This Service Information bulletin supersedes SI B17 01 02 dated **September 2002**.
Similar information may be found in SI B11 07 08, dated August 2008.
NEW designates changes to this revision

SUBJECT

Overheated Engine - Diagnostic Tips

MODEL

NEW E46 with M54 engine

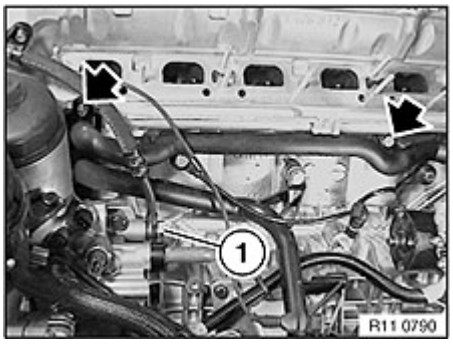
SITUATION

NEW This Service Information bulletin pertains **mainly** to E46 3 Series vehicles with M54 engines and **manual transmissions** that incorporate a combined electric engine coolant and air conditioning fan assembly.
Note: E46 3 Series with M54 engines and automatic transmissions incorporate a separate viscous clutch coolant fan, used for engine cooling, with a separate electric fan for the air conditioning system.
The viscous clutch fan cools the engine, even if the electric auxiliary fan on these models does not function properly.
The procedure below should be followed if it is evident that the customer has driven the vehicle for an extended period of time with a failed electric coolant system fan while ignoring the coolant temperature gauge, causing a severe overheat condition.
Example: The vehicle is towed in; the customer states that the engine overheated and a high loss of engine coolant is verified (no coolant in the expansion tank).
If the engine has been severely overheated due to prolonged excessive engine temperatures, the coolant system components may have exceeded the maximum allowable temperature thresholds and should be checked and replaced, if necessary.
Note: This check is intended to help verify the cooling system/engine integrity when troubleshooting a severely overheated M54 engine ONLY, and is not to be used on every vehicle with a coolant system complaint.

PROCEDURE

If during the course of regular diagnostics, when checking an overheated M54 engine (pressure testing coolant system, radiator cap checks, etc.), it is discovered that the engine has been severely overheated, the following procedure will help verify whether permanent engine/cooling system damage exists.

1. Drain the engine coolant. See Repair Manual group 17, section 17 00 005.
2. Remove the intake manifold. See Repair Manual group 11, section 11 61 050.
3. Remove the plastic heater core feed pipe, BMW Part Number 11 53 1 705 210 (located under the intake manifold; see illustration below).



Note: If the coolant pipe cannot be removed after removing the securing hardware (arrows), the VANOS banjo bolt (1) must also be removed, thus allowing the additional clearance needed to remove the pipe.

4. Visually inspect the front (inside) of the coolant pipe:

If the plastic on the inside of the coolant pipe shows no signs of deterioration (smooth surface), the engine should be reassembled using new gaskets and O rings, where necessary.
The overheat condition in this case was not severe enough to cause internal damage to the coolant system components.

If the plastic on the inside of the coolant pipe shows signs of deterioration (worn away, bubbling, etc.) as shown, this is an indication that the engine has been severely overheated and the components listed below must be replaced.
Important note: If the coolant pipe shown (P/N 11 53 1 705 210) has deteriorated as described above, it must be sent to the Warranty Parts Return Center (WPRC) in Montvale, New Jersey, along with the Warranty Parts Tag for credit and further analysis.

Components to be replaced if the inside of the coolant pipe shows signs of deterioration:

- Cylinder head gasket
- All coolant hoses
- All plastic coolant pipes
- Coolant expansion tank and cap
- Radiator
- Water pump

- Thermostat
- If the engine oil smells burned, it should be replaced, along with the oil filter.

NEW**Important:**
NEWIn the case where the M54 engine needs to be disassembled due to an overheating event and the cylinder head needs to be removed, follow the head bolt threads checking procedure from SI B11 06 06 ("Head Bolts Threads Pulling Out of Block During Engine Reassembly"), dated 06/2006.
Note: With the cylinder head removed during a head gasket replacement, the cylinder walls should be checked for signs of gouging and extreme wear, especially if the oil smells burned.
Another visual sign of engine damage due to a severe overheat condition may include cylinder sleeves that are no longer flush with the cylinder block deck.
If signs of gouging and extreme wear in the cylinder walls and/or cylinder sleeves that are no longer flush with the cylinder block deck are discovered, a remanufactured engine should be installed.

PARTS INFORMATION

See the Electronic Parts Catalog (EPC) for appropriate model-specific part numbers.

WARRANTY INFORMATION

Contact your Market Team for appropriate warranty information and approval before the above procedure is performed.