Tightening Torques Rotax 912/914 – Maintenance Manual Heavy

Source: BRP-Rotax **Maintenance Manual Heavy (MMH) 912/914 Series, Ed. 2 / Rev. 1 (November 2025)**.
All values are taken from the procedure steps of the manual; values shown **only in the exploded views** are marked *(fig. only)*. The column „Page“ refers to the chapter page in the MMH.

- Accepted torque accuracy acc. to MMH: **±10 %**
- Unless specified otherwise, threads are **not lubricated** (dry) when fastened.
- Procedure acc. to MMH: screw in all fasteners by hand → apply half the torque → tighten to full torque; with multiple fasteners use a crisscross pattern.
- Conversion: 1 Nm = 0.737 ft.lb = 8.85 in.lb
- Always refer to the latest issue of the manufacturer's manual!

24-20-00 Internal Generator (ignition housing, stator, flywheel)

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Bracket on ignition housing (Allen screw + washer A6)	M6x16	10	89 in.lb		17
Stator fixation (incl. charging coil grounding cable)		5	44 in.lb	Apply LITHIUM-BASE GREASE to contact areas, screw heads and lock washer	18
Cable clamp 15/M5 for stator cable (Allen screw + lock washer A5)	M5x16	5	44 in.lb		18
Ignition cover on housing (7 Allen screws + lock washers)	M6x30	10	89 in.lb	tighten evenly	20
HD electric starter only: Allen screws with cap nut M5 or hex nut M5 + lock washer A5	M5x45	6	53 in.lb		20
Spacer/rubber buffer of electronic module on bracket (hex nut)	M6	10	89 in.lb		21
Cable clamp with grounding cable on SMD electronic module (Allen screw)	M5x25	2.5	22 in.lb	LOCTITE 243	21
Fly wheel hub assy. (10 screws, alternating 5x M6x30 and 5x M6x25 with lock washers A6)	M6	10	89 in.lb	LOCTITE 243	22
Central screw fly wheel (with washer 17/36/5 and lock washer 16)	M16x1.5	45 **+ 180°**	33 ft.lb + 180°	tighten immediately after screwing in	22
External trigger coils (all Allen screws, after adjusting air gap IH02)		5	44 in.lb		23
Ignition cover (3 hex. screws)	M6x16	5	44 in.lb	LOCTITE 243	23

24-30-00 External Alternator

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
V-belt pulley on pulley carriers (8 Allen screws + lock washers A5)	M5x16	6	53 in.lb		7
Alternator – pre-mounted Allen screw M6	M6	10	89 in.lb		8
Alternator – pre-mounted Allen screw M8	M8	24	18 ft.lb		8
V-belt tension – hex. screw M10	M10	40	30 ft.lb	after adjusting the belt tension	9
V-belt tension – hex. screws M8	M8	22	16 ft.lb	after adjusting the belt tension	9
(Overview of all torques: Fig. 3.1 „Tightening torque“)					3

37-10-00 Vacuum Pump

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Vacuum pump gear (Allen screw)	M8x14	25	18 ft.lb	LOCTITE 648	10
Countersunk screw with thrust washer (ball bearing retention) *(fig. only, Fig. 4.3)*	M5	6	53 in.lb	LOCTITE 243	4
Studs M6 for vacuum pump (if loose)	M6	5	44 in.lb	LOCTITE 243	11
Vacuum pump on studs (4 hex. nuts + lock washers)	M6	10	89 in.lb		11

61-20-00 Governor

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Countersunk screw with thrust washer (ball bearing retention)	M5x12	6	53 in.lb	LOCTITE 243; **Fig. 5.3 shows 5 Nm / 44 in.lb**	14
Governor drive gear (Allen screw)	M8x16	25	18 ft.lb	LOCTITE 648	15
Governor flange: 4 Allen screws on crankcase + 2 Allen screws on flange (oil feed line)	M6x20 / M6x16	10	89 in.lb	LOCTITE 243	16
Governor pressure oil line on governor flange (banjo bolt, sealing rings A10x14)	M10x1x23	15	133 in.lb		16
Governor pressure oil line on oil pump housing – 912	M10x1x23	15	133 in.lb	sealing rings A10x14	16
Governor pressure oil line on oil pump housing – 914	M10x1x34	15	133 in.lb	sealing rings A10x14	16
Cable clamp governor pressure oil line – 912 (hex. nut M8 + lock washer A8)	M8	15	133 in.lb	LOCTITE 243	18
Cable clamp governor pressure oil line – 914 (hex. screw + distance sleeve + lock washer A8)	M8x25	15	133 in.lb	LOCTITE 243	18
Plug screw	M8x1	10	89 in.lb	LOCTITE 243	18
Governor studs (if loose)		15	133 in.lb	LOCTITE 243	18

71-00-00 Power Plant (engine suspension frame)

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Engine suspension frame – first side (Allen screws + lock washers A10)	M10x35/110	60	44 ft.lb	LOCTITE 243	20
Engine suspension frame – second side (Allen screws + lock washers A10)	M10x35	60	44 ft.lb	LOCTITE 243	20

72-10-00 Propeller Gearbox

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Bearing cover propeller shaft (4 hex. screws, hardened washers 7.2/18.8/3)	M7x16	15	133 in.lb	LOCTITE 243	26
Oil spray nozzle in gearbox housing (banjo bolt)	M8x1	18	159 in.lb	LOCTITE 243	26
Blinding shim in crankcase (countersunk screw with thrust washer) – configuration 2	M5x12	6	53 in.lb	LOCTITE 243	31
Stud gearbox housing *(fig. only, Fig. 8.3)*		6	53 in.lb		5
Gearbox housing to crankcase – screw M6 *(fig. only, Fig. 8.3)*	M6	10	89 in.lb		5
Gearbox housing to crankcase – screw M8 *(fig. only, Fig. 8.3)*	M8	25	18 ft.lb		5
Hex. nut drive gear on crankshaft *(fig. only, Fig. 8.3)*		**300**	221 ft.lb	LOCTITE 7063 + LOCTITE 648	5

72-20-00 Engine Block

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Hex. collar nut sprag clutch housing	M34x1.5	**150**	111 ft.lb	degrease with LOCTITE 7063, secure with LOCTITE 603	12

72-30-00 Cylinder Head

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Cylinder head studs (screwing in)		6	53 in.lb	LOCTITE 648	13
Coolant elbow (2 Allen screws + washers 6.4)	M6x20	10	89 in.lb		28
Fitting cylinder head: hand-tighten 2 collar cap nuts + 2 hex. nuts diagonally	M8	**max. 5**	44 in.lb	until cylinder head rests on cylinder; lightly lubricate flat surfaces of collar cap nuts, no grease on hex. nut contact areas	32/33
Intake manifold on cylinder head (2 Allen screws + washer each)	M6	10	89 in.lb		33
Cylinder aligning tool 877262 on intake flange (4 Allen screws)	M6x25	10	89 in.lb		34

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Cylinder head tightening torque procedure step 3: all collar cap nuts + hex. nuts	M8	10	89 in.lb	sequence acc. to fig.; always torque both cylinder heads of one side together!	34
Cylinder head tightening torque procedure step 4: all nuts	M8	30 (−5)	22 ft.lb (−4)	sequence acc. to fig.	34
Cylinder head tightening torque procedure step 5: loosen each nut 360°, then	M8	10 **+ 150°**	89 in.lb + 150°	one at a time following the torque sequence	34
Valve cover (Allen screw + washer 6/12/1, new O-rings 105×2.5 and 6.4×1.8)	M6x30	10	89 in.lb		35

73-00-10 Carburetor – Single Parts

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Stop lever + throttle lever (hex. nut + spring washer 8.3/13.6/0.4)	M8x1	5	44 in.lb		17
Choke lever / starting carburetor (hex. nut + spring washer 8.3/13.6/0.4)	M8x1	6.5	57 in.lb	O-ring 5×1.5 with lithium-base grease	17
Float chamber – 914 only (attachment screw, O-ring 15.6×1.78)		5.5	49 in.lb	secure with safety wiring (912: spring clip)	22
Fuel connection on carburetor – 914 *(Fig. 13.3)*		10	89 in.lb		4

73-10-00 Fuel System and Distribution

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Clamp block fuel manifold (Allen screw)	M5x16	6	53 in.lb	refit in the same position	18
Fuel pressure regulator – 914: cap nut of adjustment screw		5	45 in.lb	LOCTITE 243; approx. 250 hPa above airbox pressure	20
Intake manifold (4 Allen screws + washers)	M6	10	89 in.lb		23
Hex. screw with new gasket 6×10 (compensation tube)	M6x6	5	44 in.lb	LOCTITE 243	23
Clamping block – 912 only (Allen screw)	M5x16	5	44 in.lb		23
Rubber flange carburetor (hex. screws + washers, new O-ring 47×2)	M8x25 / M8x30	15	133 in.lb	LOCTITE 243	24
Airbox 914 – fuel line (banjo bolt, sealing rings 10×14)	M10x1x19	15	133 in.lb		26
Airbox 914 – plug screw	1/8-27 NPT	10	89 in.lb	LOCTITE 243	26
Airbox 914 – both hose nipples M6	M6	2	18 in.lb	LOCTITE 243	26
Airbox 914 – hex. nut M6 + hose nipple M6	M6	2	18 in.lb	LOCTITE 243	26

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Fuel pressure regulator 914 – two hose nipples 4/6 (banjo bolts, sealing rings 10×14)	M10x1x19	15	133 in.lb		28
Fuel pressure regulator 914 on airbox (hex. screws + lock washer A6)	M6x16	8	70 in.lb		28
Studs fuel pump (longer threaded end into gearbox)	M8	6	53 in.lb	LOCTITE 243	29
Fuel pump (hex. nuts + lock washers A8)	M8	15	133 in.lb	LOCTITE 243, tighten evenly	29
Nipples / adapters on fuel pump (new gasket rings)		10	89 in.lb	LOCTITE 577; ensure correct position	29
Fuel hose assy. with distance sleeve (banjo bolt, sealing rings A8x13)	M8x1x27	10	89 in.lb		31
Feed line + fuel hose assy. (banjo bolt, sealing rings A8x13)	M8x1x27	10	89 in.lb		31
Slotted head screw with sealing ring 10×14	M10x1x8	15	133 in.lb	LOCTITE 243	31
912: fuel line (from tank) on pump		32	24 ft.lb		31
912: fuel feed line (to carburetor) on pump		27	20 ft.lb		31
Ring hose nipple 3/4 return, banjo bolt with pilot jet 0.35 mm (without fuel pressure gauge)	M8x1	10	89 in.lb	sealing rings A8x13; banjo bolt marked yellow or „FUEL“	32
Double hose nipple assy. with pilot jet 0.35 mm (with fuel pressure gauge)	M8x1x17	10	89 in.lb	sealing rings A8x13	32
Collar nut (pressure connection line 914)		10	89 in.lb		33
Fuel line on fuel pressure regulator 914 (banjo bolt, sealing ring 10×14)	M10x1x19	15	133 in.lb		33
Fuel line connector on carburetor (new gasket ring A8x13, both sides)		10	89 in.lb		33

Acc. to MMH (chapter 73-10-00, inspection): in the event of leaks at banjo bolts, the max. permissible torque must **never** be exceeded; a visibly oval hole = overstretched → replace.

74-20-00 Distribution (ignition)

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Ignition coil bracket on rubber buffer (hex. screw + lock washer A6)	M6x10	10	89 in.lb	LOCTITE 243	18
Attachment screws double ignition coils	M5	6	53 in.lb		19
SMD electronic module (Allen screws + lock washer A5 / cable clamp 11.3/M5 with grounding cable)	M5x25	2.5	22 in.lb	LOCTITE 243	21/23
Ignition assy. on crankcase (Allen screw + lock washer A8)	M8x10	24	18 ft.lb		22
Bracket ignition assy. (hex. screw + lock washer A6)	M6x10	10	89 in.lb		22
Intake manifolds with pre-assembled ignition assy. (4 Allen screws + lock washers, crosswise)	M6x25/70	10	89 in.lb		22

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Grounding cables on intake manifold (hex. screw + lock washer A6)	M6x16	10	89 in.lb		23
Spark plugs *(fig. only, Fig. 16.3; text refers to MML chapter 12-20-00)*		16	142 in.lb	Silicone Heat Compound WACKER P12	5

75-00-00 Cooling System

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Water pump impeller (with special tool 877295)		15	133 in.lb	LOCTITE 243 on shaft thread, stainless compensating shim	19
Water pump housing on ignition housing (2x M6x90 + 2x M6x35 with lock washers, new gasket)	M6	10	89 in.lb		21
Allen screw stainless steel with new sealing ring 6×10	M6x35	10	89 in.lb		21
Water inlet elbow (2 Allen screws + lock washers, new O-ring 32×2)	M6x20	10	89 in.lb		21
Coolant temperature sensor in cylinder head *(fig.; text see 76-70-00)*		7	62 in.lb	LOCTITE 243	6

75-20-00 Mechanical Rev. Counter

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Rev counter housing (Allen screw + lock washer A5)	M5x16	6	53 in.lb		8

76-50-00 Wiring Harness (914)

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Starter cables on terminals (hex. nut + washer 6.4)	M6	10	89 in.lb		13

76-70-00 Sensors and Actuators

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Oil temperature sensor (OTS) in oil pump housing		7	62 in.lb	LOCTITE 243 (not if housing is not dry → use gasket ring)	24
Oil pressure sensor (OPS) in oil pump housing		15	133 in.lb	LOCTITE 243; close PIN A with LOCTITE 5910 or similar	24
Coolant temperature sensor in cylinder head (cyl. 2 and 3)		7	62 in.lb	LOCTITE 243	25
Resistance thermometer (airbox temperature) – 914		**min. 5**	44 in.lb	LOCTITE 243; until aligned correctly	25

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Airbox pressure sensor – 914 (Allen screw + washer 6.2/14/1)	M6x14	5	44 in.lb	LOCTITE 243; *MMH erroneously states „133 in.lb“*	26
Three-way solenoid valve – 914 (2 Allen screws + washer A6)	M6x14	8	70 in.lb		29

78-10-00 Exhaust

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Exhaust studs on cylinder head	M8	6	53 in.lb	LOCTITE 648	13/15
Exhaust flange on cylinder head (2 new lock nuts)	M8	15	133 in.lb	LOCTITE Anti Seize on socket	13/15
Exhaust bend clamp – 912		6	53 in.lb		13
Exhaust pipe connection – 912/914 *(fig. only, Fig. 23.2/23.3)*		10	89 in.lb	LOCTITE Anti Seize	5/6
Studs M8 for muffler on turbocharger – 914 (longer thread into turbo)	M8	6	53 in.lb	LOCTITE Anti Seize	14
Exhaust bracket (Allen screw + washer 10.5 + lock washer A10) – 914	M10x50	60	44 ft.lb	LOCTITE 243	14
Muffler assy. on turbocharger (nuts + washers 8.4) – 914	M8	25	18 ft.lb		15
Support plate (hex. screw + washer 8.4) – 914	M8x16	25	18 ft.lb		15
Muffler clamp – 914		15	133 in.lb		15
Check screws/nuts on exhaust manifold assy. – 914		25	18 ft.lb		16

78-20-00 Turbocharger (914)

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Oil sump assy. (hex. screws, cable support, new O-ring 15.9-2.3)	M6x55	10	89 in.lb	safety wire between both screws	17
Studs turbine housing (4x M8x19.5/13 + 1x M8x30/13, longer thread into turbine housing)	M8	6	53 in.lb	LOCTITE Anti Seize	17
Turbocharger on manifold bracket (Allen screw + 2 washers 8.4 + hex. nut M8)	M8x25	25	18 ft.lb	LOCTITE Anti Seize	19
Turbo bracket (Allen screw + lock washer A10 + washer 10.5)	M10x50	60	44 ft.lb	LOCTITE 243	19
After exhaust is mounted: 4 hex. screws turbine housing + Allen screws exhaust manifold	M8x16 / M8x25	25	18 ft.lb		19
Manifold bracket (if replaced, Allen screw)	M8x50	30	22 ft.lb		19
Rope sheave servo motor (Allen screw + washer A5.2×14.8×1.5 + lock washer A5)	M5x20	6	53 in.lb	hold rope sheave against rotation!	21
Screw nipple Bowden cable on rope sheave		2.5	22 in.lb		22
Turbo pressure oil line on turbo (banjo bolt) *(Fig. 24.2; text see 79-00-00)*		10	89 in.lb		3

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Cap nut check valve turbo pressure oil line *(fig. only, Fig. 24.2)*		25	18 ft.lb		3
Turbo oil suction line on turbo *(Fig. 24.2; text see 79-00-00)*		20	15 ft.lb		3
Attachment (2 screws, Fig. 24.2 bottom) *(fig. only)*		10	89 in.lb		3

79-00-00 Lubrication System

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Oil pump housing – 912 (Allen screws + washers 6.4, crosswise)	M6x50	10	89 in.lb	first crosswise by hand	25
Oil pump housing – 914 (Allen screws + washers 6.4, crosswise)	M6x65	10	89 in.lb	first crosswise by hand	27
Plug screw oil pressure regulator	M12x1	25	18 ft.lb	**oiled thread**; safety wire	26/28
Plug screw (if no governor installed) with sealing ring 10×14	M10x1	10	89 in.lb	LOCTITE 243	26
With governor: pressure oil line(s) on oil pump housing (oiled banjo bolt, 3 sealing rings 10×14) – 914	M10x1x34	15	133 in.lb		28
Without governor: pressure oil line + spacer 10.5/15/10 (oiled banjo bolt, 3 sealing rings) – 914	M10x1x34	15	133 in.lb		28
Turbo return line (oiled banjo bolt, sealing rings 10×14) – 914	M10x1x23	15	133 in.lb		28
Hose nipple 4/6 (oiled banjo bolt, sealing rings 10×14)	M10x1x23	15	133 in.lb		28
Oil tank drain screw (new gasket ring C 12×18)	M12x12	25	18 ft.lb		33
Governor pressure oil line on governor flange – 914 (banjo bolt, sealing rings 10×14)	M10x1x23	15	133 in.lb		37
Governor + turbo pressure oil line on oil pump housing – 914 (banjo bolt)	M10x1x34	15	133 in.lb	without governor: with sleeve 10.5/15/10	37
Turbo pressure oil line on turbo housing (sealing rings A8x13)	M8x1x17	10	89 in.lb	install ball + spring of check valve in correct order!	38
Turbo oil suction line on turbo		20	15 ft.lb		38
Turbo oil suction line on oil pump housing (banjo bolt, sealing rings 10×14)	M10x1x23	15	133 in.lb		39
Cable clamp turbo oil suction line on turbocharger bracket		6	53 in.lb		39
Cable clamps on turbo pressure and suction line		6	53 in.lb		39
Oil filter threaded nipple *(fig. only, Fig. 25.4/25.5)*		60	44 ft.lb	LOCTITE 243	5/6
Connection nipple oil inlet on oil pump housing *(fig. only, Fig. 25.4/25.5)*		35	26 ft.lb	LOCTITE 648	5/6

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Hose nipple oil inlet *(fig. only, Fig. 25.4/25.5)*		22	16 ft.lb	LOCTITE 243	5/6
Plug screw on oil pump housing (with O-ring) *(fig. only, Fig. 25.4)*		15	133 in.lb	LOCTITE 243 – *check deviation from text „M10x1 = 10 Nm“*	5
Screw at bottom of oil pump housing – 914 *(fig. only, Fig. 25.5)*		12	106 in.lb	engine oil	6
Bracket turbo oil line – 914 *(fig. only, Fig. 25.5)*		10	89 in.lb		6
Oil tank: screw on cover *(fig. only, Fig. 25.6)*		12	106 in.lb	engine oil	7
Oil tank: hose connections *(fig. only, Fig. 25.6)*		25	18 ft.lb		7
Crankcase: plug screw *(fig. only, Fig. 25.6)*		25	18 ft.lb	LOCTITE 5910	7
Crankcase: lower plug screw *(fig. only, Fig. 25.6)*		35	26 ft.lb	LOCTITE 243	7
Crankcase: 2 banjo bolts oil lines *(fig. only, Fig. 25.6)*		30	22 ft.lb		7
Crankcase: connection nipple *(fig. only, Fig. 25.6)*		25	18 ft.lb	LOCTITE 648	7

80-00-00 Electric Starter

Fastener	Thread	Nm	in.lb / ft.lb	Locking / Note	Page
Assembling HD starter (Allen screws)	M5x180	5	44 in.lb		16
Starter on crankcase (hex. nut M5 + lock washer A5 or cap nut M5) – standard and HD	M5	6	53 in.lb		17/18
Positive pole on starter		4	35 in.lb		17/18

Discrepancies in the MMH

- **76-70-00 p. 26:** Airbox pressure sensor „5 Nm (133 in. lb)“ – 5 Nm equals 44 in.lb; 133 in.lb would be 15 Nm. Verify value before use.
- **61-20-00:** Countersunk screw M5x12 (ball bearing) is 6 Nm in the text, but Fig. 5.3 shows 5 Nm / 44 in.lb (37-10-00 Fig. 4.3 also shows 6 Nm).
- **79-00-00 Fig. 25.4:** small plug screw with 15 Nm/LOCTITE 243 – the text specifies 10 Nm for plug screw M10x1 (without governor).
- Spark plugs (16 Nm) and the crankshaft nut of the gearbox (300 Nm) appear only in the exploded views, not in the text.
- The component assignment of values shown only in the exploded views was derived from the drawings.

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