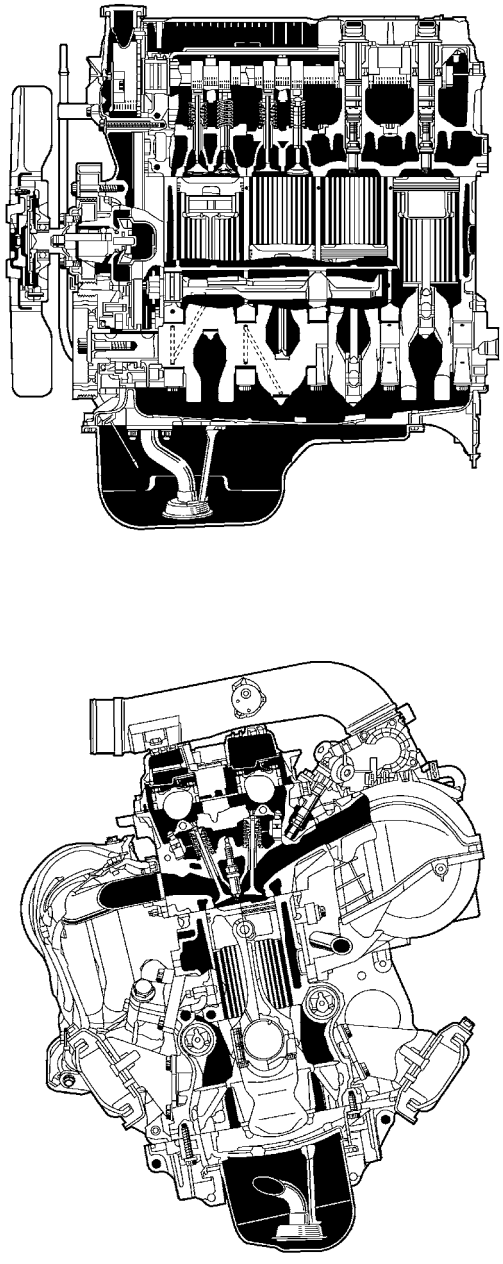
■2TR-FE ENGINE

1. 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) and VVT-i (Variable Valve Timing-intelligent). 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.



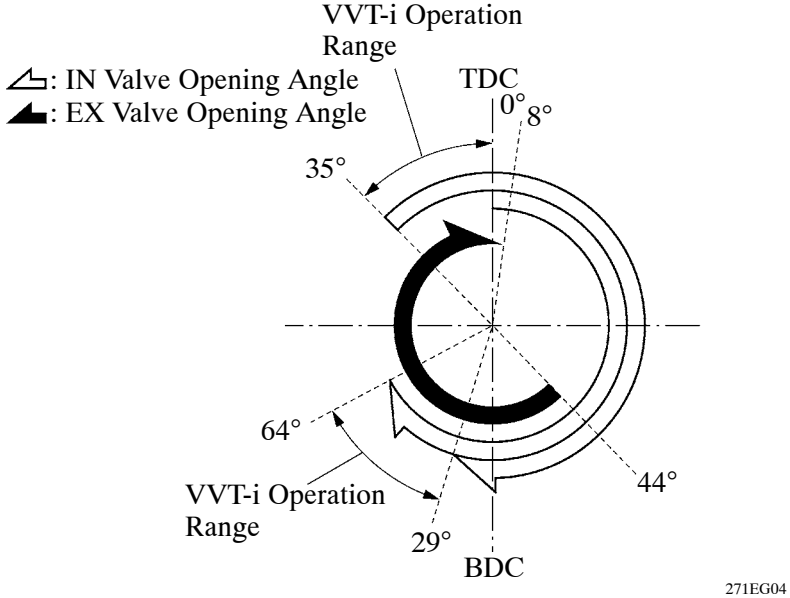
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▶ Engine Specifications ◀

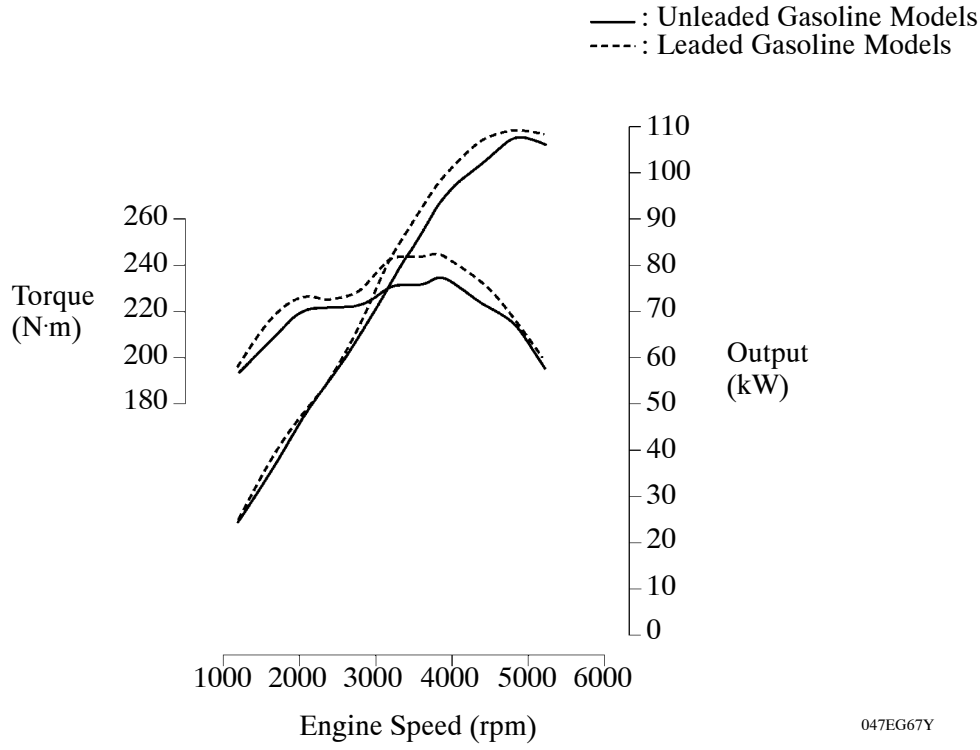
Engine Type			2TR-FE (Unleaded Gasoline Model)	2TR-FE (Leaded Gasoline Model)
No. of Cyls. & Arrangement			4-Cylinder, In-line	←
Valve Mechanism			16-Valve DOHC, Chain Drive (with VVT-i)	←
Combustion Chamber			Pentroof Type	←
Manifolds			Cross-flow	←
Fuel System			EFI	←
Ignition System			DIS	←
Displacement cm^3 (cu. in.)			2694 (164.4)	←
Bore × Stroke mm (in.)			95.0 × 95.0 (3.74 × 3.74)	←
Compression Ratio			9.6 : 1	←
Max. Output [SAE-NET]			108 kW @ 4800 rpm	109 kW @ 4800 rpm
Max. Torque [SAE-NET]			235 N·m @ 3800 rpm	245 N·m @ 3800 rpm
Valve Timing	Intake	Open	35° BTDC – 0° BTDC	←
		Close	29° ABDC – 64° ABDC	←
	Exhaust	Open	44° BBDC	←
		Close	8° ATDC	←
Firing Order			1-3-4-2	←
Fuel			Unleaded Gasoline	Leaded Gasoline
Research Octane Number			90 or higher	←
Oil Grade			API SL/EC, SM/EC or ILSAC	←
Emission Regulation			EURO II	—
Engine Service Mass* (Reference) kg (lb)			157 (346)	←

*: Weight shows the figure with the oil and water fully filled.

▶ Valve Timing ◀



▶ **Performance Curve** ◀



2. 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 air-fuel ratio sensor (Bank 1, Sensor 1) and heated oxygen sensor (Bank 1, Sensor 2) are used.	○	—
	The variable resistor is used.	—	○