

ENGINE - SPECS**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 [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 [2.5 L 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	6MT	5AT, 5MT, 6MT
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 ³ (cu in)	2, 457 (149.93)	2, 457 (149.93)
Valve driving method	DOHC + intake/exhaust AVCS	DOHC + exhaust AVCS
Compression ratio	8.4	8.4
Maximum output kW (HP)/rpm	198 (265)/5, 600	182 (243)/6, 000
Maximum torque N.m (kgf-m, ft-lb)/rpm	350 (35.7, 258)/2, 000 to 5, 200	327 (33.3, 241)/3, 600
Designated gasoline	93AKI	93AKI

SPECIFICATION [General Description]

GENERAL SPECIFICATION

	Model	2.5 L
Cylinder arrangement		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine
Valve system mechanism		Belt driven, double overhead camshaft, 4-valve/cylinder
Bore x Stroke	mm (in)	99.5 x 79.0 (3.92 x 3.11)

Engine	Piston displacement		cm ³ (cu in)	2,457 (149.94)	
	Compression ratio			8.4	
	Compression pressure (at 200 - 300 RPM)		kPa (kg/cm ² , psi)	981 - 1,177 (10 - 12, 142 - 171)	
	Number of piston rings			Pressure ring: 2, Oil ring: 1	
	Intake valve timing		Open	Max. retard	ATDC 5°
				Min. advance	BTDC 35°
			Close	Max. retard	ABDC 65°
				Min. advance	ABDC 25°
	Exhaust valve timing		Open	BBDC 55°	
			Close	ATDC 5°	
	Valve clearance	mm (in)	Inspection value	Intake	0.20 ^{+0.004} _{-0.06} (0.0079 ^{+0.0016} _{-0.0024})
				Exhaust	0.35 ± 0.05 (0.0138 ± 0.0020)
			Adjustment value	Intake	0.20 ^{+0.01} _{-0.03} (0.0079 ^{+0.0004} _{-0.0012})
				Exhaust	0.35 ± 0.02 (0.0138 ± 0.0008)
Idle speed ["P" or "N" range]		RPM	No load	700 ± 100	
			A/CON	825 ± 100	
Ignition order			1 → 3 → 2 → 4		
Ignition timing			BTDC/RPM	17° ± 10°/700	



NOTE: OS: Oversize US: Undersize

GENERAL SPECIFICATION

Belt tension adjuster	Protrusion of adjuster rod		mm (in)	5.2 - 6.2 (0.205 - 0.244)
Camshaft	Bending limit		mm (in)	0.020 (0.0079) or less
	Thrust clearance		mm (in)	Standard 0.068 - 0.116 (0.0027 - 0.0047)
	Cam lobe height	mm (in)	Intake	Standard 46.55 - 46.65 (1.833 - 1.837)
			Exhaust	Standard 46.75 - 46.85 (1.841 - 1.844)
	Journal O.D.	mm (in)	Standard	Front
Center				29.946 - 29.963 (1.1790 - 1.1796)

				rear		
Cylinder head	Journal clearance		mm (in)	Standard	0.037 - 0.072 (0.0015 - 0.0028)	
	Surface warpage limit			mm (in)	0.035 (0.0014)	
	Grinding limit			mm (in)	0.3 (0.012)	
	Standard height			mm (in)	127.5 (5.02)	
Valve seat	Seating angle				90°	
	Contacting width	mm (in)	Intake	Standard	0.6 - 1.4 (0.024 - 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)	15.8 - 16.2 (0.622 - 0.638)	
Valve	Head edge thickness	mm (in)	Intake	Standard	1.0 - 1.4 (0.039 - 0.055)	
			Exhaust	Standard	1.3 - 1.7 (0.051 - 0.067)	
	Stem outer diameter	mm (in)	Intake		5.955 - 5.970 (0.2344 - 0.2350)	
			Exhaust		5.945 - 5.960 (0.2341 - 0.2346)	
	Valve stem gap	mm (in)	Standard	Intake	0.030 - 0.057 (0.0012 - 0.0022)	
				Exhaust	0.040 - 0.067 (0.0016 - 0.0026)	
Overall length	mm (in)	Intake		104.4 (4.110)		
		Exhaust		104.65 (4.1201)		
Valve spring	Free length			mm (in)	47.32 (1.863)	
	Squareness				2.5°, 2.1 mm (0.083 in) or less	
	Tension/spring height		N (kgf, lb)/mm (in)	Set	205 - 235 (20.9 - 24.0, 46.1 - 52.8)/36.0 (1.417)	
Lift				426 - 490 (43.4 - 50.0, 95.8 - 110)/26.5 (1.043)		
Valve lifter	Outer diameter			mm (in)	Standard 34.959 - 34.975 (1.3763 - 1.3770)	
	Inner diameter (cylinder head)			mm (in)	Standard 34.994 - 35.016 (1.3777 - 1.3786)	
	Valve lifter clearance			mm (in)	Standard 0.019 - 0.057 (0.0007 - 0.0022)	
Cylinder block	Surface warpage limit (Mating surface with cylinder head)				mm (in)	0.025 (0.0098)
	Grinding limit				mm (in)	0.1 (0.004)
	Standard height				mm (in)	201.0 (7.91)
	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	Standard clearance between piston and piston pin	mm (in)	Standard	0.004 - 0.008 (0.0002 - 0.0003)	
	Degree of fit			Piston pin must be fitted into position with thumb at 20°C (68°F).	
Piston ring	Ring closed gap	mm (in)	Top ring	Standard	0.20 - 0.25 (0.0079 - 0.0098)
			Second ring	Standard	0.37 - 0.52 (0.015 - 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	0.1 (0.0039)	
	Thrust clearance	mm (in)	Standard	0.070 - 0.330 (0.0028 - 0.0130)	
Bearing of large end	Oil clearance	mm (in)	Standard	0.017 - 0.045 (0.0007 - 0.0018)	
	Bearing size (Thickness at center)	mm (in)	Standard	1.490 - 1.502 (0.0587 - 0.0591)	
			0.03 (0.0012) US	1.504 - 1.512 (0.0592 - 0.0595)	
			0.05 (0.0020) US	1.514 - 1.522 (0.0596 - 0.0599)	
0.25 (0.0098) US			1.614 - 1.622 (0.0635 - 0.0639)		
Bushing of small end	Clearance between piston pin and bushing	mm (in)	Standard	0 - 0.022 (0 - 0.0009)	
	Bending limit		mm (in)	0.035 (0.0014)	
	Crank pin	Out-of-roundness	mm (in)	0.003 (0.0001)	
		Cylindricity	mm (in)	0.004 (0.0002)	
		Grinding limit (dia.)	mm (in)	To 51.750 (2.0374)	

Crankshaft	Crank journal	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 (2.0447 - 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)	0.010 - 0.030 (0.0004 - 0.0012)	
Main bearing	Bearing size (Thickness at center) 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 [Crankshaft]

Refer to "Cylinder Block" for removal and installation procedures of the crankshaft. 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
Air Conditioning	

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
Brakes	
Bleeding Sequence	AIR BLEEDING
Disc/Drum Brakes	SPECIFICATION
Torque	See applicable COMPONENT for torque specifications.
Charging	
Generator	
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)
Drive Belts	
Belt Routing & Adjustment	
H4DOTC	INSPECTION
H4SO	INSPECTION
Engine Cooling	
H4DOTC	
General Service Specifications	SPECIFICATION
Radiator Cap Pressure	14-18 psi (.95-1.25 kg/cm ²)
Thermostat R & I	THERMOSTAT
Water Pump R & I	WATER PUMP
H4SO	
General Service Specifications	SPECIFICATION
Radiator Cap Pressure	14-18 psi (.95-1.25 kg/cm ²)
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 ²)
Oil Pressure	At Idle Speed: 14 psi (1.0 kg/cm ²) At 5,000 RPM: 43 psi (3.0 kg/cm ²)
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 ²))
Oil Pressure	At Idle Speed: 14 psi (1.0 kg/cm ²) At 5,000 RPM: 43 psi (3.0 kg/cm ²)
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 Procedure	RELEASING OF FUEL PRESSURE
Fuel Pressure Specification	49-50 psi (338-348 kPa)

(KOER)	
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)