbocharger system. If so, you should first perform a simple test to determine if the source of the problem is with the electronic portion of the boost control system or if the problem is mechanical. Perform the Low Boost Pressure Test which follows.

Low Boost Pressure Test

1. Clamp the actuating line to the wastegate using a hose clamp.
2. Test drive the vehicle and determine the available boost pressure.

CAUTION!

Use extreme caution when driving the car with the actuating line clamped off. The overboost protection system is defeated by clamping the line. If the charging system is intact, you can overboost the engine and cause extensive damage.

3. If the boost pressure achieved is 1.75 bar as indicated on the car's boost gauge, the mechanical portion of the charging system is working properly. This includes the wastegate, turbocharger, air intake system, and turbo bypass valve. If the minimum boost pressure is not achieved, proceed with testing the individual mechanical components.

Wastegate Testing

1. Wastegate testing must be done with the exhaust system initially cold.
2. Raise the vehicle on jack stand.
3. Disconnect the wastegate actuating line for the wastegate and connect a pressure pump.
4. Start the engine an allow it to idle. The exhaust line to the wastegate should heat up after a short period of time. However, if the wastegate is closed and not leaking by, the bypass line out of the wastegate will be cold.
5. Using the pressure pump slowly apply pressure to the wastegate while feeling the bypass line.

NOTE

Never apply more that approximately 14.5 psi (1 bar) pressure to the wastegate diaphragm during testing. The factory shop manual says to apply 0.6 bar (8.7 psi) of pressure to the wastegate to get it to open. However, the pressures listed below are based on actual numbers from two different 944 Turbo owners who independently tested their wastegates and came up with the same results.

6. At a pressure of approximately 4 psi (0.2 bar), the wastegate should start to open as indicated by a temperature increase in the wastegate bypass line. At a pressure of approximately 7 psi (4.8 bar) the wastegate should be fully open. Of course, you won't be able to see the exact position of the wastegate if you are testing it in place. However, you can check actual position of the valve during a bench test.
7. When the pressure is suddenly removed, the wastegate should close as indicated by an audible click.