■ FEATURES OF 1TR-FE AND 2TR-FE ENGINES

The 1TR-FE and 2TR-FE engines have 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

Section	Item	(1)	(2)	(3)	(4)	(5)
Engine Proper	A cylinder head cover made of plastic is used.		○	○		
	A taper squish shape is used for the piston head.	○				○
	2 balance shafts are used.*1		○			
	An oil pan No. 1 made of aluminum alloy is used.		○	○		
Valve Mechanism	A valve mechanism, in which the camshafts actuate the roller rocker arms in order to open and close the valves, are used.	○				○
	A hydraulic lash adjuster is used.	○	○		○	
	The VVT-i (Variable Valve Timing-intelligent) system is used.	○				○
	A timing chain and a chain tensioner are used.	○		○	○	
Cooling System	A water bypass pipe made of plastic is used.			○		
Intake and Exhaust System	An intake manifold made of plastic is used.			○		
	A stainless steel exhaust manifold is used.			○		
	A TWC (Three-Way Catalytic converter) is used.*2					○
	The linkless-type throttle body is used.			○	○	
Fuel System	Long nozzle, 12-hole type*2 or 4-hole type*3 fuel injectors with a high atomizing performance are used.	○				○
Ignition System	Long-reach type spark plugs are used.	○				
	The DIS (Direct Ignition System) makes ignition timing adjustment unnecessary.	○			○	○
Charging System	A segment conductor type alternator is used.	○		○		
Engine Control System	An ETCS-i (Electronic Throttle Control System-intelligent) is used.	○				○
	A flat type knock sensor is used.	○				
	A non-contact sensor is used in the throttle position sensor and the accelerator pedal position sensor.	○				
	The use of an air-fuel ratio sensor allows for precise control.*4					○
	The air injection system is used.*4					○

*1: Models with 2TR-FE engine

*2: Models with unleaded gasoline engine

*3: Models with leaded gasoline engine

*4: Models compliant with EURO III, EURO IV and Tier 1 emission regulations