

**ENGINE - SPECS****SPECIFICATION [ Crankshaft ]**

Refer to "Cylinder Block" for removal and installation procedures of the crankshaft. Refer to REMOVAL , Cylinder Block. Refer to INSTALLATION , Cylinder Block.

**SPECIFICATION [ 2.5 L Non-Turbo Engine (FROM '10MY) ]**

The following shows the comparison between new and existing engines.

	New engine	Existing engine
Displacement	2.5 L	2.5 L
Engine	Longitudinally-positioned, horizontally opposed 4-cylinder	Longitudinally-positioned, horizontally opposed 4-cylinder
Transmission	Lineartronic™, 6MT	4AT, 5MT
Bore x stroke mm (in)	99.5 x 79.0 (3.917 x 3.110)	99.5 x 79.0 (3.917 x 3.110)
Total displacement cm <sup>3</sup> (cu in)	2, 457 (149.93)	2, 457 (149.93)
Valve driving method	SOHC + intake i-AVLS	SOHC + intake i-AVLS
Compression ratio	10.0	10.0
Maximum output kW (HP)/rpm	127 (170)/5, 600	127 (170)/6, 000
Maximum torque N.m (kgf-m, ft-lb)/rpm	230 (23.5, 170)/4, 000	230 (23.5, 170)/4, 400
Designated gasoline	87AKI	87AKI

**SPECIFICATION [ Intake And Exhaust Valve ]**

Refer to "Cylinder Head" for removal and installation procedures of the intake and exhaust valves. Refer to REMOVAL , Cylinder Head. Refer to INSTALLATION , Cylinder Head.

**SPECIFICATION [ General Description ]**

## SPECIFICATION

	Model	2.5 L
Cylinder arrangement		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine
Valve system mechanism		Belt driven Single overhead camshaft 4 valve/cylinder
Bore x Stroke	mm (in)	99.5 x 79.0 (3.917 x 3.110)

Engine	Piston displacement		cm <sup>3</sup> (cu. in)	2,457(150)
	Compression ratio			10.0
	Compression pressure (at 200 - 300 RPM)		kPa (kg/cm <sup>2</sup> , psi)	1,020 - 1,275 (10.4 - 13.0, 148 - 185)
	Number of piston rings			Pressure ring: 2, Oil ring: 1
	Intake valve timing	Constant	Open	BTDC 0°
			Close	ABDC 58°
		Low speed	Open	BTDC 0°
			Close	ABDC - 10°
		High speed	Open	BTDC 14°
			Close	ABDC 62°
	Exhaust valve timing		Open	BBDC 30°
			Close	ATDC 14°
	Valve clearance	mm (in)	Intake	0.20±0.04 (0.0079±0.0016)
Exhaust			0.25±0.04 (0.0098±0.0016)	
Idling speed [at neutral position on MT, or "P" or "N" position on AT]	RPM	MT	650±100 (No load) 850±100 (A/CON)	
		AT	700±100 (No load) 850±100 (A/C ON)	
Ignition order			1 → 3 → 2 → 4	
Ignition timing	BTDC/RPM	MT	10°±8°/650	
		AT	15°±10°/700	



**NOTE:** US: Undersize OS: Oversize

## SPECIFICATION

Belt tension adjuster	Protrusion of adjuster rod		mm (in)	5.2 - 6.2 (0.205 - 0.244)	
Valve rocker arm	Clearance between shaft and arm	mm (in)	Standard	0.020 - 0.054 (0.0008 - 0.0021)	
	Bending limit		mm (in)	0.025 (0.0010)	
	Thrust clearance		mm (in)	Standard	0.030 - 0.090 (0.0012 - 0.0035)
		Constant	Standard	40.075 - 40.175 (1.5778 - 1.5817)	

Camshaft	Cam lobe height mm (in)	Intake	Low speed	Standard	35.496 - 35.596 (1.3975 - 1.4014)	
			High speed	Standard	40.315 - 40.415 (1.5872 - 1.5911)	
		Exhaust		Standard	39.289 - 39.389 (1.5468 - 1.5507)	
	Camshaft journal O.D.			mm (in)	31.928 - 31.945 (1.2570 - 1.2577)	
	Camshaft journal hole I.D.			mm (in)	32.000 - 32.018 (1.2598 - 1.2605)	
	Oil clearance		mm (in)		Standard	0.055 - 0.090 (0.0022 - 0.0035)
Cylinder head	Surface warpage limit (Mating surface with cylinder block)			mm (in)	0.035 (0.0014)	
	Grinding limit			mm (in)	0.1 (0.004)	
	Standard height			mm (in)	97.5 (3.84)	
Valve seat	Seating angle				90°	
	Contacting width	mm (in)	Intake	Standard	0.8 - 1.4(0.03 - 0.055)	
			Exhaust	Standard	1.2 - 1.8(0.047 - 0.071)	
Valve guide	Inside diameter			mm (in)	6.000 - 6.012 (0.2362 - 0.2367)	
	Protrusion above head		mm (in)		Intake	20.0 - 21.0 (0.787 - 0.827)
			mm (in)		Exhaust	16.5 - 17.5 (0.650 - 0.689)
Valve	Head edge thickness	mm (in)	Intake	Standard	0.8 - 1.2 (0.03 - 0.047)	
			Exhaust	Standard	1.0 - 1.4 (0.039 - 0.055)	
	Stem outer diameter		mm (in)		Intake	5.950 - 5.965 (0.2343 - 0.2348)
			mm (in)		Exhaust	5.945 - 5.960 (0.2341 - 0.2346)
	Valve stem gap	mm (in)	Standard		Intake	0.035 - 0.062 (0.0014 - 0.0024)
			Standard		Exhaust	0.040 - 0.067 (0.0016 - 0.0026)
Overall length		mm (in)		Intake	120.6 (4.75)	
				Exhaust	121.7 (4.79)	
Valve spring	Free length			mm (in)	55.2 (2.173)	
	Squareness			2.5°, 2.4 (0.094) or less		
	Tension/spring height		N (kgf, lb)/mm (in)	Set	235.3 - 270.7 (24 - 27.6, 52.9 - 60.8)/45.0 (1.772)	
				Lift	578.9 - 639.9 (59.1 - 65.3, 130.3 - 143.9)/34.7 (1.366)	
Surface warpage limit (mating with cylinder head)			mm (in)	0.025 (0.00098)		
Grinding limit			mm (in)	0.1 (0.004)		
Standard height			mm (in)	201.0 (7.91)		

Cylinder block	Cylinder inner diameter	mm (in)	Standard	A	99.505 - 99.515 (3.9175 - 3.9179)		
				B	99.495 - 99.505 (3.9171 - 3.9175)		
	Taper		mm (in)	Standard	0.015 (0.0006)		
	Out-of-roundness		mm (in)	Standard	0.010 (0.0004)		
	Piston clearance		mm (in)	Standard	-0.010 - 0.010 (-0.00039 - 0.00039)		
	Cylinder inner diameter boring limit (diameter)			mm (in)	To 100.005 (3.9372)		
Piston	Outer diameter	mm (in)	Standard	A	99.505 - 99.515 (3.9175 - 3.9179)		
				B	99.495 - 99.505 (3.9171 - 3.9175)		
			0.25 (0.0098) OS		99.745 - 99.765 (3.9270 - 3.9278)		
			0.50 (0.0197) OS		99.995 - 100.015 (3.9368 - 3.9376)		
Piston pin	Clearance between piston and piston pin:		mm (in)	Standard	0.004 - 0.008 (0.0002 - 0.0003)		
	Degree of fit				Piston pin can be fitted into position with thumb at 20°C (68°F).		
Piston ring	Ring closed gap	mm (in)	Top ring	Standard	0.20 - 0.35 (0.0079 - 0.0138)		
			Second ring	Standard	0.37 - 0.52 (0.0144 - 0.0203)		
			Oil ring	Standard	0.20 - 0.50 (0.0079 - 0.0197)		
	Ring groove gap	mm (in)	Top ring	Standard	0.040 - 0.080 (0.0016 - 0.0031)		
Second ring			Standard	0.030 - 0.070 (0.0012 - 0.0028)			
Connecting rod	Bend or twist per 100 mm (3.94 in) in length		mm (in)	Limit	0.10 (0.0039)		
	Thrust clearance		mm (in)	Standard	0.070 - 0.330 (0.0028 - 0.0130)		
Bearing of large end	Oil clearance		mm (in)	Standard	0.016 - 0.044 (0.00063 - 0.0017)		
	Bearing size (Thickness at center)	mm (in)	Standard		1.492 - 1.501 (0.0587 - 0.0591)		
			0.03 (0.0012) US		1.510 - 1.513 (0.0594 - 0.0596)		
			0.05 (0.0020) US		1.520 - 1.523 (0.0598 - 0.0600)		
			0.25 (0.0098) US		1.620 - 1.623 (0.0638 - 0.0639)		
Bushing of small end	Clearance between piston pin and bushing		mm (in)	Standard	0 - 0.022 (0 - 0.0009)		
Crank pin	Bend limit			mm (in)	0.035 (0.0014)		
	Out-of-roundness	mm (in)		0.003 (0.0001)			
		Cylindricity		mm (in)	0.004 (0.0002)		
		Grinding limit					

Crankshaft	Crank journal	(dia.)	mm (in)	To 51.750 (2.0374)	
		Out-of-roundness	mm (in)	0.005 (0.0002)	
		Cylindricity	mm (in)	0.006 (0.0002)	
		Grinding limit (dia.)	mm (in)	To 59.758 (2.3527)	
	Crank pin outer diameter	mm (in)	Standard	51.984 - 52.000 (2.0466 - 2.0472)	
			0.03 (0.0012) US	51.954 - 51.970 (2.0454 - 2.0461)	
			0.05 (0.0020) US	51.934 - 51.950 (2.0446 - 2.0453)	
			0.25 (0.0098) US	51.734 - 51.750 (2.0368 - 2.0374)	
	Crank journal outer diameter	mm (in)	Standard	59.992 - 60.008 (2.3619 - 2.3625)	
			0.03 (0.0012) US	59.962 - 59.978 (2.3607 - 2.3613)	
			0.05 (0.0020) US	59.942 - 59.958 (2.3599 - 2.3605)	
			0.25 (0.0098) US	59.742 - 59.758 (2.3520 - 2.3527)	
	Thrust clearance	mm (in)	Standard	0.030 - 0.115 (0.0012 - 0.0045)	
Oil clearance	mm (in)	Standard	0.010 - 0.030 (0.0001 - 0.0012)		
Main bearing	Main bearing mm (in)	#1, #3	Standard	1.998 - 2.011 (0.0787 - 0.0792)	
			0.03(0.0012) US	2.017 - 2.020 (0.0794 - 0.0795)	
			0.05 (0.0020) US	2.027 - 2.030 (0.0798 - 0.0799)	
			0.25 (0.0098) US	2.127 - 2.130 (0.0837 - 0.0839)	
	#2, #4, #5	Standard	2.000 - 2.013 (0.0787 - 0.0793)		
		0.03 (0.0012) US	2.019 - 2.022 (0.0795 - 0.0796)		
		0.05 (0.0020) US	2.029 - 2.032 (0.0799 - 0.0800)		
		0.25 (0.0098) US	2.129 - 2.132 (0.0838 - 0.0839)		

### SPECIFICATION [ Connecting Rod ]

Refer to "Cylinder Block" for removal and installation procedures of connecting rod.

Refer to REMOVAL , Cylinder Block. Refer to INSTALLATION , Cylinder Block.

### SPECIFICATION [ Piston ]

Refer to "Cylinder Block" for removal and installation procedures of pistons. Refer to REMOVAL , Cylinder Block. Refer to INSTALLATION , Cylinder Block.

### SPECIFICATIONS INDEX

FORESTER SPECIFICATIONS INDEX

System	Specification/Procedure
<b>Air Conditioning</b>	
Service	SPECIFICATION
Torque	See applicable COMPONENT for torque specifications.
Axle Shaft Nut (Front)	162 Ft. Lbs. (22.4 kgf-m, 220 N.m)
Axle Shaft Nut (Rear)	140 Ft. Lbs. (19.4 kgf-m, 190 N.m)
Battery	NA
<b>Brakes</b>	
Bleeding Sequence	AIR BLEEDING
Disc/Drum Brakes	SPECIFICATION
Torque	See applicable COMPONENT for torque specifications.
<b>Charging</b>	
<b>Generator</b>	
H4DOTC	TURBO MODEL
H4SO	NON-TURBO MODEL
Torque (H4DOTC & H4SO)	Bolt: 18.4 Ft. Lbs. (25 N.m) Slider Bolt: 5.9 Ft. Lbs. (8 N.m)
<b>Drive Belts</b>	
<b>Belt Routing &amp; Adjustment</b>	
H4DOTC	INSPECTION
H4SO	INSPECTION
<b>Engine Cooling</b>	
<b>H4DOTC</b>	
General Service Specifications	SPECIFICATION
Radiator Cap Pressure	14-18 psi (.95-1.25 kg/cm <sup>2</sup> )
Thermostat R & I	THERMOSTAT
Water Pump R & I	WATER PUMP
<b>H4SO</b>	
General Service Specifications	SPECIFICATION
Radiator Cap Pressure	14-18 psi (.95-1.25 kg/cm <sup>2</sup> )
Thermostat R & I	THERMOSTAT

Water Pump R & I	WATER PUMP
Engine Mechanical	
H4DOTC	
Compression (at 200-300 RPM)	142-171 psi (981-1,177 kPa, 10-12 kgf/cm <sup>2</sup> )
Oil Pressure	At Idle Speed: 14 psi (1.0 kg/cm <sup>2</sup> ) At 5,000 RPM: 43 psi (3.0 kg/cm <sup>2</sup> )
Overhaul	SPECIFICATION
Torque	See applicable COMPONENT for torque specifications.
H4SO	
Compression (at 200-300 RPM)	148-185 psi (1,020-1,275 kPa (10.4-13.0 kgf/cm <sup>2</sup> ))
Oil Pressure	At Idle Speed: 14 psi (1.0 kg/cm <sup>2</sup> ) At 5,000 RPM: 43 psi (3.0 kg/cm <sup>2</sup> )
Overhaul	SPECIFICATION
Torque	See applicable COMPONENT for torque specifications.
Fluid Specifications	See FLUIDS under MAINTENANCE tab. From within Manager or Service Writer, click the "30/60/90 Interval" or "Maint." button.
Flywheel/Flex Plate (Drive Plate) Torque	53.1 Ft. Lbs. (72 N.m)
Fuel System	
H4DOTC	
Fuel Pressure Test Procedure	FUEL PRESSURE
Fuel Pressure Release Procedure	RELEASING OF FUEL PRESSURE
Fuel Pressure Specification	With vacuum: 33-38 psi (230-260 kPa) Without vacuum: 41-46 psi (284-314 kPa)
Fuel Filter Location	In-Tank Type as part of Fuel Pump Module
H4DOTC Fuel Filter R & I	FUEL PUMP
H4SO	
Fuel Pressure Test Procedure	FUEL PRESSURE
Fuel Pressure Release	RELEASING OF FUEL PRESSURE

Procedure	
Fuel Pressure Specification (KOER)	49-50 psi (338-348 kPa)
Fuel Filter Location	In-Tank Type as part of Fuel Pump Module
Fuel Filter R & I	FUEL PUMP
Ignition	
Firing Order & Cylinder Identification	FIRING ORDER & CYLINDER IDENTIFICATION
Ignition Wires (Resistance)	
H4DOTC	Coil On Plug
H4SO	SPARK PLUG CORD
Ignition Wires (Routing)	Coil On Plug
Spark Plug	
H4DOTC	
Type	NGK: SILFR6A
Gap	0.028-0.031 in. (0.7-0.8 mm)
Torque	15.5 Ft. Lbs. (21 N.m)
H4SO	
Type	NGK: FR5AP-11
Gap	0.039-0.043 in. (1.0-1.1 mm)
Torque	15.5 Ft. Lbs. (21 N.m)
Starting	
Starter	
H4DOTC	TURBO MODEL
H4SO	NON-TURBO MODEL
Torque (H4DOTC & H4SO)	INSTALLATION
Wheel Alignment	
Adjustment Specifications	
Front	SPECIFICATION
Rear	SPECIFICATION
Torque	



Front	COMPONENT
Rear	COMPONENT
Wheel & Tire	
Wheel Lug Nut Torque	73.8 Ft. Lbs. (100 N.m)