9. Engine Control System

General

The engine control system of the 2UZ-FE engine on the ’05 Toyota Tundra has following systems.

System	Outline	Model	
		’05 Toyota Tundra	’04 Toyota Tundra
SFI (Sequential Multiport Fuel Injection)	An L-type SFI system directly detects the intake air mass with a hot wire type mass air flow meter.	○	○
ESA (Electronic Spark Advance)	Ignition timing is determined by the ECM based on the signals from various sensors. The ECM corrects ignition timing in response to engine knocking.	○	○
ETCS-i (Electronic Throttle Control System-intelligent)	Optimally controls the throttle valve opening in accordance with the amount of accelerator pedal effort and the conditions of the engine and the vehicle.	○	○
VVT-i (Variable Valve Timing-intelligent) [See page 166]	Controls the intake camshaft to ensure optimal valve timing in accordance with the engine condition.	○	—
ACIS (Acoustic Control Induction System) [See page 170]	The intake air passages are switched according to the engine speed and throttle valve opening angle to provide high performance in all speed ranges.	○	—
Air Injection [See page 172]	The ECM controls the air injection time based on the signals from the crankshaft position sensor, engine coolant temp. sensor, mass air flow meter and air pressure sensor.	○	—
Fuel Pump Control	• The fuel pump speed is controlled by the signal from the ECM. • The fuel pump is stopped when the SRS airbag is deployed in front, side or rear side collision.	○	○
Starter Control (Cranking Hold Function)	Once the ignition switch is turned to the START position, this control continues to operate the starter until the engine starts.	○	○
Oxygen Sensor Heater Control	Maintains the temperature of the oxygen sensor at an appropriate level to increase accuracy of detection of the oxygen concentration in the exhaust gas.	—	○
Air Fuel Ratio Sensor and Oxygen Sensor Heater Control	Maintains the temperature of the air fuel ratio sensor or oxygen sensor at an appropriate level to increase accuracy of detection of the oxygen concentration in the exhaust gas.	○	—
Evaporative Emission Control [See page 130]	The ECM controls the purge flow of evaporative emission (HC) in the charcoal canister in accordance with engine conditions.	○	○
	Using two VSVs and a vapor pressure sensor, the ECM detects any evaporative emission leakage occurring between the fuel tank and the charcoal canister through the changes in the tank pressure.	—	○
	Approximately five hours after the ignition switch has been turned OFF, the ECM operates the leak detection pump to detect any evaporative emission leakage occurring between the fuel tank and the charcoal canister through changes in the fuel tank pressure.	○	—

(Continued)

System	Outline	Model	
		’05 Toyota Tundra	’04 Toyota Tundra
Air Conditioning Cut-off Control	By turning the A/C compressor ON or OFF in accordance with the engine condition, drivability is maintained.	○	○
Diagnosis [See page 177]	When the ECM detects a malfunction, the ECM diagnoses and memorizes the failed section.	○	○
Fail-Safe	When the ECM detects a malfunction, the ECM stops or controls the engine according to the data already stored in the memory.	○	○