



3 - Torque settings

Frame torque settings

Part	Thread (mm)	Nm \pm 10% Tolerance	Notes
Sidestand			
Stand sensor bolt		5	Pre-applied threadlocker
Stand plate fixing screw	M10x25	43	Pre-applied threadlocker
Side stand fastening pin			
Side stand fastening nut	M8	20	
Front sprocket			
Front sprocket retaining nut	M25x1.5	186*	
Sprocket guard retaining bolt	M6x16	6	LOCK 2
Lights and reflectors			
Headlight support to chassis fixing screw	M8x20	25	
Wiring protection on headlamp support fixing screw	M5x10	1.5	LOCK 2
Headlight fixing screw	M5x22	6	
Rear headlamp fixing screw	M5x14	3	
Front turn signals on hand guard fixing screw	M3.5x13	0.5 /0.40	
Rear turn signals fixing screw	M5x12	3	
Left mirror fixing screw	M10x1.25	40	
Right mirror fixing screw	M10x1.25	40	
Instruments			
Fixing screw on instrument panel	M5	By hand	
Instrument panel on panel retaining nut	M5	3	
Front fork			
Steering head terminals	M6x30	10*	GREASE B
Central tightening screw on steering head	M8x30	22*	GREASE B
Handlebar on head stud bolt (Daniel)	M10x1.25	45*	LOCK 2
Steering bearing ring nut		3*	"GREASE B: sequence 1-2-1"
Steering limit switch register counter nut	M8	18	LOCK 2 on thread nut only
Steering base clamps (Daniel)	M8x30	16 \pm 5%	"GREASE B: sequence 1-2-1"
Handlebar U-bolt fixing screw (Daniel)	M8x25	25*	
Front pipe grommet to bottom yoke fixing screw		10	
Ohlins fork end terminal fixing screw		19*	Sequence 1-2-1
Marzocchi fork end terminal fixing screw		10*	Sequence 1-2-1
Splash guard to bottom yoke fixing screw		3	LOCK 2
Electrical/electronic system			
Electrical components support to subframe bracket front fixing screw	M6x25	10	
Battery bracket fixing screw	M5x9	5	
Black box bracket fixing screw	AF5x16	3.5	



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	Thread (mm)	Nm $\pm 10\%$ Tolerance	Notes
Vibration damper to black box and bracket retaining nut	M5	2	Fit toothed washer between support and vibration damper
Solenoid bracket to tank front fixing screw	AF5x16	3	
Solenoid bracket to tank lower fixing screw	M5x12	4	
Voltage regulator bracket to electric components housing fixing screw	M6x20	5	
Voltage regulator to bracket fixing screw	M6x20	10	
Electrical components support to frame fixing screw	M6x25	6	
Mitsubishi control unit bracket fixing screw	AF5x16	2	
Map Sensor to electrical components support fixing screw	M6x18	4	
Wiring support to left frame plate fixing screw	M5x8	6	
Electrical components support to tank fixing screw	M5x8.5	5	
Left/right light switch fixing screw (Daniel)		1.3	
Hands free fixing screw (key lock)		20	LOCK 2
Battery leads and starter motor on solenoid fixing screw		4	
Ground cable to crankcase fixing screw		10	
Cable to starter motor retaining nut		5	
Bolt securing horn to frame		22	
Electrical component housing to storage compartment rear fixing screw		8	
Sensor TPRT to front rh half-fairing fixing screw	M5x14	5	
Power outlet retaining nut		3.5	
Rear brake to support STOP switch		5	
Cover on wiring support to left plate fixing screw		1.5	
Left heated handgrip fixing screw		1.5	
Front brake			
ABS control unit bracket fixing screw	AF5x16	3	
Front callipers fixing screw	M10x1.25	45*	GREASE B
Front brake pump terminal	M6x25	10	Sequence 1-2-1 starting from upper screw
Front brake oil reservoir to hand guard fixing screw		3 / 2	
Front brake hose (pipe grommet) bracket on base fixing screw	M6x10	10	
ABS tube cover on electrical components housing fixing screw	AF5x16	3.5	
Front brake calliper pre-tightening	M10x1.25	2	
Front ABS sensor fixing screw	M6x16	10	
Rear ABS sensor fixing screw	M6x16	10	
Rear swingarm			
Upper slider and chain guard fixing screw	M5x8.5	5	LOCK 2
Lower chain slider fixing screw	M5x8.5	5	LOCK 2
Eccentric hub tightening screw	M12x1.25	35*	"GREASE B: sequence 1-2-1"
Swingarm pivot tightening screw		72*	



Part	Thread (mm)	Nm \pm 10% Tolerance	Notes
Rear brake calliper support bracket locking pin		33*	LOCK 8
Rear brake			
Brake pump and sensor bracket stop to crankcase fixing screw	M6x20	10	
Rear oil reservoir fixing screw	M6x16	2	
Rear calliper fixing screw	M8x20	25*	
Pipe grommet clamps to swingarm fixing screw	M6x16	8	
Rear brake pipe grommet to swingarm fixing screw	M6x15	5	
Handlebars - Clutch control			
Clutch pump fixing screw (Daniel)	M6x25	10	Sequence 1-2-1 starting from upper screw
Hand guard to right/left pump fixing screw	M6x18	10	
Hand guard to right/left terminal fixing screw	M5x20	5	
Piston clutch to crankcase fixing screw	M6x20	10	Sequence 1-2-3-1
Oil clutch reservoir to hand guard fixing screw		2	
Throttle twistgrip fixing screw		10	
Handlebar counterweight fixing screw		2	
Rear suspension			
Shock absorber upper fixing screw		42*	GREASE B
Shock absorber lower fixing screw		42*	GREASE B
Ohlins preloading actuator fixing screw	M6x15	10	
Spring preloading hydraulic press to support (sachs rear shock absorber) fixing screw	M5x22	10	
Spring preloading support to left side frame fixing screw		10	
Front mudguard			
Mudguard to fork fixing screw	M6x16	5	
Pipe grommet to plastic mudguard plus splash guard fixing screw	M5x9	3.5	
Pipe grommet to carbon mudguard fixing screw	M5x16		
Pipe grommet to carbon mudguard fixing screw			
Liquid cooling			
Right/left radiator upper fixing screw	M6x22	10	
Wing on radiator bracket fixing screw	M6x10	6	
Internal threaded head pin fixing screw		10	
Lower radiator fixing screw	M5x14	5	
Expansion tank fixing screw	M6x10	8	
Water hose guide clamp (thermostatic valve unit)		2.5	
Clamp on water pump tube (piston clutch)		2.5	
Expansion tank pipe to radiator fixing clamp		1	
Expansion tank pipe fixing clamp		1	
Water clamp on radiator		3	
Bleed pipe clamp to Horizontal cylinder		1	
Water bleed plug on left crankcase		19	



Technical data



	Thread (mm)	Nm ±10% Tolerance	Notes
Footrest and linkage			
Brake lever and gearshift on frame plate fixing screw		23	LOCK 2
Spacer on brake lever fixing screw	M6x28		
Gearshift lever on crankshaft fixing screw	M6x18	10	LOCK 1
Gearchange lever tie-rod junction fixing screw	M6x20	10	
Right/left passenger footrest fixing screw	M8x25	24	LOCK 2 on thread
Rear brake linkage to brake lever pivot bolt		5	LOCK 2
Counter nut for rear brake pedal adjuster screw		2.5	
Master cylinder pushrod retaining nut		7.5	
Handgrip on rear left footrest fixing screw		20	
Pannier support rod on rear right/left footrest fixing screw		10	
Rear mudguard			
Licence plate holder to cover fixing screw	M5x12	3	
License plate holder unit to storage compartment fixing screw	M6x14	6	
License plate holder fixing screw	M6x18	6	
Reflector retaining nut	M4x0.7		
Mudguard to right side swingarm fixing screw	M5x8.5	5	
Mudguard to swingarm plus rear brake pipe grommet fixing screw	M5x8.5	5	
Carbon mudguard to swingarm plus rear brake pipe grommet fixing screw	M5x8.5	5	
Carbon mudguard to right side swingarm fixing screw	M5x8.5	5	
Splash guard to plastic swingarm fixing screw	M6x15	10	LOCK 2 on thread
Splash guard to carbon swingarm fixing screw		10	LOCK 2 on thread
Front wheel			
Disc and phonic wheel to wheel rim fixing screw	M8x20		
Front wheel axle nut		63*	GREASE B on the undersides of the head and threaded pin
Rear wheel			
Phonic wheel to disc fixing screw	M5x8	6	
Brake disc to pin fixing screw		27	
Left/right rear wheel retaining nut	M48	230	
Rear wheel cush drive retaining nut	M10x1	44.0	LOCK 2
Fuel tank			
Fuel plug fixing screw	M5x30	4	
GAC fixing screw	M5	6	
Front plugs fixing screw	M6x30	10	
Rear plugs fixing screw	M6x40	10	
Fuel probe fixing ring nut		8	
Exhaust system			
Central cover to silencer (Black) fixing screw	M5x8	5	
Lower silencer cover (Grey) fixing screws		5	



Part	Thread (mm)	Nm \pm 10% Tolerance	Notes
Upper silencer cover (Grey) fixing screw		5	
Starter motor valve to support fixing screw	AF4.5x12	2	
Lambda sensor fixing		24.5	
Starter motor valve support to right footrest bracket fixing screw		10	
Rubber pad for starter motor valve to right plate fixing screw	M6x20	10	
Exhaust link rod to right/left plate link rod	M6x18	10	
Left link rod to silencer fixing screw	M6x22	10	
Right link rod to silencer fixing screw	M6x22	10	
Drainage to vertical big end retaining nut		10	
Drainage to vertical big end retaining nut		10	
Drainage to horizontal big end retaining nut		10	
Silencer clamp fixing screw		22	
C.O. cover screw		25	
Bowden cable on the exhaust adjuster nut		2.5	
Seat			
Saddle lock fixing screw	M6	8	
Seat lock nut		3	
Fixing the retaining pin of the rider saddle		6	
Frame			
Front frame-plates fixing screw		50*	GREASE B
Plate-frame connection rear screw		50*	GREASE B
Recovery locking ring nut		100*	GREASE B
Frame-engine retaining nut		60*	GREASE B
Plates connection brackets fixing screw	M8x28	25*	GREASE B
Lower plate to right/left crankcase fixing screw	M10x28	42*	LOCK 8
Rear subframe retaining bolt	M8	25*	
Clearance adjuster		0.6	
Storage compartment to frame fixing screw	M8	14*	
Carrier side panel to tub lower fixing screw		10	
Tub to carrier side panel lateral fixing screw		5	
Rear plate to crankcase fixing screw		50*	
Oil cooler			
Fixing union to radiator (nipple)		23	LOCK 1
Fixing tube to radiator coupling		18 *	Lubricate with engine oil
Radiator (to headlight support) upper fixing screw	M6x25	6	
Tubes plate to crankcase fixing screw	M6x14	10	
Pressure switch adjustment		19	
Air intake oil breather			
Funnels to air box fixing screw	M5x8.5	5	Solid threadlocker
Duct to air box fixing screw		3.5	
Map sensor support to air box fixing screw	M6x18	5	



Technical data



	Thread (mm)	Nm ±10% Tolerance	Notes
Map sensor to support retaining nut		5	
Blow by to air box fixing screw	M5x8.5	5	
Clamp on tube valve blow by	Clamp Clip	1.5	
Injectors to vertical/horizontal funnels fixing screw	M5x14	5	
Fuel system			
Intake funnels to throttle body fixing screw	M5x16	2.5	Solid threadlocker
Canister bracket to threaded pin rod fixing screw		5	
Nut securing EVAP canister support to bracket	M6x20	10	
Vertical/horizontal intake manifold throttle body fixing clamp		2.5	
GAS cable to throttle body retaining nut		2.5	
Fairings			
Bracket to crankcase for left gravel guard fixing screw		5	
Left oil sump guard plus pipe grommet to plate fixing screw		5	
Left gravel guard to bracket on the crankcase fixing screw		5	
Left gravel guard support to crankcase stud bolt fixing screw		5	
Gravel guard to right frame plate fixing screw		5	
Right gravel guard to bracket fixing screw		5	
Left/right gravel guard to oil sump guard fixing screw		5	
Left oil sump guard to stand bracket fixing screw		24	
Right oil sump guard to plate fixing screw		24	
Oil sump guard to vibration damper fixing screw		24	
Oil sump guard support plate to crankcase fixing screw		24	
Cover to central tank fixing screw		4	
Right/left panels to lower tank fixing screw		4	
Right/left cover (saddle joint) fixing banjo bolt		4	
Right/left panel to carrier panel fixing screw		2	
Right/left panel to carrier panel fixing screw		2	
Right/left panel to carrier panel fixing screw		2	
Right/left panel to frame and to plate fixing screw		4	
Top fairing to headlight support fixing screw		10	
Fixing the windshield adjustment slide		5	
Slide adjustment knobs stop nut		1.5	LOCK 2
Aerial (HANDSFREE) to top fairing fixing screw	Self-tapping	0.7	
Windshield to slide fixing screw		3	
Right/left panel to top fairing and reservoir fixing screw	M5x12	2	Threadlocker
Right/left panel to top fairing fixing screw	M5x8.5	2	
WING to bracket on right/left radiator fixing screw		5	
Front Rh and Lh half-fairing upper joint fixing screw		2	
Front Rh and Lh half-fairing lower joint fixing screw		2	
Front Rh/Lh half-fairing to reservoir panel fixing screw		2	
Right/left deflector to reservoir panel fixing screw		2	
WING to front half-fairing fixing screw	M3.5X16	1	



Part	Thread (mm)	Nm \pm 10% Tolerance	Notes
Balk berry holder (right) /relay cover (left) fixing screw		2	
Balk berry holder (right) /relay cover (left) fixing screw		4	

*dynamic safety-critical point; tightening torque must be within Nm \pm 5%.



Note

For product specifications and symbols, refer to "Product specifications" (Sec. 1 - 2).



Technical data



Engine torque settings

Part	Thread (mm)	Nm	Min.	Max.	Notes
Idler and tensioner pulley bolts	M20x1	50	45	55	LOCK 2 or TB1324
Camshaft pulley retaining nut	M17x1	71	64	78	GREASE A
Rocker arm shaft covers	M12x1.25	15	14	16	LOCK 2 or TB1324
Coolant temperature sensor on coolant outlet union	M12x1.5	23	20	26	LOCK 4 – Restrain the insert when tightening
Cylinder head nut:	M10x1.5				Apply GREASE C to the underside of the nut and the thread of the stud
Snug torque		20			
Preload torque		40	38	42	
Tightening torque		60	57	63	
Cam cap bolt:	M8x1.25				Engine oil
Preload torque		10	9	11	
Tightening torque		22.5	21	25	
Coil retaining bolt	M6x1	10	9	11	
Pulley flange retaining bolts	M6x1	10	9	11	
Cylinder head cover bolt	M6x1	10	9	11	
Exhaust manifold stud	M6x1	10	9	11	LOCK 5
Vacuum gauge connection screw on cylinder head (EU only)	M6x1	5	4	6	LOCK 2 or TB1324
Evaporative emissions canister fitting on cylinder head (California only)	M6x1	5	4	6	LOCK 2 or TB1324
Air breather fitting on horizontal cylinder head	M6x1	2.5	2	3	LOCK 2
Air breather blanking screw on vertical cylinder head	M6x1	10	9	11	LOCK 6
Intake manifold bolt	M6x1	10	9	11	
Water temperature sensor	M6x1	6	5	7	
Bolts securing coolant unions to cylinder head	M5x1	6	5	7	Pre-applied Tecnologic 150 threadlocker
Oil cartridge	M16x1.5	11	10	12	Engine oil on gasket
Oil cartridge nipple	M16x1.5	42	38	46	LOCK 2 or TB1324
Oil pick-up pipe plug	M14x1.5	24	21	27	LOCK 5
Oil cooler nipple	M14x1.5	32	29	35	LOCK 5
Oil drain plug with magnet	M12x1.5	20	18	22	THREEBOND TB1215
0603 Gear position sensor	M12x1.25	12	11	13	
Clutch cover oilway blanking plug	M10x1.5	15	13	17	LOCK 5
Neutral sensor	M10x1.25	10	9	11	
Oil pump adapter bolt	M10x1				LOCK 5
Clutch cover inner oilway screw	M10x1.5	15	13	17	LOCK 5
Cylinder head/barrel stud	M10x1.5	30	28	32	LOCK 2 or TB1324
Vertical cylinder zone crankcase bolt:	M8x1.25				GREASE B or Agip GR SM on thread
Preload torque		19	17	21	
Tightening torque		25	22	28	
Central crankcase bolt + swingarm pivot bolt:	M8x1.25				GREASE B or Agip GR SM on thread
Preload torque		19	17	21	
Tightening torque		25	22	28	
Gear stop lever bolt	M8x1.25	18	16	20	LOCK 2 or TB1324
Blow-by valve fixing screw	M6x1	10	9	11	
Chain side secondary bearing retaining bolt	M6x1	10	9	11	LOCK 2 or TB1324



Part	Thread (mm)	Nm	Min.	Max.	Notes
Clutch side primary bearing retaining bolt	M6x1	10	9	11	LOCK 2 or TB1324
Crankcase bolt – idler area	M6x1	10	9	11	
Outer crankcase bolt	M6x1	10	9	11	
Oil pick-up gauze filter bolt	M6x1	10	9	11	TB1215
Chain cover oil circuit blanking screw	M6x1	8	7	9	LOCK 2 or TB1324
Under-piston oil jet retaining screw	M5x0.8	8	7	9	LOCK 2 or TB1324
Starter motor mounting bolt	M6x1	10	9	11	Loctite 516 pre-applied to thread
Starter motor rear bolt	M6x1	10	9	11	Loctite 516 pre-applied to thread
Idler gear shaft retaining bolt	M6x1	10	9	11	LOCK 2 or TB1324
Primary sprocket nut retainer	M24x1	190	171	209	GREASE B
Ring nut fastening wet clutch primary pinion	M24x1	190	171	209	GREASE B
Flywheel retaining nut	M24x1	330	313	346	LOCK 5
Balancing cap	M12x1.25	28	26	30	LOCK 5
Con-rod bolts:	M10x1				Apply GREASE B to thread
Tightening of 45°±1°		30			
Torque check		65 to 95			
Crankshaft grub screw	M8x1.25	13	11	15	LOCK 5
Drilled crankshaft grub screw	M8x1.25	13	11	15	LOCK 5
Selector drum locating screw	M16x1.5	30	27	33	
Selector claw bolt	M8x1.25	36	34	38	LOCK 2 or TB1324
Selector claw locator nut	M6x1	10	9	11	
Selector claw bolt	M6x1	16	15	17	LOCK 2 or TB1324
Idler and tensioner pulley bolts	M20x1	50	45	55	LOCK 2 or TB1324
Timing belt driveshaft pulley retaining nut	M15x1	71	64	78	GREASE A
Timing belt driveshaft gear nut	M14x1	55	50	60	GREASE A
Fixed tensioner bearing locking screw	M14x2	50	45	50	GREASE A
Idler and tensioner pulley nut	M8x1.25	25	22	28	GREASE A
Carbon fibre cover bolts	M6x1	6	5.5	6.5	Loctite 516 pre-applied to thread
Plastic cover bolt	M6x1	10	9	11	Loctite 516 pre-applied to thread
Carbon filter cover support fixing screw	M4x0.7	1.75	1.5	2	
Self-tapping screw for timing belt cover filter	M3.5				
Coolant inlet union	M30x1.5	25	23	27	LOCK 5
Coolant outlet union	M22x1.5	25	23	27	LOCK 5
Oil filler plug	M20x2.5				Tighten as far as it will go
Alternator cover inspection plug	M15x1	20	18	22	TB1215
Pick-up sensor inspection bolt	M12x1	15	13	17	LOCK 2 or TB1324
Water pump cover plug	M10x1	20	18	22	
Oil pressure sensor	M10x1	19	17	21	
Clutch oil pan cap	M10x1	15	13.5	16.5	
Oil way blanking plug	M10x1	20	18	22	LOCK 5
Coolant pump bearing stop screw	M6x1	10	9	11	LOCK 2 or TB1324



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	Thread (mm)	Nm	Min.	Max.	Notes
Stator wiring clamp bracket bolt	M6x1	10	9	11	LOCK 2 or TB1324
Water pump cover screw	M6x1	10	9	11	
Alternator-side crankcase cover bolt	M6x1	10	9	11	
Alternator cover screw - idle gear	M6x1	10	9	11	
Alternator-side crankcase cover + water pump bolt	M6x1	10	9	11	
Inspection cover bolt	M6x1	5	4.5	5.5	
Alternator-side crankcase cover bolt	M6x1	10	9	11	
Alternator stator retaining bolt	M6x1	10	9	1	LOCK 2 or TB1324
Clutch cover bolt	M6x1	10	9	11	
Clutch cover bolt	M6x1	10	9	11	
Wet clutch cover closing screw	M6x1	10	9	11	
Wet clutch cover closing screw	M6x1	10	9	11	
Wet clutch cover closing screw	M6x1	10	9	11	
Wet clutch drum nut	M25x1.5	190	180	200	GREASE B
Wet clutch spring screw	M6x1	10	9	11	
Spark plug	M10x1	12	11	13	
Alternator rotor/flywheel bolt	M6x1	13	11	15	LOCK 5
By-pass pump cap	M15x1	25	22	28	LOCK 5
Oil pump retaining bolt	M6x1	10	9	11	
Oil pump assembly bolt	M6x1	10	9	11	
Oil pump retaining bolt	M8x1.25	26	23	29	
Coolant outlet union	M22x1.5	25	23	27	LOCK 5
Coolant circuit hose clamps		2.5	2	3	

*dynamic safety-critical point; tightening torque must be within Nm ±5%.

 **Note**

For product specifications and symbols, refer to paragraph "Product specifications" (Sec. 1 - 2).