



# SERVICE DATA

## TRIMMER/BRUSHCUTTER

ECHO: SRM-420ES SRM-420ES-LW  
SRM-420TES

shindaiwa: T410S B410S B410S-LW  
T410TS B410TS

(Serial number : 37000001 and after)

(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 products information available at the time of publication.

SERVICE MANUAL Ref. No. 402-44 (Model: SRM-420ES, SRM-420TES, T410S, B410S, T410TS, B410TS) contains lots of information for servicing these models.

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## 1 SERVICE INFORMATION

## 1-1 Specifications

Model			SRM-420ES (L) T410S	SRM-420ES (U) B410S	SRM-420ES-LW B410S-LW
Dimensions* <sup>1</sup>	Length	mm (in)	1836 (72.2)		
	Width	mm (in)	355 (14.0)	700 (27.6)	673 (26.5)
	Height	mm (in)	287 (11.3)	585 (23.0)	510 (20.1)
Dry weight* <sup>2</sup>		kg (lb)	7.8 (17.2)	8.5 (18.7)	8.0 (17.6)
Engine	Type	YAMABIKO, air-cooled, two-stroke, single cylinder			
	Rotation	Counterclockwise as viewed from the output end			
	Displacement	cm <sup>3</sup> (in <sup>3</sup> )	41.5 (2.532)		
	Bore	mm (in)	40.0 (1.575)		
	Stroke	mm (in)	33.0 (1.299)		
	Compression ratio	6.7			
Carburetor	Type	Rotary type : Diaphragm, horizontal-draft with purge bulb			
	Model	WT-1046	WT-1046 WT-1170	WT-1170	
	Venturi size-Throttle bore	mm (in)	12.7 - 14.3 (0.50 - 0.56)		
Ignition	Type	CDI (Capacitor discharge ignition) system, Digital magneto			
	Spark plug	NGK BPMR8Y			
Exhaust	Muffler type	Spark arrester muffler with catalyst			
Starter	Type	ES-start (effortless) / Soft Start			
	Rope diameter x length	mm (in)	3.8 x 910 (0.15 x 35.9)		
Fuel* <sup>3</sup>	Type* <sup>4</sup>	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: 0.60 (20.3)			
		L (U.S.fl.oz.)			
Clutch	Type	Centrifugal, 2-shoe pivot			
Handle	Type	Front:	Crescent loop with cushion grip	U-handle with integrated control grip	
		Rear:	Integrated control grip with cushion		
Drive shaft	Type	Solid type with serration (10-tooth)			
	Diameter - Length	mm (in)	8.0 - 1588 (0.31 - 62.52)		
	Housing (Main pipe)	OD - ID	mm (in)	28.0 - 24.0 (1.10 - 0.94)	
		Length	mm (in)	1537 (60.5)	
Gear case	Reduction ratio	1.33			
	Gear tooth	Spiral bevel gear			
	Lubrication	Lithium based grease			
Cutter	Type	Nylon line cutter DS-5	3-tooth blade (255 mm) Nylon line cutter DS-5	Nylon line cutter DS-5	
	Arbor diameter for blade	mm (in)	25.4 (1.0)		
	Fastener type, size	mm	Left-hand thread nut, M10 x 1.25 pitch		
	Cutting rotation	Counterclockwise as viewed from top			

1-1 Specifications (continued)

Model			SRM-420TES (L) T410TS	SRM-420TES (U) B410TS	
Dimensions* <sup>1</sup>	Length	mm (in)	1848 (72.7)		
	Width	mm (in)	355 (14.0)	700 (27.6)	
	Height	mm (in)	312 (12.3)	620 (24.4)	
Dry weight* <sup>2</sup>		kg (lb)	8.0 (17.6)	8.7 (19.2)	
Engine	Type		YAMABIKO, air-cooled, two-stroke, single cylinder		
	Rotation		Counterclockwise as viewed from the output end		
	Displacement	cm <sup>3</sup> (in <sup>3</sup> )	41.5 (2.532)		
	Bore	mm (in)	40.0 (1.575)		
	Stroke	mm (in)	33.0 (1.299)		
	Compression ratio		6.7		
Carburetor	Type		Rotary type : Diaphragm, horizontal-draft, with purge bulb		
	Model		WT-1046	WT-1046 WT-1170	
	Venturi size-Throttle bore	mm (in)	12.7 - 14.3 (0.50 - 0.56)		
Ignition	Type		CDI (Capacitor discharge ignition) system, Digital magneto		
	Spark plug		NGK BPMR8Y		
Exhaust	Muffler type		Spark arrester muffler with catalyst		
Starter	Type		ES-start (effortless) / Soft Start		
	Rope diameter x length	mm (in)	3.8 x 910 (0.15 x 35.9)		
Fuel* <sup>3</sup>	Type* <sup>4</sup>		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	L (U.S.fl.oz.)	Full tank capacity: 0.69 (23.3) Usable capacity: 0.60 (20.3)		
Clutch	Type		Centrifugal, 2-shoe pivot		
Handle	Type	Front:	Crescent loop with cushion grip	U-handle with integrated control grip	
		Rear:	Integrated control grip with cushion		
Drive shaft	Type		Solid type with serration (10-tooth)		
	Diameter - Length	mm (in)	8.0 - 1588 (0.31 - 62.52)		
	Housing (Main pipe)	OD - ID	mm (in)	28.0 - 24.0 (1.10 - 0.94)	
		Length	mm (in)	1537 (60.5)	
Gear case	Reduction ratio		2.08		
	Gear tooth		Spiral bevel gear		
	Lubrication		Lithium based grease		
Cutter	Type		Nylon line cutter B6		
	Arbor diameter for blade	mm (in)	25.4 (1.0)		
	Fastener type, size	mm	Left-hand thread nut, M10 x 1.25 pitch		
	Cutting rotation		Counterclockwise as viewed from top		

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

\*<sup>1</sup> Without Nylon line head    \*<sup>2</sup> Without Nylon line head and Shield    \*<sup>3</sup> Refer to Operator's manual

\*<sup>4</sup> Premixed alkylate fuel for 2-stroke can be used

## 1-2 Technical data

Model	SRM-420ES SRM-420ES-LW T410S, B410S B410S-LW	SRM-420TES T410TS, B410TS	
Engine			
Compression pressure	MPa (kgf/cm <sup>2</sup> ) (psi)	0.92 (9.4) (132)	
Clutch engagement speed	r/min	3,700	
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	930 - 970	
Pole shoe air gaps	mm(in)	0.3 - 0.4 (0.012 - 0.016)	
Ignition timing	at 3,000 r/min	°BTDC	12
	at 8,500 r/min	°BTDC	29
Carburetor			
Test Pressure, minimum	MPa (kgf/cm <sup>2</sup> ) (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	
Carburetor adjustment			
Cutting head preparation	Nylon line cutter	DS-5	B6
	Line length* <sup>1</sup>	190 mm without shield	240 mm without shield
1) Initial setting	H mixture needle	turn out	3
	L mixture needle	turn out	2 3/8
	Throttle adjust screw	turn in* <sup>2</sup>	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* <sup>3</sup>
3) Set idle maximum speed w/ TAS		r/min	3,550
4) Set idle speed by turning L mixture needle CCW		r/min	2,750
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: 2,400 - 3,200
		r/min	WOT: 9,500 - 10,500* WOT: 10,500 - 11,500**
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

\* With Nylon line head and shield \*\* With 3-tooth blade (255 mm)

\*<sup>1</sup> From eyelet on nylon head

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

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

1-3 Torque limits

Descriptions		Size	kgf•cm	N•m	in•lbf
Starter system	Pawl	M5	60 - 90	6 - 9	50 - 80
	Starter case	M5* <sup>3</sup>	30 - 45	3 - 4.5	26 - 40
Ignition system	Magneto rotor (Flywheel)	LM8	200 - 240	20 - 24	175 - 210
	Ignition coil	M5	50 - 70	5 - 7	45 - 60
	Spark plug	M14	130 - 170	13 - 17	115 - 150
	Fan cover	M5	50 - 70	5 - 7	45 - 60
Fuel system	Carburetor	M5	40 - 55	4 - 5.5	35 - 50
	Intake bellows	M5* <sup>3</sup>	30 - 50	3 - 5	26 - 45
	Intake insulator	M5* <sup>3</sup>	50 - 70	5 - 7	45 - 60
	Insulator plate	M5* <sup>3</sup>	30 - 45	3 - 4.5	26 - 40
	Fuel tank bracket	M5	50 - 70	5 - 7	45 - 60
	Fuel tank	M5	50 - 70	5 - 7	45 - 60
Clutch	Clutch shoe	M6	70 - 110	7 - 11	60 - 95
Engine	Crankcase	M5* <sup>2</sup>	70 - 110	7 - 11	60 - 95
	Cylinder	M5* <sup>2</sup>	70 - 110	7 - 11	60 - 95
	Cylinder cover	M5* <sup>3</sup>	20 - 30	2 - 3	17 - 26
	Inner cylinder cover	M5* <sup>3</sup>	30 - 45	3 - 4.5	26 - 40
	Stand	M5* <sup>3</sup>	20 - 30	2 - 3	17 - 26
	Muffler	M6	100 - 140	10 - 14	90 - 125
	Muffler cover	M5* <sup>1</sup>	30 - 45	3 - 4.5	26 - 40
	Muffler stay	M5	60 - 90	6 - 9	50 - 80
Others	Blade fastening nut	LM10	280 - 320	28 - 32	245 - 280
Regular bolt, nut, and screw		M3	6 - 10	0.6 - 1	5 - 9
		M4	15 - 25	1.5 - 2.5	13 - 22
		M5	25 - 45	2.5 - 4.5	22 - 40
		M6	45 - 75	4.5 - 7.5	40 - 65
		M8	110 - 150	11 - 15	95 - 130
		M10	210 - 300	21 - 30	180 - 260

LM: Left hand thread.

\*<sup>1</sup> Apply thread locking sealant. (See “1-4 Special repairing materials”)

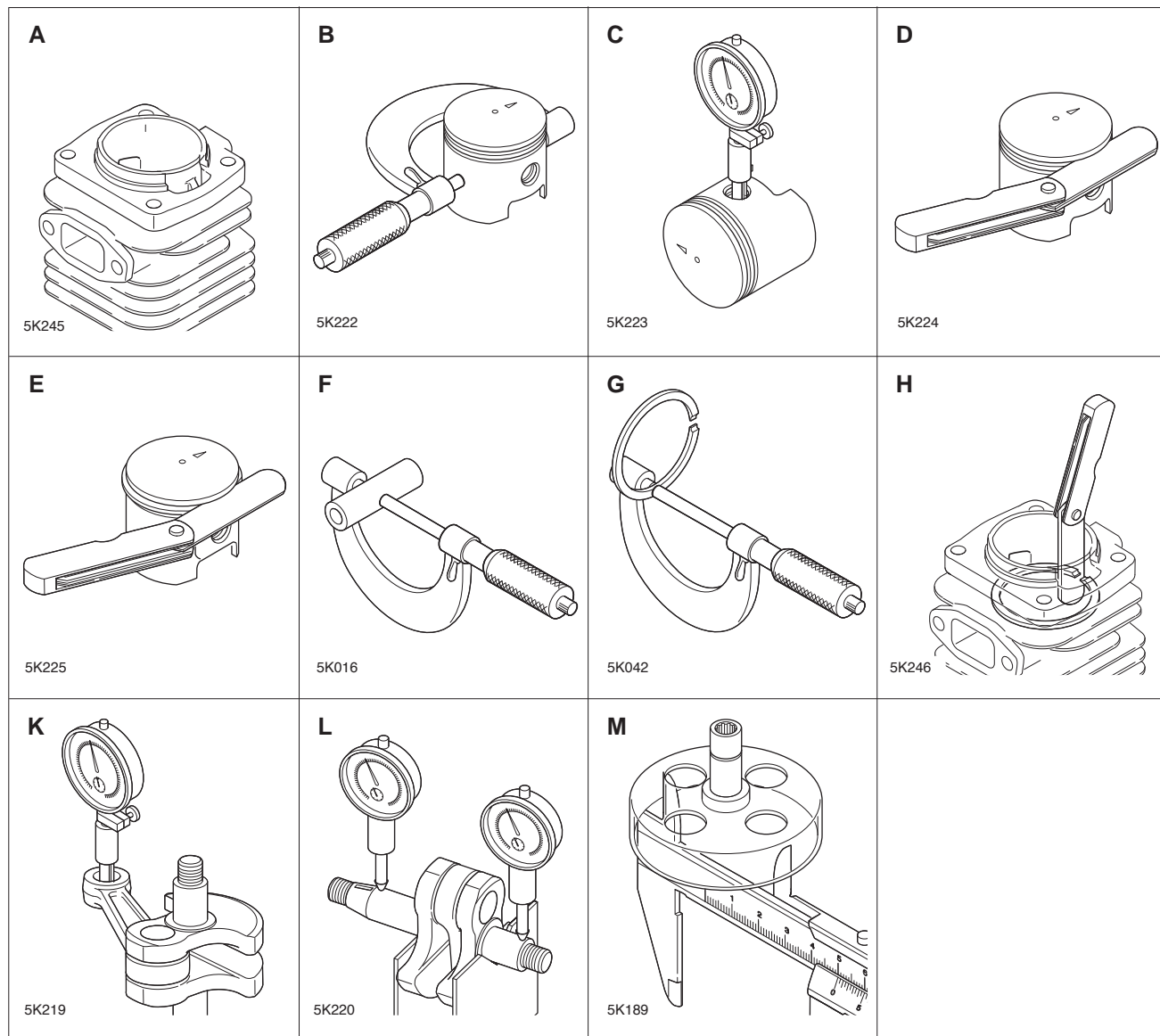
\*<sup>2</sup> The torque differences among four bolts should not exceed 20 kgf•cm (2N•m, 17in•lbf) on one cylinder or crankcase.

\*<sup>3</sup> **Precoat bolt:** If the coat is peeled off, replace new one or apply ThreeBond #1324 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.

1-4 Special repairing materials

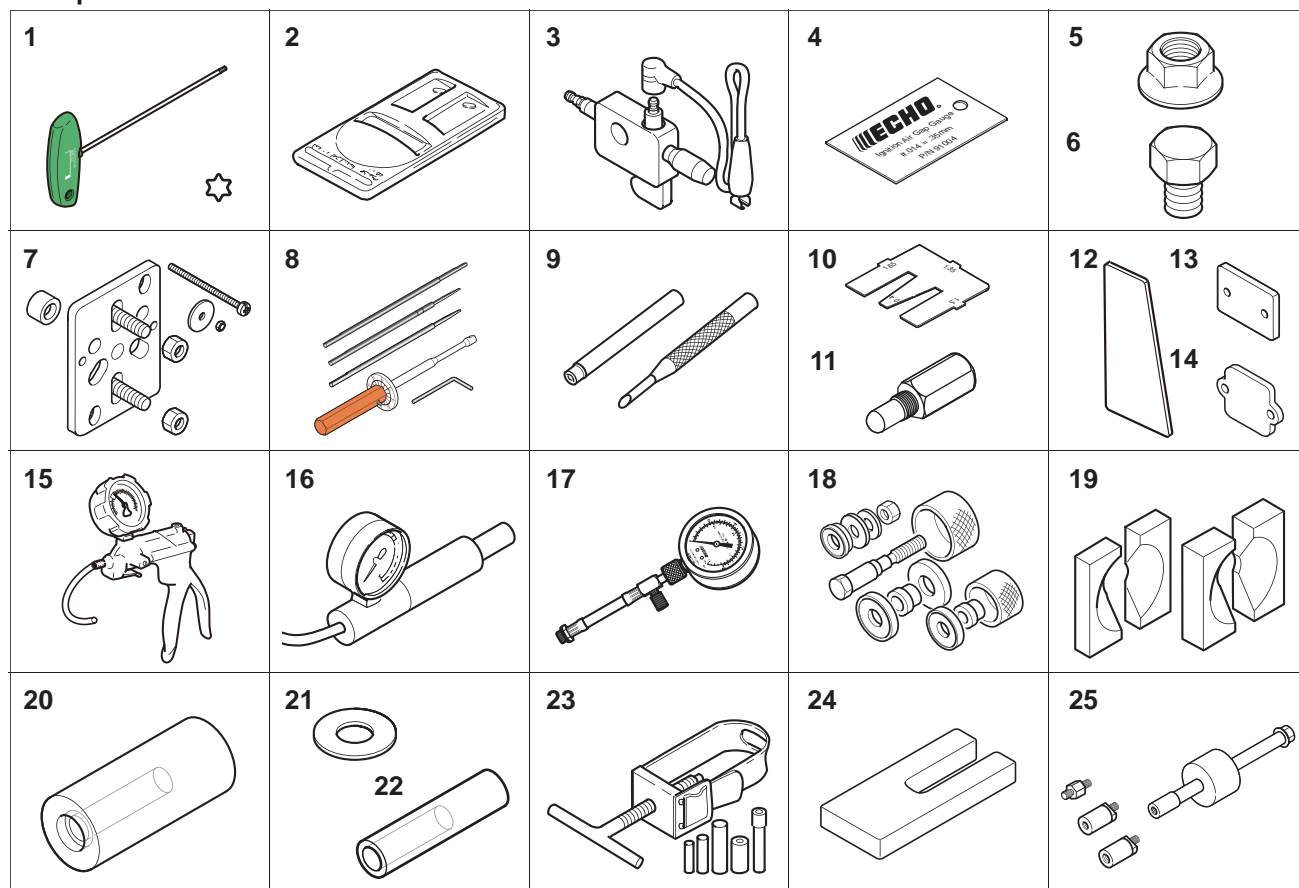
Material	Location	Remarks
Grease	Gear case	EPNOC AP2 (Lithium based grease) P/N X695-000060
	Rewind spring	
	Starter center post	
Oil	Oil seal inner lips	Two-stroke engine oil or engine oil (SAE#30)
	Intake bellows lips	
	Drive shaft	
Thread locking sealant	Muffler cover	Loctite #242, ThreeBond #1324 or equivalent
	Ignition switch	

### 1-5 Service limits



Description		mm (in)	
A	Cylinder bore	When plating is worn and aluminum can be seen	
B	Piston outer diameter	Min.	39.91 (1.571)
C	Piston pin bore	Max.	10.035 (0.3951)
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.	9.98 (0.3929)
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.	13.025 (0.5128)
L	Crankshaft runout	Max.	0.02 (0.001)
M	Clutch drum bore	Max.	71.5 (2.81)

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	Y089-000094	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	897726-21430	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	P021-044870	PTO shaft puller	Removing PTO shaft