3. Technical Description

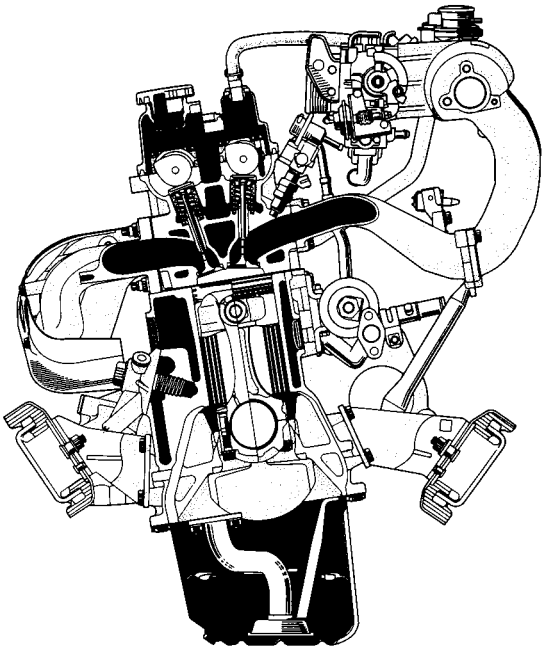
ENGINE

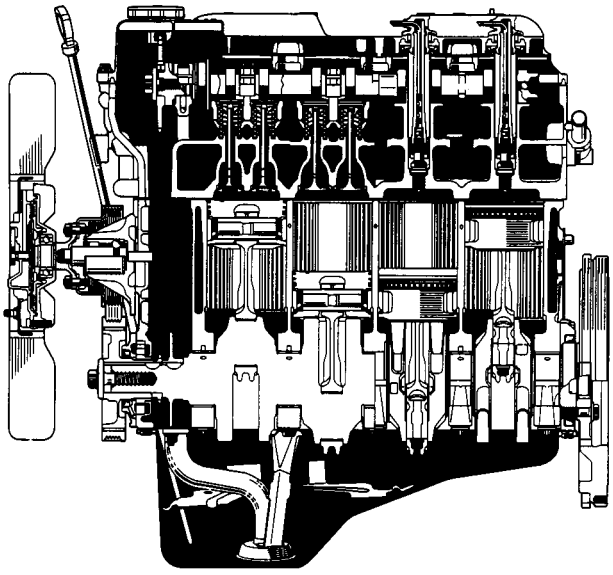
2RZ–FE AND 3RZ–FE ENGINE

■ DESCRIPTION

The 3RZ–FE engine that is newly adopted in the Toyota Tacoma 4WD model is an in–line, 4–cylinder, 2.7–liter, 16–valve DOHC engine used in the Toyota T100. As the successor to the 22R–E engine in the ’95 Truck application, the 3RZ–FE is an ideal gasoline engine that offers outstanding features for commercial vehicles. The 2RZ–FE engine that has been adopted in the 2WD model is a new engine that is based on the 3RZ–FE, and has its piston stroke shortened to provide a total cylinder displacement of 2.4 liters.

▶2RZ–FE Engine◀

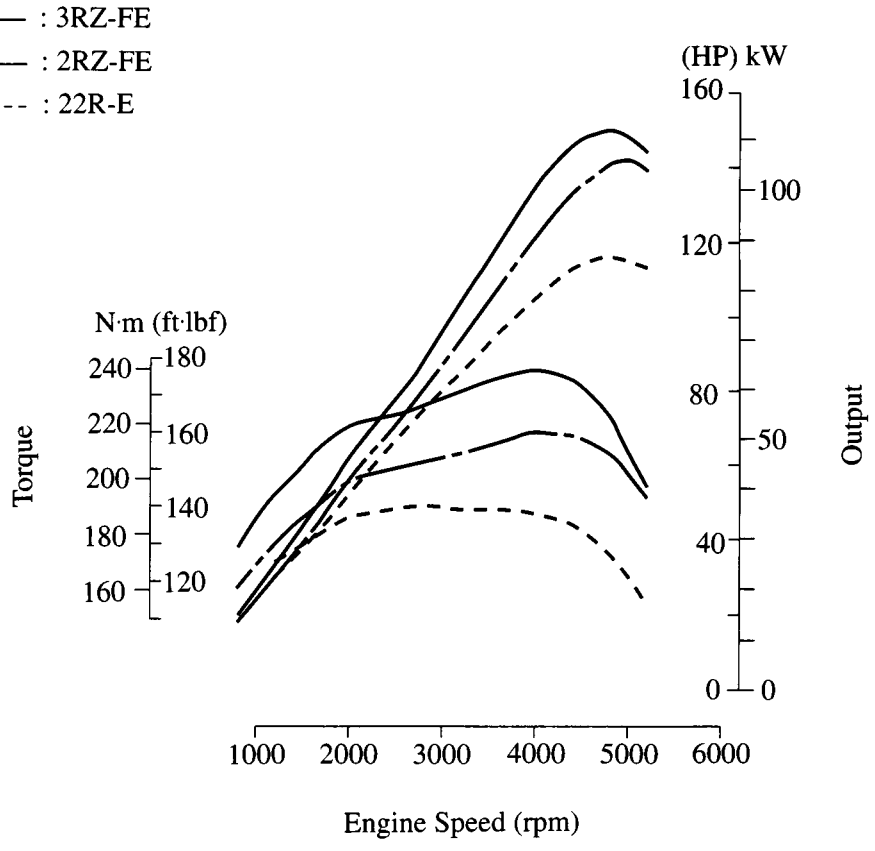




■ ENGINE SPECIFICATIONS AND PERFORMANCE CURVE

Engine / Item			2RZ–FE	3RZ–FE	22R–E ('95 Truck)
No. of Cyls. & Arrangement			4–Cylinder, In–line		←
Valve Mechanism			16–Valve DOHC, Chain & Gear Drive		8–Valve OHC, Chain Drive
Combustion Chamber			Pentroof Type		Multi–Spherical Type
Manifolds			Cross–Flow		←
Fuel System			MFI*1 [EFI]		←
Displacement cm^3 (cu. in.)			2438 (148.8)	2694 (164.4)	2367 (144.4)
Bore x Stroke mm (in.)			95.0 x 86.0 (3.74 x 3.39)	95.0 x 95.0 (3.74 x 3.74)	92.0 x 89.0 (3.62 x 3.50)
Compression Ratio			9.5		9.3
Max. Output [SAE–NET]			106 kW @ 5000 rpm (142 HP @ 5000 rpm)	112 kW @ 4800 rpm (150 HP @ 4800 rpm)	87 kW @ 4800 rpm (116 HP @ 4800 rpm)
Max. Torque [SAE–NET]			217 N·m @ 4000 rpm (160 ft·lbf @ 4000 rpm)	240 N·m @ 4000 rpm (177 ft·lbf @ 4000 rpm)	190 N·m @ 2800 rpm (140 ft·lbf @ 2800 rpm)
Valve Timing	Intake	Open	5° BTDC		14° BTDC
		Close	45° ABDC		54° ABDC
	Exhaust	Open	42° BBDC		58° BBDC
		Close	2° ATDC		18° ATDC
Fuel Octane Number (RON)			91		←
Oil Grade			API SH, EC–II, ILSAC*2 or Better		←

*1: MFI (Multiport Fuel Injection)
*2: ILSAC (International Lubricant Standardization and Approval Committee)



■ FEATURES OF 2RZ–FE AND 3RZ–FE ENGINE

The features of the 2RZ–FE and 3RZ–FE engines and comparison between the 2RZ–FE and 3RZ–FE engines in the Toyota Tacoma and 3RZ–FE engine in the '95 Toyota T100 are listed below.

Item	Details	Toyota Tacoma		'95 Toyota T100
		2RZ–FE	3RZ–FE	3RZ–FE
Engine Proper	• A pentroof type combustion chamber plus high compression ratio. • A highly rigid full balance crankshaft assembly and cylinder block.	○	○	○
	2 balance shafts built into the cylinder block to reduce vibration and noise.	—	○	○
Valve Mechanism	• Direct–drive DOHC with a 4–valve cross–flow layout for high intake/exhaust efficiency. • A single timing chain with superb wear resistance. • A scissors gear mechanism for the camshaft reduces the size of the cylinder head.	○	○	○
Cooling System	An aluminum radiator core is used for weight reduction.	○	○	○*1
	A linear control type temperature–controlled fluid coupling is used.	○	○	—
Engine Control System	• MFI*2 [EFI] system with a hot–wire type mass air flow meter. • Rotary solenoid type IAC*3 [ISC] system and ESA*4 system for precision in accordance with engine operating conditions. • A diagnosis system conforming to OBD–II.	○	○	○
Emission Control System	The charcoal canister has been enlarged to increase the absorption rate of the evaporative HC and to improve the efficiency of the system.	—	○*5	—
	2 monolithic type three–way catalytic converters are used.	—	○	○
	A large monolithic type three–way catalytic converter is used.	○	—	—

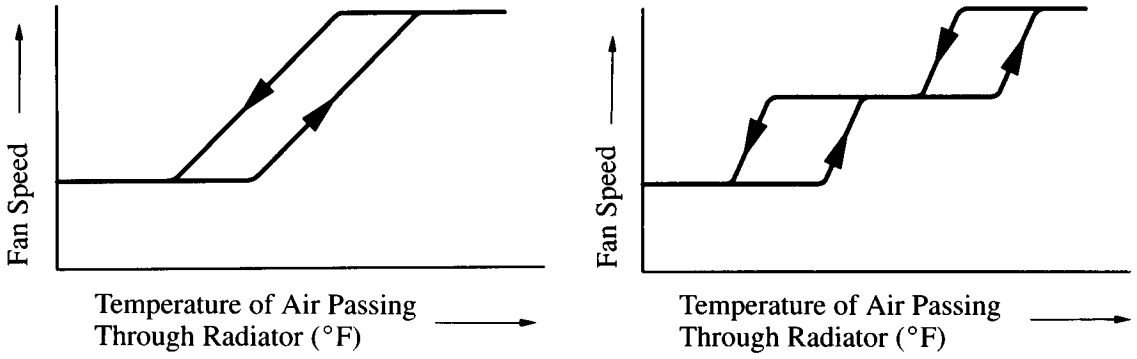
*1: Automatic Transmission Model Only
*2: MFI (Multiport Fuel Injection)
*3: IAC (Idle Air Control)
*4: ESA (Electronic Spark Advance)
*5: California specification models only.

■ COOLING SYSTEM

1. Coupling Fan

A linear control type temperature–controlled fluid coupling has been adopted.
This fan coupling linearly controls the fan speed in accordance with the temperature of air passing through the radiator. As a result, cooling performance is improved and fan noise reduced.

▶Fan Coupling Characteristics◀



Toyota Tacoma (Linear Control Type)

'95 Toyota T100 (3-Stage Type)

■ EMISSION CONTROL SYSTEM

1. Evaporative Emission Control System

Charcoal Canister

On the 3RZ–FE engine model, the construction of the charcoal canister for the California specification models is changed and its capacity is increased (847 cc → 2000 cc) to improve the canister's HC absorption performance and efficiency. The construction of the charcoal canister is basically the same as the '95 Avalon. For details, see the '95 Avalon New Car Features (Pub. No. NCF113U), page 34.

5VZ–FE ENGINE

■ DESCRIPTION

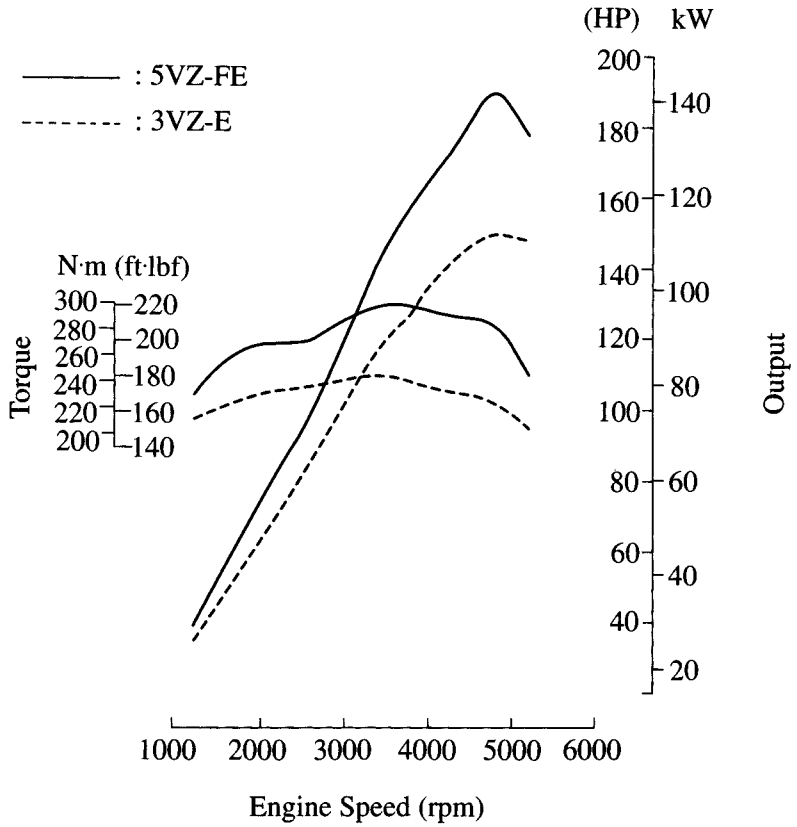
The 5VZ–FE engine is a newly adopted V6, 3.4–liter, 24–valve DOHC engine used in the Toyota T100.

Based on the 3VZ–E engine used in the ’95 Truck, this engine has realized both high performance and fuel economy through an increased total cylinder displacement and the adoption of the 4–valve mechanism.

■ ENGINE SPECIFICATIONS AND PERFORMANCE CURVE

Engine / Item			5VZ–FE (Toyota Tacoma)	3VZ–E (’95 Truck)
No. of Cyls. & Arrangement			6–Cylinder, V Type	←
Valve Mechanism			24–Valve DOHC Belt & Gear Drive	12–Valve OHC Belt Drive
Combustion Chamber			Pentroof Type	Semi–Heron Type
Manifolds			Cross–Flow	←
Fuel System			SFI*1 [EFI]	MFI*2 [EFI]
Displacement cm^3 (cu. in.)			3378 (206.1)	2959 (180.5)
Bore x Stroke mm (in.)			93.5 x 82.0 (3.68 x 3.23)	87.5 x 82.0 (3.44 x 3.23)
Compression Ratio			9.6 : 1	9.0 : 1
Max. Output [SAE–NET]			142 kW @ 4800 rpm (190 HP @ 4800 rpm)	112 kW @ 4800 rpm (150 HP @ 4800 rpm)
Max. Torque [SAE–NET]			298 N·m @ 3600 rpm (220 ft·lbf @ 3600 rpm)	244 N·m @ 3400 rpm (180 ft·lbf @ 3400 rpm)
Valve Timing	Intake	Open	4° BTDC	11° BTDC
		Close	42° ABDC	51° ABDC
	Exhaust	Open	46° BBDC	53° BBDC
		Close	4° ATDC	9° ATDC
Fuel Octane Number (RON)			91	←
Oil Grade			API SH, EC–II ILSAC*3 or Better	←

*1: SFI (Sequential Multiport Fuel Injection)
*2: MFI (Multiport Fuel Injection)
*3: ILSAC (International Lubricant Standardization and Approval Committee)



■ MAJOR DIFFERENCES

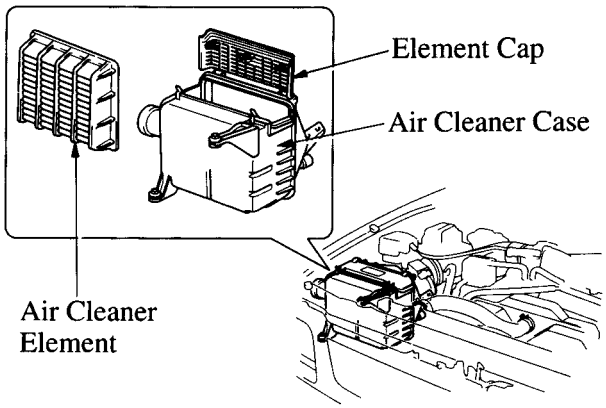
Major differences between the 5VZ–FE engine of the Toyota Tacoma and the Toyota T100 are listed below.

Item	Features
Intake and Exhaust System	A dual mode type resonator and a side branch type resonator are equipped with an air connector hose to reduce the intake air noise.
	A non–linear throttle has been adopted in the throttle body of the 4WD model with a manual transmission. This throttle body smoothes out the engine's output characteristics when the accelerator pedal is depressed. As a result, the vehicle's drivability and off–road performance have been enhanced.
Emission Control System	The charcoal canister, which is a component of the evaporative emission control system of the 4WD model for the California specification model, has been enlarged to increase the absorption rate of the evaporative HC and to improve the efficiency of the system. The construction of the charcoal canister is basically the same as the '95 Avalon. For details, see the '95 Avalon New Car Features (Pub. No. NCF113U), page 34.

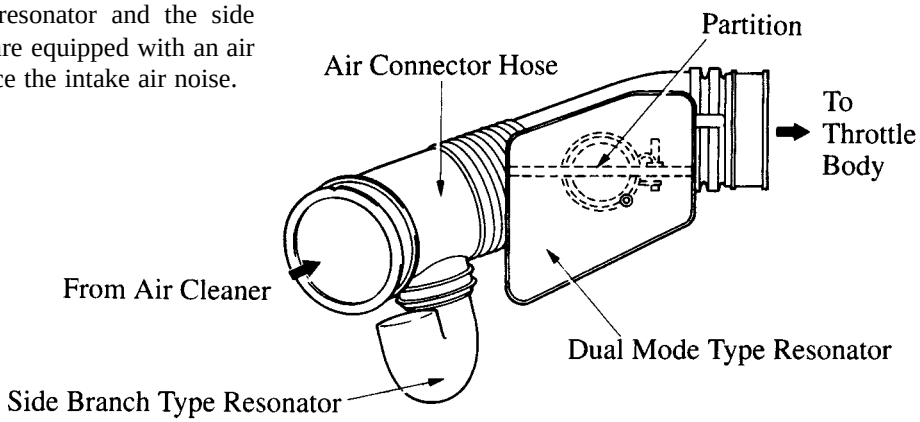
■ INTAKE AND EXHAUST SYSTEM

1. Air Cleaner and Intake Air Connector

- A large capacity air cleaner is used to increase the intake air efficiency and an element cap is attached to the air cleaner case to increase ease of servicing.



- The dual mode type resonator and the side branch type resonator are equipped with an air connector hose to reduce the intake air noise.



2. Throttle Body

A non–linear throttle has been adopted in the throttle body of the 4WD model with a manual transmission. This throttle valve opens slowly when the accelerator pedal is initially depressed and later increases its opening according to the amount of pedal effort applied to the accelerator pedal. In addition to improving the vehicle's control performance during low–speed driving, this feature enhances the engine's response performance during medium to high–load conditions. As a result, the vehicle's drivability and off–road performance have been enhanced.