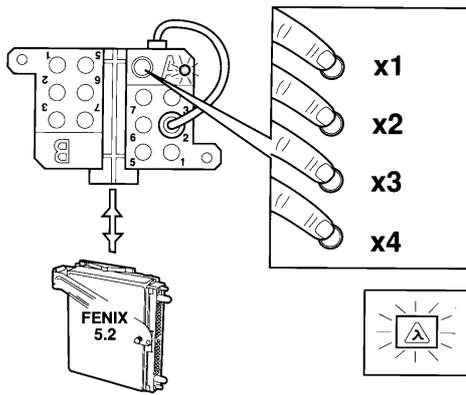


Volvo Diagnostics

Functions



The control module has an inbuilt diagnostics system which continuously monitors input and output signals. If a fault occurs which affects exhaust gas emission levels, the control module switches the MIL on. To assist fault tracing, there are 4 DTMs which can be accessed via DLC A socket 2.

DTMs:

- 1 Display any DTCs held in memory.
- 2 Acknowledge component operation.
- 3 Operate components in a given preset sequence.
- 4 Operate components individually, and adjust the readout speed to the DLC.

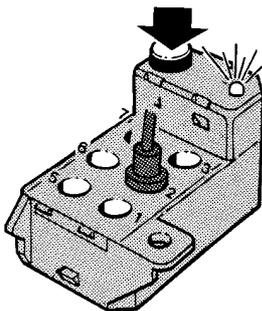
Operation:

The control unit constantly monitors the signals from the sensors and adjustments in certain components. If a fault occurs, there are a number of emergency programs which mean the car will still run in most cases.

For example:

- If the ECT signal is faulty, the control module assumes that the ECT is the same as the temperature at the air temperature sensor. Once the engine is warm, the control module assumes that the temperature is 90°C.
- If the engine or control module temperature signal is missing, the FC runs constantly and also stays on for a while after switching the engine off. This also happens if the load signal is faulty.
- If the CMP sensor signal is faulty, the control module uses information from the RPM sensor instead.
- If any of the injectors is faulty, that injector is switched out individually.
- If the pressure sensor signal is faulty, the system estimates the pressure using the signal from the TP sensor.
- If the TP sensor signal is faulty, the control module sets the signal at a fixed value.

DTM 1



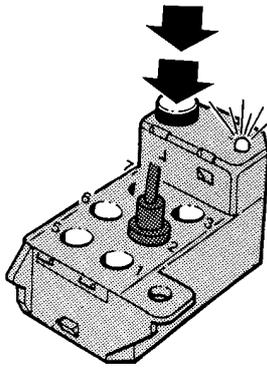
The control module stores any faults it detects during self-diagnosis. DTM 1 is used to read off and delete any DTCs in memory.

Readout is activated by pressing the button on the DLC briefly. The control module responds either with code 1-1-1 or a DTC as in [DTC table](#) . DTC table.

DTCs may be erased only when all have been displayed at least once and the first DTC has been repeated.

To erase, press the button and hold down for at least five seconds, wait until the LED lights up and then press the button and hold down for more than five seconds again.

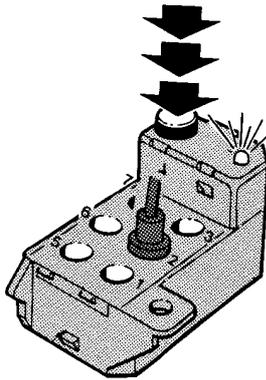
DTM 2



To activate DTM 2, press the button on the DLC twice in quick succession: the LED should now flash rapidly. The control module will emit an acknowledgement code when it detects a change in the signal from:

- The TP sensor when the throttle is moved to or from CTP (3-3-2).
- The TP sensor when the throttle is moved to or from WOT (3-3-3).
- TCM when the gear selector lever is moved to or from a drive position (1-2-4).
- Control module when A/C switch is closed or open (1-1-4).

DTM 3



To activate DTM 3, press the button on the DLC three times in quick succession. The control module responds by operating the following components in the order shown for three seconds. The sequence is repeated 3 times. DTM 3 cannot be activated with the engine running.

- EGR controller, some markets.
- Air pump and relay, some markets.
- Solenoid valve, some markets.
- Coolant fan (half speed).
- Coolant fan (full speed).
- Injector 1.
- Injector 2.
- Injector 3.
- Injector 4.
- Injector 5.
- IAC valve.
- A/C relay.
- Main relay.
- FP relay.
- Electrical control box fan, some markets.

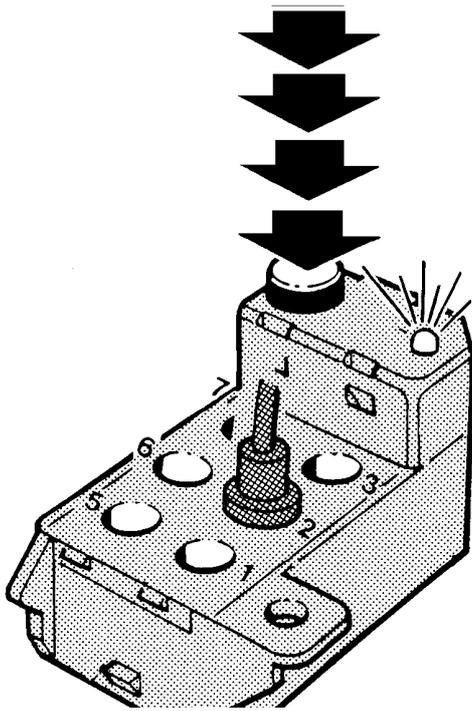
Engine coolant fans of the single-stage type will run with one speed during activation of both half and full speed.

DTM 4

To activate DTM 4, press the button on the DLC 4 times. Entering a code, one digit each time the LED lights up, activates the components below. DTM 4 cannot be activated with the engine running.

To use DTM 4 via the DLC button, you will need to run DTMs 1 and 3 first, otherwise the transmission rate will automatically be 10 times the basic rate. This is done to speed up communications when using the Volvo Scan Tool or Volvo Diagnostic Key.

- EGR controller on for 3 seconds (2-3-5).
- Air pump on for 3 seconds (4-4-2).
- Air pump valve on for 3 seconds (1-5-2).
- Coolant fan on at half speed for 3 seconds (5-1-4).
- Coolant fan on at full speed for 3 seconds (5-1-5).



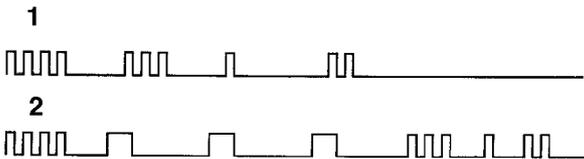
- Injector 1 on for 3 seconds (1–1–5).
- Injector 2 on for 3 seconds (1–2–5).
- Injector 3 on for 3 seconds (1–3–5).
- Injector 4 on for 3 seconds (1–4–5).
- Injector 5 on for 3 seconds (1–5–5).
- IAC valve on for 3 seconds (2–2–3).
- A/C relay on for 3 seconds (3–4–2).
- Main relay on for 3 seconds (2–2–2).
- FP relay on for 3 seconds (3–4–3).
- Electrical control box fan on for 3 seconds (5–2–3).

Engine coolant fans of the single-stage type will run with one speed during activation of both half and full speed. Changing transmission speed. Ten times base speed can only be read off using the Volvo Scan Tool or Volvo Diagnostic Key.

- Base speed (3–1–1).
- x base speed (3–1–2).
- 10 x base speed (3–1–3).

Example 3–1–2

*Push-button
LED*



DTC table

Functions

There are two kinds of fault, intermittent and permanent. Intermittent faults are temporary, or in some cases recurrent; permanent faults are persistent. In the case of all diagnostic system faults (with the exception of a faulty KS signal or ICM knock control circuit), the control module will re-adopt the correct value of a previously faulty or absent signal once the signal has been restored, rather than continuing to use a fixed substitute value. In the case of an output signal, however, the engine must have been stopped. The DTC remains stored in the control module.

Caution! The ignition must be switched off when connecting or disconnecting connectors or test box, otherwise, the control module may be damaged.

DTCs

DTC	Fault text	Notes
1-1-1	Diagnostic system has not detected any faults	
1-1-2	Control module fault	Switches MIL on ²⁾
1-1-3	Short-term fuel trim,	1993 models
1-1-3	Short-term fuel trim, upper limit, 1994 models onwards	Switches MIL on ²⁾
1-1-5	Injector 1	Switches MIL on ²⁾
1-2-1	Air pressure signal	Switches MIL on ²⁾
1-2-2	Air temperature signal	
1-2-3	ECT signal	Switches MIL on ²⁾
1-2-5	Injector 2	Switches MIL on ²⁾
1-3-1 1)	RPM sensor signal	
1-3-2 1)	Battery voltage	
1-3-5	Injector 3	Switches MIL on ²⁾
1-4-3	Front knock signal	Switches MIL on ²⁾
1-4-4 1)	Load signal	
1-4-5	Injector 4	Switches MIL on ²⁾
1-5-2 1)	Air pump valve	Switches MIL on
1-5-5	Injector 5	Switches MIL on ²⁾
2-1-2	HO2S signal	Switches MIL on ²⁾
2-2-1 1)	Long-term fuel trim part load, upper limit	Switches MIL on
2-2-2	System relay signal	
2-2-3	IAC valve signal	
2-2-5 1)	A/C pressure sensor signal	
2-3-1	Long-term fuel trim part load, lower limit	Switches MIL lamp on
2-3-5	EGR converter	Switches

1)		MIL on
2-4-3	TP sensor signal	Switches MIL on ²⁾
3-1-1 3)	VSS signal	
3-1-4	CMP sensor signal	Switches MIL on ²⁾
3-2-3 1)	MIL	Switches MIL on
3-4-2	A/C relay signal	
3-4-3	FP relay signal	
4-3-2	Temperature warning >90°C	
4-3-3	KS signal rear	Switches MIL on ²⁾
4-4-2 1)	Air pump relay signal	Switches MIL on
5-1-2 1)	Short-term fuel trim, lower limit, 1994 models onwards	
5-1-3	Temperature warning >95°C	Switches MIL on ²⁾
5-1-4	Fan low speed signal	
5-1-5	Fan high speed signal	
5-2-1	HO2S heating	Switches MIL on ²⁾
5-2-3 3)	Control module box FC	
5-2-4	Ignition retard signal	

Notes:

- 1) DTC does not apply to 1993 models.
- 2) MIL does not come on in 1993 models.
- 3) DTC does not apply to 1994 models onwards.