2. Major Difference

The major differences between the 3UR-FBE engine and 3UR-FE engine are as follows:

Item	Outline
Engine Proper (See page 12)	The material of the valve seat has been changed to be compatible with alcohol fuel.
Valve Mechanism (See page 19)	The material of the valve face has been changed to be compatible with alcohol fuel.
Intake and exhaust System (See page 31)	The material of the intake manifold gasket has been changed to be compatible with alcohol fuel.
Fuel System (See page 37)	● The fuel pump has been changed to be compatible with alcohol fuel. ● A pulsation damper is installed on the left and right fuel delivery pipes. ● Two pressure regulators (for high and low pressures) are installed.
Engine Control System (See page 48)	● For the EFI (Electronic Fuel Injection) system, the injection volume correction depending on ethanol concentration in fuel in the fuel tank has been added. ● For the ESA (Electronic Spark Advance) system, the ignition timing correction depending on ethanol concentration in fuel in the fuel tank has been added. ● A fuel pressure switching system has been added.

3. Features of 3UR-FBE Engine

The 3UR-FBE engine has achieved the following performance features through the use of the items listed below:

(1) High performance and reliability

(2) Low noise and vibration

(3) Lightweight and compact design

(4) Good serviceability

(5) Clean emission and fuel economy

Item		(1)	(2)	(3)	(4)	(5)
Engine Proper	A taper squish shape is used for the combustion chamber.	○				○
	An aluminum alloy cylinder block containing an engine coolant distribution pathway is used.	○		○		
	Spiny-type liners are used in the cylinder bores.	○		○		
	Water jacket spacers are used.	○				
	A piston skirt is coated with resin.	○	○			○
	A No. 1 oil pan made of aluminum alloy is used.	○	○	○		
Valve Mechanism	Timing chains and chain tensioners are used.	○		○		
	Hydraulic lash adjusters are used.	○	○		○	○
	Roller rocker arms are used.	○				○

(Continued)

Item		(1)	(2)	(3)	(4)	(5)
Lubrication System	An oil filter with a replaceable element is used.				○	
	A water-cooled type oil cooler is used.*	○				
Cooling System	TOYOTA Genuine Super Long Life Coolant (SLLC) is used.				○	
Intake and Exhaust System	A carbon filter is used in the air cleaner cap.					○
	A linkless-type throttle body is used.	○		○		
	An intake manifold made of plastic is used.	○		○		
	Stainless steel exhaust manifolds are used.	○		○		○
	Ceramic type TWCs (Three-Way Catalytic converters) are used.					○
Fuel System	12-hole type fuel injectors are used to improve the atomization of fuel.	○				○
Ignition System	The DIS (Direct Ignition System) makes ignition timing adjustment unnecessary.	○			○	○
	Long-reach type iridium-tipped spark plugs are used.	○			○	○
Charging System	A segment conductor type generator is used.	○		○		
Starting System	A planetary reduction type starter is used.			○		
Serpentine Belt Drive System	A serpentine belt drive system is used.			○	○	
Blowby Gas Ventilation System	A separator case is provided between the cylinder block and the intake manifold.	○				○
Engine Control System	An MRE (Magnetic Resistance Element) type crankshaft position, a camshaft position, and VVT sensors are used.	○				
	The ETCS-i (Electronic Throttle Control System-intelligent) is used.	○				○
	The Dual VVT-i (Variable Valve Timing-intelligent) system is used.	○				○
	The ACIS (Acoustic Control Induction System) is used.	○				○
	An air injection system is used.					○
	A starter control (cranking hold function) is used.	○				
	An evaporative emission control system is used.					○

*: Towing package models