Misfire

Misfire Detected

Misfire Monitor

MONITOR DESCRIPTION

The ECM monitors the engine operation for misfires and counts the number of misfires that occur in a specified number of engine revolutions. Misfires generate unburned hydrocarbons and increase the load on the catalytic converter. If the misfire rate is excessive, the catalytic converter can overheat and be damaged. Under these conditions it is also possible that unburned hydrocarbons could pass through the converter.
For monitoring misfire, the ECM uses both the camshaft sensor and the crankshaft sensor. The camshaft position sensor is used to identify misfiring cylinders and the crankshaft position sensor is used to measure variations in the crankshaft rotation speed. If the crankshaft rotation slows for a moment during a revolution, the ECM concludes that a misfire has occurred. The misfire counter increments when crankshaft rotation speed below the threshold values.
The ECM illuminates the MIL (2−trip detection logic) and sets a DTC if the misfiring rate exceeds specified values that would cause emissions deterioration or catalyst damage.
There are several diagnostic thresholds and test modes:

(a) Misfires occurring in 1,000 revolutions which could result in a deterioration of emissions. This will set a DTC.
(b) Misfires occurring in 200 revolutions exceed the specified limit for catalyst damage will set a DTC.
(c) In FTP mode, misfires are checked between 450 and 3,800 rpm. (1996 and 1997 models)
(d) In “Full Range” detection mode, misfires are checked between 400 rpm and the allowable engine rpm limit. (1998 to 2003 models)
(e) In 2002 and later models, misfires are detected within 2 or 3 revolutions after engine start.

MONITOR STRATEGY

Related DTCs	P0300	Misfire detected in 2 or more cylinders at the same time
	P0301 (cylinder No. 1)	Misfire detected in each cylinder
	P0302 (cylinder No. 2)	
	P0303 (cylinder No. 3)	
	P0304 (cylinder No. 4)	
Required sensors/Components	Main	Crankshaft position sensor
	Sub	Camshaft position sensor, MAF sensor (or Vacuum sensor), Throttle position sensor, ECT sensor, IAT sensor
Frequency of operation	Continuous	
Duration	1,000 rev.	Emission−related−misfire after engine start
	1,000 rev. x 4	Emission−related−misfire while engine running
	200 rev.	Catalyst−damaged−misfire while high engine RPM (3,000 rpm or more)
	200 rev. x 3	Catalyst−damaged−misfire while low engine RPM (less than 3,000 rpm)
MIL operation	2 drive cycles	Emission−related−misfire
	2 drive cycles (MIL flashing immediately)	Catalyst−damaged−misfire
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present	See page In–4	
Battery voltage	8 – 11 V	–
ECT	– 10°C (14°F)	–
IAT	– 10°C (14°F)	–
Engine RPM (1996 to 1997 models)	450 rpm	3,800 rpm
Engine RPM (1998 to 2003 models)	400 to 450 rpm	Allowable engine rpm limit
Intake air amount	Greater than specified value (varies with engine RPM)	
Engine RPM fluctuation	Not changing rapidly	
Rough road counter	–	10 times/1,000 rev. (not running on rough road)
Fuel cut	Not operating	
Transient spark retarded	Not commanded	

TYPICAL MALFUNCTION THRESHOLDS

Case 1: Emission–related–misfire

Detection criteria	Threshold
Misfire rate every 1,000 rev.	1.0 to 4.5 % (detected 4 times)
Misfire rate during 1,000 rev. after engine start	1.0 to 4.5 % (detected once)

Case 2: Catalyst–damaged–misfire

Detection criteria	Threshold
Misfire count every 200 rev. (while low engine RPM [less than 3,000 rpm])	20 to 220 times*1 or more (detected 3 times)
Misfire count during 200 rev. (while high engine RPM [3,000 rpm or more])	20 to 220 times*1 or more (detected once)

* Varies with engine RPM and volume of intake air.