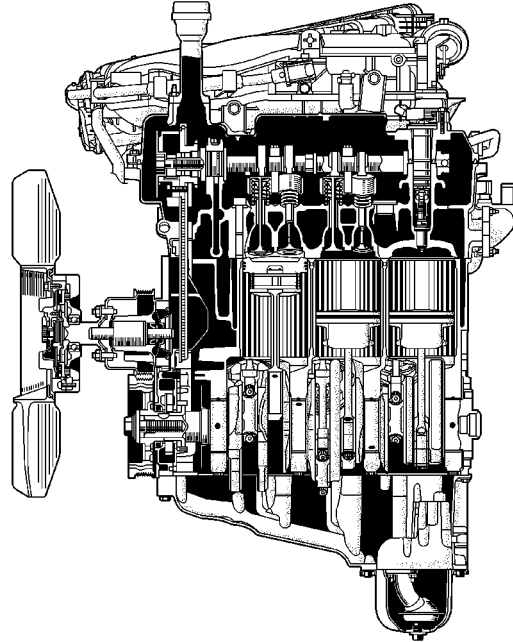


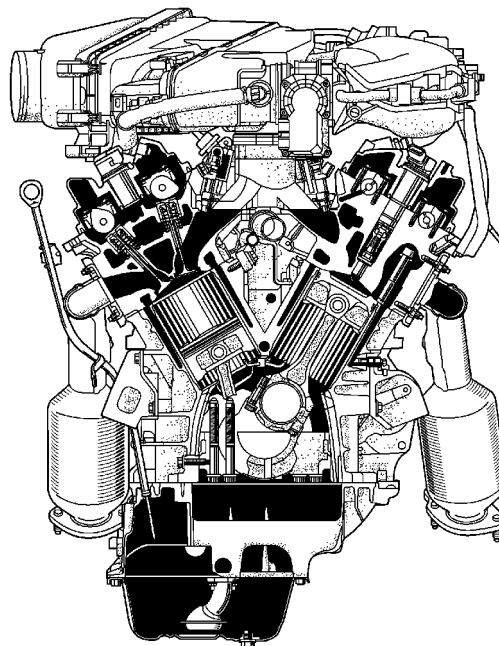
1GR-FE ENGINE

■ DESCRIPTION

The 1GR-FE engine is a V6, 4.0-liter, 24-valve DOHC engine. This engine has used the 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 are optimized to further improve engine performance, fuel economy, and reduce exhaust emissions.



238EG01



238EG02

► Engine Specification ◀

No. of Cyls. & Arrangement		6-Cylinder, V Type	
Valve Mechanism		24-Valve DOHC, Chain Drive (with VVT-i)	
Combustion Chamber		Pentroof Type	
Manifolds		Cross-Flow	
Fuel System		SFI	
Displacement		cm ³ (cu. in.)	3956 (241.4)
Bore x Stroke		mm (in.)	94.0 x 95.0 (3.70 x 3.74)
Compression Ratio		10.0 : 1	
Max. Output (SAE-NET)		183 kW @ 5200 rpm (245HP @ 5200 rpm)	
Max. Torque (SAE-NET)		382 N·m @ 3800 rpm (282 ft·lbf @ 3800 rpm)	
Oil Capacity (2WD Models except PreRunner)	Dry		5.6 liters (5.9 US qts, 4.9 Imp. qts)
	with Oil Filter		4.5 liters (4.8 US qts, 4.0 Imp. qts)
	without Oil Filter		4.2 liters (4.4 US qts, 3.7 Imp. qts)
Oil Capacity (4WD Models and PreRunner)	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, 4.2 Imp. qts)
Oil Grade		API SL, EC or ILSAC	
Engine Coolant	Type		TOYOTA Genuine Super Long Life Coolant or Equivalent* ¹
	Capacity	M/T	9.7 liters (10.3 US qts, 8.5 Imp. qts)
		A/T	9.6 liters (10.1 US qts, 8.4 Imp. qts)
Spark Plug	Type	DENSO	K20HR-U11 (Nickel)
		NGK	LFR6C-11 (Nickel)
	Plug Gap		mm (in.)
Firing Order		1 - 2 - 3 - 4 - 5 - 6	
Octane Rating		91 or more	
Emission Regulation	Tailpipe	California	LEVII, SFTP
		Except California	Tier2-Bin5, SFTP
	Evaporative		LEVII, ORVR
Engine Service Mass* ²	kg (lb)	M/T	179 (395)
		A/T	166 (366)

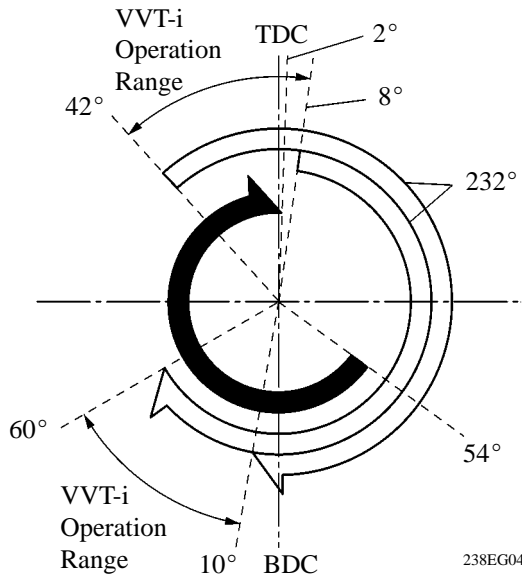
*¹: Similar high quality ethylene glycol based non-silicate, non-amine, non-nitrite, and non-borate coolant with long-life hybrid organic acid technology. (Coolant with hybrid organic acid technology consists of the combination of low phosphates and organic acids.)

*²: Weight shows the figure with the oil and engine coolant fully filled.

► Valve Timing ◀

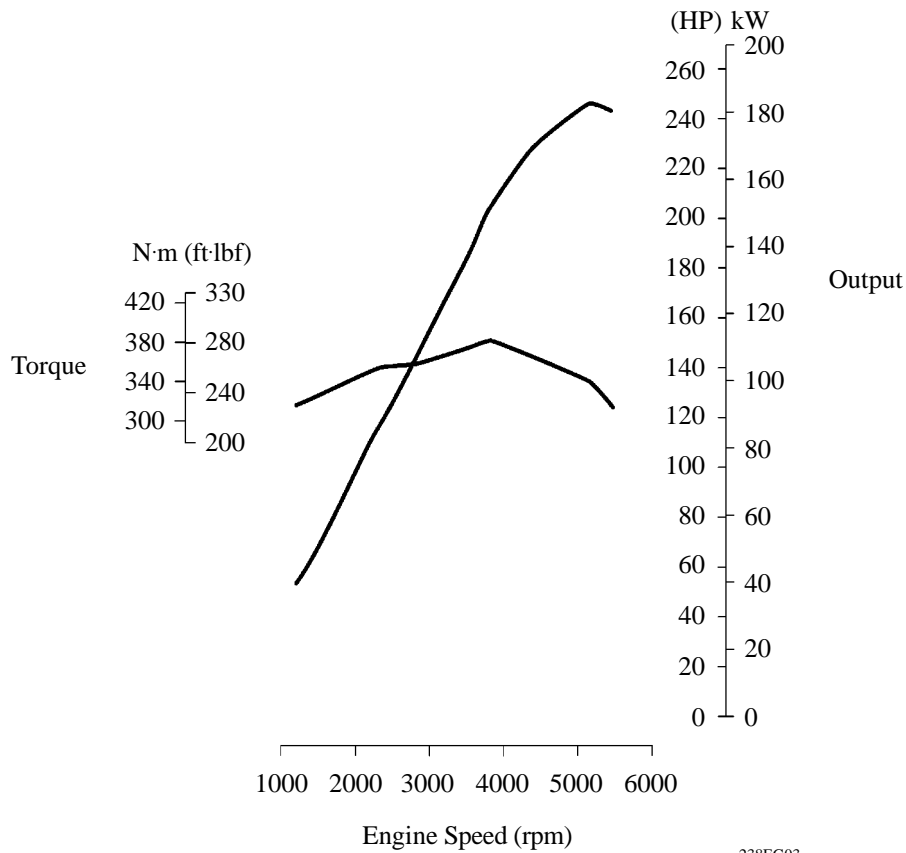
◁ : Intake Valve Opening Angle

▴ : Exhaust Valve Opening Angle



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

► Performance Curve ◀



■ FEATURES OF 1GR-FE ENGINE

The 1GR-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 plating to reduce friction.	○	○			○
	An oil pan No. 1 made of aluminum alloy is used.		○	○		
Valve Mechanism	The VVT-i (Variable Valve Timing-intelligent) system is used.	○				○
	A timing chain and chain tensioner are used.		○	○	○	
Cooling System	The engine coolant is used the TOYOTA Genuine SLLC (Super Long Life Coolant).				○	
Intake and Exhaust System	The link-less type throttle body is used.			○	○	
	The intake air chamber made of plastic is used.			○		
	A stainless steel exhaust manifold is used.			○		
	An ultra thin-wall, high-cell density ceramic type TWC (Three-Way Catalytic Converter) is used.					○
Fuel System	The fuel delivery pipe made of plastic is used.			○		
	12-hole type fuel injectors are used.	○				○
	A multi-layer plastic fuel tank is used.			○		○
	Quick connectors are used to connect the fuel hose with the fuel pipe.				○	
	The quick turn construction fuel cap is used.				○	
Ignition System	The DIS (Direct Ignition System) makes ignition timing adjustment unnecessary.	○			○	○
	The long-reach type spark plugs are used.	○				
Charging System	A segment conductor type generator is used.	○		○		
Serpentine Belt Drive System	A serpentine belt drive system is used.			○	○	
Engine Control System	The MRE (Magnetic Resistance Element) type VVT sensors have been adopted.	○				
	The ETCS-i (Electronic Throttle Control System-intelligent) is used.	○				○
	The ACIS (Acoustic Control Induction System) is used.	○				○
	Evaporative emission control system is used.					○