## ■ FEATURES OF 1TR-FE ENGINE

The 1TR-FE engine has achieved the following performance through the adoption 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 sub-assembly made of plastic is used. | — | — | ○ | — | — |
| | A taper squish shape is used for the piston head. | ○ | — | — | — | ○ |
| | An oil pan sub-assembly 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, is used. | ○ | — | — | — | ○ |
| | A hydraulic lash adjuster is used. | ○ | ○ | — | ○ | — |
| | The Dual VVT-i (Dual Variable Valve Timing-intelligent) system is used. | ○ | — | — | — | ○ |
| | A timing chain and a No. 1 chain tensioner assembly 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. | — | — | — | — | ○ |
| | The linkless-type throttle body with motor assembly is used. | ○ | — | ○ | — | — |
| Fuel System | Long nozzle, 12-hole type 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 generator with regulator assembly 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 heated oxygen sensor allows for precise control. | — | — | — | — | ○ |
| | An air injection system is used. | — | — | — | — | ○ |

○: Applicable

—: Not Applicable