2TR-FBE ENGINE

■ DESCRIPTION

- The 2TR-FBE engine for the FFV (Flexible Fuel Vehicle) has been introduced on the models for Brazil. The 2TR-FBE engine, which has been developed based on the 2TR-FE engine, can run on gasoline/ethanol mixed fuel from 22% ethanol (E22) up to 100% ethanol (E100).
- This engine is an in-line 4-cylinder, 2.7-liter, 16-valve DOHC flexible fuel engine. The VVT-i (Variable Valve Timing-intelligent) system and DIS (Direct Ignition System) are used on this engine to achieve high performance and fuel economy, and reduce exhaust emission.
- The following have been achieved by using alcohol fuel as an alternative to gasoline for environmental friendliness.
  - CO and soot in emission gas have been reduced.
  - The amount of sulfur accumulated in the catalytic converter has been reduced because alcohol fuel contains a smaller amount of sulfur. As a result, the durability of the catalytic converter has been improved.

▶ Engine Specifications ◀

Engine Type			2TR-FBE	2TR-FE
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			12.0 : 1	9.6 : 1
Max. Output	[SAE-NET]		116 kW @ 5000 rpm*2 120 kW @ 5000 rpm*3	116 kW @ 5200 rpm
Max. Torque	[SAE-NET]		245 N·m @ 3800 rpm	240 N·m @ 3800 rpm
Valve Timing	Intake	Open	45° BTDC to 0° BTDC	←
		Closed	19° ABDC to 64° ABDC	←
	Exhaust	Open	44° BBDC	←
		Closed	8° ATDC	←
Firing Order			1 – 3 – 4 – 2	←
Fuel			Alcohol Fuel*4	Unleaded Gasoline
Research Octane Number			—	91 or Higher
Emission Regulation			BR-LEV	EURO IV*5
Engine Service Mass*1 (Reference)			157 kg (346 lb)	←

*1: Weight shows the figure with oil and water fully filled.
*2: For E22 (22% ethanol)
*3: For E100 (100% ethanol; actually 93% ethanol with water)
*4: Mixed fuel from E22 to E100 is available.
*5: For the details of the emission regulation, see page EG-3 in the 1TR-FE AND 2TR-FE ENGINES section.