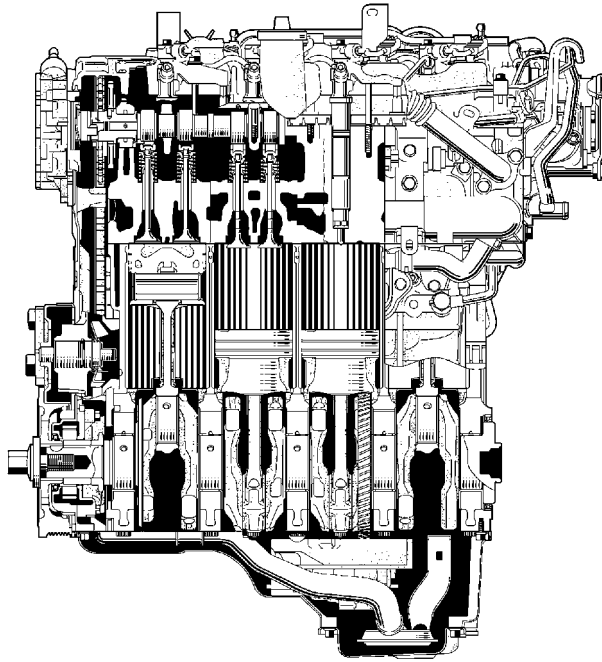


2AD-FHV ENGINE

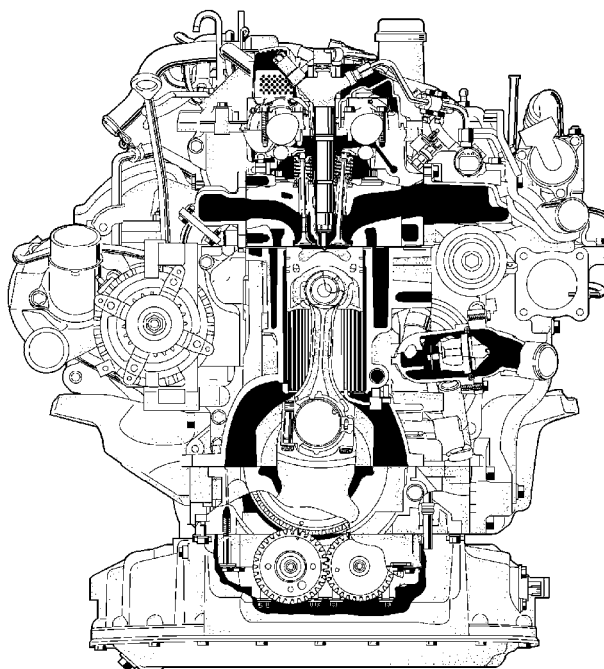
■ DESCRIPTION

The newly developed 2AD-FHV D-4D (Direct injection 4-stroke common-rail Diesel engine) is an in-line 4-cylinder, 2.2 liter, 16-valve DOHC turbocharged intercooled diesel engine.

This engine uses a direct injection system and common-rail system to realize higher performance, clean emissions, low noise and low vibration. In addition, this engine uses D-CAT (Diesel Clean Advanced Technology) system to reduce emissions.



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0151EG02Z

► Engine Specification ◀

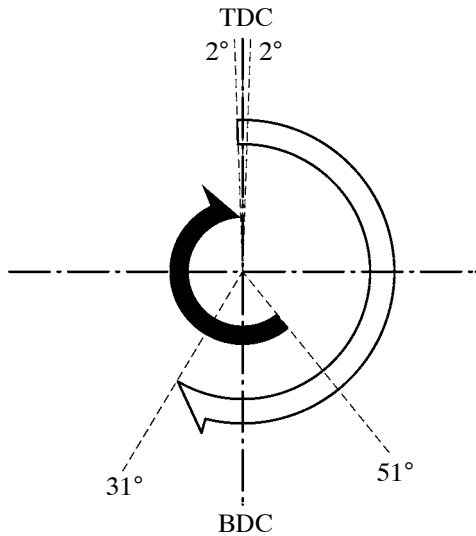
Engine Type			2AD-FHV
No. of Cyls. & Arrangement			4-Cylinder, In-line
Valve Mechanism			16-Valve DOHC, Chain and Gear Drive
Combustion Chamber			Direct Injection Type
Flow of Intake and Exhaust Gasses			Cross-Flow
Fuel System			Common-Rail Type
Displacement		cm ³ (cu. in.)	2231 (136.1)
Bore × Stroke		mm (in.)	86.0 × 96.0 (3.39 × 3.78)
Compression Ratio			15.8 : 1
Max. Output (EEC)			130 kW @ 3600 rpm
Max. Torque (EEC)			400 N·m @ 2000 - 2600 rpm
Oil Capacity	Dry		6.7 liters (7.1 US qts, 5.9 Imp. qts)
	With Oil Filter		6.0 liters (6.3 US qts, 5.3 Imp. qts)
	Without Oil Filter		5.2 liters (5.5 US qts, 4.6 Imp. qts)
Oil Grade			ACEA B1, API CF-4 or CF
Engine Coolant	Type		TOYOTA Genuine Super Long Life Coolant or the following* ¹
	Capacity	Without Combustion Type Power Heater	8.0 liters (8.5 US qts, 7.0 Imp. qts)
		With Combustion Type Power Heater	8.2 liters (8.7 US qts, 7.2 Imp. qts)
Firing Order			1 - 3 - 4 - 2
Fuel Cetane Number			48 or more
Emission Regulation			EURO IV
Engine Service Mass* ² (Reference)		kg (lb)	193.7 (427.0)

*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: The engine service mass shown is with the oil and engine coolant fully filled.

► Valve Timing ◀

 : IN Valve Opening Angle
 : EX Valve Opening Angle

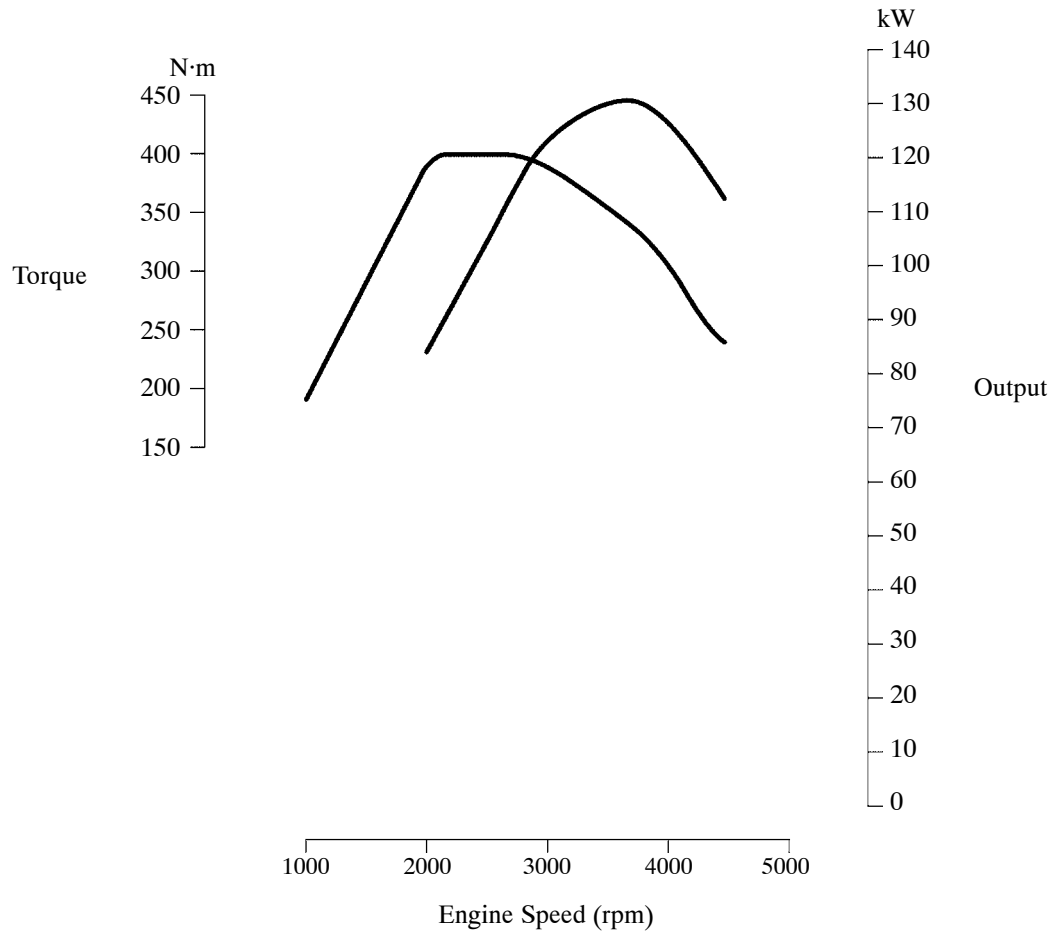


Intake	Open	2° BTDC
	Close	31° ABDC
Exhaust	Open	51° BBDC
	Close	2° ATDC

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288EG03Y

► Performance Curve ◀



288EG05Y