

2.7t Pressure Test

Home Pressure Test
Audi 2.7t

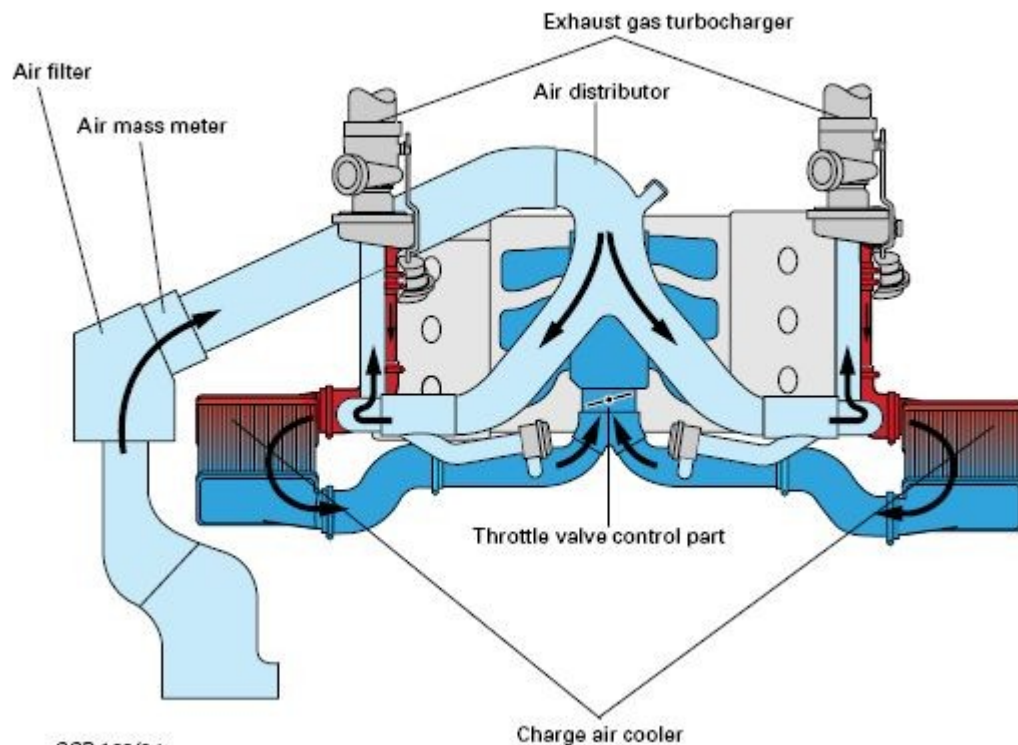
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2.7t Pressure Test

Introduction and Theory

The Audi 2.7 turbo engine has been around for some time now. As the engine ages the hoses connecting the turbo plumbing can develop leaks. The goal of this document is to supplement AWE Tuning's 2.7t pressure test document <http://tinyurl.com/q45t4> in finding charge pressure leaks.

An understanding of the 2.7t plumbing can help in diagnosing any leaks. The picture below is from the 2.7t study guide <http://tinyurl.com/pxn9b> and shows the primary air path.



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Illustration 1: 2.7t Study Guide Page 22

The light blue signifies atmospheric air. Damaged turbos, premature oil breakdown and premature engine wear will result if you have leaks in the atmospheric air path. However a leak here will not cause boost problems.

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The red path is compressed air leaving the turbos before the intercoolers. Air density is increased by cooling and that's the job of the intercoolers. By cooling the air you increase the air's density which increases the engine's volumetric efficiency. The dark blue path represents this dense air as it enters the intake manifold.

Another important path is the lines going to the N75 Charge pressure control valve. The picture below shows this air path.

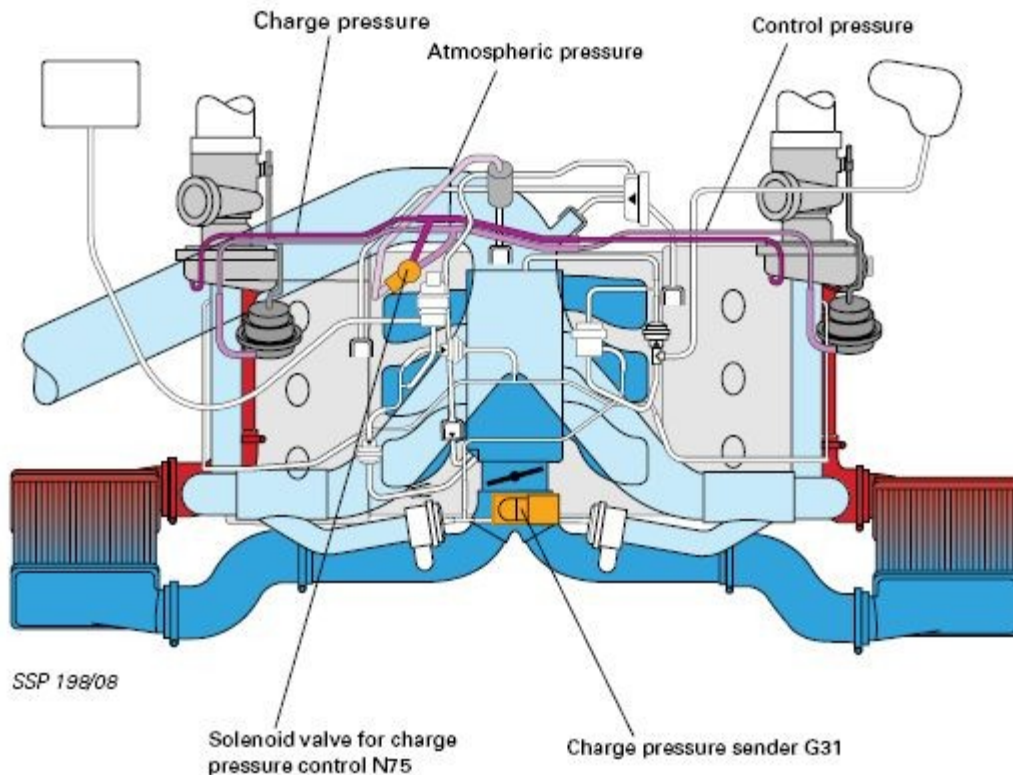


Illustration 2: 2.7t Study Guide Page 26

The charge pressure line has two purposes. First these lines equalize the charge pressure between the left and right turbos. Second is to allow the N75 valve regulate the compressed or charged air.

The control pressure line also has two purposes. First the line equalizes pressure between the left and right wastegate control valve. Second is to allow the N75 valve to regulate the wastegates.

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Leaks in the charge pressure path, charge pressure line, or the control pressure line will cause boost problems.

Below is a logical diagram of the 2.7t turbo.

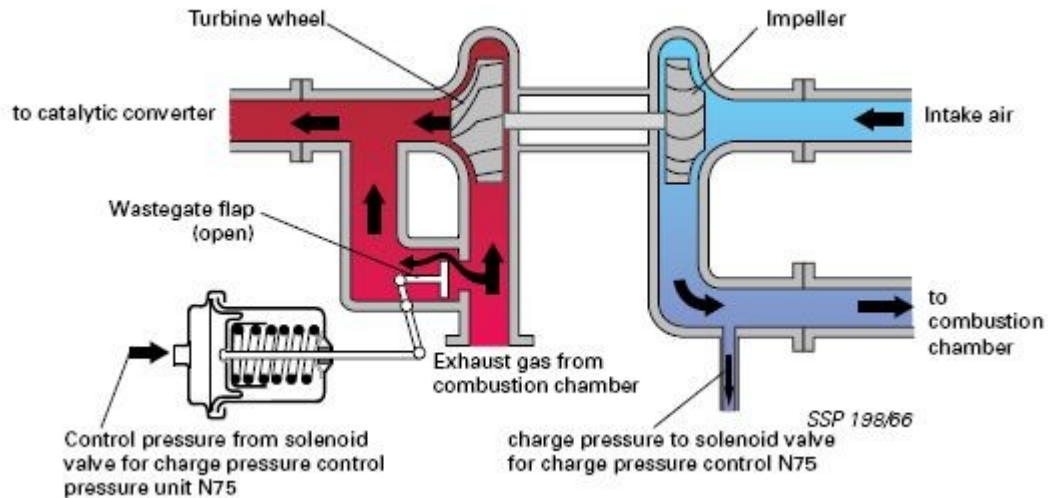


Illustration 3: 2.7t Study Guide Page 27

The N75 valve when deactivated (normal state) allows charge pressure air to act on the wastegate actuator. This is important to know when pressure testing.

Below is a diagram of the N75 valve.

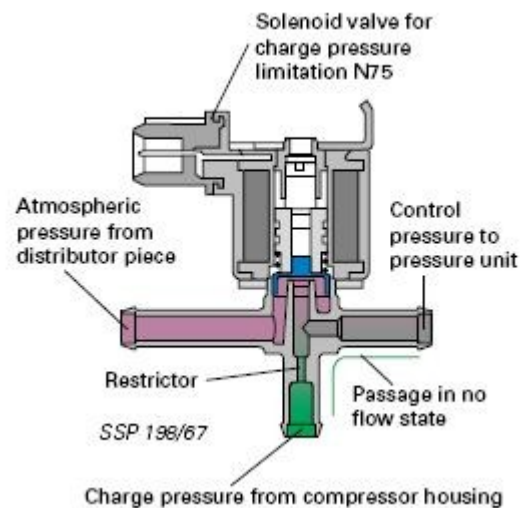


Illustration 4: 2.7t Study Guide Page 27

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Pressure Testing

How do you know when to pressure test? Check engine light, soft engine code (engine code without check engine light), or the cars performance.

When setting up the pressure test your should remove the bracket holding the O2 sensor connectors. When pressurizing the air path, the pressure cap might blow off. This can break the connector bracket.



Illustration 5: O2 Sensor Bracket

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To aid in leak detection add a regulating valve to the AWE test setup. A paint sprayer regulating valve found at Lowes or Home Depot works well. The valve is approx. \$13.00. Note: If you look hard you can see a broken O2 sensor bracket.



Illustration 6: Test Rig with Regulator

As the air path fills there is constant air noise. This makes it difficult to pin point leaks. By shutting off the air supply via the regulating valve, when the pressure gage reads 5-7 psi, helps in leak detection.

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Common failure points are the throttle body boot (TBB), hoses connected to the N75 valve and the intercoolers hose caps.

You can divide and conquer to find difficult leaks. Here are a couple of suggestions.

If you detect an air leak in the back of, or under the engine, remove the N75 valve and test the control pressure and charge pressure lines.

The control pressure line(wastegate control)can be checked by using a hand vacuum pump. If the line cannot hold vacuum run air into the line an listen for leaks.



Illustration 7: Control Pressure Line (Wastegate Control)

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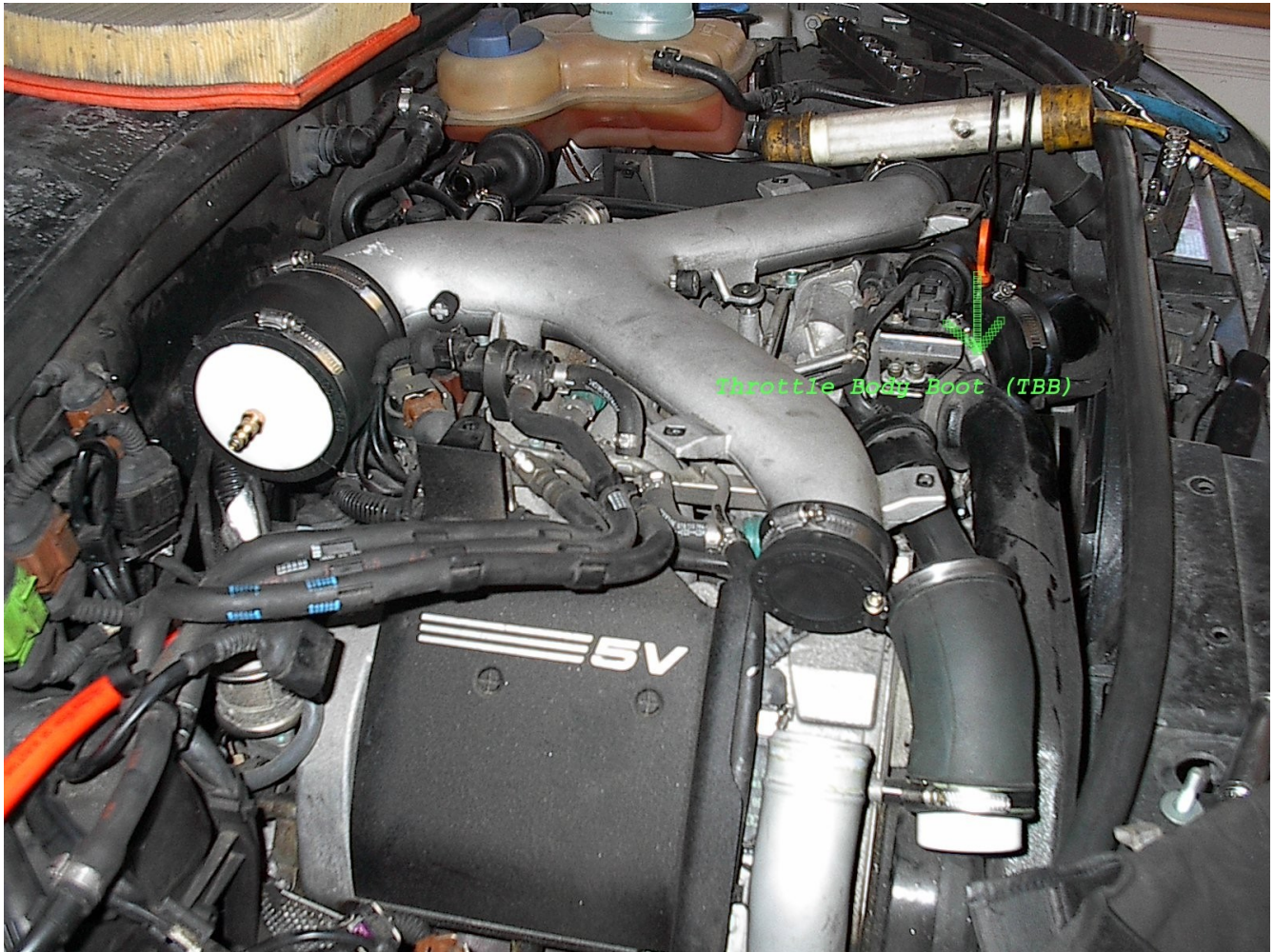
The charge pressure line is more difficult. This line connects to the turbo and is part of the charge pressure path. However you can pinch off each side of the Y connector, joining the two charge pressure lines, to isolate leaks in this area.



Illustration 8: Charge Pressure Line

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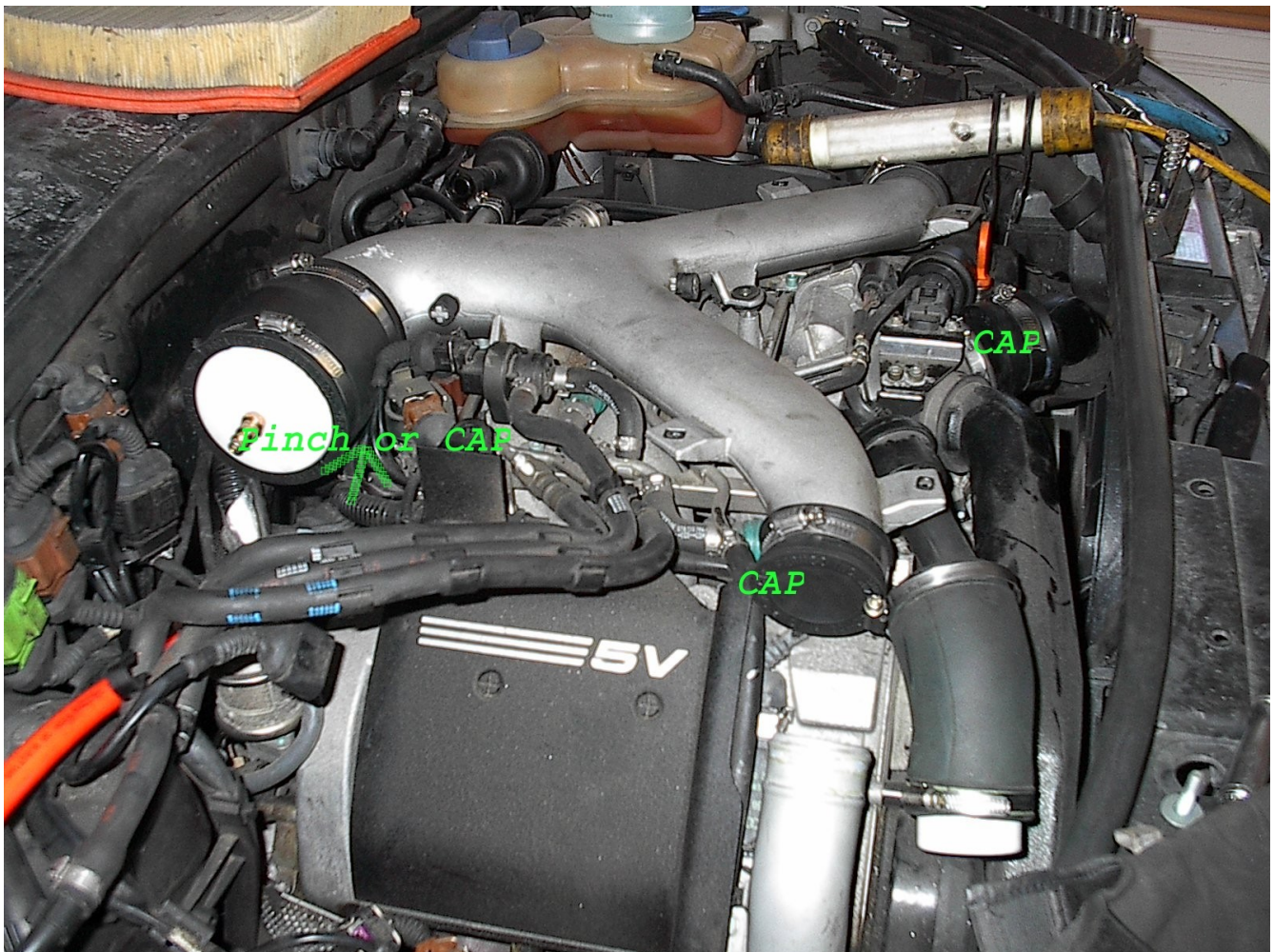
If you hear a leak in the front of the engine check the Throttle Body Boot. This is a very common failure point.



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Finally, if needed, you can isolate the driver side and passenger side air paths. This example tests the driver side air path.

First pinch off the drivers side charge pressure hose. You can use a small c-clamp or a bolt. Cap the passenger side intake Y pipe. Use a 2 ½" rubber pipe cap from Lowes or Home Depot. Finally cap the drivers side intake pipe to the TBB, using another 2 ½" rubber cap.



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In conclusion, this document is a supplement to the AWE 2.7t pressure test guide. Hopefully the information presented here will help anyone find leaks in the 2.7t boost air path. Good luck and happy testing