

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 ²	cm ²	6.45	
in ³	cm ³	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 (lbf/in ²)	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 "mm" to "in", divide by 25.4.

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

Section 11 TECHNICAL DATA
Subsection 02 (ENGINE AND VEHICLE)

ENGINE AND VEHICLE

VEHICLE MODEL				RALLY™ 200	
ENGINE	Engine type			BOMBARDIER-ROTAX, 4 stroke, Over Head Camshaft (OHC), liquid cooled	
	Starting system			Electric	
	Number of cylinder(s)			1	
	Number of valves			4 valves with mechanical adjustment	
	Bore	Standard	mm (in)	62 (2.4)	
	Stroke		mm (in)	58.4 (2.3)	
	Displacement		cm ³ (in ³)	176.3 (10.8)	
	Compression ratio		± 0.4	11.3:1	
	Maximum HP RPM			10500	
	Lubrication	Wet sump with replaceable oil filter, without oil filter bypass			
	Oil filter	BOMBARDIER-ROTAX — CHAMPION			
	Air filter type	2 stage foam filter			
	Exhaust system	Type	Single output		
		Spark arrester	USDA approved		
	Intake valve opening			13.00° BTDC	
	Intake valve closing			43.00° ABDC	
	Exhaust valve opening			48.00° BBDC	
	Exhaust valve closing			8.00° ATDC	
	Valve/valve stem diameter clearance	Intake	New minimum	mm (in)	0.022 (.0009)
			New maximum	mm (in)	0.045 (.0018)
			Wear limit	mm (in)	0.120 (.0047)
		Exhaust	New minimum	mm (in)	0.032 (.0013)
			New maximum	mm (in)	0.055 (.0022)
			Wear limit	mm (in)	0.120 (.0047)
	Valve guide diameter		Wear limit	mm (in)	4.06 (.16)
	Valve spring free length		New nominal	mm (in)	33.6 (1.323)
			Service limit	mm (in)	33.4 (1.315)
	Valve seat contact width	Intake	New	mm (in)	1.05 to 1.35 (.041 to .053)
			Wear limit	mm (in)	1.6 (.063)
		Exhaust	New	mm (in)	1.25 to 1.55 (.049 to .061)
			Wear limit	mm (in)	1.8 (.070)
	Piston measurement		New nominal	mm (in)	61.942 to 61.958 (2.4386 to 2.4393)
			Wear limit	mm (in)	61.930 (2.4382)
	Piston/cylinder clearance		New nominal	mm (in)	0.042 to 0.072 (.0016 to .0028)
			Wear limit	mm (in)	0.100 (.0039)
	Piston ring type			1 st	Rectangular
				2 nd	Taper-face
				3 rd	Oil scraper ring
	Piston ring end gap	Rectangular	New minimum	mm (in)	0.15 (.006)
		Taper-face		mm (in)	0.15 (.006)
Oil scraper ring		mm (in)		0.15 (.006)	
Rectangular		New maximum	mm (in)	0.35 (.014)	
Taper-face			mm (in)	0.35 (.014)	
Oil scraper ring			mm (in)	0.30 (.012)	
All		Wear limit	mm (in)	1.5 (.06)	
Piston/ring groove clearance	Rectangular	New minimum	mm (in)	0.025 (.001)	
	Taper-face		mm (in)	0.015 (.0006)	
	Oil scraper ring		mm (in)	0.020 (.0008)	
	Rectangular	New maximum	mm (in)	0.070 (.0028)	
	Taper-face		mm (in)	0.060 (.0024)	
	Oil scraper ring		mm (in)	0.055 (.0021)	
	All	Wear limit	mm (in)	0.15 (.0059)	

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VEHICLE MODEL		RALLY™ 200			
ENGINE	Rocker arm bore diameter	New minimum	mm (in)	10.036 (.3951)	
		New maximum	mm (in)	10.050 (.3957)	
		Wear limit	mm (in)	10.060 (.3961)	
	Rocker arm shaft diameter	New minimum	mm (in)	10.006 (.3939)	
		New maximum	mm (in)	10.015 (.3943)	
		Wear limit	mm (in)	9.950 (.3917)	
	Cylinder bore	New	mm (in)	62.000 to 62.014 (2.4409 to 2.4415)	
		Wear limit	mm (in)	62.030 (2.4417)	
	Cylinder taper	New maximum	mm (in)	0.052 (.002)	
		Wear limit	mm (in)	0.090 (.004)	
	Cylinder out of round	New maximum	mm (in)	0.015 (.0006)	
		Wear limit	mm (in)	0.02 (.0008)	
	Camshaft bearing journal	PTO side	New minimum	mm (in)	19.959 (.7857)
			New maximum	mm (in)	19.980 (.7866)
			Wear limit	mm (in)	19.940 (.7850)
		Magneto side	New minimum	mm (in)	31.950 (1.2578)
			New maximum	mm (in)	31.975 (1.2588)
			Wear limit	mm (in)	31.930 (1.2571)
	Camshaft bore	PTO side	New minimum	mm (in)	20.000 (.7874)
			New maximum	mm (in)	20.021 (.7882)
			Wear limit	mm (in)	20.035 (.7888)
		Magneto side	New minimum	mm (in)	32.000 (1.2598)
			New maximum	mm (in)	32.025 (1.2608)
			Wear limit	mm (in)	32.040 (1.2614)
Cam lobe	Intake	New minimum	mm (in)	30.887 (1.216)	
		New maximum	mm (in)	31.087 (1.224)	
		Wear limit	mm (in)	30.800 (1.252)	
	Exhaust	New minimum	mm (in)	30.887 (1.216)	
		New maximum	mm (in)	31.087 (1.224)	
		Wear limit	mm (in)	30.800 (1.252)	
Crankshaft axial clearance	New minimum	mm (in)	0.2 (.0078)		
	New maximum	mm (in)	0.4 (.0157)		
Crankshaft deflection	MAG side	New nominal	mm (in)	0.04 (.0024)	
	PTO side	New nominal	mm (in)	0.04 (.0024)	
Crankshaft pin diameter	New minimum	mm (in)	26.037 (1.0250)		
	New maximum	mm (in)	26.040 (1.0252)		
	Wear limit	mm (in)	26.020 (1.0244)		
Crankshaft journal diameter	MAG side	New minimum	mm (in)	32.010 (1.2602)	
		New maximum	mm (in)	32.025 (1.2608)	
		Wear limit	mm (in)	32.000 (1.2598)	
	PTO side	New minimum	mm (in)	32.010 (1.2602)	
		New maximum	mm (in)	32.025 (1.2608)	
		Wear limit	mm (in)	32.000 (1.2598)	
Crankshaft radial clearance	MAG side	Service limit	mm (in)	0.07 (.0028)	
	PTO side	Service limit	mm (in)	0.07 (.0028)	
Connecting rod big end diameter	New minimum	mm (in)	26.050 (1.0256)		
	New maximum	mm (in)	26.078 (1.0267)		
	Service limit		26.090 (1.0272)		
Connecting rod big end clearance	Service limit		0.07 (.0028)		
Connecting rod big end axial play	New minimum	mm (in)	0.3 (.012)		
	New maximum	mm (in)	0.627 (.025)		
	Wear limit	mm (in)	0.8 (.03)		
Connecting rod small end diameter	New minimum	mm (in)	15.005 (.5908)		
	New maximum	mm (in)	15.015 (.5911)		
	Wear limit	mm (in)	15.060 (.5929)		
Piston pin diameter	New minimum	mm (in)	14.997 (.5904)		
	New maximum	mm (in)	15.000 (.5906)		
	Wear limit	mm (in)	14.990 (.5902)		
Piston pin bore clearance	Wear limit	mm (in)	0.03 (.0012)		

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	VEHICLE MODEL		RALLY™ 200	
ELECTRICAL	Magneto/generator		200 W @ 6000 RPM	
	Ignition system type		IDI (Inductive Discharge Ignition)	
	Ignition timing		Not adjustable	
	Spark plug	Quantity		1
		Make and type		NGK CR8E
		Gap	mm (in)	0.6 to 0.7 (.024 to .027)
	Trigger coil (pickup coil)		Ω	190 – 300
	Battery charging coil (lightning coil)		Ω	0.6 ± 01
	Ignition coil	Primary	Ω	1.87 to 2.53 @ 20°C (68°F)
		Secondary	kΩ	10.4 to 15.6 @ 20°C (68°F)
	Engine RPM limiter			10500
	Engine RPM limiter (reverse)			6000
	Battery	Type		Electrolyte battery type
		Voltage		12 volts
		Nominal rating		14 A•h
		Power starter output		0.6 KW
Headlight			2 x 30 W	
Taillight			8/27 W, 1157	
Pilot lamp cluster			LEDS	
Fuses			25 A	
CARBURETION	Carburetor	Type	Mikuni with manual choke	
		Model	VM-24	
	Idle engine speed		RPM	1500 ± 100
	Main jet			105
	Pilot jet			22.5
	Needle jet			0-2M
	Jet needle			5GNY 72-3
	Choke plunger position			Variable
	Adjustment	Throttle cable		4 mm (.157 in)
		Preliminary pilot screw turn		3/4
		Float level	± 0.5 mm	15
± 0.020 in	.591			
Fuel	Type		Regular unleaded gasoline	
	Octane no.		87 (Ron + Mon)/2	
LUBRICATION	Lubricant		SAE 5W30 or 5W40 Bombardier synthetic oil mineral based	
	Oil pressure switch		30 to 60 kPa (4.35 to 8.70 PSI)	
	Oil temperature (max.)		120°C (248°F)	
	Oil pressure (min.)		350 kPa (50.76 PSI)	
CVT	Belt width	New minimum	mm (in)	21.00 (.8267)
		New maximum	mm (in)	22.00 (.8661)
		Wear limit	mm (in)	19.50 (.7677)
	CVT - temperature (max.)			75°C (167°F)
Centrifugal clutch (driven pulley)		Operating RPM	3500 ± 100	
COOLING	Coolant		Ethyl glycol/water mix (50% coolant, 50% water). Use coolant specifically designed for aluminum engines	
	Water temperature switch		115°C (239°F)	
	Water temperature (max.)		100°C (212°F)	
	Engine thermostat	Opening temperature	65°C (149°F)	
	Radiator cap opening pressure		110 kPa (16 PSI)	
DRIVE TRAIN	Transmission	Type	CVT (Continuously Variable Transmission). HI range, neutral and reverse	
	Rear axle		Chain driven/solid axle	
	Rear axle ratio		2.7:1	

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VEHICLE MODEL		RALLY™ 200		
STEERING/ CONTROL	Turning radius		1.85 m (73 in)	
	Total toe (vehicle on ground)	mm (in)	0 ± 3 (0 ± .118), each side	
	Camber angle		4°	
	Tie-rod total length	mm (in)	320 ± 5 (12.598 ± 0.197)	
	Tie-rod maximum length unengaged	mm (in)	23 ± 5 (.906 ± 0.197)	
SUSPENSION	<i>FRONT</i>			
	Suspension type		Independent suspension — single A-arm	
	Suspension travel		mm (in)	137 (5.39)
	Shock absorber	Qty	2	
		Type	Oil	
	Spring free length		mm (in)	261 (10.27)
	Spring color code		Silver	
	Front preload adjustment		N.A.	
	<i>REAR</i>			
	Suspension type		Rigid swing arm	
	Suspension travel		mm (in)	163.0 (6.42)
	Shock absorber	Qty	1	
Type		Oil		
Spring free length		mm (in)	294 (11.57)	
Spring color code		Silver		
Rear preload adjustment		N.A.		
BRAKES	Front brake	Qty	2, discs	
		Type	Hydraulic	
	Rear brake	Qty	1, disc	
		Type	Mechanical cable	
	Parking brake		Brake lever lock on LH brake lever	
	Caliper		Floating	
	Lining material		Organic	
	Minimum pad thickness		mm (in)	1 (.04)
Minimum brake disk thickness		mm (in)	3.5 (.14)	
Maximum brake disk warpage		mm (in)	0.25 (.01)	
TIRES AND WHEELS	<i>TIRE</i>			
	Pressure	Front	Recommended	24 kPa (3.5 PSI)
			Minimum	21 kPa (3 PSI)
		Rear	Recommended	24 kPa (3.5 PSI)
			Minimum	21 kPa (3 PSI)
	Minimum tire thread depth		mm (in)	4 (0.16)
	Size	Front	22 x 10 x 7	
		Rear	22 x 10 x 10	
	<i>WHEELS</i>			
	Size	Front	10 x 5.5	
Rear		10 x 8		
Overall length		mm (in)	2026 (79.8)	
Overall width		mm (in)	1054 (41.5)	
Overall height		mm (in)	1070 (42)	
DIMENSION	Dry weight		kg (lb)	176 (388)
	Wheel base		mm (in)	1181 (46.5)
	Wheel track	Front	mm (in)	880 (34.6)
		Rear	mm (in)	811 (31.9)
	Front and under engine ground clearance		mm (in)	229 (9)
Rear rigid axle ground clearance		mm (in)	160 (6.3)	

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VEHICLE MODEL		RALLY™ 200	
CAPACITIES	<i>LIQUID</i>		
	Fuel tank	16.5 l (4.4 U.S. gal)	
	Fuel tank reserve	5 l (1.2 U.S. gal)	
	Engine	Capacity ± 100	1.35 l (1.43 quarts)
		Recommended	SAE 5W30, 4 stroke mineral based oil SG, SH or SJ or 5W40 Bombardier synthetic oil. Refer to the oil viscosity chart in the MAINTENANCE AND LUBRICATION subsection
	Gearbox	Capacity	200 ml (6.76 U.S. oz)
		Recommended	Castrol HYPOX C 175 W or ISO V G 100 (BP GR-XP 100)
	Hydraulics brakes	Capacity	202 ml (6.83 U.S. oz)
		Recommended	Brake fluid DOT 4, ONLY
	Cooling system	2.5 l (2.65 quarts)	
	<i>BODY AND FRAME</i>		
	Weight distribution	Front/rear %	52/48
	Rack	Front	16 kg (35 lb)
		Rear (including tongue weight)	30 kg (65 lb)
	Total vehicle load allowed (including driver, all other loads and added accessories)		175 kg (386 lb)
Gross vehicle weight rating		369 kg (813 lb)	
Towing		227 kg (500 lb)	
Tongue (included with rear rack weight)		14 kg (30 lb)	
MATERIAL	Frame	Material	Steel
		Color	Black
	Wheel	Material	Steel
		Color	Silver
	Front/rear rack	Material	High density polyethylene
		Color	Earthen grey
	Front bumper	Material	Steel
		Color	Silver
	Front/rear fender	Material	High density polyethylene
		Color	Red, Green or Yellow
	Steering cover	Material	High density polyethylene
		Color	Red or Green or Yellow
	Front fascia	Material	High density polyethylene
		Color	Red, Green or Yellow
	Engine side panel	Material	HMWPE
		Color	Black
	Air box	Material	High density polyethylene
		Color	Black
Seat base	Material	High density polyethylene	
	Color	Black	
Seat cover	Material	Thermoformed vinyl	
	Color	Black	

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VEHICLE MODEL		RALLY™ 200	SERVICE PRODUCT
TORQUE	ENGINE		
	Oil filter screw	9 N•m (80 lbf•in)	None
	Dipstick tube screw		
	Magneto cover bolts		
	Starter bolts		
	Engine sprocket nut	95 N•m (70 lbf•ft)	
	Starter RED (+) cable	6 N•m (53 lbf•in)	Dielectric grease
	Rotor bolt	35 N•m (26 lbf•ft)	Loctite 243
	Stator bolt	9 N•m (80 lbf•in)	None
	Trigger coil bolt		
	COOLING		
	Block heater lock	3 N•m (27 lbf•in)	None
	Thermostat housing	5 N•m (44 lbf•in)	
	Thermostat bleeding screw	4 N•m (35 lbf•in)	
	Temperature sensor	17 N•m (151 lbf•in)	
	Water pump housing	9 N•m (80 lbf•in)	
	Fan mount screw/nut	4.5 N•m (40 lbf•in)	Loctite 243
	Temperature sender on radiator	11 N•m (97 lbf•in)	None
	EXHAUST		
	Exhaust nut	11 N•m (97 lbf•in)	None
	Exhaust clamp	15 N•m (133 lbf•in)	
	LUBRICATION		
	Engine drain plug	20 N•m (15 lbf•ft)	None
	Engine oil strainer	30 N•m (22 lbf•ft)	
	Oil pump housing	6 N•m (53 lbf•in)	Loctite 243
	Oil pressure switch	12 N•m (106 lbf•in)	
	CYLINDER AND HEAD		
	Valve cover	9 N•m (80 lbf•in)	None
	Cylinder head screw	10 N•m (89 lbf•in)	
	Cylinder head nut	25 N•m (18 lbf•ft)	
	Camshaft timing gear	30 N•m (22 lbf•ft)	Loctite 243
	Chain tensioner plug	35 N•m (26 lbf•ft)	None
	CRANKSHAFT		
	Crankcase housing screw	9 N•m (80 lbf•in)	None
	Crankshaft locking access screw	15 N•m (133 lbf•in)	
	GEARBOX		
	Gearbox cover	25 N•m (18 lbf•ft)	Loctite 648
	Shifting indicator switch	4 N•m (35 lbf•in)	Loctite 243
	CVT		
	CVT cover	9 N•m (80 lbf•in)	None
	Centrifugal clutch nut	55 N•m (41 lbf•ft)	
	Drive pulley	60 N•m (44 lbf•ft)	
	Driven pulley		
	FUEL		
	Carburetor mounting clamp	0.6 N•m (5.4 lbf•in)	None
Air intake silencer screw	5 N•m (44 lbf•in)		
Fuel tank screw			
Fuel valve	9 N•m (80 lbf•in)		

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VEHICLE MODEL		RALLY™ 200	SERVICE PRODUCT
TORQUE	DRIVE TRAIN		
	Front wheel hub nut	135 N•m (100 lbf•ft)	None
	Rear wheel hub nut		
	Chain tensioner lock bolt	42 N•m (31 lbf•ft)	Loctite 277
	Rear axle nut	140 N•m (103 lbf•ft)	
	WHEEL		
	Wheel nuts	70 N•m (52 lbf•ft)	Anti-seize
	STEERING/CONTROL		
	Throttle handle housing	5 N•m (44 lbf•in)	None
	Tie rod ends	42 N•m (31 lbf•ft)	
	Steering column nut	58 N•m (43 lbf•ft)	
	Handle grip screw	1 N•m (9 lbf•in)	
	SUSPENSION		
	Swing arm nut	100 N•m (74 lbf•ft)	None
	BRAKE		
	Caliper brake screws	24 N•m (17 lbf•ft)	None
	Brake pedal	50 N•m (37 lbf•ft)	
	Front master cylinder cover screws	1.5 N•m (13 lbf•in)	
	Front master cylinder BANJO bolt	24 N•m (17 lbf•ft)	
	Caliper BANJO bolt		
	Caliper bleeder valve	5 N•m (44 lbf•in)	
	Rear cable adjusting nut	10 N•m (89 lbf•in)	
	BODY/FRAME		
	Front bumper	24 N•m (17 lbf•ft)	None
	Front fascia	2.5 N•m (22 lbf•in)	
	Luggage rack hook		
	Front/rear luggage rack	5 N•m (44 lbf•in)	
	Seat screw	9 N•m (80 lbf•in)	
Footpeg			
Headlight housing	0.6 N•m (5.4 lbf•in)		