

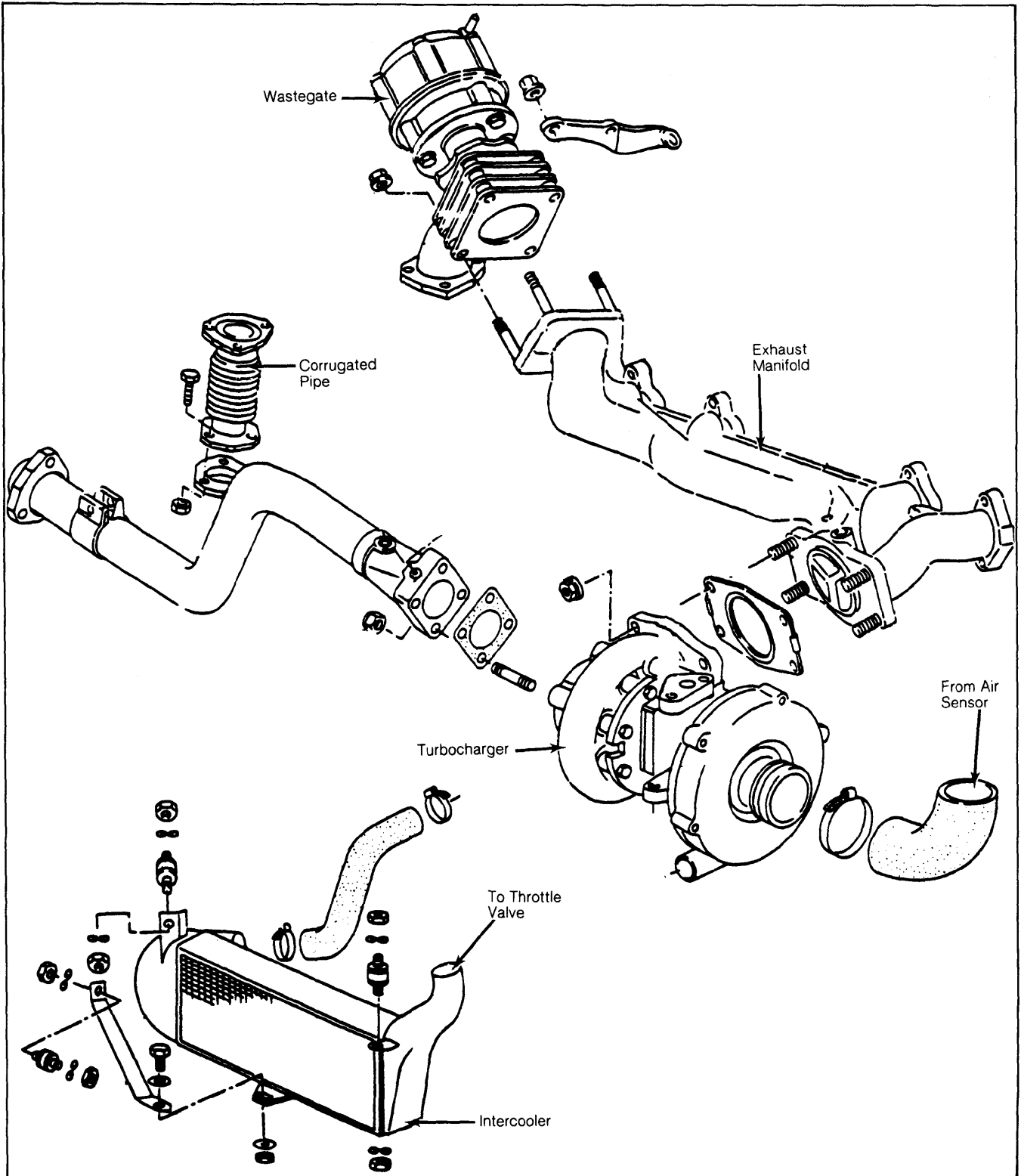
AUDI QUATTRO

DESCRIPTION

The Audi Quattro Turbo uses a KKK (Kuhnle, Kopp, Kausch) turbocharger, that is mounted directly to the front of the exhaust manifold. A wastegate is attached

to the back of the manifold. Other system components include an intake air inter-cooler, an additional safety system to prevent excessive pressure boost.

Fig. 1: Exploded View of Quattro Turbocharger System Components



1982 Turbocharging Systems

AUDI QUATTRO (Cont.)

OPERATION

At idle and light throttle, the Turbo engine operates like any other engine. As more power is required, the usually wasted exhaust gases from the exhaust manifold enter the turbocharger's turbine housing and flow through the turbine blades.

Exhaust flow and turbine speed increase as throttle opens and engine RPM increases. The impeller turns with the turbine and forces the compressed air through the inter-cooler, where it is cooled by ram air. This compressed, cooled air is then forced into the cylinders via the intake manifold.

The faster the impeller and turbine spin, the greater the volume and density of air that is supplied to the engine. If boost pressure rises past the safe limit (too high), engine damage would result. The wastegate opens when exhaust pressure exceeds a predetermined limit and allows exhaust gases to by-pass the compressor.

A boost pressure safety system is built into the fuel/timing control unit. This system protects against high boost pressure in the event the wastegate fails. If the wastegate fails and boost pressure rises past the safe limit, the fuel pump will be switched off, slowing the engine speed, and thereby reducing boost pressure.

TESTING

1) To test the Quattro turbocharging system, use a pressure gauge (VW 1397) calibrated in both psi and bar. The gauge is equipped with a valve which locks pressure measurement when closed.

2) Disconnect vacuum hose from intake manifold connector. Attach pressure gauge (VW 1397) between disconnected vacuum hose and manifold connector, using "T" fitting supplied with gauge. Use hose clamps at all connections to avoid low readings.

3) Boost pressure can only be tested on a chassis dynamometer or through road testing. Carry the gauge inside car by routing the hose out right rear corner of hood and into passenger side vent wing window.

NOTE: If chassis dynamometer is used, disconnect drive shaft at rear of transmission and lock center differential. Be sure differential control knob is pulled out and control lights are on.

4) Accelerate engine to full throttle in 2nd gear. Hold vehicle speed constant with foot brake, until engine speed reaches 5500 RPM. Close gauge valve by pulling sleeve away from dial, and record gauge reading.

NOTE: Testing should not exceed 10 seconds at full boost.

5) Boost pressure readings will vary with atmospheric pressure, temperature and altitude, but will fall between ranges listed in Boost Pressure Specifications Table if turbocharger operation is correct.

BOOST PRESSURE SPECIFICATIONS

Ambient Temperature	psi (kg/cm ²)
50°F (19°C)	7.0-7.6 (.49-.53)
68°F (20°C)	6.7-7.4 (.47-.52)
77°F (25°C)	6.6-7.3 (.46-.51)
86°F (30°C)	6.4-7.0 (.45-.49)

6) If specified manifold pressure is not obtained, ensure that all vacuum hose connections are tight and that there are no intake manifold leaks. If no vacuum leaks are found, replace wastegate and retest system. If boost pressure is still incorrect, reinstall wastegate and replace turbocharger unit.