



SERVICE DATA

CLEARING SAW

ECHO: BCLS-520ES

(Serial number : 38000001 and after)

INTRODUCTION

We are constantly working on technical improvement of our products. For this reason, technical data, equipment and design are subject to change without notice. All specifications and directions in this SERVICE DATA are based on the latest product information available at the time of publication.

SERVICE MANUAL Ref. No. 402-44 (Model : SRM-420ES) contains lots of information for servicing this model.

CONTENTS

	page
1 SERVICE INFORMATION	2
1-1 Specification	2
1-2 Technical data.....	3
1-3 Torque limits.....	4
1-4 Special repairing materials	5
1-5 Service limits.....	6
1-6 Special tools	7

Reference No. 10-50C-00
ISSUED : 201912



1 SERVICE INFORMATION

1-1 Specifications

Dimensions* ¹	Length	mm (in)	1753 (69.0)	
	Width	mm (in)	701 (27.6)	
	Height	mm (in)	535 (21.1)	
Dry weight** ²		kg (lb)	9.4 (20.7)	
Engine	Type		YAMABIKO, air-cooled, two-stroke, single cylinder	
	Rotation		Counterclockwise as viewed from the output end	
	Displacement	cm ³ (in ³)	50.2 (3.063)	
	Bore	mm (in)	44.0 (1.732)	
	Stroke	mm (in)	33.0 (1.299)	
	Compression ratio		7.1	
Carburetor	Type		Diaphragm, horizontal-draft	
	Model		Walbro WT-1096	
	Venturi size - Throttle bore	mm (in)	13.5 - 15.85 (0.53 - 0.62)	
Ignition	Type		CDI (Capacitor discharge ignition) system, Digital magneto	
	Spark plug		NGK BPMR8Y	
Exhaust	Muffler type		Spark arrester muffler	
Starter	Type		ES-start (effortless)	
	Rope diameter x length	mm (in)	3.8 x 910 (0.15 x 35.9)	
Fuel* ³	Type* ⁴		Mixed two-stroke fuel	
	Mixture ratio		50 : 1 (2%)	
	Gasoline		Minimum 89 octane	
	Two-stroke engine oil		ISO-L-EGD (ISO/CD13738), JASO FC/FD	
	Tank capacity		Full tank capacity: 0.69 (23.3) Usable capacity: 0.6 (20.3)	
		L (U.S.fl.oz.)		
Clutch	Type		Centrifugal, 2-shoe pivot	
Handle	Type		U-handle with integrated control grip	
Drive shaft	Type		Solid type with serration (10-tooth)	
	Diameter - Length	mm (in)	8.0 - 1488 (0.31 - 58.58)	
	Housing	OD - ID	mm (in)	28.0 - 24.0 (1.10 - 0.94)
	(Main pipe)	Length	mm (in)	1437 (56.57)
Gear case	Reduction ratio		1.4	
	Gear tooth		Spiral bevel gear	
	Lubrication		Lithium based grease	
Cutter	Type		Option: 3-tooth blade (255 mm), Nylon line cutter B6, Shredder blade (270 mm)	
	Arbor diameter for blade	mm (in)	25.4 (1.0)	
	Fastener type, size	mm	Left-hand thread M12 x 1.75 pitch	
	Cutting rotation		Counterclockwise as viewed from top	

OD: Outer diameter. **ID:** Inner diameter.

*¹ Without cutting attachment *² Without cutting attachment and Shield *³ Refer to Operator's manual

*⁴ Premixed alkylate fuel for 2-stroke can be used

1-2 Technical data

Engine			
Compression pressure	MPa (kgf/cm ²) (psi)	0.88 (8.9) (127)	
Clutch engagement speed	r/min	3800	
Ignition system			
Spark plug gap	mm(in)	0.6 - 0.7 (0.024 - 0.028)	
Spark test	Tester gap w/ spark plug	mm(in)	4.0 (0.16)
	Tester gap w/o spark plug	mm(in)	6.0 (0.24)
Secondary coil resistance	Ω	750 - 1150	
Pole shoe air gaps	mm(in)	0.3 - 0.4 (0.012 - 0.016)	
Ignition timing	at 3000 r/min	°BTDC	14
	at 9000 r/min	°BTDC	28
Carburetor			
Test Pressure, minimum	MPa (kgf/cm ²) (psi)	0.05 (0.5) (7.0)	
Metering lever height	mm(in)	1.65 (0.06) lower than diaphragm seat	
Tool to adjust mixture needles		D-shaped (L) P/N X645-000031 (Carb. adjustment tool P/N Y089-000095)	
Carburetor adjustment			
Cutting head preparation	Nylon line cutter	B6	
	Line length* ¹	197 mm	
1) Initial setting	H mixture needle	turn out	2 3/4
	L mixture needle	turn out	2
	Throttle adjust screw	turn in* ²	2 1/8
Engine warm-up	Idle - WOT : Total	sec.	10 - 50 : 180
2) Find idle maximum speed			Adjust L mixture needle to maximum idle speed* ³
3) Set idle maximum speed w/ TAS		r/min	3600
4) Set idle speed by turning L mixture needle CCW		r/min	2800
5) Find WOT maximum speed		r/min	Adjust H mixture needle to maximum WOT speed
6) WOT setting		r/min	Turn H mixture needle CCW to decrease WOT speed by : 120
7) Verify final engine speed with standard equipment		r/min	Idle: 2400 - 3300 WOT: 9700 - 10700** (11500 - 12300*) Line length* ¹ : 177 mm (Cut by shield knife)
8) Verify clutch engagement speed			Confirm clutch engagement speed. If it is less than 1.25 times the idle speed, adjust the idle speed by turning TAS CCW.

BTDC: Before top dead center. **WOT:** Wide open throttle **CCW:** Counterclockwise **TAS:** Throttle adjust screw

*¹ From eyelet on nylon head

*² Set Throttle adjust screw to the point that its tip just contacts throttle plate before initial setting.

*³ If clutch engages during adjustment process 2), decrease engine speed by turning TAS CCW until clutch disengages and then redo 2).

* With 3-tooth blade (255 mm). ** With Nylon line cutter

1-3 Torque limits

Descriptions		Size	N•m	kgf•cm	in•lbf
Starter system	Starter pawl assembly	M5	6 - 9	60 - 90	50 - 80
	Starter case	M5**	3 - 4.5	30 - 45	26 - 40
Ignition system	Magneto rotor (Flywheel)	M8	20 - 24	200 - 240	175 - 210
	Ignition coil	M5	5 - 7	50 - 70	45 - 60
	Spark plug	M14	13 - 17	130 - 170	115 - 150
Fuel system	Carburetor	M5	4 - 5.5	40 - 55	35 - 50
	Intake bellows	M5**	3 - 5	30 - 50	26 - 45
	Intake insulator	M5**	6 - 8	60 - 80	53 - 70
	Insulator plate	M5**	3 - 4.5	30 - 45	26 - 40
	Fuel tank bracket	M5	5 - 7	50 - 70	45 - 60
	Fuel tank with stand	M5**	3 - 4.5	30 - 45	26 - 40
Clutch	Clutch shoe	M8	20 - 23	200 - 230	175 - 200
	Clutch hub	M10	20 - 23	200 - 230	175 - 200
Engine	Crankcase	M5	7 - 11	70 - 110	60 - 95
	Cylinder	M5	7 - 11	70 - 110	60 - 95
	Cylinder (Inner)	M5**	3 - 4.5	30 - 45	26 - 40
	Cylinder (Outer)	M5**	2 - 3	20 - 30	17 - 26
	Stand	M5**	3 - 4.5	30 - 45	26 - 40
	Muffler	M6	10 - 14	100 - 140	90 - 125
	Muffler cover	M5*	3 - 4.5	30 - 45	26 - 40
	Muffler stay	M5	6 - 9	60 - 90	50 - 80
	Clutch case	M5	5 - 7	50 - 70	45 - 60
Others	Gearcase assembly	M5	6 - 9	60 - 90	50 - 80
	Blade fastening nut	LM12	28 - 32	280 - 320	245 - 280
	Handle fixture (See NOTE below)	M5**	3 - 4	30 - 40	26 - 35
Regular bolt, nut and screw		M3	0.6 - 1	6 - 10	5 - 9
		M4	1.5 - 2.5	15 - 25	13 - 22
		M5	3 - 4.5	30 - 45	26 - 40
		M6	4.5 - 7.5	45 - 75	40 - 65
		M8	11 - 15	110 - 150	95 - 130
		M10	21 - 30	210 - 300	180 - 260

LM: Left hand thread

* Apply thread locking sealant. (See next page)

** Precoat bolt: If the coat is peeled off, replace new one or apply thread locking sealant. (See next page)

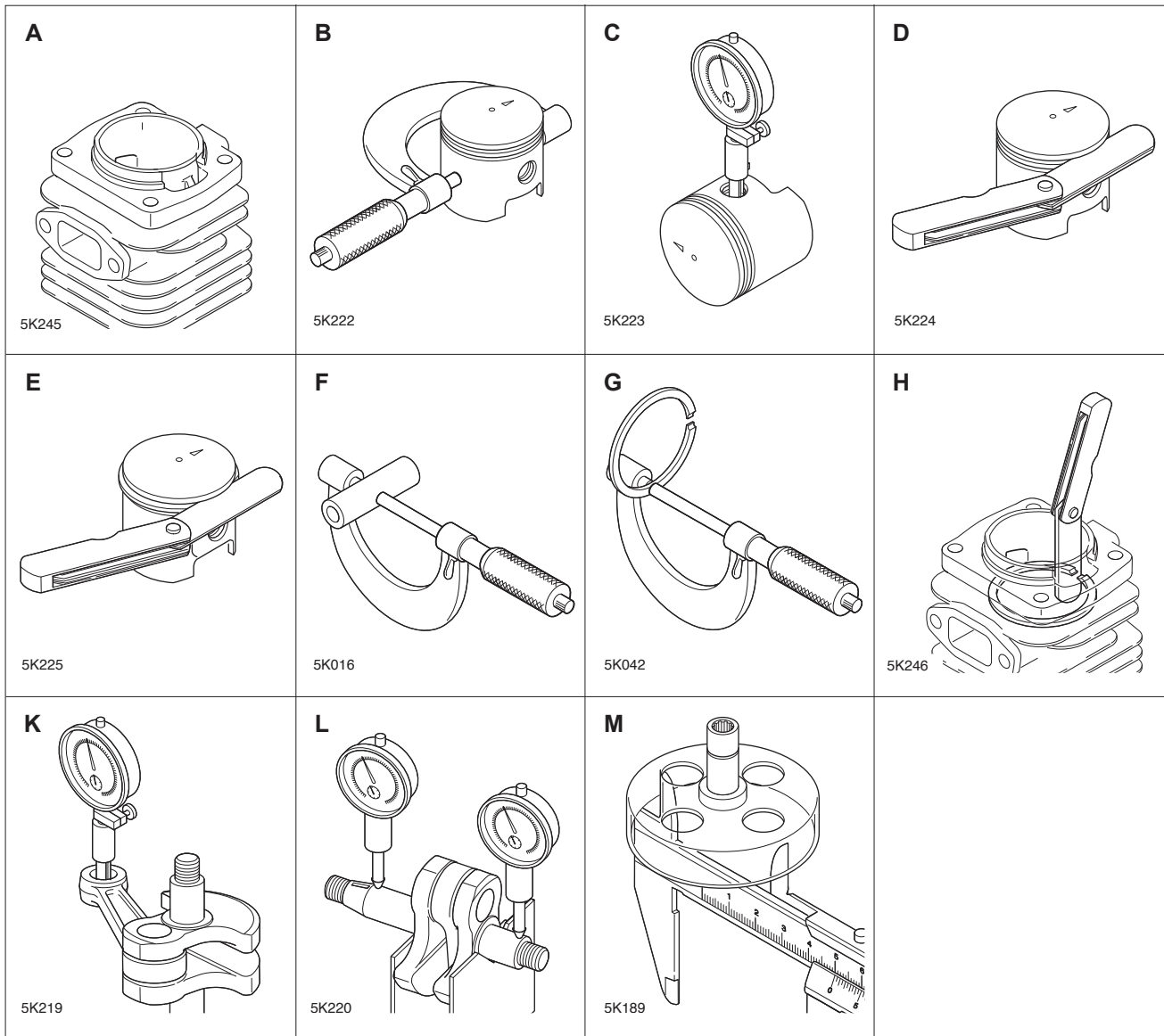
NOTE: After tightening the bolts, turn the bolts counterclockwise 1 1/2 turns.

1-4 Special repairing materials

Material	Location	Remarks
Grease	Gear case	EPNOC AP2 (Lithium based grease) P/N X695-000060
	Rewind spring	
	Starter center post	
	Drive shaft	
	Holder cushions	
Oil	Oil seal inner lips	Two-stroke engine oil or engine oil (SAE#30)
	Intake bellows	
Thread locking sealant	Muffler cover	ThreeBond #1324N or equivalent
	Cylinder cover (re-use*)	
	Insulator plate (re-use*)	
	Intake bellows (re-use*)	ThreeBond #1360N or equivalent
	Intake insulator (re-use*)	Loctite #675 or equivalent
	Stand (re-use*)	
	Starter case (re-use*)	
Handle fixture (re-use*)	ThreeBond #1344J or equivalent	

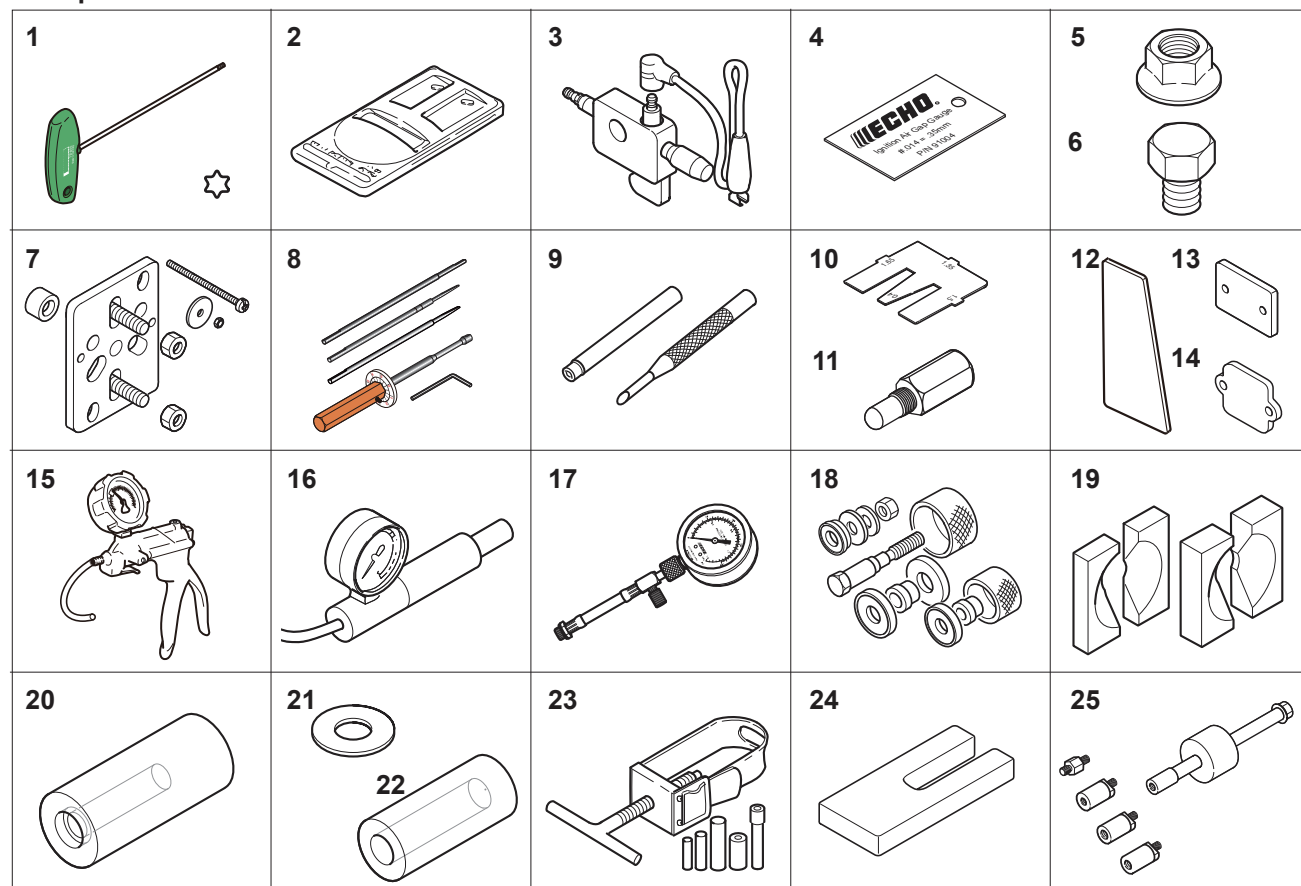
* If old thread locking sealant is left in threads, correct torque may not be secured. In case old thread locking sealant is left, remove it.

1-5 Service limits



Description		mm (in)	
A	Cylinder bore	When plating is worn and aluminium can be seen	
B	Piston outer diameter	Min.	43.92 (1.571)
C	Piston pin bore	Max.	11.035 (0.4344)
D	Piston ring groove	Max.	1.6 (0.063)
E	Piston ring side clearance	Max.	0.1 (0.004)
F	Piston pin outer diameter	Min.	10.98 (0.4323)
G	Piston ring width	Min.	1.45 (0.057)
H	Piston ring end gap	Max.	0.5 (0.02)
K	Con-rod small end bore	Max.	15.025 (0.5915)
L	Crankshaft runout	Max.	0.02 (0.001)
M	Clutch drum bore	Max.	79.5 (3.13)

1-6 Special tools



Key	Part Number	Description	Reference
1	X602-000340	Torx wrench (T27)	Removing and installing torx bolt
2	897802-33330	Tachometer PET-1000R	Measuring engine speed to adjust carburetor
3	897800-79931	Spark tester	Checking ignition system
4	91004	Module air gap gauge	Adjusting pole shoe air gaps
5	V265-000200	Flange nut	Removing crankshaft from crankcase (clutch side)
6	900100-08008	Bolt	Removing crankshaft from crankcase (clutch side)
7	Y089-000111	Puller	Removing magneto rotor
8	Y089-000095	Carburetor adjustment tool	Adjusting carburetor
9	500-500	Welch plug tool (Walbro)	Removing and installing welch plug
10	897563-19830	Metering lever gauge	Measuring metering lever height on carburetor
11	X644-000020	Piston stopper	Locking crankshaft rotation
12	91041	Pressure rubber plug	Plugging exhaust port to test crankcase / cylinder leakages
13	897826-16131	Pressure rubber plug	Plugging intake port to test crankcase / cylinder leakages
14	897827-16131	Pressure plate	Plugging intake port to test crankcase / cylinder leakages
15	91149	Pressure / vacuum tester	Testing crankcase and cylinder leakages
16	897803-30133	Pressure tester	Testing carburetor and crankcase leakages
17	91037	Compression gauge	Measuring cylinder compression
18	897701-14732	Bearing tool	Removing and installing ball bearings on crankcase
19	897701-02830	Bearing wedge	Removing ball bearings on crankshaft
20	897714-24330	Oil seal tool	Installing ball bearings of gear case
21	363018-00310	Washer	Installing crankcase oil seal
22	897726-16431	Oil seal tool	Installing crankcase oil seal
23	897702-30131	Piston pin tool	Removing and installing piston pin
24	897719-02830	Piston holder	Making piston steady to remove and install piston/ring
25	P021-044871	PTO shaft puller	Removing PTO shaft