

General Description

MECHANICAL

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A: SPECIFICATION

Engine	Type		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine			
	Valve arrangement		Belt driven, double overhead camshaft, 4-valve/cylinder			
	Bore × Stroke		mm (in)	99.5 × 79.0 (3.92 × 3.11)		
	Piston displacement		cm ³ (cu in)	2,457 (149.94)		
	Compression ratio		8.4			
	Compression pressure (at 200 — 300 rpm)		kPa (kgf/cm ² , psi)	981 — 1,177 (10 — 12, 142 — 171)		
	Number of piston rings		Pressure ring: 2, Oil ring: 1			
	Intake valve timing		Opening	Max. retard	5° ATDC	
				Max. advance	15° BTDC	
			Closing	Max. retard	65° ABDC	
				Max. advance	45° ABDC	
	Exhaust valve timing		Opening		55° BBDC	
			Closing		5° ATDC	
	Valve clearance		mm (in)	Intake	STD	0.20±0.02 (0.0079±0.0008)
				Exhaust	STD	0.35±0.02 (0.0138±0.0008)
Idling speed [At neutral position on MT or "P" or "N" range on AT]		rpm	No load	MT: 700±100 AT: 700±100		
			A/C ON	A/C Refrigerant pressure (LOW)	MT: 725±100 AT: 750±100	
				A/C Refrigerant pressure (HIGH)	MT: 800±100 AT: 825±100	
Firing order		1 → 3 → 2 → 4				
Ignition timing		BTDC/rpm	MT model	17°±10°/700		
			AT model	17°±10°/700		

NOTE:

STD: Standard I.D.: Inner Diameter O.D.: Outer Diameter OS: Oversize US: Undersize

Belt tension adjuster	Protrusion of adjuster rod		mm (in)	5.2 — 6.2 (0.205 — 0.244)	
Belt tensioner	Spacer O.D.		mm (in)	17.955 — 17.975 (0.7069 — 0.7077)	
	Tensioner bushing I.D.		mm (in)	18.0 — 18.08 (0.7087 — 0.7118)	
	Clearance between spacer and bushing	mm (in)	STD	0.025 — 0.125 (0.0010 — 0.0049)	
			Limit	0.175 (0.069)	
	Side clearance of spacer	mm (in)	STD	0.2 — 0.55 (0.0079 — 0.0217)	
Limit			0.81 (0.0319)		

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Camshaft	Bend limit		mm (in)	0.020 (0.0008)		
	Thrust clearance		mm (in)	STD	0.068 — 0.116 (0.0027 — 0.0046)	
				Limit	0.14 (0.0055)	
	Cam lobe height		mm (in)	Intake	STD	46.55 — 46.65 (1.833 — 1.837)
					Limit	46.45(1.829)
			Exhaust	STD	46.75 — 46.85 (1.841 — 1.844)	
				Limit	46.65(1.837)	
	Journal O.D.		mm (in)	STD	Front	37.946 — 37.963 (1.4939 — 1.4946)
					Center rear	29.946 — 29.963 (1.1790 — 1.1796)
	Oil clearance		mm (in)	STD	0.037 — 0.072 (0.0015 — 0.0028)	
Limit				0.10 (0.0039)		
Cylinder head	Surface warpage limit (mating with cylinder head)			mm (in)	0.035 (0.0014)	
	Surface grinding limit			mm (in)	0.3 (0.012)	
	Standard height			mm (in)	127.5 (5.02)	
Valve seat	Refacing angle				90°	
	Contacting width		mm (in)	Intake	STD	0.6 — 1.4 (0.024 — 0.055)
					Limit	1.7 (0.067)
	Exhaust		mm (in)	STD	1.2 — 1.8 (0.047 — 0.071)	
Limit				2.2 (0.087)		
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	STD	1.0 — 1.4 (0.039 — 0.055)
					Limit	0.8 (0.031)
	Exhaust		mm (in)	STD	1.3 — 1.7 (0.051 — 0.067)	
				Limit	0.8 (0.031)	
	Stem diameter		mm (in)	Intake	5.955 — 5.970 (0.2344 — 0.2350)	
				Exhaust	5.945 — 5.960 (0.2341 — 0.2346)	
	Stem oil clearance		mm (in)	STD	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 (4.120)		
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, lbf)/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)/26.50 (1.043)		
Cylinder block	Surface warpage limit (mating with cylinder head)			mm (in)	0.025 (0.00098)	
	Surface grinding limit			mm (in)	0.1 (0.004)	
	Standard height			mm (in)	201.0 (7.91)	
	Inside diameter		mm (in)	STD	A	99.505 — 99.515 (3.9175 — 3.9179)
					B	99.495 — 99.505 (3.9171 — 3.9175)
	Taper		mm (in)	STD	0.015 (0.0006)	
				Limit	0.050 (0.0020)	
	Out-of-roundness		mm (in)	STD	0.010 (0.0004)	
				Limit	0.050 (0.0020)	
	Piston clearance		mm (in)	STD	-0.010 — 0.010 (-0.0004 — 0.0004)	
Limit				0.030 (0.0012)		
Cylinder enlarging (boring) limit (dia.)			mm (in)	To 100.005 (3.937)		

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Piston	Outer diameter	mm (in)	STD	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 pin and hole in piston	mm (in)	STD		0.004 — 0.008 (0.0002 — 0.0003)
			Limit		0.020 (0.0008)
	Degree of fit		Piston pin must be fitted into position with thumb at 20°C (68°F).		
Piston ring	Piston ring gap	mm (in)	Top ring	STD	Outer circle side: 0.20 — 0.25 (0.0079 — 0.0098)
				Limit	Inner circle side: 0.20 — 0.30 (0.0079 — 0.0117)
			Second ring	STD	0.37 — 0.52 (0.015 — 0.020)
				Limit	1.0 (0.039)
	Oil ring	STD	0.20 — 0.50 (0.0079 — 0.0197)		
		Limit	1.5 (0.059)		
	Clearance between piston ring and piston ring groove	mm (in)	Top ring	STD	0.04 — 0.08 (0.0016 — 0.0031)
				Limit	0.15 (0.0059)
Second ring			STD	0.030 — 0.070 (0.0012 — 0.0028)	
			Limit	0.15 (0.0059)	
Connecting rod	Bend twist per 100 mm (3.94 in) in length	mm (in)	Limit	0.10 (0.0039)	
	Side clearance	mm (in)	STD	0.070 — 0.330 (0.0028 — 0.0130)	
Limit			0.4 (0.016)		
Connecting rod bearing	Oil clearance	mm (in)	STD	0.017 — 0.045 (0.0007 — 0.0018)	
			Limit	0.05 (0.0020)	
	Thickness at center portion	mm (in)	STD	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)	
Connecting rod bushing	Clearance between piston pin and bushing	mm (in)	STD	0 — 0.022 (0 — 0.0009)	
			Limit	0.030 (0.0012)	

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Crankshaft	Bend limit		mm (in)	0.035 (0.0014)	
	Crank pin	mm (in)	Out-of-roundness		0.003 (0.0001)
			Cylindricality		0.004 (0.0002)
			Grinding limit (diameter)		To 51.750 (2.0374)
			Out-of-roundness		0.005 (0.0002)
	Crank journal	mm (in)	Cylindricality		0.006 (0.0002)
			Grinding limit (diameter)		To 59.750 (2.3524)
			STD		51.984 — 52.000 (2.0466 — 2.0472)
	Crank pin outer diameter	mm (in)	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)
			STD		59.992 — 60.008 (2.3619 — 2.3625)
	Crank journal outer diameter	mm (in)	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)
			STD		0.030 — 0.115 (0.0012 — 0.0045)
Side clearance	mm (in)	Limit		0.25 (0.0098)	
		STD		0.010 — 0.030 (0.0004 — 0.0012)	
Oil clearance	mm (in)	Limit		0.40 (0.016)	
		STD		1.998 — 2.011 (0.0787 — 0.0792)	
Main bearing	Thickness at center	#1, #3	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)
			STD		2.000 — 2.013 (0.0787 — 0.0793)
		#2, #4, #5	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)
			STD		2.000 — 2.013 (0.0787 — 0.0793)