

1503 ACE ENGINE

ENGINE			
Engine type			ROTAX® 1503 4-TEC™, 4-stroke, Single Over Head Camshaft (SOHC)
Declared Power		130	97 kW @ 7300 RPM
		155	106 kW @ 7300 RPM
		230	163 kW @ 8000 RPM
Induction		130 155	Naturally-Aspirated
		230	Supercharged intercooled
Number of cylinders			3
Number of valves			12 valves with hydraulic lifters (no adjustment)
Bore			100 mm (3.9 in)
Stroke			63.4 mm (2.5 in)
Displacement			1 493.8 cm³ (91 in³)
Compression ratio		130 155	10.6:1
		230	8.4:1
Maximum HP RPM		130 155	7300 RPM
		230	8000 RPM
Intake valve opening			0° BTDC
Intake valve closing			50° ABDC
Exhaust valve opening			50° BBDC
Exhaust valve closing			0° ATDC
Valve stem diameter	Intake	New	5.961 mm to 5.975 mm (.2347 in to .2352 in)
		Service limit	5.930 mm (.233 in)
	Exhaust	New	5.946 mm to 5.960 mm (.2341 in to .2346 in)
		Service limit	5.930 mm (.233 in)
Valve guide inner diameter		New	5.994 mm to 6.018 mm (.236 in to .2369 in)
		Service limit	6.060 mm (.2386 in)
Valve spring free length	Inner	New	41.02 mm (1.615 in)
		Service limit	38.80 mm (1.528 in)
	Outer	New	45.45 mm (1.789 in)
		Service limit	43.00 mm (1.693 in)

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Valve seat contact width	Intake	New		1.10 mm to 1.30 mm (.043 in to .051 in)
		Service limit		1.60 mm (.063 in)
	Exhaust	New		1.25 mm to 1.55 mm (.049 in to .061 in)
		Service limit		1.80 mm (.071 in)
Rocker arm inner diameter		New		20.007 mm to 20.020 mm (.7877 in to .7882 in)
		Service limit		20.050 mm (.7894 in)
Rocker arm shaft diameter		New		19.980 mm to 19.993 mm (.7866 in to .7871 in)
		Service limit		19.970 mm (.7862 in)
Cylinder head maximum warpage		Service limit		0.15 mm (.006 in)
Piston ring type		1 st		Upper compression ring, rectangular
		2 nd		Lower compression ring, tapered face
		3 rd		Oil scraper ring
Ring end gap	Rectangular	New		0.30 mm to 0.50 mm (.012 in to .02 in)
		Service limit	130 155	1.50 mm (.059 in)
			230	1.20 mm (.047 in)
	Taper-face	New		0.35 mm to 0.55 mm (.014 in to .02 in)
		Service limit	130 155	1.50 mm (.059 in)
			230	1.20 mm (.047 in)
	Oil scraper ring	New		0.35 mm to 0.50 mm (.014 in to .02 in)
		Service limit	130 155	1.50 mm (.059 in)
			230	1.20 mm (.047 in)
Ring/piston groove clearance	Rectangular	New		0.025 mm - 0.070 mm (.001 in - .0028 in)
		Service limit		0.150 mm (.0059 in)
	Taper-face	New		0.015 mm - 0.060 mm (.0006 in - .0024 in)
		Service limit		0.150 mm (.0059 in)
	Oil scraper ring All	New	130 155	0.020 mm - 0.055 mm (.0008 in - .0022 in)
			230	0.010 mm to 0.180 mm (.0004 in to .0071 in)
		Service limit	130 155	0.150 mm (.0059 in)
			230	0.200 mm (.0079 in)

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Piston measurement		New	130 155	99.951 mm to 99.969 mm (3.9351 in to 3.9358 in)
			230	99.931 mm to 99.949 mm (3.9343 in to 3.935 in)
		Service limit		99.900 mm (3.9331 in)
Piston/cylinder wall clearance		New	130 155	0.024 mm to 0.056 mm (.001 in to .002 in)
			230	0.044 mm to 0.076 mm (.0017 in to .003 in)
		Service limit		0.100 mm (.0039 in)
Cylinder taper		New maximum		0.038 mm (.0015 in)
		Service limit		0.100 mm (.0039 in)
Cylinder out of round (maximum)		New maximum		0.008 mm (.0003 in)
		Service limit		0.025 mm (.001 in)
Camshaft bearing journal diameter	Front	New		24.919 mm to 24.940 mm (.9811 in to .9819 in)
		Service limit		24.890 mm (.9799 in)
	PTO and center	New		39.892 mm to 39.905 mm (1.5706 in to 1.5711 in)
		Service limit		39.880 mm (1.5701 in)
Camshaft bearing inner diameter	Front	New		25.000 mm to 25.013 mm (.9843 in to .9848 in)
		Service limit		25.050 mm (.9862 in)
	PTO and center	New		40.000 mm to 40.020 mm (1.5748 in to 1.5756 in)
		Service limit		40.050 mm (1.5768 in)
Cam lobe height	Intake	New		31.540 mm to 31.740 mm (1.2417 in to 1.2496 in)
		Service limit		31.50 mm (1.2402 in)
	Exhaust	New		31.430 mm to 31.630 mm (1.2374 in to 1.2453 in)
		Service limit		31.380 mm (1.2354 in)
Crankshaft deflection		Maximum		0.05 mm (.002 in)
Crankshaft axial clearance		New		0.080 mm to 0.220 mm (.0031 in to .0087 in)
		Service limit		0.35 mm (.014 in)
Crankshaft bearing journal diameter		New		49.991 mm to 50.01 mm (1.9681 in to 1.9689 in)
		Service limit		49.950 mm (1.9665 in)
Crankshaft radial clearance		Service limit		0.07 mm (.0028 in)
Crankshaft bearing inside diameter		Service limit		50.10 mm (1.9724 in)

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Crankshaft pin diameter	New		45.032 mm to 45.048 mm (1.7729 in to 1.7735 in)
	Service limit		45.029 mm (1.7728 in)
Crankshaft pin radial clearance	Service limit		0.09 mm (.0035 in)
Connecting rod big end diameter	Service limit		45.080 mm (1.7748 in)
Connecting rod big end radial play	Service limit		0.090 mm (.0035 in)
Connecting rod big end axial play	New		0.100 mm to 0.352 mm (.004 in to .014 in)
	Service limit		0.500 mm (.0197 in)
Connecting rod small end diameter	New		23.010 mm to 23.020 mm (.9059 in to .9063 in)
	Service limit		23.070 mm (.9083 in)
Connecting rod small end radial play	Service limit		0.080 mm (.0031 in)
Piston pin diameter	New		22.996 mm to 23.000 mm (.9054 in to .9055 in)
	Service limit		22.990 mm (.9051 in)
Balancer shaft journal diameter	New		31.984 mm to 32.000 mm (1.2592 in to 1.2598 in)
	Service limit		31.950 mm (1.2579 in)
Balancer shaft bearing inside diameter	Service limit		32.11 mm (1.2642 in)
Balancer shaft radial clearance	Service limit		0.070 mm (.0028 in)
Balancer shaft axial clearance	New		0.020 mm to 0.250 mm (.0008 in to .0098 in)
	Service limit		0.35 mm (.014 in)
Supercharger clutch slipping moment	New supercharger	230	9 N•m to 14 N•m (80 lbf•in to 124 lbf•in)
	Break-in supercharger	230	8 N•m to 12 N•m (71 lbf•in to 106 lbf•in)

AIR INTAKE SYSTEM	
Intake spark arrester	Tubular, wire screen

LUBRICATION SYSTEM		
Lubrication	Oil type	XPS 4-stroke synthetic blend oil (P/N 293 600 121) or a 10W40 mineral engine oil compatible with wet clutches (JASO MA certified oils)
	Capacity	3 L (3.2 qt (U.S. liq.)) oil change w/filter 4.5 L (4.8 qt (U.S. liq.)) total
	Type	Dry sump (2 oil pumps). Replaceable oil filter. Water-cooled oil cooler

LUBRICATION SYSTEM		
Oil pressure	Idle (cold)	448 kPa - 648 kPa (65 PSI - 87 PSI)
	Idle (at 80°C (176°F))	Min. 228 kPa (33 PSI)
	4000 - 7500 (at 100°C (212°F))	400 kPa - 496 kPa (58 PSI - 72 PSI)
Oil pressure regulator outer compression spring free length	New	60 mm (2.362 in)
	Service limit	57 mm (2.244 in)
Oil temperature sensor	Limp home mode activation	Above 95°C (203°F)
Oil pump radial clearance	Service limit	0.25 mm (.0098 in)
Oil pump axial clearance	Service limit	0.1 mm (.004 in)
COOLING SYSTEM		
Type		Closed loop cooling system
Coolant		Ethylene-glycol / distilled water mix (50%/50%). Use premix coolant from BRP (Long life antifreeze) or a coolant specially formulated for aluminum engines
Thermostat		87°C (189°F)
Monitoring beeper setting		110°C (230°F)
FUEL SYSTEM		
Fuel injection type		Multipoint fuel injection with iTC (intelligent Throttle Control). Single throttle body (62 mm) with an actuator
Fuel pressure		386 kPa to 414 kPa (56 PSI to 60 PSI)
Fuel injector	Quantity	3
Idle speed		1750 ± 50 RPM (not adjustable)
ELECTRICAL SYSTEM		
Magneto generator output		14V 420W @ 6000 RPM
Stator		0.1 to 1.0 Ω
Ignition system type		IDI (Inductive Discharge Ignition)
Ignition timing		Variable (electronically controlled)
Spark plug	Make and type	NGK DCPR8E
	Gap	0.8 mm to 0.9 mm (.031 in to .035 in)
Ignition coil	Primary	0.80 to 0.97 Ω
	Secondary	N.A.
Engine speed limiter setting		8300 RPM