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## About the N75 Wastegate Bypass Regulator Valve. (m)

**Posted by:** VonK :: Indukted on 2002-11-28 13:06:25

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I haven't been around this forum for over a year. So, when I visited again yesterday, a post about the N75 "race valve" caused me to look into this matter. I haven't time to search the whole past, so some readers might find this just another review. Nonetheless, here's my take for anyone else who might be interested. I'm motivated to do this by people who think they can go the Audi engineers one better by screwing with the unit's calibration screw. The following will explain why this is a dangerous undertaking.

Figure 1 shows how the Waste Gate controls boost, and Figure 2 shows how the ECU controls the Waste Gate by means of the Wastegate Bypass Regulator (N75).

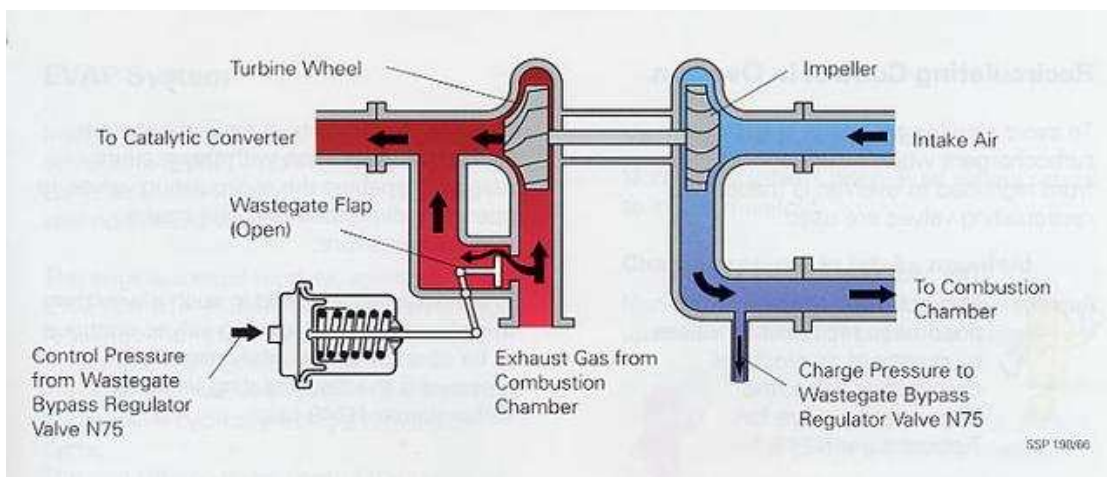


Figure 1

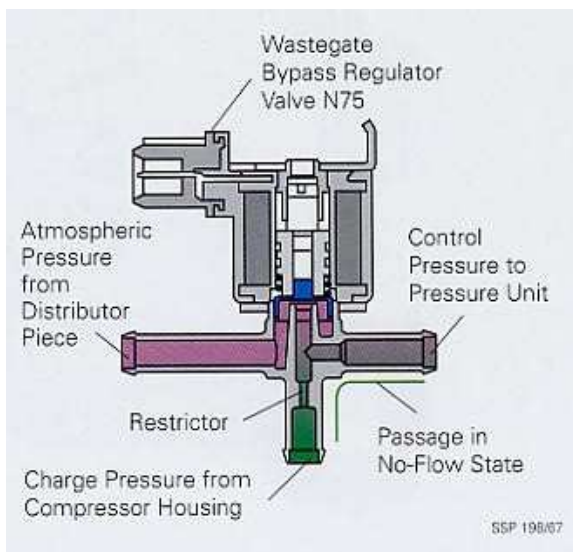


Figure2

In your imagination, connect the outlet of high pressure from the Impeller (blue) in Figure 1 to the bottom inlet (green) in Figure 2, and the right side outlet (gray) in Figure 2 to the Waste Gate actuator (Pressure Unit) in Figure 1.

Here's how this appears to work:

A "No-Flow State" exists during idle, when there is no boost and the Waste Gate is held shut by the spring in its actuator (Pressure Unit).

When you step on the accelerator, boost builds up, and so does the pressure in the green bottom port of Figure 2. This also pressurizes the gray outlet of N75 leading to the actuator (Pressure Unit) in Figure 1. Once the air pressure in that actuator overcomes the spring pressure, the Waste Gate opens and allows some of the exhaust gases to bypass the turbine wheel. However, this action alone would open the Waste gate at lower boost pressures than are desirable. Here's where N75 comes in.

Notice the Restrictor in Figure 2. It allows only a small amount of air to enter from the green port below. As a result the pressure above the Restrictor (that goes to the Waste Gate actuator) can be regulated by bleeding off controlled amounts of air through the left side purple port of N75. The bleed-off rate is controlled by how far the electric coil pulls up its central plunger, allowing air to escape under the blue cap at its bottom. That pull-up distance is precisely controlled by a pulse width modulated signal from the ECU. To achieve the intended results, N75 is factory calibrated by a screw above the plunger that sets the proper spring pressure of a spring between the plunger and the blue cap.

It's easy to see that one might get a little more boost by turning the calibration screw up a bit, thus increasing the bleed-off rate and reducing the pressure to the Waste Gate actuator. But wait, if the ECU finds the boost higher than expects, it will modify its signal to N75 to correct the situation within limits. If those limits are exceeded, surging will set in, particularly under part load.

The moral of the story: Don't screw with the screw. Trying to fix any drivability problems this way, only hides some other fault.

Sorry about the lecture. :-)

Graphics courtesy of Audi of America

VonK

**"Not dead yet...!"** (Monty Python)

**"A little bit of knowledge is a dangerous thing."** (unknown)

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**All statements, quotations and illustrations by VonK are to be construed as his opinions only, and not as advice, consent, recommendation, guidance, instruction, and/or suggestion.**

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