

ENGINE - SPECS**SPECIFICATION [General Description]**


ENGINE SPECIFICATION

Engine	Cylinder arrangement		Horizontally opposed, liquid cooled, 6-cylinder, 4-stroke gasoline engine			
	Valve system mechanism		Chain driven, double overhead camshaft, 4-valve/cylinder			
	Bore x Stroke		mm (in)	89.2 x 80 (3.512 x 3.150)		
	Displacement		cm ³ (cu in)	3,000 (183)		
	Compression ratio		10.7			
	Compression pressure (350 RPM and fully open throttle):		kPa (Kgf/cm ² , psi)	1,275 - 1,471 (13.0 - 15.0, 185 - 213)		
	Number of piston rings		Pressure ring: 2, Oil ring: 1			
	Intake valve timing		Min. advance		Open	BTDC 47°
					Close	
			Max. retard		Open	ATDC 3°
					Close	
	Exhaust valve timing		Open	BBDC 46°		
			Close	ATDC 6°		
	Valve clearance		mm (in)	Intake		0.20 ^{+0.04} _{-0.06} (0.0079 ^{+0.0016} _{-0.0024})
				Exhaust		0.35±0.05 (0.0138±0.0020)
Idle RPM ["P" or "N" range]		RPM		No load	650±50	
				A/C ON	770±50	
Ignition order		1 → 6 → 3 → 2 → 5 → 4				
Ignition timing		BTDC/RPM	15°±8°/650			
Side clearance		mm (in)	Intake		Standard 0.075 - 0.135 (0.0030 - 0.0053)	
			Exhaust		Standard 0.030 - 0.090 (0.0012 - 0.0035)	
Cam lobe height		mm (in)	Intake	HIGH	Standard 42.09 - 42.19 (1.6571 - 1.6610)	
				LOW1	Standard 38.14 - 38.24 (1.5016 - 1.5055)	
				LOW2	Standard 38.14 - 38.24 (1.5016 - 1.5055)	

Camshaft	Cam base circle diameter	mm (in)	Exhaust		Standard	40.45 - 40.55 (1.5925 - 1.5965)
			Intake	HIGH	Standard	32.00 (1.2598)
				LOW1	Standard	31.84 (1.2535)
				LOW2	Standard	31.84 (1.2535)
			Exhaust		Standard	32.00 (1.2598)
	Journal O.D.	mm (in)	Front		Standard	37.946 - 37.963 (1.4939 - 1.4946)
			Except for front		Standard	25.946 - 25.963 (1.0215 - 1.0222)
Oil clearance			mm (in)	Standard	0.037 - 0.072 (0.0015 - 0.0028)	
Cylinder head	Flatness		mm (in)	Standard	0.02 (0.0008)	
	Inner diameter of valve lifter hole			mm (in)	32.994 - 33.016 (1.2990 - 1.2998)	
	Standard height			mm (in)	124±0.05 (4.88±0.0020)	
Valve seat	Seating angle				90°	
	Contacting width	mm (in)	Intake		Standard	1.0 (0.039)
			Exhaust		Standard	1.5 (0.059)
Valve guide	Inside diameter			mm (in)	5.500 - 5.512 (0.2165 - 0.2170)	
	Protrusion above head			mm (in)	11.4 - 11.8 (0.449 - 0.465)	
Valve	Head edge thickness	mm (in)	Intake		Standard	1.0 (0.039)
			Exhaust		Standard	1.2 (0.047)
	Stem outer diameter		mm (in)	Intake		5.455 - 5.470 (0.2148 - 0.2154)
				Exhaust		5.445 - 5.460 (0.2144 - 0.2150)
	Stem oil clearance	mm (in)	Intake		Standard	0.030 - 0.057 (0.0012 - 0.0022)
			Exhaust		Standard	0.040 - 0.067 (0.0016 - 0.0026)
	Overall length		mm (in)	Intake		99.7 (3.925)
Exhaust				105.2 (4.142)		
Outer diameter of valve lifter			mm (in)	32.959 - 32.975 (1.2976 - 1.2982)		
Valve spring	Free length	mm (in)	Intake		Inner	39.55 (1.5571)
					Outer	41.18 (1.6213)
			Exhaust			46.32 (1.8236)
	Squareness		Intake	Inner		2.5°, 1.7 mm (0.067 in) or less
Outer				2.5°, 1.8 mm (0.071 in) or less		

			Exhaust		2.5°, 2.0 mm (0.079 in) or less		
Cylinder block	Standard height			mm (in)	202 (7.95)		
	Cylinder inner diameter	mm (in)	Standard	A	89.205 - 89.215 (3.5120 - 3.5124)		
				B	89.195 - 89.205 (3.5116 - 3.5120)		
	Cylindrically		mm (in)	Standard	0.030 (0.0012)		
	Out-of-roundness		mm (in)	Standard	0.010 (0.0004)		
	Piston clearance		mm (in)	Standard	-0.010 - 0.010 (-0.0004 - 0.0004)		
	Cylinder inner diameter boring limit (diameter)			mm (in)	To 89.715 (3.5321)		
Piston	Outer diameter	mm (in)	Standard	A	89.205 - 89.215 (3.5120 - 3.5124)		
				B	89.195 - 89.205 (3.5116 - 3.5120)		
			0.25 (0.0098) OS				89.445 - 89.465 (3.5215 - 3.5222)
			0.50 (0.0197) OS				89.695 - 89.715 (3.5313 - 3.5321)
Inner diameter of piston pin hole		mm (in)	Standard	22.000 - 22.006 (0.8661 - 0.8664)			
Piston pin	Outer diameter		mm (in)	Standard	21.994 - 22.000 (0.8659 - 0.8661)		
	Standard clearance between piston and piston pin		mm (in)	Standard	0.004 - 0.008 (0.0002 - 0.0003)		
Piston ring	Ring closed gap	mm (in)	Top ring		Standard	0.20 - 0.35 (0.0079 - 0.0138)	
			Second ring		Standard	0.35 - 0.50 (0.0138 - 0.0197)	
			Oil ring		Standard	0.20 - 0.60 (0.0079 - 0.0236)	
	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)	
			Oil ring		Standard	0.045 - 0.125 (0.0018 - 0.0049)	
Connecting rod	Thrust clearance		mm (in)	Standard	0.070 - 0.330 (0.0028 - 0.0130)		
Bearing of large end	Oil clearance		mm (in)	Standard	0.016 - 0.043 (0.0006 - 0.0017)		
	Bearing size (Thickness at center)	mm (in)	Standard		1.490 - 1.506 (0.0587 - 0.0593)		
			0.03 (0.0012) US		1.509 - 1.513 (0.0594 - 0.0596)		

			0.05 (0.0020) US	1.519 - 1.523 (0.0598 - 0.0600)	
Bushing of small end	Clearance between piston pin and bushing		0.25 (0.0098) US	1.619 - 1.623 (0.0637 - 0.0639)	
			Standard	0 - 0.022 (0 - 0.0009)	
Crankshaft	Crank pin and crank journal		Out-of-roundness	mm (in)	
			Cylindrically	mm (in)	
	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	#1, #3, #5, #7	mm (in)	Standard	63.992 - 64.008 (2.5194 - 2.5200)
				0.03 (0.0012) US	63.962 - 63.978 (2.5182 - 2.5188)
				0.05 (0.0020) US	63.942 - 63.958 (2.5174 - 2.5180)
				0.25 (0.0098) US	63.742 - 63.758 (2.5095 - 2.5102)
		#2, #4, #6	mm (in)	Standard	63.992 - 64.008 (2.5194 - 2.5200)
				0.03 (0.0012) US	63.962 - 63.978 (2.5182 - 2.5188)
				0.05 (0.0020) US	63.942 - 63.958 (2.5174 - 2.5180)
				0.25 (0.0098) US	63.742 - 63.758 (2.5095 - 2.5102)
	Thrust clearance		mm (in)	Standard	0.030 - 0.115 (0.0012 - 0.0045)
Oil clearance		mm (in)	Standard	0.010 - 0.030 (0.0004 - 0.0012)	
Main bearing	Bearing size (Thickness at center)	mm (in)	#1, #3, #5, #7	Standard	1.992 - 2.005 (0.0784 - 0.0789)
				0.03 (0.0012) US	2.011 - 2.014 (0.0792 - 0.0793)
				0.05 (0.0020) US	2.021 - 2.024 (0.0796 - 0.0797)
				0.25 (0.0098) US	2.121 - 2.124 (0.0835 - 0.0836)
			#2, #4, #6	Standard	1.996 - 2.009 (0.0786 - 0.0791)
				0.03 (0.0012) US	2.015 - 2.018 (0.0793 - 0.0794)

				0.05 (0.0020) US	2.025 - 2.028 (0.0797 - 0.0798)
				0.25 (0.0098) US	2.125 - 2.128 (0.0837 - 0.0838)
 NOTE: OS: Oversize US: Undersize					

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 . >

SPECIFICATION [Intake And Exhaust Valve]

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

SPECIFICATION [Crankshaft]

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

SPECIFICATIONS INDEX

LEGACY & OUTBACK SPECIFICATIONS INDEX

System	Specification/Procedure
Air Conditioning	
Service	SPECIFICATION
Torque	COMPONENT
Axle Shaft Nut (Front)	162 Ft.lb (22.4 kgf-m, 220 N.m)
Axle Shaft Nut (Rear)	177 Ft.lb (24.5 kgf-m, 240 N.m)
Battery	NA
Brakes	
Bleeding Sequence	AIR BLEEDING
Disc/Drum Brakes	SPECIFICATION
Torque	See applicable COMPONENT for torque specifications.
Charging	
Generator	
H4DOTC, H4SO	SPECIFICATION

& H6DO		
Torque		
H4DOTC, H4SO & H6DO	INSTALLATION	
Pulley	80 Ft.lb (11 kgf-m, 108 N.m)	
Drive Belts		
Adjustment		
H4DOTC	INSPECTION	
H4SO	INSPECTION	
H6DO	INSPECTION	
Belt Routing		
H4DOTC	V-BELT	
H4SO	V-BELT	
H6DO	V-BELT	
Engine Cooling		
General Service Specifications		
H4DOTC	SPECIFICATION	
H4SO	SPECIFICATION	
H6DO	SPECIFICATION	
Radiator Cap Pressure	14-18 psi (.95-1.25 kg/cm ²)	
Thermostat R & I		
H4DOTC	THERMOSTAT	
H4SO	THERMOSTAT	
H6DO	THERMOSTAT	
Water Pump R & I		
H4DOTC	WATER PUMP	
H4SO	WATER PUMP	
H6DO	WATER PUMP	
Engine Mechanical		
Compression		
H4DOTC	142-171 psi (981-1,177 kPa (10-12 kg/cm ²)	
H4SO	148-185 psi (1,020-1,275 kPa (10.4-13.0 kgf/cm ²)	

H6DO		185-213 psi (1,275-1,471 kPa (13.0-15.0 kgf/cm ²))
Oil Pressure		
At Idle Speed	H4DOTC & H4SO 14 psi (1.0 kg/cm ²) H6DO 23 psi (3.0 kg/cm ²)	
At 5,000 RPM	H4DOTC & H4SO 43 psi (3.0 kg/cm ²) H6DO 85 psi (6.0 kg/cm ²)	
Overhaul		
H4DOTC		SPECIFICATION
H4SO		SPECIFICATION
H6DO		SPECIFICATION
Torque		
H4DOTC		See applicable COMPONENT for torque specifications.
H4SO		See applicable COMPONENT for torque specifications.
H6DO		See applicable COMPONENT for torque specifications.
Fluid Specifications		See FLUIDS under MAINTENANCE tab.
Flywheel/Flex Plate (Drive Plate) Torque		
4 Cylinder		53 Ft.lbs (72 N.m)
6 Cylinder		60 Ft.lbs (81 N.m)
Fuel System		
Fuel Pressure Test Procedure		
H4DOTC		FUEL PRESSURE
H4SO		FUEL PRESSURE
H6DO		FUEL PRESSURE
Fuel Filter Location		In-Tank Type
Ignition		
Firing Order & Cylinder Identification		
H4DOTC & H4SO	FIRING ORDER & CYLINDER IDENTIFICATION	
H6DO	FIRING ORDER & CYLINDER	

IDENTIFICATION	
Ignition Wires (Resistance)	
H4DOTC	Coil On Plug
H4SO	SPARK PLUG CORD
H6DO	Coil On Plug
Ignition Wires (Routing)	NA
Spark Plug	
H4DOTC	SPARK PLUG
H4SO	SPARK PLUG
H6DO	SPARK PLUG
Starting	
Starter	
H4SO, H4DOTC & H6DO	SPECIFICATION
Torque	37 Ft.lb (5.1 kgf-m, 50 N.m)
Wheel Alignment	
Legacy & Outback	
Adjustment Specifications	
Front	SPECIFICATION
Rear	SPECIFICATION
Torque	
Front	COMPONENT
Rear	COMPONENT
Wheel & Tire	
Wheel Lug Nut Torque	88.5 Ft.lb (12.2 kgf-m, 120 N.m)