

Introduction

The operation of the internal combustion engine depends on the ability to rapidly and accurately control several variables. The two main variables are; the quantity of fuel passed to the cylinder and the timing of ignition. Basic control of these variables is exercised by the Powertrain Control Modules (Primary and Secondary PCMs) which contain all the software to supervise and control the engine management system. The PCMs also contain the diagnostic software (the Diagnostic Executive) required to detect any system malfunctions which could increase harmful emissions.

The Diagnostic Executive is the computer programme which monitors aspects of emission related engine performance. This programme controls all the monitor sequences, records DTCs, lights the MIL lamp and memorises freeze frame data for later analysis

The freeze frame data may be accessed using the World Diagnostic System (WDS) or other scan tool. The stored data describes engine conditions at the time the malfunction was detected, such as the state of the engine, state of fuel control, spark, rpm, load and warm up status. Previously stored conditions will be replaced only if a fuel or misfire malfunction is detected.

In order to pass all diagnostic monitors, a new vehicle or one in which the PCM memory has been cleared must be driven sufficiently (a complete drive cycle) to clear all component checks. A P1000 code will be recorded until all sections of the OBD II drive cycle are completed. The presence of a P1000 code is not a cause for concern unless other codes are present. The drive cycles are described later in this section.

The following monitors are included in the diagnostic software:

- Heated Oxygen Sensor (HO2S) Monitor
- Catalyst Efficiency Monitor
- Misfire Detection Monitor
- Fuel System Monitor
- Comprehensive Component Monitor

NB: TRIP - In the following descriptions the term trip is defined as successful completion of all monitors without detecting any fault which would illuminate the MIL lamp.