

Turbocharger And Charge Air Cooler (CAC) System

The PCM controls the variable turbocharger geometry using the turbocharger actuator. The turbocharger control is a closed-loop system that provides feedback to the PCM. In response to engine speed, load, manifold pressure and barometric pressure, the PCM controls the turbocharger actuator position to match manifold boost to the requirements of the engine.

Filtered air enters the turbocharger compressor and the heated compressed air is then delivered to the charge air cooler (CAC). The CAC is designed to cool the induction air which has been heated by the turbocharger. The removal of heat from the pressurized air going into the CAC increases the air density which improves combustion efficiency, engine horsepower, and torque. The CAC is positioned directly after the turbocharger in the intake airflow path. As the heated air flows through the CAC, heat is transferred to the air flowing over the outside of the CAC (Transit), or the coolant (all others), reducing the temperature of the intake air. Considerably more air is forced into the intake manifold causing the pressure to be much greater than normal atmospheric pressure. This results in increased power, fuel efficiency and the ability to maintain power at higher altitudes. For additional information on the turbocharger and CAC components, refer to [Engine Control Components](#) in this section.

The air temperature entering the intake manifold is measured by the charge air cooler temperature (CACT) sensor located in the intake tube between the CAC and the intake throttle assembly.
