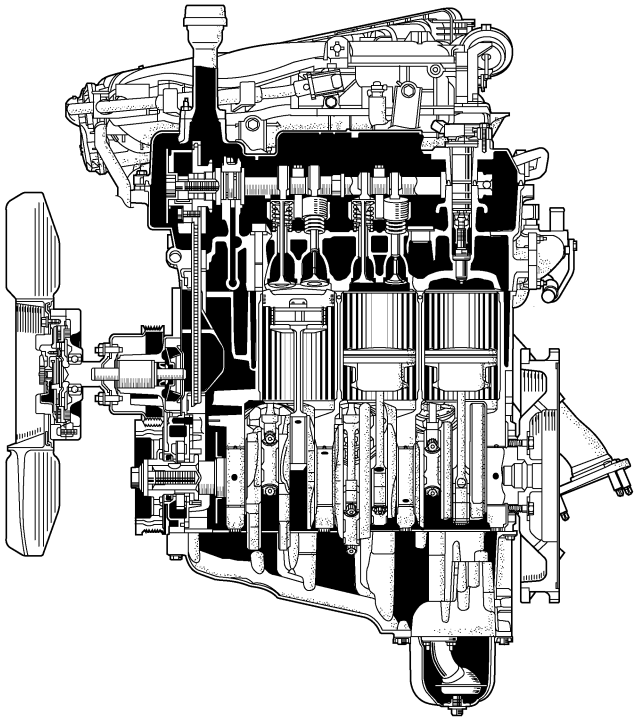
ENGINE

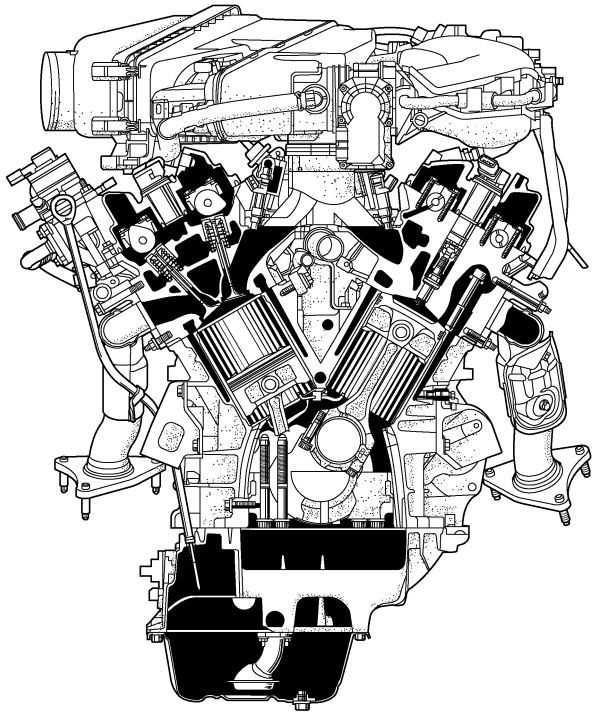
1GR-FE ENGINE

■ DESCRIPTION

The 1GR-FE engine is a 4.0-liter, 24-valve DOHC V6. This engine uses the VVT-i (Variable Valve Timing-intelligent) system, DIS (Direct Ignition System), ACIS (Acoustic Control Induction System), ETCS-i (Electronic Throttle Control System-intelligent), and AI (Air Injection) system. These control functions achieve improved engine performance, fuel economy, and clean emissions.



04E0EG72Z



04E0EG73Z

▶ Engine Specification ◀

Engine Type			**1GR-FE**
No. of Cyls. & Arrangement			6-Cylinder, V Type
Valve Mechanism			24-Valve DOHC, Chain Drive (with VVT-i)
Combustion Chamber			Pentroof Type
Flow of Intake and Exhaust Gasses			Cross-Flow
Fuel System			SFI
Ignition System			DIS
Displacement cm^3 (cu. in.)			3956 (241.4)
Bore × Stroke mm (in.)			94.0 × 95.0 (3.70 × 3.74)
Compression Ratio			10.0 : 1
Max. Output (SAE-NET)*1			176 kW @ 5200 rpm (236 HP @ 5200 rpm)
Max. Torque (SAE-NET)*1			361 N·m @ 4000 rpm (266 ft·lbf @ 4000 rpm)
Oil Capacity	Dry		6.0 liters (6.3 US qts, 5.3 Imp. qts)
	With Oil Filter		5.2 liters (5.5 US qts, 4.6 Imp. qts)
	Without Oil Filter		4.9 liters (5.2 US qts, 4.3 Imp. qts)
Oil Grade			ILSAC
Engine Coolant	Type		TOYOTA Genuine Super Long Life Coolant or the following*2
	Capacity		9.6 liters (10.1 US qts, 8.4 Imp. qts)
Spark Plug	Type	DENSO	K20HR-U11 (Nickel)
		NGK	LFR6C11 (Nickel)
	Plug Gap mm (in.)		1.0 - 1.1 (0.0394 - 0.0433)
Firing Order			1 - 2 - 3 - 4 - 5 - 6
Fuel Octane Rating (RON+MON)/2			87 or higher
Emission Regulation	Tailpipe	California	LEVII,□$FTP
		Except California	Tier2-Bin5, SFTP
	Evaporative		LEVII, ORVR
Engine Service Mass*3 (Reference) kg (lb)			170 (374.8)

*1: Maximum output and torque rating are determined using the revised SAE J1349 procedure.

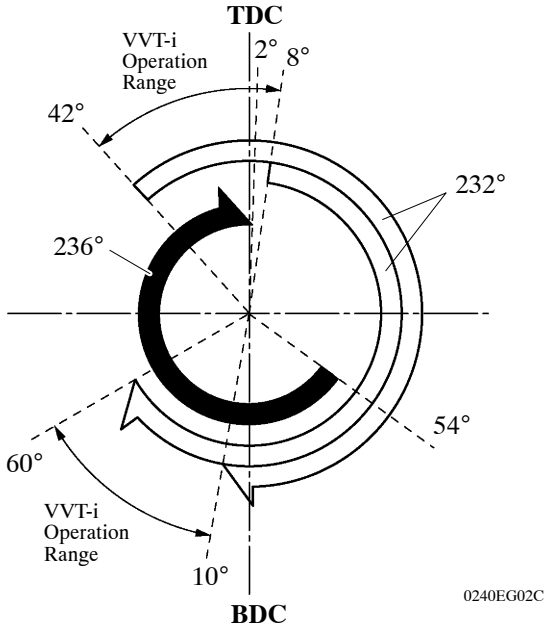
*2: Similar high quality ethylene glycol based non-silicate, non-amine, non-nitrite, and non-borate coolant with long-life hybrid organic acid technology. (Coolant with long-life hybrid organic acid technology consists of a combination of low phosphates and organic acids.)

*3: The figure shown is the weight of the part without coolant and oil.

▶ Valve Timing ◀

: **Intake Valve Opening Angle**

: **Exhaust Valve Opening Angle**



Intake	Open	8° ATDC to 42° BTDC
	Close	60° to 10° ABDC
Exhaust	Open	54° BBDC
	Close	2° ATDC

▶ Performance Curve ◀

