

## **1.8T Turbocharger Operation**

SYSTEM OVERVIEWS



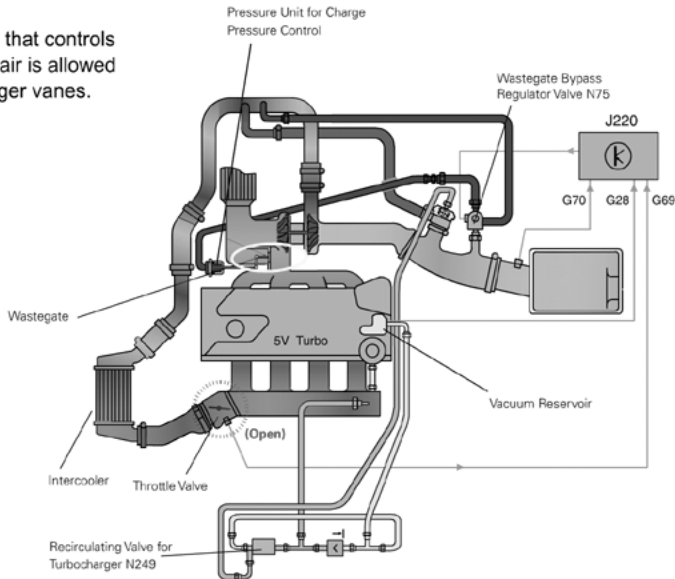


Before learning how to repair the **1.8T Turbocharger System**, it is important to understand:

- The components used to control the turbocharger system.
- When the components are used.
- How the turbocharger system is tested.

## Wastegate Operation

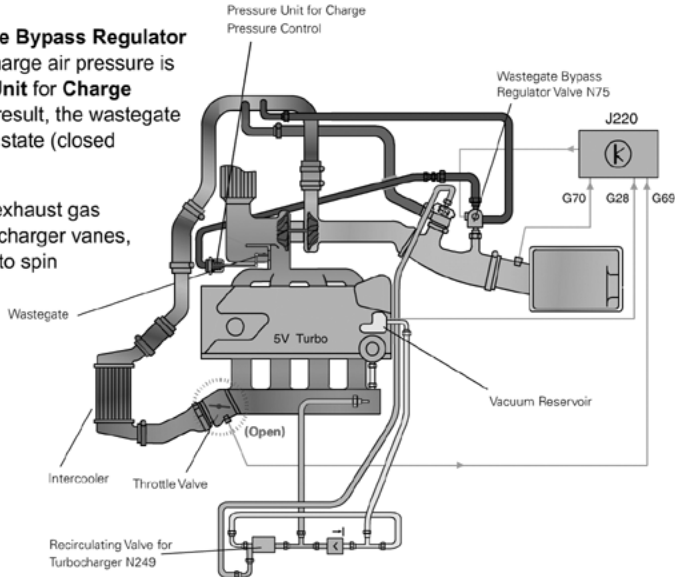
The **Wastegate** is a valve that controls how much of the exhaust air is allowed to flow over the turbocharger vanes.



## Wastegate Operation

When **N75**, the **Wastegate Bypass Regulator Valve**, is energized, no charge air pressure is applied to the **Pressure Unit for Charge Pressure Control**. As a result, the wastegate valve moves to its resting state (closed position).

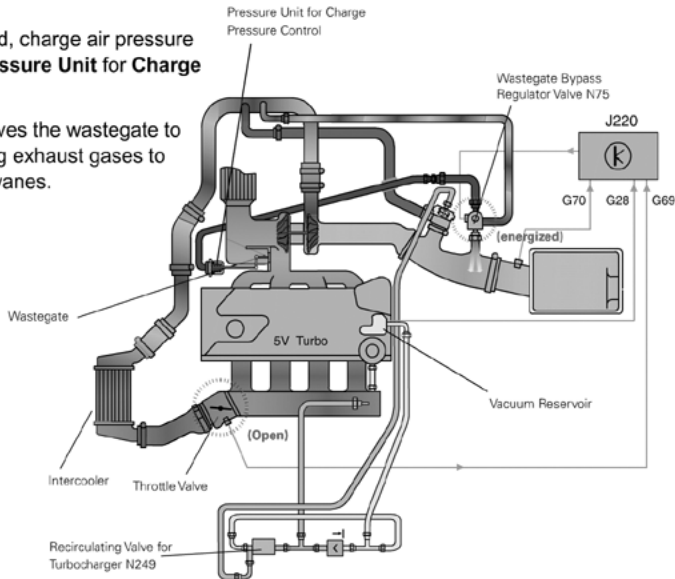
In this position, all of the exhaust gas is routed across the turbocharger vanes, causing the turbocharger to spin faster (boost).



## Wastegate Operation

When **N75** is de-energized, charge air pressure flows from **N75** to the **Pressure Unit for Charge Pressure Control**.

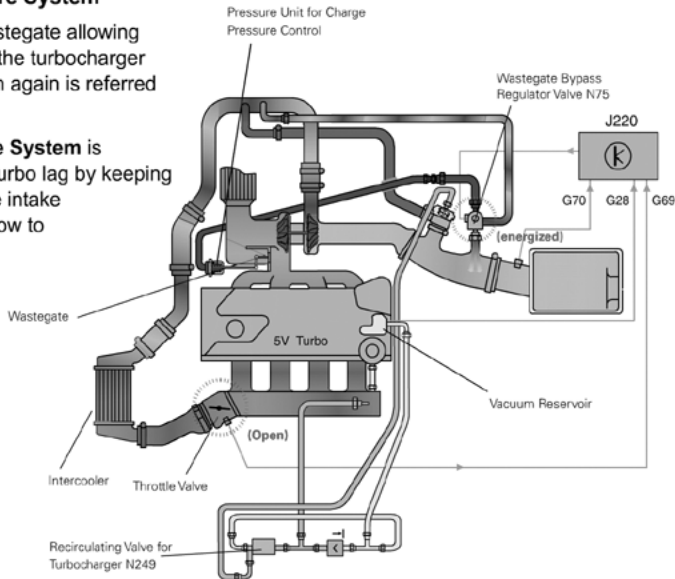
This applied pressure moves the wastegate to the open position, allowing exhaust gases to bypass the turbocharger vanes.



## The Charge Air Pressure System

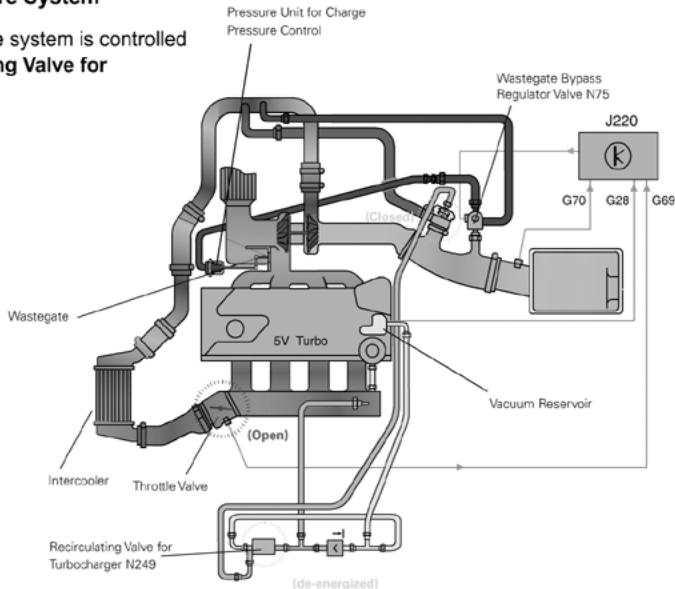
The time between the wastegate allowing exhaust gases to bypass the turbocharger and when boost can begin again is referred to as "turbo lag."

The **Charge Air Pressure System** is designed to help reduce turbo lag by keeping an alternate section of the intake pressurized, even under low to no-throttle conditions.



## The Charge Air Pressure System

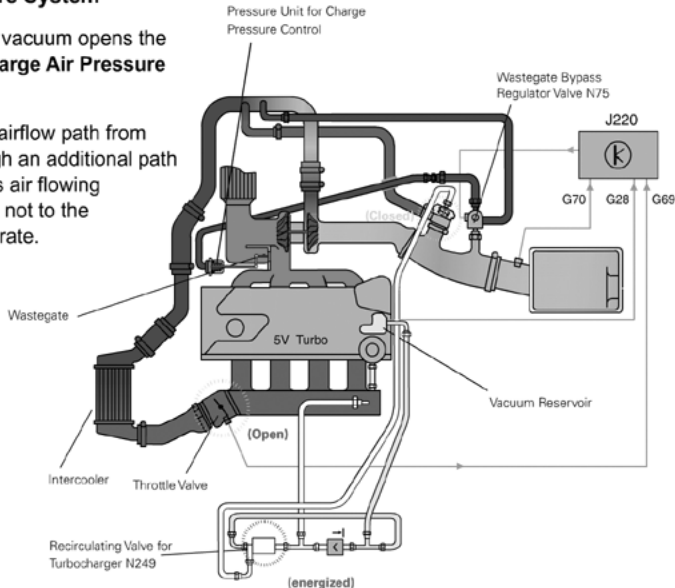
The **Charge Air Pressure** system is controlled by **N249**, the **Recirculating Valve for Turbocharger**.



## The Charge Air Pressure System

When **N249** is energized, vacuum opens the valve that controls the **Charge Air Pressure System**.

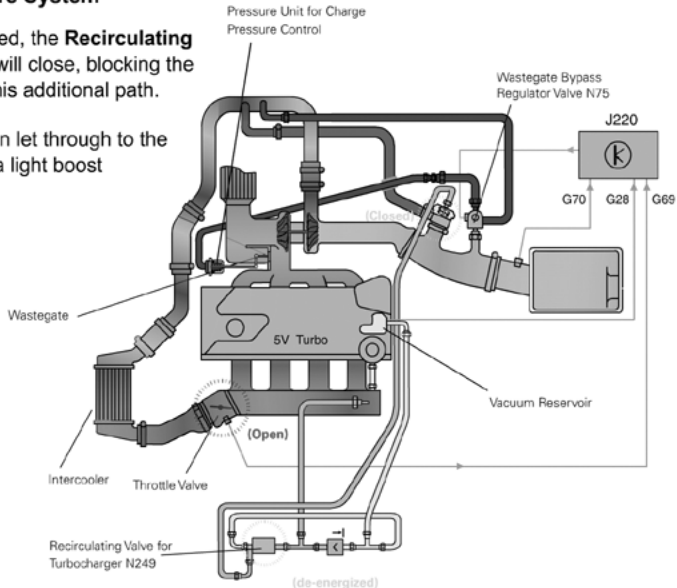
This changes the regular airflow path from the intake manifold through an additional path of hoses. This path keeps air flowing past the turbocharger, but not to the intake manifold, at a high rate.



## The Charge Air Pressure System

When **N249** is de-energized, the **Recirculating Valve for Turbocharger** will close, blocking the air from flowing through this additional path.

This pressurized air is then let through to the intake manifold, creating a light boost condition.





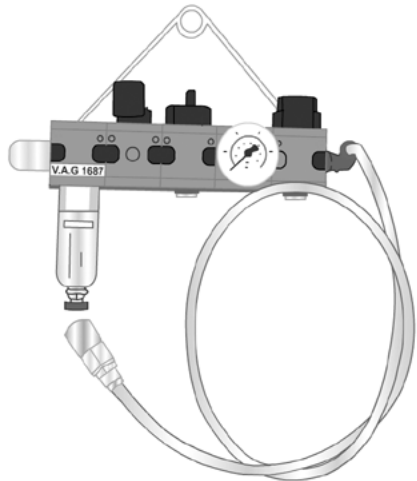
### Special Tools

There are two separate tools that are used to test the integrity of the turbocharger and turbocharger system.

They are the **VAG 1397A** and **VAG 1687**.

## Special Tools

The **VAG 1687** is used to test whether there is a leak in the turbocharger system. It uses compressed shop air and checks for leakdown.



## Special Tools

The **VAG 1397A** is used to test the turbocharger's capacity for producing boost. It is connected between the intake manifold and the **Charge Pressure Recirculation Valve**.

Procedures for using **VAG 1397A** are detailed in normal repair procedures in VESIS, Repair Group 21.

