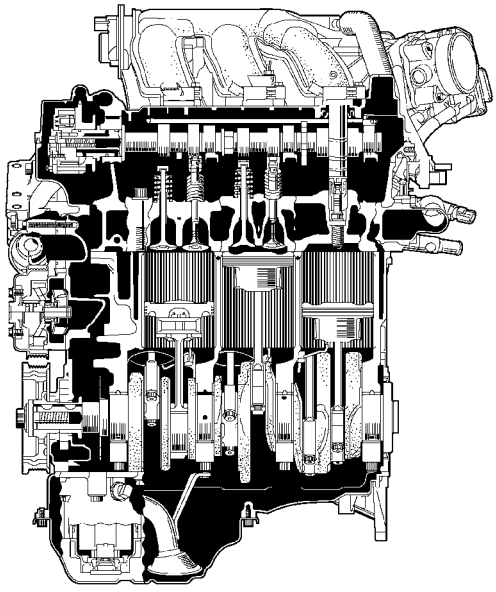
NEW FEATURES

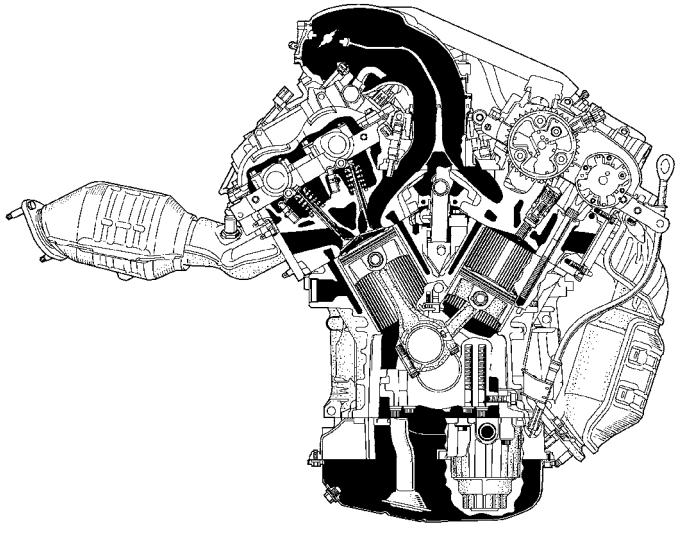
■2GR-FE ENGINE

1. Description

The newly developed 2GR-FE engine is a 3.5-liter, 24-valve DOHC V6 engine. This engine uses the Dual VVT-i (Variable Valve Timing-intelligent) system, DIS (Direct Ignition System), ACIS (Acoustic Control Induction System), and ETCS-i (Electronic Throttle Control System-intelligent). These control functions achieve improved engine performance, fuel economy, and reduced exhaust emissions.



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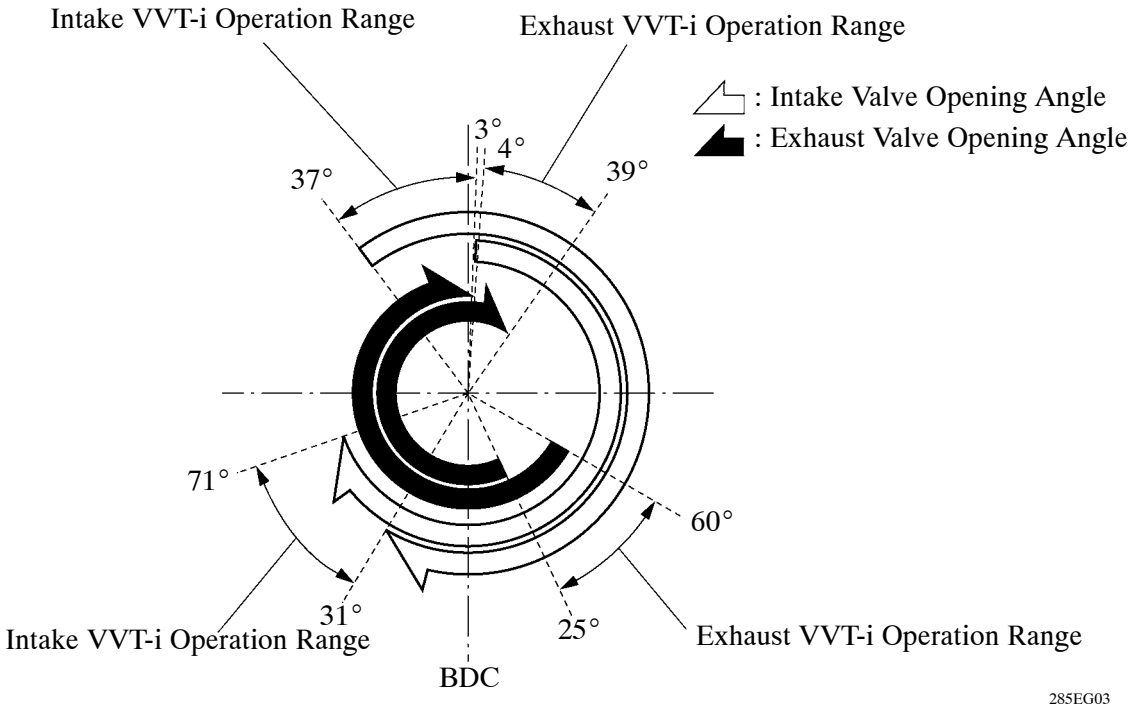
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▶ Engine Specifications ◀

No. of Cyls. & Arrangement			6-cylinder, V Type
Valve Mechanism			24-valve DOHC, Chain Drive (with Dual VVT-i)
Combustion Chamber			Pentroof-type
Manifolds			Parallel-flow
Fuel System			EFI
Ignition System			DIS
Displacement cm^3 (cu. in.)			3456 (210.9)
Bore × Stroke mm (in.)			94.0 × 83.0 (3.70 × 3.27)
Compression Ratio			10.8 : 1
Max. Output (SAE-NET)			201 kW @ 6200 rpm
Max. Torque (SAE-NET)			330 N·m @ 4700 rpm
Valve Timing	Intake Valve	Open	–3° to 37° BTDC
		Close	71° to 31° ABDC
	Exhaust Valve	Open	60° to 25° BBDC
		Close	4° to 39° ATDC
Firing Order			1 – 2 – 3 – 4 – 5 – 6
Research Octane Number (RON)			91 or higher
Engine Oil Grade			API SL, SM or ILSAC
Emission Regulation			EURO IV
Engine Service Mass* (Reference) kg (lb)			163 (359)

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

▶ Valve Timing ◀



2. Features of 2GR-FE Engine

The 2GR-FE engine has achieved the following performance through the use of the items listed below.

(1) High performance and reliability

(2) Low noise and vibration

(3) Lightweight and compact design

(4) Good serviceability

(5) Clean emission and fuel economy

Item		(1)	(2)	(3)	(4)	(5)
Engine Proper	A steel laminate type cylinder head gasket is used.	○				
	An upright intake port is used.	○		○		
	A taper squish shape is used for combustion chamber.	○				○
	A cylinder block made of aluminum alloy is used.			○		
	The skirt portion of the piston is applied with resin to reduce friction.	○	○			○
	An oil pan No. 1 made of aluminum alloy is used.		○	○		
Valve Mechanism	The Dual VVT-i (Variable Valve Timing-intelligent) system is used.	○				○
	Hydraulic lash adjusters are used.	○	○		○	
	Timing chains and chain tensioners are used.		○	○	○	
	Roller rocker arms are used.	○				○
Lubrication System	An oil filter with a replaceable element is used.				○	

(Continued)