

**1. Engine**  
**A: SPECIFICATIONS**

Engine	Model		2200 cc
	Type		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine
	Valve arrangement		Belt driven, single over-head camshaft, 4-valve/cylinder
	Bore x Stroke		mm (in) 96.9 x 75.0 (3.815 x 2.953)
	Displacement		cm <sup>3</sup> (cu in) 2,212 (135.0)
	Compression ratio		9.7
	Compression pressure (at 200 — 300 rpm)		kPa (kg/cm <sup>2</sup> , psi) 1,079 — 1,275 (11.0 — 13.0, 156 — 185)
	Number of piston rings		Pressure ring: 2, Oil ring: 1
	Intake valve timing	Opening	4° BTDC
		Closing	52° ABDC
	Exhaust valve timing	Opening	48° BBDC
		Closing	12° ATDC
	Valve clearance	Intake	mm (in) 0.20±0.02 (0.0079±0.0008)
		Exhaust	mm (in) 0.25±0.02 (0.0098±0.0008)
	Idling speed [At neutral position on MT, or "P" or "N" position on AT]		rpm 700±100 (No load) 850±50 (A/C switch ON)
Firing order		1 → 3 → 2 → 4	
Ignition timing		BTDC/rpm 14°±8°/700 (MT), 20°±8°/700 (AT)	

**B: SERVICE DATA**

Belt tension adjuster	Protrusion of adjuster rod			15.4 — 16.4 mm	(0.606 — 0.646 in)				
Belt tensioner	Spacer O.D.			16 mm	(0.63 in)				
	Tensioner bush I.D.			16.16 mm	(0.6362 in)				
	Clearance between spacer and bush			STD	0.117 — 0.180 mm	(0.0046 — 0.0071 in)			
				Limit	0.230 mm	(0.0091 in)			
	Side clearance of spacer			STD	0.37 — 0.54 mm	(0.0146 — 0.0213 in)			
Limit				0.8 mm	(0.031 in)				
Valve rocker arm	Clearance between shaft and arm			STD	0.020 — 0.054 mm	(0.0008 — 0.0021 in)			
				Limit	0.10 mm	(0.0039 in)			
Camshaft	Bend limit			0.025 mm	(0.0010 in)				
	Thrust clearance			STD	0.030 — 0.260 mm	(0.0012 — 0.0102 in)			
				Limit	0.35 mm	(0.0138 in)			
	Cam lobe height			Intake	STD	32.244 — 32.344 mm	(1.2694 — 1.2734 in)		
					Limit	32.094 mm	(1.2635 in)		
				Exhaust	STD	31.964 — 32.064 mm	(1.2584 — 1.2624 in)		
					Limit	31.814 mm	(1.2525 in)		
	Camshaft journal O.D.			RH	Front	LH	Rear	31.935 — 31.950 mm	(1.2573 — 1.2579 in)
							Center	37.435 — 37.450 mm	(1.4738 — 1.4744 in)
							Rear	37.935 — 37.950 mm	(1.4935 — 1.4941 in)
	Camshaft journal hole I.D.			RH	Front	LH	Rear	32.005 — 32.025 mm	(1.2600 — 1.2608 in)
							Center	37.505 — 37.525 mm	(1.4766 — 1.4774 in)
							Rear	38.005 — 38.025 mm	(1.4963 — 1.4970 in)
	Oil clearance						STD	0.055 — 0.090 mm	(0.0022 — 0.0035 in)
Limit							0.10 mm	(0.0039 in)	
Cylinder head	Surface warpage limit			0.05 mm	(0.0020 in)				
	Surface grinding limit			0.1 mm	(0.004 in)				
	Standard height			98.3 mm	(3.870 in)				
Valve set	Refacing angle			90°					
	Contacting width			Intake	STD	0.7 mm	(0.028 in)		
					Limit	1.4 mm	(0.055 in)		
				Exhaust	STD	1.4 mm	(0.055 in)		
					Limit	1.8 mm	(0.071 in)		
Valve guide	Inner diameter			6.000 — 6.012 mm	(0.2362 — 0.2367 in)				
	Protrusion above head			17.5 — 18.0 mm	(0.689 — 0.709 in)				
Valve	Head edge thickness			Intake	STD	1.0 mm	(0.039 in)		
					Limit	0.8 mm	(0.031 in)		
				Exhaust	STD	1.2 mm	(0.047 in)		
					Limit	0.8 mm	(0.031 in)		
	Stem diameter				Intake	5.950 — 5.965 mm	(0.2343 — 0.2348 in)		
					Exhaust	5.945 — 5.960 mm	(0.2341 — 0.2346 in)		
	Stem oil clearance			STD	Intake	0.035 — 0.062 mm	(0.0014 — 0.0024 in)		
					Exhaust	0.040 — 0.067 mm	(0.0016 — 0.0026 in)		
Limit					—	0.15 mm	(0.0059 in)		
Overall length				Intake	101.0 mm	(3.976 in)			
				Exhaust	101.2 mm	(3.984 in)			

STD: Standard I.D.: Inner Diameter O.D.: Outer Diameter

Valve spring	Free length		44.05 mm	(1.7342 in)	
	Squareness		2.5°, 1.9 mm	(0.075 in)	
	Tension/spring height		174.6 — 200.1 N (17.8 — 20.4 kg, 39.2 — 45.0 lb)/36.0 mm (1.417 in) 405.0 — 458.0 N (41.3 — 46.7 kg, 91.1 — 103.0 lb)/28.2 mm (1.110 in)		
Cylinder block	Surface warpage limit (mating with cylinder head)			0.05 mm	(0.0020 in)
	Surface grinding limit			0.1 mm	(0.004 in)
	Cylinder bore	STD	A	96.905 — 96.915 mm	(3.8151 — 3.8155 in)
			B	96.895 — 96.905 mm	(3.8148 — 3.8151 in)
	Taper	STD		0.015 mm	(0.0006 in)
		Limit		0.050 mm	(0.0020 in)
	Out-of-roundness	STD		0.010 mm	(0.0004 in)
		Limit		0.050 mm	(0.0020 in)
	Piston clearance	STD		0.010 — 0.030 mm	(0.0004 — 0.0012 in)
Limit		0.050 mm	(0.0020 in)		
Enlarging (boring) limit			0.5 mm	(0.020 in)	
Piston	Outer diameter	STD	A	96.885 — 96.895 mm	(3.8144 — 3.8148 in)
			B	96.875 — 96.885 mm	(3.8140 — 3.8144 in)
		0.25 mm (0.0098 in) OS		97.115 — 97.145 mm	(3.8234 — 3.8246 in)
		0.50 mm (0.0197 in) OS		97.365 — 97.395 mm	(3.8333 — 3.8344 in)
Piston pin	Standard clearance between piston pin and hole in piston		STD	0.004 — 0.010 mm	(0.0002 — 0.0004 in)
			Limit	0.020 mm	(0.0008 in)
	Degree of fit			Piston pin must be fitted into position with thumb at 20°C (68°F).	
Piston ring	Piston ring gap	Top ring	STD	0.20 — 0.35 mm	(0.0079 — 0.0138 in)
			Limit	1.0 mm	(0.039 in)
		Second ring	STD	0.20 — 0.50 mm	(0.0079 — 0.0197 in)
			Limit	1.0 mm	(0.039 in)
		Oil ring	STD	0.20 — 0.70 mm	(0.0079 — 0.0276 in)
			Limit	1.5 mm	(0.059 in)
	Clearance between piston ring and piston ring groove	Top ring	STD	0.040 — 0.080mm	(0.0016 — 0.0031 in)
			Limit	0.15 mm	(0.0059 in)
Second ring		STD	0.030 — 0.070 mm	(0.0012 — 0.0028 in)	
		Limit	0.15 mm	(0.0059 in)	
Connecting rod	Bend twist per 100 mm (3.94 in) in length		Limit	0.10 mm	(0.0039 in)
	Side clearance		STD	0.070 — 0.330 mm	(0.0028 — 0.0130 in)
			Limit	0.4 mm	(0.016 in)
Connecting rod bearing	Oil clearance		STD	0.015 — 0.045 mm	(0.0006 — 0.0018 in)
			Limit	0.05 mm	(0.0020 in)
	Thickness at center portion		STD	1.492 — 1.501 mm	(0.0587 — 0.0591 in)
			0.03 mm (0.0012 in) US	1.510 — 1.513 mm	(0.0594 — 0.0596 in)
			0.05 mm (0.0020 in) US	1.520 — 1.523 mm	(0.0598 — 0.0600 in)
			0.25 mm (0.0098 in) US	1.620 — 1.623 mm	(0.0638 — 0.0639 in)
Connecting rod bushing	Clearance between piston pin and bushing		STD	0 — 0.022 mm	(0 — 0.0009 in)
			Limit	0.030 mm	(0.0012 in)

STD: Standard OS: Oversize US: Undersize

# SPECIFICATIONS AND SERVICE DATA

**2-3**

1. Engine

Crankshaft	Bend limit		0.035 mm	(0.0014 in)	
	Crank pin and crank journal	Out-of-roundness	0.030 mm (0.0012 in) or less		
		Grinding limit	0.25 mm	(0.0098 in)	
	Crank pin outer diameter		STD	51.984 — 52.000 mm	(2.0466 — 2.0472 in)
			0.03 mm (0.0012 in) US	51.954 — 51.970 mm	(2.0454 — 2.0461 in)
			0.05 mm (0.0020 in) US	51.934 — 51.950 mm	(2.0446 — 2.0453 in)
			0.25 mm (0.0098 in) US	51.734 — 51.750 mm	(2.0368 — 2.0374 in)
	Crank journal outer diameter	#1, #5	STD	59.992 — 60.008 mm	(2.3619 — 2.3625 in)
			0.03 mm (0.0012 in) US	59.962 — 59.978 mm	(2.3607 — 2.3613 in)
			0.05 mm (0.0020 in) US	59.934 — 59.950 mm	(2.3596 — 2.3602 in)
			0.25 mm (0.0098 in) US	59.742 — 59.758 mm	(2.3520 — 2.3527 in)
		#2, #3, #4	STD	59.992 — 60.008 mm	(2.3619 — 2.3625 in)
			0.03 mm (0.0012 in) US	59.954 — 59.970 mm	(2.3604 — 2.3610 in)
			0.05 mm (0.0020 in) US	59.934 — 59.950 mm	(2.3596 — 2.3602 in)
			0.25 mm (0.0098 in) US	59.734 — 59.750 mm	(2.3517 — 2.3524 in)
Thrust clearance		STD	0.030 — 0.115 mm	(0.0012 — 0.0045 in)	
		Limit	0.25 mm	(0.0098 in)	
Oil clearance	#1, #5	STD	0.003 — 0.030 mm	(0.0001 — 0.0012 in)	
	#2, #3, #4	STD	0.010 — 0.033 mm	(0.0004 — 0.0013 in)	
	#1, #3, #5	Limit	0.040 mm	(0.0016 in)	
	#2, #4	Limit	0.035 mm	(0.0014 in)	
Crankshaft bearing	Crankshaft bearing thickness	#1, #5	STD	1.998 — 2.011 mm	(0.0787 — 0.0792 in)
			0.03 mm (0.0012 in) US	2.017 — 2.020 mm	(0.0794 — 0.0795 in)
			0.05 mm (0.0020 in) US	2.027 — 2.030 mm	(0.0798 — 0.0799 in)
			0.25 mm (0.0098 in) US	2.127 — 2.130 mm	(0.0837 — 0.0839 in)
		#2, #3, #4	STD	2.000 — 2.013 mm	(0.0787 — 0.0793 in)
			0.03 mm (0.0012 in) US	2.019 — 2.022 mm	(0.0795 — 0.0796 in)
			0.05 mm (0.0020 in) US	2.029 — 2.032 mm	(0.0799 — 0.0800 in)
			0.25 mm (0.0098 in) US	2.129 — 2.132 mm	(0.0838 — 0.0839 in)

STD: Standard US: Undersize