



SERVICE DATA

TRIMMER/BRUSHCUTTER

ECHO: GT-222ES SRM-222ES

shindaiwa: F226S T226S C226S

(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 product information available at the time of publication.

SERVICE MANUAL Ref. No. 402-18 (Model: GT-1100, GT-2010, GT-2101, GT-2102, SRM-1500, SRM-1501, SRM-2010, SRM-2300, SRM-2301) contains lots of information for servicing these models.

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Reference No. **10-21U-03**

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1 SERVICE INFORMATION

1-1 Specifications

Model			GT-222ES F226S	SRM-222ES (L) T226S	SRM-222ES (U) C226S
Dimensions* ¹	Length	mm (in)	1460 (57.5)	1756 (69.1)	1760 (69.3)
	Width	mm (in)	320 (12.6)	345 (13.6)	655 (25.8)
	Height	mm (in)	575 (22.6)	320 (12.6)	420 (16.5)
Dry weight* ²		kg (lb)	4.3 (9.5)	4.5 (9.9)	4.9 (10.8)
Engine	Type	YAMABIKO, air-cooled, two-stroke, single cylinder			
	Rotation	Counterclockwise as viewed from the output end			
	Displacement	cm ³ (in ³)	21.2 (1.29)		
	Bore	mm (in)	32.2 (1.27)		
	Stroke	mm (in)	26.0 (1.02)		
	Compression ratio	6.9			
Carburetor	Type	Diaphragm, horizontal-draft, with purge bulb			
	Model	ZAMA RB-K113 / OPPAMA R09-001			
	Venturi size-Throttle bore	mm(in)	9.0 - 9.0 (0.354 - 0.354)		
Ignition	Type	CDI (Capacitor discharge ignition) system with electronic timing advancer and speed governor : VST			
	Spark plug	NGK BPMR8Y			
Exhaust	Muffler type	Spark arrester muffler with catalyst			
Starter	Type	ES-start / Soft Start			
	Rope diameter x length	mm (in)	3.0 x 820 (0.12 x 32.2)		
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	L (U.S.fl.oz.)	Full tank capacity: 0.40 (13.5), Usable capacity: 0.38 (12.8)		
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	Flexible			
	Diameter - Length	mm (in)	6.1 - 1330 (0.24 - 52.36)	6.15 - 1522 (0.24 - 59.92)	
	Housing OD - ID	mm (in)	25.0 - 22.0 (0.98 - 0.87)	25.0 - 22.0 (0.98 - 0.87)	
	Main pipe Length	mm (in)	1330 (52.4)	1500 (59.1)	
Gear case	Reduction ratio	---		1.36	
	Gear tooth	---		Spiral bevel gear	
	Lubrication	---		EPNOC AP2 (Lithium based grease)	
Cutter	Type	Nylon line cutter G137	Nylon line cutter G138	3-tooth blade (230 mm)	
	Arbor diameter for blade	mm (in)	---		
	Fastener type, size	mm	Standard thread 3/8 inch - 24UNF	Left-hand thread nut, M10 x 1.25 pitch	
	Cutting rotation	Clockwise as viewed from top		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

Model	GT-222ES F226S	SRM-222ES(L) T226S	SRM-222ES(U) C226S
Engine			
Compression pressure	MPa (kgf/cm ²) (psi)		
Clutch engagement speed	r/min		
Ignition system			
Spark plug gap	mm(in)		
Spark test	Tester gap w/ spark plug		
	Tester gap w/o spark plug		
Secondary coil resistance	kΩ		
Pole shoe air gaps	mm(in)		
Ignition timing	at 3,000 r/min		°BTDC
	at 8,000 r/min		°BTDC
	at 11,000 r/min		°BTDC
Carburetor			
Test Pressure, minimum	MPa (kgf/cm ²) (psi)		
Metering lever height	mm(in)		
Limiting cap / plug			
Tool to adjust mixture needles			

BTDC: Before top dead center.

1-2 Technical data (continued)

Carburetor adjustment

Model	GT-222ES F226S	SRM-222ES(L) T226S	SRM-222ES(U) C226S
Carburetor type	ZAMA RB-K113		OPPAMA R09-001
1) Initial setting	H mixture needle	turn out	1 1/8
	L mixture needle	turn out	3 7/8
	Throttle adjust screw	turn in*2	7 3/4
			3/4
			3 1/4
			6 1/4

Model	GT-222ES, F226S		
Cutting head preparation	Nylon line cutter	G137	
	Line diameter	3.0 mm	2.0 mm
	Line length*1	mm(in)	130 (With shield)
			150 (Without shield)
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	4100	
4) Set idle speed by turning L mixture needle CCW	r/min	3000	
5) Find WOT maximum speed	Adjust H mixture needle to maximum WOT speed		
6) WOT setting	r/min	Turn H mixture needle CCW to reduce WOT speed by : 10 - 30	
7) Verify final engine speed with standard equipment	r/min	Idle: 2600 - 3400	
		WOT: 6700 - 7700*	WOT: 7700 - 8700*

Model	SRM-222ES(L), SRM-222ES(U), T226S, C226S		
Cutting head preparation	Nylon line cutter	G138	
	Line diameter	3.0 mm	2.0 mm
	Line length*1	mm(in)	180 (Without shield)
			200 (Without shield)
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	4100	
4) Set idle speed by turning L mixture needle CCW	r/min	3000	
5) Find WOT maximum speed	Adjust H mixture needle to maximum WOT speed		
6) WOT setting	r/min	Turn H mixture needle CCW to reduce WOT speed by : 10 - 30	
7) Verify final engine speed with standard equipment	r/min	Idle: 2600 - 3400	
		WOT: 9000 - 10000*	WOT: 9500 - 10500*
		10500 - 11500**	10500 - 11500**

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.
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WOT: Wide open throttle **CCW:** Counterclockwise **TAS:** Throttle adjust screw

* With Nylon line cutter and shield **With 3-tooth blade (230mm)

*1 From eyelet on nylon head

*2 Turn TAS clockwise until its head touches boss. Then turn TAS counterclockwise.

*3 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	Starter pawl assembly	M8	80 - 100	8 - 10	70 - 90
	Starter case	M4* ²	10 - 20	1 - 2	9 - 17
Ignition system	Magneto rotor (Flywheel)	M8	160 - 200	16 - 20	140 - 175
	Ignition coil	M4* ¹	35 - 45	3.5 - 4.5	30 - 40
	Fan cover	M4* ¹	18 - 28	1.8 - 2.8	16 - 24
	Spark plug	M14	130 - 170	13 - 17	112 - 150
Fuel system	Carburetor	M5	35 - 50	3.5 - 5	30 - 45
	Intake insulator	M5* ¹	25 - 36	2.5 - 3.6	22 - 31
	Fuel tank	M5* ¹	25 - 36	2.5 - 3.6	22 - 31
Cylinder cover	Starter side	M4* ²	15 - 32	1.5 - 3.2	13 - 28
	Fan cover side	M5	25 - 45	2.5 - 4.5	22 - 40
Engine	Crankcase	M5	70 - 110	7 - 11	60 - 95
	Cylinder	M5	70 - 110	7 - 11	60 - 95
	Muffler	M5* ¹	90 - 110	9 - 11	80 - 95
	Exhaust guide	M4	15 - 30	1.5 - 3	13 - 25
Other	Cutter fastener	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

LM: Left hand thread

*¹ Apply thread locking sealant. (see below)

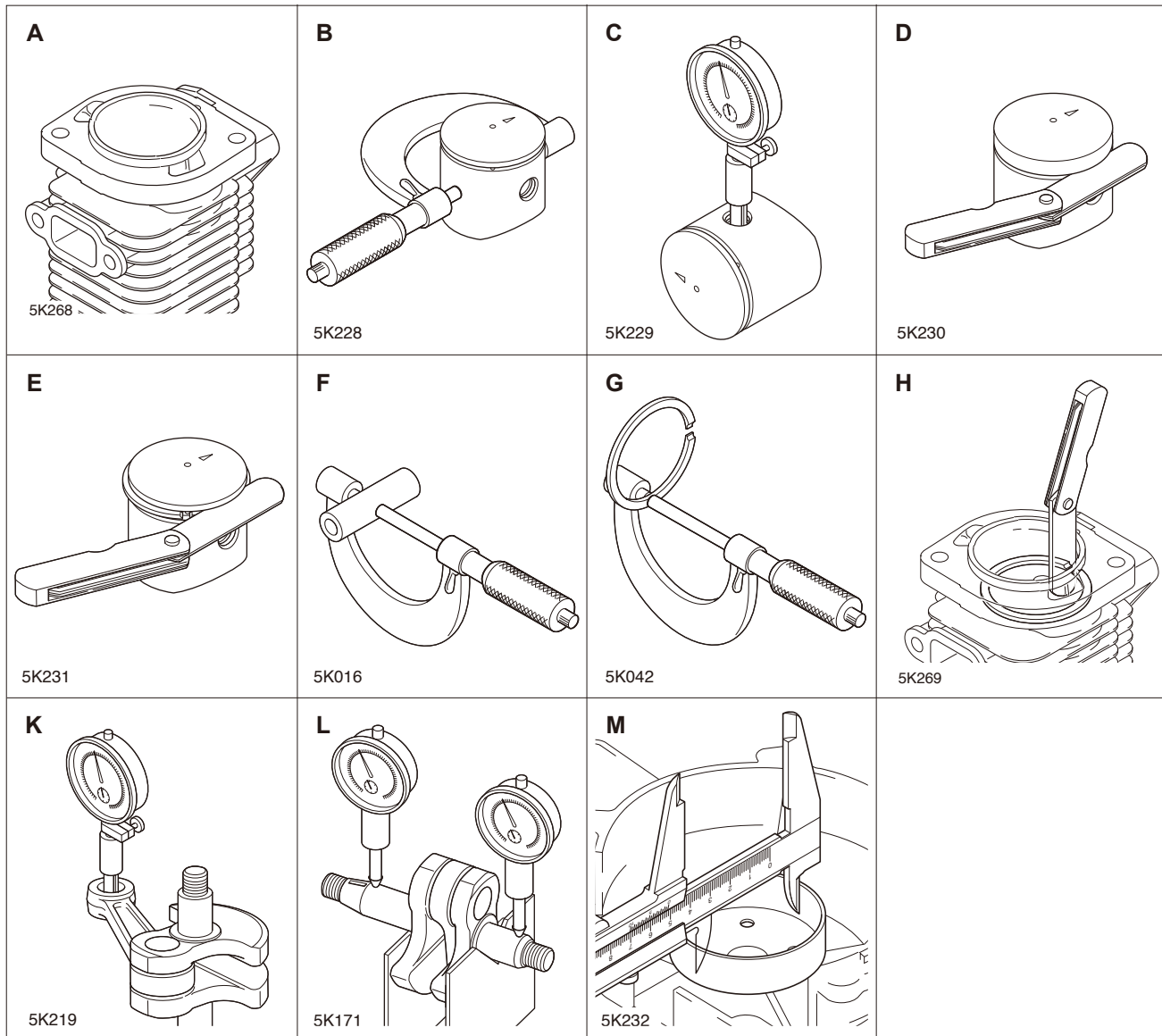
*² Precoat bolt : If the coat is peeled off, replace new one.

† Tapping screw

1-4 Special repairing materials

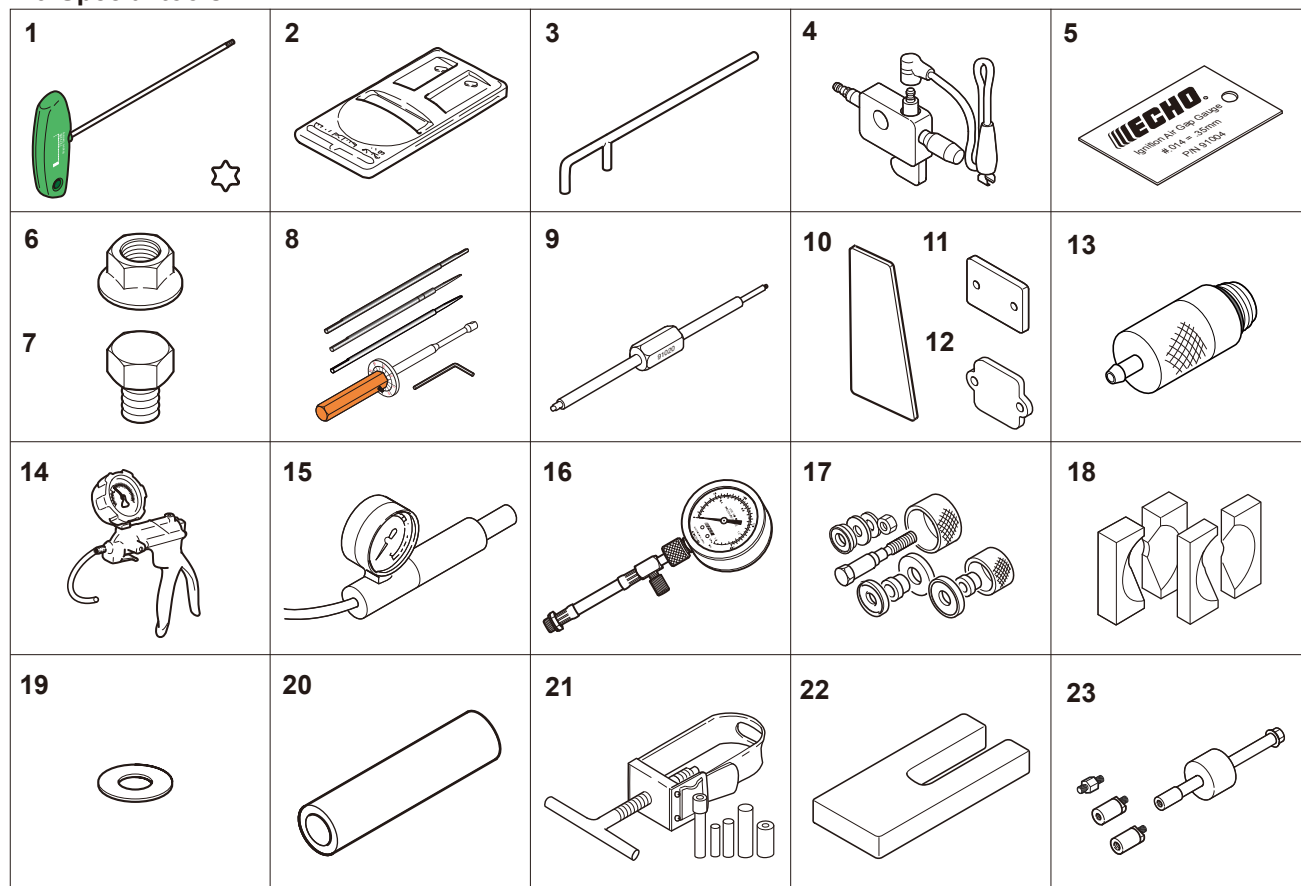
Material	Location	Remarks
Grease	Drive shaft	EPNOC AP2 (Lithium based grease) P/N X695-000060
	Gear case	
	Rewind spring	
	Starter center post	
	Oil seal inner lips	
Thread locking sealant	Muffler	ThreeBond #1327 or equivalent
	Fan cover	ThreeBond #1344 or equivalent
	Fuel tank	Loctite #648 or equivalent
	Intake insulator	
	Ignition coil	

1-5 Service limits



Description		mm (in)
A	Cylinder bore	When plating is worn and aluminium can be seen
B	Piston outer diameter	Min. 32.10 (1.264)
C	Piston pin bore	Max. 8.030 (0.3161)
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. 7.97 (0.3138)
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. 12.000 (0.4724)
L	Crankshaft runout	Max. 0.03 (0.001)
M	Clutch drum bore	Max. 51.5 (2.03)

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	897712-04630	2-pin wrench	Removing and installing pawl carrier
4	897800-79931	Spark tester	Checking ignition system
5	91004	Module air gap gauge	Adjusting pole shoe air gaps
6	V265-000200	Flange nut	Removing magneto rotor (flywheel)
7	900100-08008	Bolt	Removing magneto rotor (flywheel)
8	Y089-000094	Carburetor adjustment tool	Adjusting carburetor
9	91020	Limiter plug tool	Removing and installing limiter plug
10	91041	Pressure rubber plug	Plugging exhaust port to test crankcase/cylinder leakages
11	897826-16131	Pressure rubber plug	Plugging intake port to test crankcase/cylinder leakages
12	897827-16131	Pressure plate	Plugging intake port to test crankcase/cylinder leakages
13	A131-000150	Pressure connector	Testing crankcase and cylinder leakage
14	91149	Pressure / vacuum tester	Testing crankcase / cylinder leakages
15	897803-30133	Pressure tester	Testing carburetor and crankcase leakage
16	91037	Compression gauge	Measuring cylinder compression
17	897701-14732	Bearing tool	Removing and installing ball bearings on crankcase
18	897701-02830	Bearing wedge	Removing ball bearings on crankshaft
19	363018-00310	Washer	Installing crankcase oil seal
20	897726-09130	Oil seal tool	Installing crankcase oil seal
21	897702-30131	Piston pin tool	Removing and installing piston pin
22	897719-02830	Piston holder	Making piston steady to remove and install piston/ring
23	P021-044870	PTO shaft puller	Removing PTO shaft