OUTLINE

a. The 1UR-FE engine is a V-type, 8-cylinder, 4.6-liter, 32-valve DOHC engine.

b. On this engine, the Dual Variable Valve Timing-intelligent (Dual VVT-i) system, Electronic Throttle Control System-intelligent (ETCS-i), air injection system and Exhaust Gas Recirculation (EGR) control are used. These control functions have been optimized to further improve engine performance and fuel economy, and to reduce exhaust emissions.

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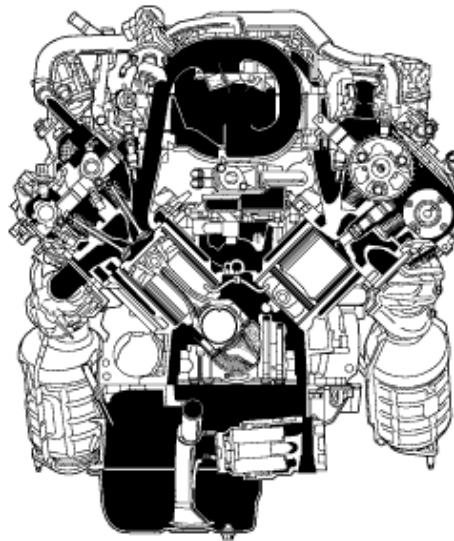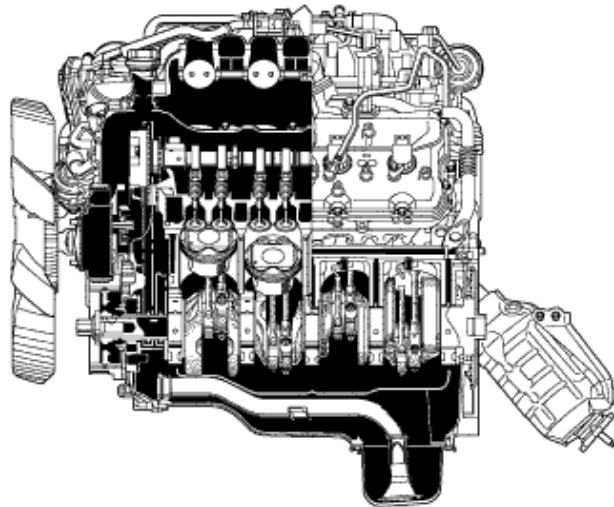
SPECIFICATION

| No. of Cyls. and Arrangement			8-cylinder, V-type
Valve Mechanism			32-valve DOHC, Chain Drive (with Dual VVT-i)
Combustion Chamber			Pentroof Type
Manifolds			Cross-flow
Fuel System			Sequential Multiport Fuel Injection (SFI)
Ignition System			Direct Ignition System (DIS)
Displacement			4608 cm^3 (281.2 cu. in.)
Bore x Stroke			94.0 mm x 83.0 mm (3.70 in. x 3.27 in.)
Compression Ratio			10.2 : 1
Max. Output [SAE-NET]			218 kW @ 5500 rpm
Max. Torque [SAE-NET]			438 N*m @ 3500 rpm
Valve Timing	Intake	Open	-18° to 22° BTDC
		Closed	70° to 30° ABDC
	Exhaust	Open	62° to 30° BBDC
		Closed	-8° to 24° ATDC
Spark Plug	Manufacturer		DENSO
	Type		SK20HR11
	Plug Gap		1.0 mm to 1.1 mm (0.0394 in. to 0.0433 in.)
Firing Order			1 - 8 - 7 - 3 - 6 - 5 - 4 - 2
Research Octane Number			95 or higher*2
Emission Regulation			EURO IV*3
			EURO II*4
Engine Service Mass (Reference)*1			212 kg (467 lb)

HINT:

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

*2: Premium unleaded gasoline with a research octane number 95 or higher required for optimum engine performance. If 95 octane cannot be obtained, you may use unleaded gasoline with a research octane number as low as 91. Use of unleaded fuel with a research octane number lower than 95 may result in engine knocking and significantly reduced performance. Persistent knocking can lead to engine damage and should be corrected by refueling with higher octane unleaded gasoline.

*3: Models for Europe and China

*4: Models for G.C.C. countries

(kW) / (N*m) Torque vs Output — Engine Speed (rpm)

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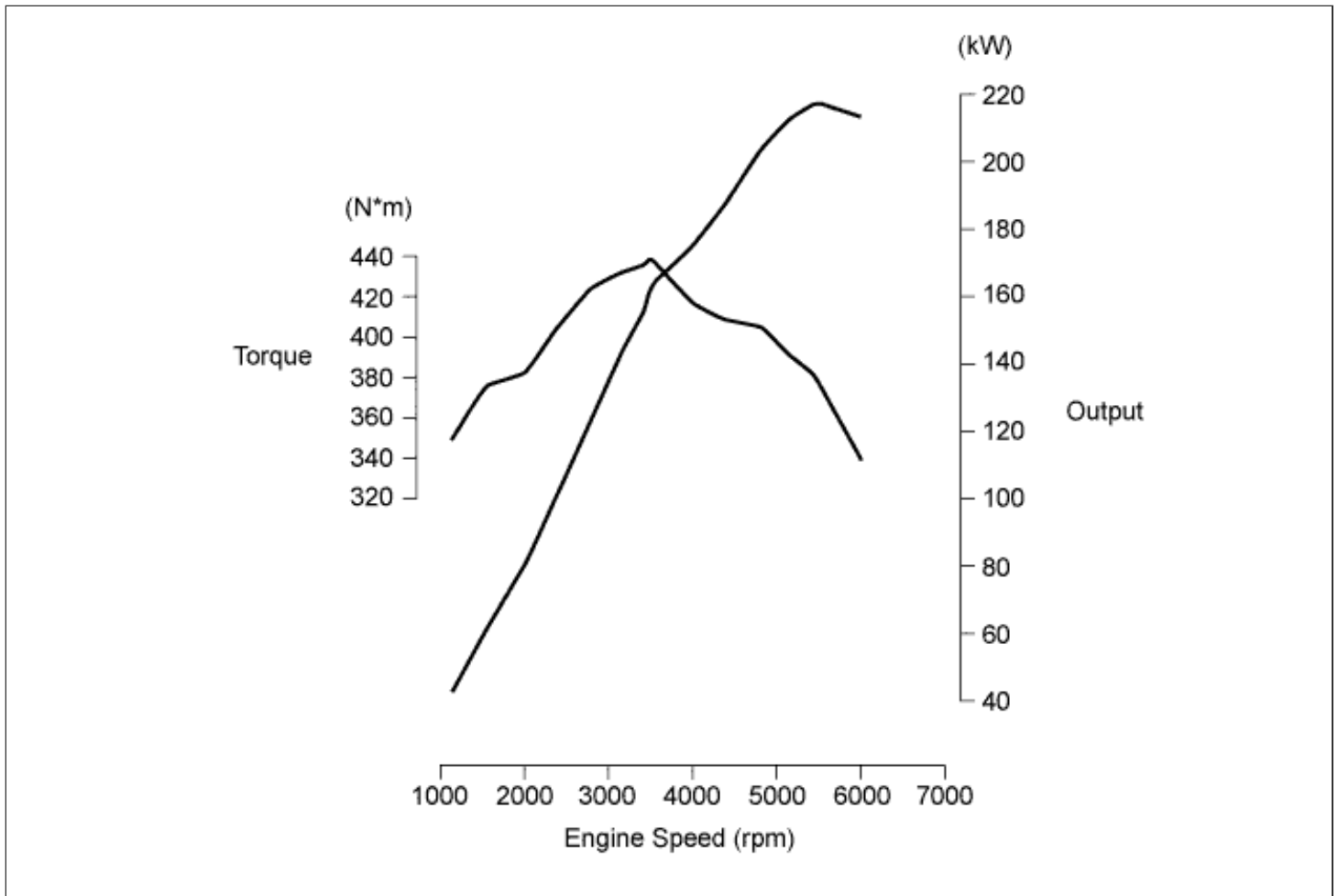
a. This engine has been able to achieve the following performance through the use of the items listed below:

i. High performance and fuel economy

ii. Low noise and vibration

iii. Lightweight and compact design

iv. Good serviceability

v. Clean emissions

Item		(1)	(2)	(3)	(4)	(5)
Engine Proper	A taper squish shape is used for the combustion chamber.	○	-	-	-	○
	An aluminum alloy cylinder block containing an engine coolant distribution pathway is used.	○	-	○	-	-
	Spiny-type liners are used in the cylinder bores.	○	-	○	-	-

	Cylinder block water jacket spacers are used.	○	-	-	-	-
	The piston skirt is coated with resin.	○	○	-	-	○
	A No. 1 oil pan made of aluminum alloy is used.	○	○	○	-	-
Valve Mechanism	Timing chains and chain tensioners are used.	○	-	○	-	-
	Valve lash adjuster assemblies are used.	○	○	-	○	○
	Valve rocker arm sub-assemblies are used.	○	-	-	-	○
Lubrication System	An oil filter with a replaceable element is used.	-	-	-	○	-
Intake and Exhaust System	An intake manifold made of plastic is used.	○	-	○	-	-
	A linkless-type throttle body is used.	-	-	○	○	-
	Three-Way Catalytic converters (TWCs) are used.	-	-	-	-	○
Fuel System	12-hole type fuel injector assemblies are used to improve the atomization of fuel.	○	-	-	-	○
Ignition System	Long-reach type spark plugs are used.	○	-	-	-	-
Serpentine Belt Drive System	A serpentine belt drive system is used.	○	-	-	-	○
Blowby Gas Ventilation System	A separator case is provided between the cylinder block and the intake manifold.	○	-	-	-	○
Emission Control System	An air injection system is used.	-	-	-	-	○
	The Exhaust Gas Recirculation (EGR) control is used.	-	-	-	-	○
Engine Control	The Electronic Throttle Control System-intelligent (ETCS-i) is used.	○	-	-	-	○
	The Direct Ignition System (DIS) makes ignition timing adjustment unnecessary.	○	-	-	○	○
	The Dual Variable Valve Timing-intelligent (Dual VVT-i) system is used.	○	-	-	-	○
	The Acoustic Control Induction System (ACIS) is used.	○	-	-	-	○