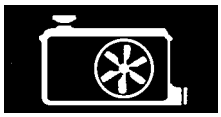

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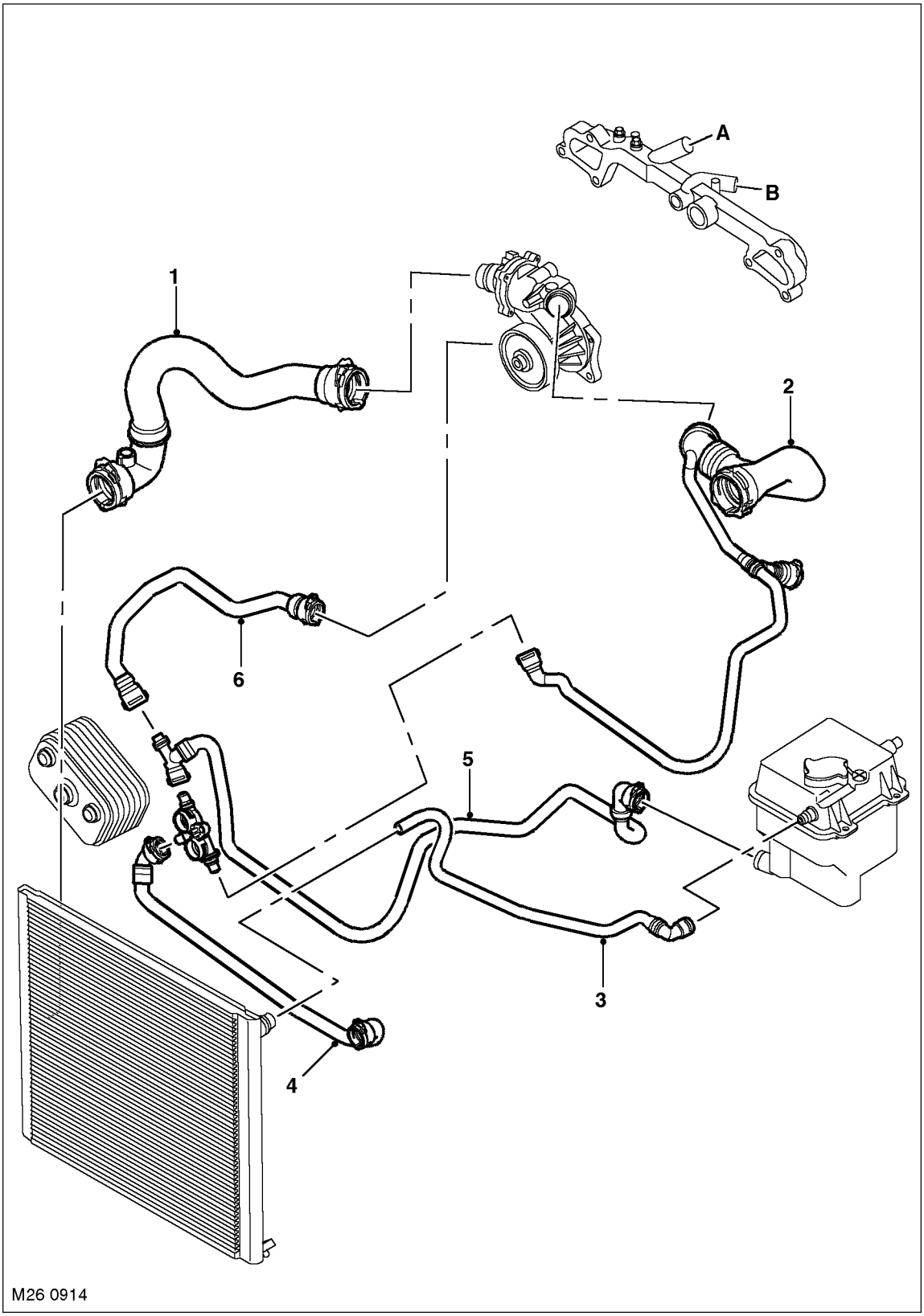
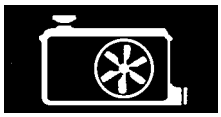
V8 Cooling System – Sheet 1 of 2

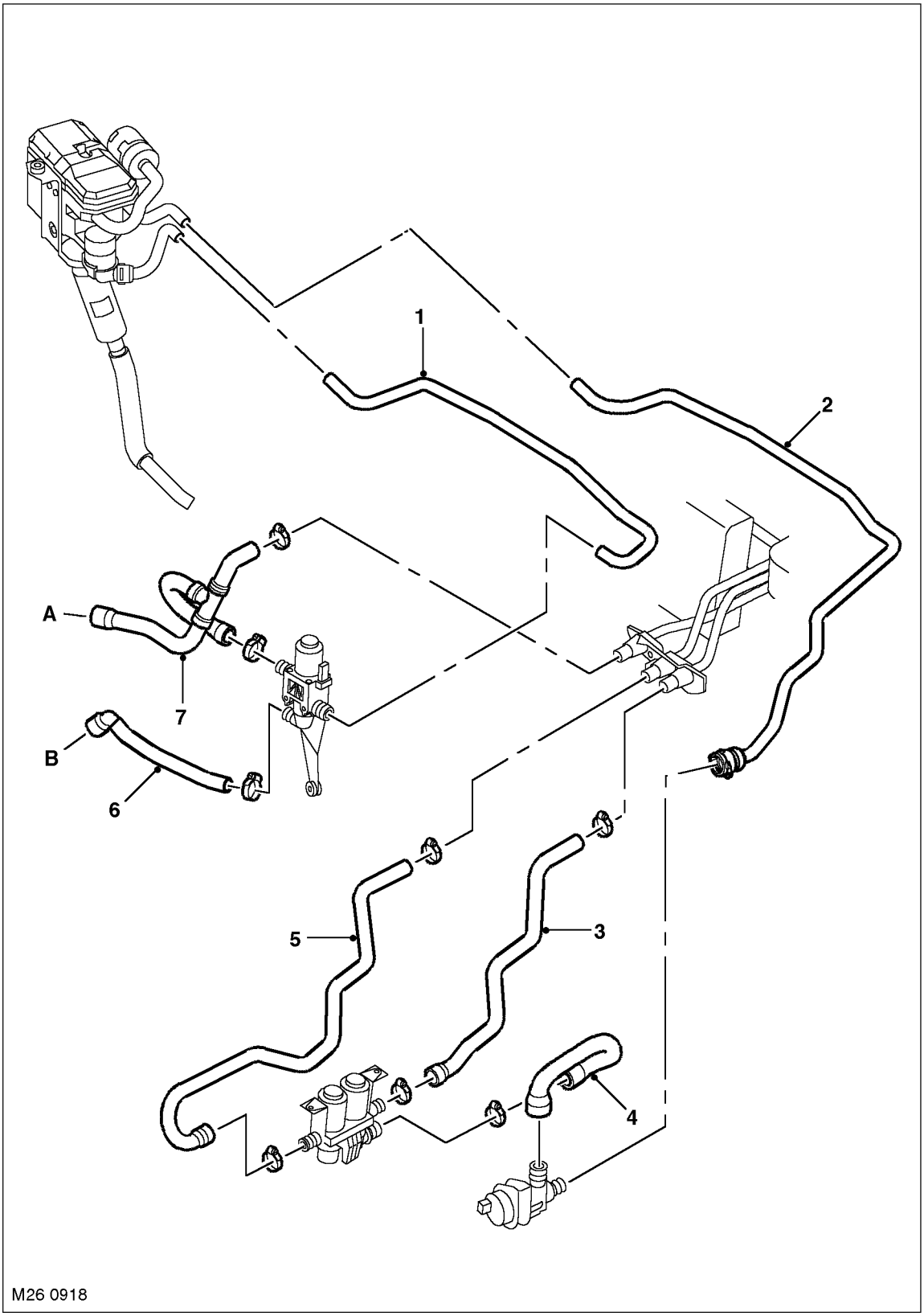


A and B = Heater matrix



1 Radiator bottom hose
2 Radiator top hose
3 Hose – Coolant/air bleed to expansion tank
4 Hose – Alternator housing
5 Hose – Expansion tank to coolant valve
6 Hose – Coolant valve to water pump

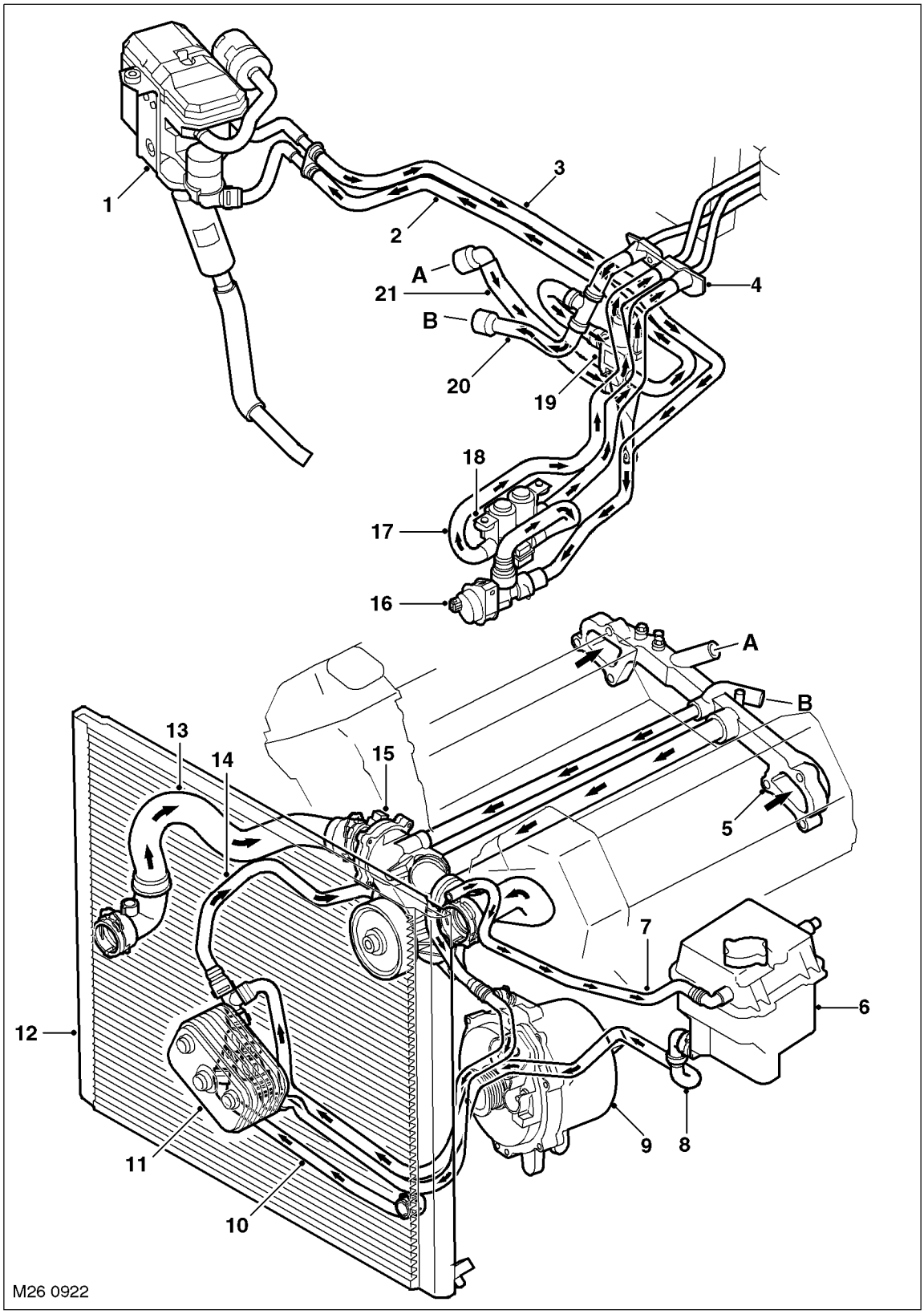
V8 Cooling System – Sheet 2 of 2



A and B = Heater matrix

1 Hose – Changeover valve to Fuel Burning Heater (FBH)
2 Hose – FBH to auxiliary coolant pump
3 Hose – Coolant valve to heater assembly
4 Hose – Auxiliary coolant pump to coolant valve
5 Hose – Coolant valve to heater assembly
6 Hose – Engine to changeover valve
7 Hose – Engine to heater assembly

V8 Coolant Flow – Models With FBH



A and B = Heater matrix to engine coolant connections

1 Fuel Burning Heater (FBH)
2 Hose – Changeover valve to FBH
3 Hose – FBH to auxiliary coolant pump
4 Bulkhead connections
5 Coolant manifold
6 Expansion tank
7 Hose – Coolant/air bleed to expansion tank
8 Hose – Expansion tank to coolant valve
9 Water cooled alternator housing
10 Hose – Radiator
11 Transmission oil cooler
12 Radiator
13 Radiator bottom hose
14 Hose – Coolant valve to water pump
15 Thermostat housing
16 Auxiliary coolant pump
17 Hose – Coolant valve to heater assembly
18 Coolant valve
19 Changeover valve
20 Hose – Engine to heater assembly
21 Hose – Engine to changeover valve

Description

General

The cooling system employed is the bypass type, which allows coolant to circulate around the engine and the heater circuit while the thermostat is closed. The primary function of the cooling system is to maintain the engine within an optimum temperature range under changing ambient and engine operating conditions. Secondary functions are to provide heating for the passenger compartment and cooling for the transmission fluid. The cooling system comprises:

- Radiator
- Passenger compartment heater matrix
- Transmission fluid cooler
- Coolant pump
- Thermostat
- Expansion tank
- Viscous cooling fan
- Electric cooling fan
- Connecting hoses and pipes
- Fuel Burning Heater (FBH) – selected markets only
- Liquid cooled alternator housing.

The coolant is circulated by a centrifugal type pump mounted on the front of the engine and driven by an ancillary drive 'polyvee' belt. The coolant pump circulates coolant through the cylinder block and the cylinder heads via a chamber located in the 'vee' of the engine. Having passed through the engine, the coolant returns via a rear-mounted manifold that features the connections for the heater matrix and through pipes running in the 'vee' of the engine to the coolant pump. The coolant pump also circulates coolant to the radiator-mounted transmission fluid cooler and the liquid cooled alternator housing via flexible hoses.

The die-cast coolant pump, driven by an ancillary drive belt, is fitted to the timing case cover. It contains the dual coolant temperature sensor and the electrically heated 'map controlled' thermostat controlled by the engine management system.

The map controlled thermostat incorporates a heating element inside a conventional expanding wax thermostat core which enables the engine management system to 'power' the thermostat open when the engine is under full load and/or high output conditions. This provides sufficient cooling reserve through anticipation of the thermal load whilst allowing the engine to run at higher operating temperatures under part load conditions.

☞ **ENGINE MANAGEMENT SYSTEM – V8, DESCRIPTION AND OPERATION, Bosch ME 7.2 Engine Management System.**

The radiator is a cross flow type with an aluminium matrix and has a drain tap on the lower left hand rear face. The bottom of the radiator is located in rubber bushes supported by plastic brackets which are clipped into the body longitudinals. The top of the radiator is located in rubber bushes secured by brackets fitted to the bonnet locking platform.

The radiator top and bottom hoses are connected to the outlet and inlet sides of the coolant pump housing respectively.

An expansion tank is fitted forward of the LH suspension turret in the engine compartment. The expansion tank allows for expansion of the coolant when the engine is hot and replaces the coolant into the system as the engine cools down.

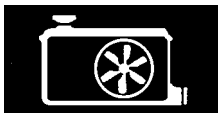
The liquid cooled transmission fluid cooler is mounted on the plastic radiator support adjacent to the lower right hand rear of the matrix and receives coolant from either the bottom of the radiator or the return elbow pipe between the coolant pump and the radiator as required.

The Fuel Burning Heater (FBH) is located below the battery. The unit is connected in series with the coolant supply to the heater matrix.

☞ **AIR CONDITIONING, DESCRIPTION AND OPERATION, Description.**

For additional airflow through the radiator matrix, particularly when the vehicle is stationary, two cooling fans are fitted; one being driven by the engine via the coolant pump drive shaft and one being driven by an integral electric motor.

CAUTION: The fan is attached to a threaded spigot on the pulley with a left hand thread.



The engine driven fan contains a viscous coupling that allows the fan to slip as the engine speed increases. The fan is attached to a threaded spigot on the pulley with a left hand threaded nut. The fan draws air through the radiator to assist in cooling when the vehicle is stationary.

An electric fan controlled by the engine management system is fitted in front of the radiator assembly.
☞ **ENGINE MANAGEMENT SYSTEM – V8, DESCRIPTION AND OPERATION, Bosch ME 7.2 Engine Management System.**

Operation
With the engine running, the coolant pump pulley is driven by an ancillary drive belt. When the engine is cold, the thermostat is closed and coolant is prevented from circulating through the radiator. Coolant is able to circulate through the engine and the passenger compartment heater matrix via a thermostat bypass.

As the temperature increases the thermostat begins to open, allowing cool fluid to be drawn from the radiator bottom hose through the pump and into the cylinder block and hot coolant to flow from the coolant pump housing to the radiator via the radiator top hose, where it is cooled by air passing through the matrix. When the thermostat opens fully, the full flow of coolant passes through the radiator.

Coolant is also drawn through the liquid cooled transmission fluid cooler and the liquid cooled alternator housing by the coolant pump via the coolant circuit.

The increased coolant volume, created by heat expansion, is directed to the expansion tank through a bleed hose from the top of the radiator. The expansion tank has an outlet hose which is connected into the coolant circuit. This outlet hose returns the coolant to the system when the engine cools.