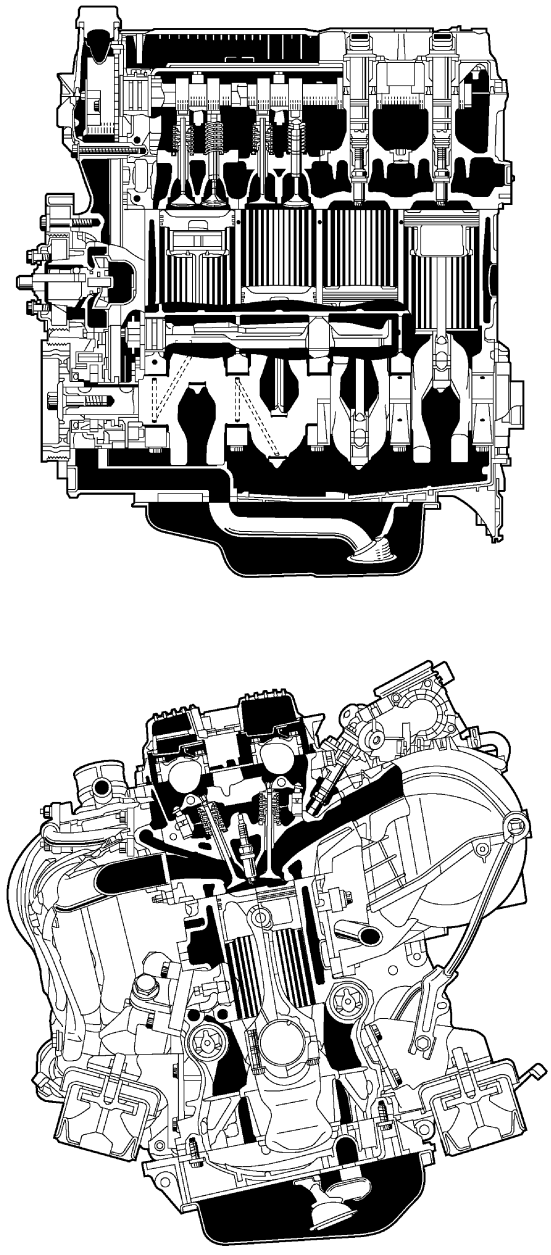
ENGINE

2TR-FE ENGINE

■ DESCRIPTION

- The 2TR-FE engine is newly developed, inline 4-cylinder, 2.7-liter, 16-valve DOHC engine.
- This engine uses the DIS (Direct Ignition System), ETCS-i (Electronic Throttle Control System-intelligent), VVT-i (Variable Valve Timing-intelligent) system and an Air Injection system*. It has been developed to realize high performance, quietness, fuel economy and clean emission.
- The 2TR-FE engine is available for use with leaded or unleaded gasoline, depending on the destination.

*: An air injection system is used on the EURO III emission regulation compliant models.



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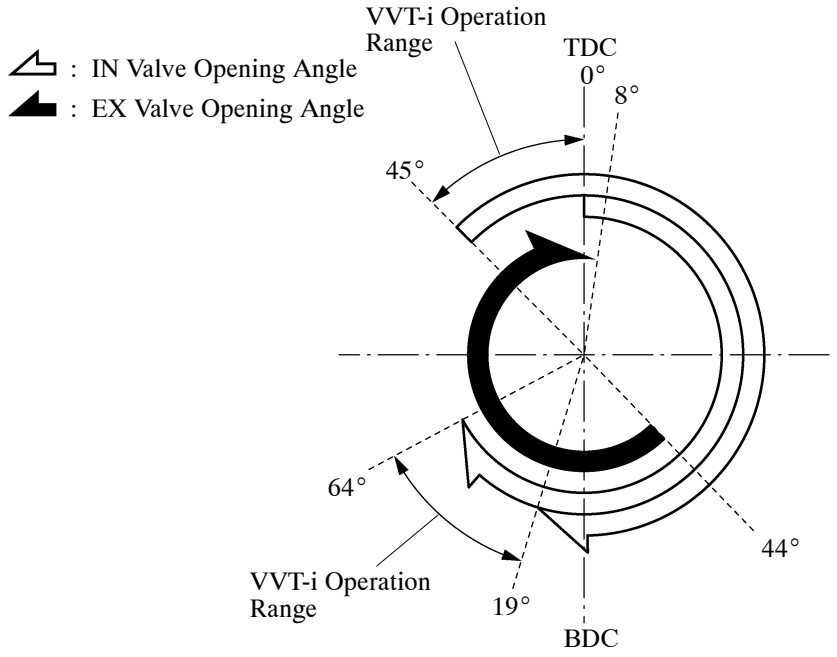
▶ Engine Specifications ◀

Model			New		Previous
Engine Type			2TR-FE (Unleaded Gasoline Model)	2TR-FE (Leaded Gasoline Model)	2RZ-FE
No. of Cyls. & Arrangement			4-Cylinder, In-line	←	←
Valve Mechanism			16-Valve DOHC, Chain Drive (with VVT-i)	←	8-Valve OHC, Chain Drive (without VVT-i)
Combustion Chamber			Pentroof Type	←	Wedge
Manifolds			Cross-flow	←	←
Fuel System			EFI	←	←
Ignition System			DIS	←	Distributor Type
Displacement cm^3 (cu. in.)			2694 (164.4)	←	2438 (148.8)
Bore × Stroke mm (in.)			95.0 × 95.0 (3.74 × 3.74)	←	95.0 × 86.0 (3.74 × 3.39)
Compression Ratio			9.6 : 1	←	8.8 : 1
Max. Output [SAE-NET]			111 kW @ 4800 rpm	←	85 kW @ 4600 rpm
Max. Torque [SAE-NET]			241 N·m @ 3800 rpm	←	203 N·m @ 2400 – 3600 rpm
Valve Timing	Intake	Open	45° BTDC - 0° BTDC	←	13° BTDC
		Close	19° ABDC - 64° ABDC	←	47° ABDC
	Exhaust	Open	44° BBDC	←	53° BBDC
		Close	8° ATDC	←	7° ATDC
Firing Order			1-3-4-2	←	←
Fuel			Unleaded Gasoline	Leaded Gasoline	Unleaded Gasoline
Research Octane Number			91 or higher	←	←
Oil Grade			API SJ, SL, EC or ILSAC	←	←
Emission Regulation			EURO II*1, EURO III*2	—	—
Engine Service Mass*3 (Reference) kg (lb)			157 (346)	←	—

*1: G.C.C Countries, Russia and Ukraine
*2: Australia, New Zealand, Hong Kong, Thailand and China
*3: Weight shows the figure with the oil and water fully filled.

EG

▶ Valve Timing ◀



■MAJOR DIFFERENCE

The table below lists the major differences between the leaded gasoline model and unleaded gasoline model.

Section	Item	Unleaded	Leaded
Engine Proper	The piston rings have been made to support leaded gasoline.	—	○
Valve Mechanism	The valve faces of the intake and exhaust valves have been metallized to support leaded gasoline.	—	○
Exhaust System	A TWC (Three Way Catalytic Converter) is used.	○	—
Fuel System	Long nozzle, 12-hole type fuel injectors are used.	○	—
	Long nozzle, 4-hole type fuel injectors are used.	—	○
Ignition System	An iridium-tipped spark plugs are used.	○	—
Engine Control System	The oxygen sensor (Bank 1 Sensor 1) is used.	○*1	—
	The air-fuel ratio sensor (Bank 1 Sensor 1) and oxygen sensor (Bank 1 Sensor 2) are used.	○*2	—
	The variable resistor is used.	—	○
	An Air Injection system is used.	○*2	—

*1: for EURO II Emission Regulation Compliant Models
*2: for EURO III Emission Regulation Compliant Models