

# TECHNICAL DATA

## SI\* METRIC INFORMATION GUIDE

BASE UNITS			
DESCRIPTION	UNIT	SYMBOL	
length .....	meter .....	m	
mass .....	kilogram .....	kg	
force .....	newton .....	N	
liquid .....	liter .....	L	
temperature .....	Celsius .....	°C	
pressure .....	kilopascal .....	kPa	
torque .....	newton•meter .....	N•m	
speed .....	kilometer per hour .....	km/h	
PREFIXES			
PREFIX	SYMBOL	MEANING	VALUE
kilo .....	k .....	one thousand .....	1 000
centi .....	c .....	one hundredth .....	0.01
milli .....	m .....	one thousandth .....	0.001
micro .....	μ .....	one millionth .....	0.000001
CONVERSION FACTORS			
TO CONVERT	TO †	MULTIPLY BY	
in .....	mm .....	25.4	
in .....	cm .....	2.54	
in <sup>2</sup> .....	cm <sup>2</sup> .....	6.45	
in <sup>3</sup> .....	cm <sup>3</sup> .....	16.39	
ft .....	m .....	0.3	
oz .....	g .....	28.35	
lb .....	kg .....	0.45	
lbf .....	N .....	4.4	
lbf•in .....	N•m .....	0.11	
lbf•ft .....	N•m .....	1.36	
lbf•ft .....	lbf•in .....	12	
PSI .....	kPa .....	6.89	
imp. oz .....	U.S. oz .....	0.96	
imp. oz .....	mL .....	28.41	
imp. gal .....	U.S. gal .....	1.2	
imp. gal .....	L .....	4.55	
U.S. oz .....	mL .....	29.57	
U.S. gal .....	L .....	3.79	
MPH .....	km/h .....	1.61	
Fahrenheit .....	Celsius .....	(°F - 32) ÷ 1.8	
Celsius .....	Fahrenheit .....	(°C × 1.8) + 32	

\* The international system of units abbreviates SI in all languages.

† To obtain the inverse sequence, divide by the given factor. To convert **millimeters** to **inches**, divide by 25.4.

**NOTE:** Conversion factors are rounded off to 2 decimals for easier use.

## Section 08 TECHNICAL DATA

### Subsection 02 (ENGINE)

VEHICLE MODEL		LEGEND V-1000 SPORT AND GRAND TOURING V-1000 SPORT	
<b>ENGINE</b>			
Engine type		BOMBARDIER-ROTAX 1004 4-TEC, 4-stroke, Over Head Camshaft (OHC), liquid cooled	
Cylinder arrangement and quantity		V2	
Quantity of valves per cylinder		4 valves with hydraulic lifters (no adjustment)	
Bore	Standard	100 mm (3.937 in)	
Stroke		63.4 mm (2.496 in)	
Displacement		995.90 cm <sup>3</sup> (60.774 in <sup>3</sup> )	
Compression ratio		10.3 ± 0.5	
Decompressor type		Automatic	
Engine speed for transmission calibration ①		6000 to 7250 RPM progressive	
Lubrication		Dry sump with replaceable oil filter	
Intake valve opening		10° BTDC	
Intake valve closing		45° ABDC	
Exhaust valve opening		50° BBDC	
Exhaust valve closing		5° ATDC	
Starting system		Electric start	
Valve stem diameter	Intake	Minimum (new)	5.961 mm (.2347 in)
		Maximum (new)	5.975 mm (.2352 in)
		Wear limit	5.930 mm (.2330 in)
	Exhaust	Minimum (new)	5.946 mm (.2341 in)
		Maximum (new)	5.960 mm (.2346 in)
		Wear limit	5.930 mm (.2335 in)
Valve guide diameter		Wear limit	6.060 mm (.2386 in)
Valve spring free length	Inner	Nominal (new)	41.02 mm (1.615 in)
		Wear limit	38.8 mm (1.499 in)
	Outer	Nominal (new)	45.45 mm (1.789 in)
		Wear limit	43 mm (1.693 in)
Valve seat contact width	Intake	Nominal (new)	1.1 to 1.3 mm (.043 to .051 in)
		Wear limit	1.6 mm (.063 in)
	Exhaust	Nominal (new)	1.25 to 1.55 mm (.049 to .061 in)
		Wear limit	1.8 mm (.071 in)
Rocker arm bore diameter		Minimum (new)	20.007 mm (.7876 in)
		Maximum (new)	20.020 mm (.7881 in)
		Wear limit	20.035 mm (.7887 in)
Rocker arm shaft diameter		Minimum (new)	19.980 mm (.7866 in)
		Maximum (new)	19.993 mm (.7871 in)
		Wear limit	19.965 mm (.7860 in)
Cylinder head screw length		Service limit	216.5 mm (8.524 in)
Piston ring type		1 <sup>st</sup>	Rectangular
		2 <sup>nd</sup>	Ring
		3 <sup>rd</sup>	Oil scraper ring
Ring end gap	1 <sup>st</sup>	Minimum (new)	0.15 mm (.006 in)
	2 <sup>nd</sup>		0.15 mm (.006 in)
	3 <sup>rd</sup>		0.15 mm (.006 in)
	1 <sup>st</sup>	Maximum (new)	0.35 mm (.014 in)
	2 <sup>nd</sup>		0.35 mm (.014 in)
	3 <sup>rd</sup>		0.3 mm (.012 in)
	All	Wear limit	1.5 mm (.060 in)

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VEHICLE MODEL		LEGEND V-1000 SPORT AND GRAND TOURING V-1000 SPORT	
<b>ENGINE</b>			
Ring/piston groove clearance	1 <sup>st</sup>	Minimum (new)	0.025 mm (.001 in)
	2 <sup>nd</sup>		0.015 mm (.0006 in)
	3 <sup>rd</sup>		0.02 mm (.0008 in)
	1 <sup>st</sup>	Maximum (new)	0.07 mm (.0028 in)
	2 <sup>nd</sup>		0.06 mm (.0024 in)
	3 <sup>rd</sup>		0.055 mm (.0021 in)
		All	Wear limit
Piston/cylinder wall clearance		New (minimum)	0.024 - 0.056 mm (.001 - .0022 in)
		Wear limit	0.09 mm (.0035 in)
Cylinder taper (maximum)	Maximum (new)		0.038 mm (.0015 in)
	Wear limit		0.09 mm (.0035 in)
Cylinder out of round	Maximum (new)		0.01 mm (.0004 in)
	Wear limit		0.02 mm (.0008 in)
Camshaft bearing journal	PTO side	Minimum (new)	24.967 mm (.9830 in)
		Maximum (new)	25.000 mm (.9843 in)
		Wear limit	25.020 mm (.9850 in)
	Alternator side	Minimum (new)	39.984 mm (1.5742 in)
		Maximum (new)	40.000 mm (1.5748 in)
		Wear limit	40.020 mm (1.5756 in)
Camshaft bore	PTO side	Minimum (new)	24.967 mm (.9830 in)
		Maximum (new)	24.980 mm (.9835 in)
		Wear limit	24.960 mm (.9827 in)
	Alternator side	Minimum (new)	39.927 mm (1.5719 in)
		Maximum (new)	39.935 mm (1.5722 in)
		Wear limit	39.920 mm (1.5716 in)
Cam lobe	Intake	Minimum (new)	31.654 mm (1.2462 in)
		Maximum (new)	31.854 mm (1.2541 in)
		Wear limit	31.600 mm (1.2441 in)
	Exhaust	Minimum (new)	31.435 mm (1.2376 in)
		Maximum (new)	31.635 mm (1.2455 in)
		Wear limit	31.400 mm (1.2362 in)
Crankshaft axial clearance		Minimum (new)	0.100 mm (.0039 in)
		Maximum (new)	0.400 mm (.0157 in)
Crankshaft journal diameter		Minimum (new)	54.961 mm (2.1638 in)
		Maximum (new)	54.980 mm (2.1646 in)
		Wear limit	54.940 mm (2.1630 in)
Crankshaft radial clearance		Wear limit	0.080 mm (.0031 in)
Connecting rod big end diameter		Service limit	45.090 mm (1.7752 in)
Connecting rod big end clearance		Service limit	0.09 mm (.0035 in)
Connecting rod big end axial play		Minimum (new)	0.150 mm (.0059 in)
		Maximum (new)	0.450 mm (.0177 in)
		Wear limit	0.500 mm (.0197 in)
Crankshaft deflection		Wear limit	0.050 mm (.002 in)
Connecting rod small end diameter		Minimum (new)	23.010 mm (.9059 in)
		Maximum (new)	23.020 mm (.9063 in)
		Wear limit	23.070 mm (.9080 in)

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### Subsection 02 (ENGINE)

VEHICLE MODEL		LEGEND V-1000 SPORT AND GRAND TOURING V-1000 SPORT	
<b>ENGINE</b>			
Piston pin diameter	Minimum (new)	22.996 mm (.9053 in)	
	Maximum (new)	23.000 mm (.9055 in)	
	Wear limit	22.990 mm (.9051 in)	
Piston pin bore clearance	Wear limit	0.080 mm (.0031 in)	

<b>ELECTRICAL</b>			
Alternator output		40 A	
Ignition system type		DI (Digital Induction)	
Ignition timing		Not adjustable	
Spark plug	Make and type	NGK DCPR8E	
	Gap	0.75 mm (.030 in)	
Ignition coil	Primary	0.85 - 1.15 $\Omega$	
	Secondary	9.2 - 13.8 k $\Omega$	
Engine RPM limiter setting		8000 RPM	
Battery		12 V, 21 A•h	
Fuse	F1: Cylinder no.1 (alternator side) ignition coil and injector		5 A
	F2: Cylinder no.2 (PTO side) ignition coil and injector		5 A
	F3: ECM/fuel pump		7.5 A
	F4: Instrumentation		5 A
	F5: CAPS		1 A
	F6: Fuel level sender		0.5 A
	F7: Secondary load		20 A
	F8: Lighting		20 A
	F9: Not applicable		N.A.
	F10: Battery (main)		30 A
	F11: Relay/start button		5 A
	F12: Alternator		5 A

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### Subsection 02 (ENGINE)

VEHICLE MODEL		LEGEND V-1000 SPORT AND GRAND TOURING V-1000 SPORT
<b>FUEL SYSTEM</b>		
Fuel injection type	Rotax EMS (engine management system) Multipoint Fuel Injection Single throttle body (52 mm)	
Fuel pressure	400 kPa (58 PSI)	
Idle speed	1300 ± 200 RPM	
Throttle Position Sensor (TPS) ②	1.6 kΩ - 2.4 kΩ	
Crankshaft Position Sensor (CPS) ②	0.7 Ω - 1.1 Ω	
Camshaft Position Sensor (CAPS)	12 volts	
Camshaft Position Sensor (CAPS) ②	1.2 kΩ	
Air Temperature Sensor (ATS) ②	2.28 kΩ - 2.74 kΩ	
Coolant Temperature Sensor (CTS) ②	2.28 kΩ - 2.74 kΩ	
Manifold Air Pressure Sensor (MAPS)	5 volts	
Idle bypass valve ②	50 Ω	
Oil Pressure Switch (OPS) ②	0 Ω, if oil pressure is inferior to 20 kPa (2.9 PSI)	
Fuel injector	9.2 Ω - 13.8 Ω	
Fuel	Type	Regular unleaded gasoline
	Minimum pump octane no.	87
ADDITIONAL INFORMATION:		

<b>COOLING SYSTEM</b>	
Type	Liquid cooled
Coolant	④
Thermostat	82°C (180°F)

<b>TIGHTENING TORQUES (ENGINE COLD N•M (LBF•FT))</b>		
Drive pulley retaining screw		③
Cylinder head screws		50 (37) + 90° rotation
Rocker arm shaft screws		20 (15) + 90° rotation
Crankcase screws	M6	9 (7)
	M8	23 (171)
Oil drain plug		55 (41)

## Section 08 TECHNICAL DATA

### Subsection 03 (VEHICLES)

VEHICLE MODEL		LEGEND V-1000 SPORT	GRAND TOURING V-1000 SPORT	
ENGINE TYPE		1004	1004	
Chain Drive Ratio		21/44	21/44	
Chain	Pitch in	3/8	3/8	
	Type/Links Qty/Plates Qty	Silent 74/13	Silent 74/13	
Drive Pulley	Type of Drive Pulley	TRA IV	TRA IV	
	Ramp Identification and Roller Pin Type	607 ①	607 ①	
	Calibration Screw Position ②	3	3	
	Spring Color	Red/Yellow	Red/Yellow	
	Spring Length mm (in)	87.90 (3.461)	87.90 (3.461)	
	Clutch Engagement ± 100 RPM	2500	2500	
Driven Pulley	Type	HPV VSA	HPV VSA	
	Spring Preload ± 0.7 kg (± 1.5 lb)	6.1 (13.5)	6.1 (13.5)	
	Cam Angle Degree	50/40	50/40	
Pulley Distance	Z ± 0.5 mm (± .020 in)	20.0 (.787)	20.0 (.787)	
	X ± 0.5 mm (± .020 in)	37.0 (1.457)	37.0 (1.457)	
Offset	Y - X			
	MIN. - MAX. mm (in)	1.5 ± 0.75 (.059 ± .030)	1.5 ± 0.75 (.059 ± .030)	
Drive Belt Part Number (P/N)		417 300 197	417 300 197	
Drive Belt Width (wear limit) mm (in)		33.35 (1.313)	33.35 (1.313)	
Drive Belt Adjustment	Deflection ± 5 mm (± .197 in)	32 (1.260)	32 (1.260)	
	Force ③ kg (lbf)	11.3 (25)	11.3 (25)	
Track	Width mm (in)	381 (15.0)	381 (15.0)	
	Length mm (in)	3074 (121)	3074 (121)	
	Profile Height mm (in)	22.34 (.880)	22.34 (.880)	
	Adjustment	Deflection mm (in)	30 - 35 (1-3/16 - 1-3/8)	30 - 35 (1-3/16 - 1-3/8)
		Force ④ kg (lbf)	7.3 (16)	7.3 (16)
Suspension Type	Track	SC-10 III 121	SC-10 III 136	
	Ski	ADSA	ADSA	
Length mm (in)		2801 (110.3)	3039 (119.6)	
Width mm (in)		1213 (47.756)	1213 (47.756)	
Height mm (in)		1232 (48.5)	1409 (55.472)	
Ski Stance (between outer runners) mm (in)		1195 (47.1)	1195 (47.1)	
Mass (dry) kg (lb)		263 (578)	281 (619)	
Ground Contact Area cm <sup>2</sup> (in <sup>2</sup> )		6910 (1071.1)	7596 (1177.4)	
Ground Contact Pressure kPa (PSI)		3.73 (.514)	3.63 (.526)	
Frame Material		Aluminum	Aluminum	
Bottom Pan Material		Impact Copolymer	Impact Copolymer	
Hood Material		RRIM Polyurethane	RRIM Polyurethane	
Headlamp W		H4 60/55	H4 60/55	
Taillight and Stoplight W		8/27	8/27	
Tachometer and Speedometer Bulbs W		2 x 3	2 x 3	
Fuel Tank L (U.S. gal)		39.0 (10.3)	39.0 (10.3)	
Gearbox mL (U.S. oz)		250 (8.5)	250 (8.5)	
Cooling System ② L (U.S. oz)		3.8 (128.5)	4.0 (135.3)	
Engine Oil Change Quantity (with filter replacement) L (U.S. oz)		2.9 (98)	2.9 (98)	
Total Engine Oil Quantity (rebuild) L (U.S. oz)		3.4 (115)	3.4 (115)	

## ENGINE LEGEND

ABDC: After Bottom Dead Center  
ATDC: After Top Dead Center  
BBDC: Before Bottom Dead Center  
BTDC: Before Top Dead Center  
CDI: Capacitor Discharge Ignition  
K: Kilo (x 1000)  
N.A.: Not Applicable  
PTO: Power Take Off Side

- ① The engine speed for transmission calibration applicable on the vehicle. It may be different under certain circumstances and BOMBARDIER INC. reserves the right to modify it without obligation.
- ② All resistance measurements must be performed with parts at room temperature (approx. 20°C (68°F)). Temperature greatly affects resistance measurements.
- ③ Drive pulley retaining screw: torque to 125 to 135 N•m (92 to 100 lbf•ft), install drive belt, accelerate the vehicle at low speed (maximum 30 km/h (20 MPH)) and apply the brake; repeat 5 times. Retorque screw to 125 to 135 N•m (92 to 100 lbf•ft).
- ④ Ethylene glycol antifreeze for aluminum engines mixed with distilled water (1 parts of antifreeze for 1 parts of distilled water). Bombardier premixed coolant - 37°C (- 35°F) (16 x 1 L) (P/N 293 600 038).

## VEHICLE LEGEND

ADSA: Advanced Direct Shock Action  
RRIM: Reinforced Reaction Injection Molding  
TRA: Total Range Adjustable  
RER: Rotax Electronic Reverse  
VSA: Variable Sheave Angle  
N.A.: Not Applicable

- ① Lever with roller pin (P/N 417 222 594) (long and solid).
- ② From factory TRA IV drive pulley adjustment screws are set to position 3. This position allows the best compromise between acceleration, top speed and fuel economy. Position 1 or 2 would provide the best fuel economy. Top speed would be reduced. Position 4 would give the best acceleration. Fuel economy would be reduced.
- ③ Force applied midway between pulleys to obtain specified deflection.
- ④ Force or downward pull applied to track to obtain specified deflection.