

**Haynes**
shows you how

BMW 3-Series and Z4 (99-05) Includes 2006 325ci/330ci Coupe and Convertible models Haynes Online Manual.

1 General information and precautions

General information

Warning:

Do not allow antifreeze to come in contact with your skin or painted surfaces of the vehicle. Rinse off spills immediately with plenty of water. Antifreeze is highly toxic if ingested. Never leave antifreeze lying around in an open container or in puddles on the floor; children and pets are attracted by it's sweet smell and may drink it. Check with local authorities about disposing of used anti-freeze. Many communities have collection centers which will see that antifreeze is disposed of safely. Never dump used anti-freeze on the ground or into drains.

Note:

Non-toxic coolant is available at most auto parts stores. Although the coolant is non-toxic, proper disposal is still required.

The cooling system is of pressurized type, consisting of a pump, an aluminum crossflow radiator, cooling fan, and a thermostat. The system functions as follows. Cold coolant from the radiator passes through the hose to the water pump where it is pumped around the cylinder block and head passages. After cooling the cylinder bores, combustion surfaces and valve seats, the coolant reaches the underside of the thermostat, which is initially closed. The coolant passes through the heater and is returned through the cylinder block to the water pump.

When the engine is cold, the coolant circulates only through the cylinder block, cylinder head, expansion tank and heater. When the coolant reaches a predetermined temperature, the thermostat opens and the coolant passes through to the radiator. The thermostat opening and closing is controlled by the engine management ECM by a heating element within the wax capsule of the thermostat. This allows fine control of the engine running temperature, resulting in less emissions, and better fuel consumption. As the coolant circulates through the radiator it is cooled by the inrush of air when the car is in forward motion. Airflow is supplemented by the action of the cooling fan. Upon reaching the radiator, the coolant is now cooled and the cycle is repeated.

Two different engine cooling fan systems are used, depending on the model. On automatic transmission models, the main engine cooling fan is electric and is mounted in front of the radiator (bumper side). A mechanical fan with a viscous coupling driven by a drivebelt also cools the radiator. The fan clutch (viscous coupling) controls the speed of the fan depending upon the engine compartment temperature. On manual transmission models, one multi-speed cooling fan mounted on the engine side of the radiator cools the radiator coolant. On both

manual and automatic models, the electric cooling fan is operated using a pulse width modulated signal from the ECM and is protected by a 50 amp fuse. The electric cooling fan and coolant temperatures are controlled using 15 different speed selections depending upon the radiator outlet temperature, the catalytic converter temperature, the vehicle speed, the battery voltage and the air conditioning pressure.

Refer to [Section 11](#) for information on the air conditioning system.

Precautions

Warning:

Do not attempt to remove the expansion tank filler cap or disturb any part of the cooling system while the engine is hot, as there is a high risk of scalding. If the expansion tank filler cap must be removed before the engine and radiator have fully cooled (even though this is not recommended) the pressure in the cooling system must first be relieved. Cover the cap with a thick layer of cloth, to avoid scalding, and slowly unscrew the filler cap until a hissing sound can be heard. When the hissing has stopped, indicating that the pressure has reduced, slowly unscrew the filler cap until it can be removed; if more hissing sounds are heard, wait until they have stopped before unscrewing the cap completely. At all times keep well away from the filler cap opening.

Do not allow antifreeze to come into contact with skin or painted surfaces of the vehicle. Rinse off spills immediately with plenty of water. Never leave antifreeze lying around in an open container or in a puddle in the driveway or on the garage floor. Children and pets are attracted by its sweet smell. Antifreeze can be fatal if ingested.

Refer to [Section 11](#) for precautions to be observed when working on models equipped with air conditioning.