4.13 Knock Sensor

4.13.1 Description

The ECM uses active knock control, which serves to prevent engine damaging pre-ignition or detonation under all operating conditions enabling the engine to operate without additional safety margins. For the ECM to be able to determine the point at which a cylinder is pre-detonating, 2 piezo ceramic sensors are mounted on the engine block. Each sensor monitors all 4 cylinders in a bank (i.e. cylinders 1, 3, 5 & 7, and cylinders 2, 4, 6 and 8) by converting the engine block noise into a suitable electrical signal, which is then transmitted back to the ECM via a shielded cable. The signal is then processed within the ECM to identify the data that characterises knocking.

There are three knock sensor diagnostic checks during which a fault is detected if: -

1. The sensor signal is less than the minimum engine rpm dependant threshold.
2. The sensor signal is greater than the maximum engine rpm dependant threshold.
3. The error counter for the verification of knock internal circuitry is exceeded.

Knock Sensor								
Component/ System	Fault Codes	Monitoring Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameter	Enable Conditions	Time Required	MIL Illumination
Knock Sensor		sensor	sensor		knock control	active (for at least 50	approximately	No MIL
Bank 1	P0327	reference	reference	from <2.44 mV at 2000 rpm		engine revolutions)	20 engine	illumination
Bank 2	P0332	voltage	voltage	to <25.02mV at 5200 rpm	engine speed	> 2200 rpm (and not	revolutions/	
Bank 1	P0328	check	(10 samples)	from>207.5mV at 2000 rpm		changing	continuous	
Bank 2	P0333			to >622.6mV at 5200 rpm		dynamically)		
	P0606	response to test Signal	integrator output (3 samples)	< 3.51V	ECT	> 60 °C	approximately 740 engine revolutions/ continuous	
		null test	integrator output (3 samples)	> 0.353V				
		OR	integrator change **AND** engine speed	> 45.5V/sec < 4200 rpm				

If the above table does not include details of the following enabling conditions: - IAT, ECT, vehicle speed range, and time after engine start-up then the state of these parameters has no influence upon the execution of the monitor.