



# SERVICE DATA

## TRIMMER/BRUSHCUTTER

ECHO: SRM-300ES

(Serial number : 37000001 and after)

ECHO: SRM-300TES

shindaiwa: T280TS C280TS

(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, illustrations and directions in this SERVICE DATA are based on the latest product information available at the time of publication.

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Reference No. **10-28B-04**

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## 1 SERVICE INFORMATION

## 1-1 Specifications

Model			SRM-300ES (L)	SRM-300TES(L) T280TS	SRM-300ES (U)	SRM-300TES (U) C280TS
Dimensions* <sup>1</sup>	Length	mm (in)	1784 (70.2)	1797 (70.7)	1784 (70.2)	1797 (70.7)
	Width	mm (in)	340 (13.4)		666 (26.2)	
	Height	mm (in)	318 (12.5)		492 (19.4)	528 (20.8)
Dry weight* <sup>2</sup>		kg (lb)	5.8 (12.8)		6.0 (13.2)	5.8 (12.8)
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> )	28.1 (1.715)			
	Bore	mm (in)	34.0 (1.339)			
	Stroke	mm (in)	31.0 (1.220)			
	Compression ratio		5.8			
Carburetor	Type		Diaphragm, horizontal-draft, with purge bulb			
	Model		Walbro WYK-233A			
	Venturi size-Throttle bore	mm (in)	12.2 - 12.2 (0.48 - 0.48)			
Ignition	Type		CDI (Capacitor discharge ignition) system, Digital Magneto			
	Spark plug		NGK BPMR8Y			
Exhaust	Muffler type		Spark arrester muffler with catalyst			
Starter	Type		ES (effortless)-start / S(Soft)-start			
	Rope diameter x length	mm (in)	2.8 x 850 (0.11 x 33.5)			
Fuel* <sup>3</sup>	Type* <sup>4</sup>		Mixed two-stroke fuel			
	Mixture ratio		50 : 1 (2 %)			
	Gasoline		Minimum 89 octane			
	Two-stroke air cooled engine oil		ISO-L-EGD (ISO/CD13738), JASO FC/FD			
	Tank capacity	L (U.S.fl.oz.)	Full tank capacity: 0.61 (20.6), Usable capacity: 0.52 (17.6)			
Clutch	Type		Centrifugal, 2-shoe pivot			
Handle	Type	Front:	Crescent loop w/ cushion grip	U-handle with integrated control grip		
		Rear:	Integrated control grip w/ cushion			
Drive shaft	Type		Solid, hollow type with spline (7-tooth)			
	Diameter - Length	mm (in)	7.0 - 1540 (0.27 - 60.62)			
	Housing OD - ID	mm (in)	25.0 - 22.0 (0.98 - 0.87)			
	(Main pipe) Length	mm (in)	1500 (59.1)			
Gear case	Reduction ratio		1.36	2.07	1.36	2.07
	Gear tooth		Spiral bevel gear			
	Lubrication		Lithium based grease			
Cutter	Nylon line cutter type		Nylon line cutter F4	Nylon line cutter Z5	Nylon line cutter F4 3-tooth Blade (255mm)	Nylon line cutter Z5
		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 Cutting attachment and Blade fixture \*<sup>2</sup> Without Cutting attachment 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-300ES	SRM-300TES T280TS, C280TS		
Engine				
Compression pressure	MPa (kgf/cm <sup>2</sup> ) (psi)	0.77 (7.8) (111)		
Clutch engagement speed	r/min	3,800		
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	kΩ	2.7 - 3.3		
Pole shoe air gaps	mm(in)	0.3 - 0.4 (0.012 - 0.016)		
Ignition timing	at 2,000 r/min	°BTDC	9	
	at 3,000 r/min	°BTDC	11	
	at 8,000 r/min	°BTDC	34	
	at 10,000 r/min	°BTDC	22	
PET-9000 Parameter	Parameter 1		64	
	Parameter 2		02	
Carburetor				
Test Pressure, minimum	MPa (kgf/cm <sup>2</sup> ) (psi)	0.05 (0.5) (7.0)		
Metering lever height	mm(in)	0.1-0.25 (0.004-0.01) lower than diaphragm seat		
Limiter cap / plug		Limiter plug P/N A259-000000		
Tool to adjust mixture needles		Screwdriver 2.5 mm P/N X603-000050		
Carburetor adjustment				
Cutting head preparation	Nylon line cutter		F4	Z5
	Line length* <sup>1</sup>	mm(in)	165 (Cut by shield knife)	220 (Without shield)
1) Initial setting	H mixture needle	turn out	3 1/4	
	L mixture needle	turn in* <sup>2</sup>	12 1/8	
	Throttle adjust screw	turn in* <sup>3</sup>	9 3/4	
Engine warm-up	Idle - WOT : Total	sec.	5 - 5 : 120	
2) Find idle maximum speed			Adjust L mixture needle to maximum idle speed* <sup>4</sup>	
3) Set idle maximum speed w/ TAS		r/min	3,500	
4) Set idle speed by turning L mixture needle CCW		r/min	2,700	
5) Find WOT maximum speed			Adjust H mixture needle to maximum WOT speed	
6) WOT setting		r/min	Turn H mixture needle CCW to decrease WOT speed by : 100	
7) Verify final engine speed with standard equipment		r/min	Idle: 2,500 - 3,100	
			WOT: 9,000 - 9800*	WOT: 10,300 - 11,300*
			10,500 - 11,000**	
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 cutter and shield \*\*With 3-tooth blade (230mm) \*<sup>1</sup> From eyelet on nylon head

\*<sup>2</sup> Screw in L mixture needle from initial thread engagement (at the point that the clicking sound is heard)

\*<sup>3</sup> Turn TAS clockwise until its head touches boss. Then turn TAS counterclockwise.

\*<sup>4</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	Starter pawl assembly	M 8	160 - 200	16 - 20	140 - 175
	Starter case	M 4*	40 - 60	4 - 6	35 - 53
Ignition system	Flywheel	M 8	160 - 200	16 - 20	140 - 175
	Ignition coil	M 4*	40 - 60	4 - 6	35 - 53
	Fan cover	M 5*	50 - 70	5 - 7	44 - 61
	Spark plug	M 14	130 - 170	13 - 17	112 - 150
Fuel system	Carburettor	M 5	30 - 45	3 - 4.5	26 - 39
	Intake insulator	M 5	50 - 70	5 - 7	44 - 61
	Fuel tank with stand	M 5*	40 - 60	4 - 6	32 - 53
Clutch	Clutch shoe	M 6	70 - 110	7 - 11	61 - 95
Cylinder cover	Flanged bolt	M 5	30 - 45	3 - 4.5	26 - 39
	Button bolt	M 5	30 - 45	3 - 4.5	26 - 39
Engine	Crankcase	M 5	70 - 110	7 - 11	60 - 95
	Cylinder	M 5	70 - 110	7 - 11	60 - 95
	Muffler	M 5*	60 - 80	6 - 8	53 - 70
	Exhaust guide	M 4	14 - 28	1.4 - 2.8	12 - 24
	Muffler cover	M 5*	30 - 45	3 - 4.5	26 - 39
	Top guard	M 5*	30 - 45	3 - 4.5	26 - 39
Other	Cutter fastener	LM 10	280 - 320	28 - 32	245 - 280
Regular bolt, nut and screw		M 3	6 -10	0.6 - 1	5 - 9
		M 4	15 -25	1.5 - 2.5	13 - 22
		M 5	25 -45	2.5 - 4.5	22 - 40
		M 6	45 -75	4.5 - 7.5	40 - 65
		M 8	110 -150	11 - 15	95 - 130

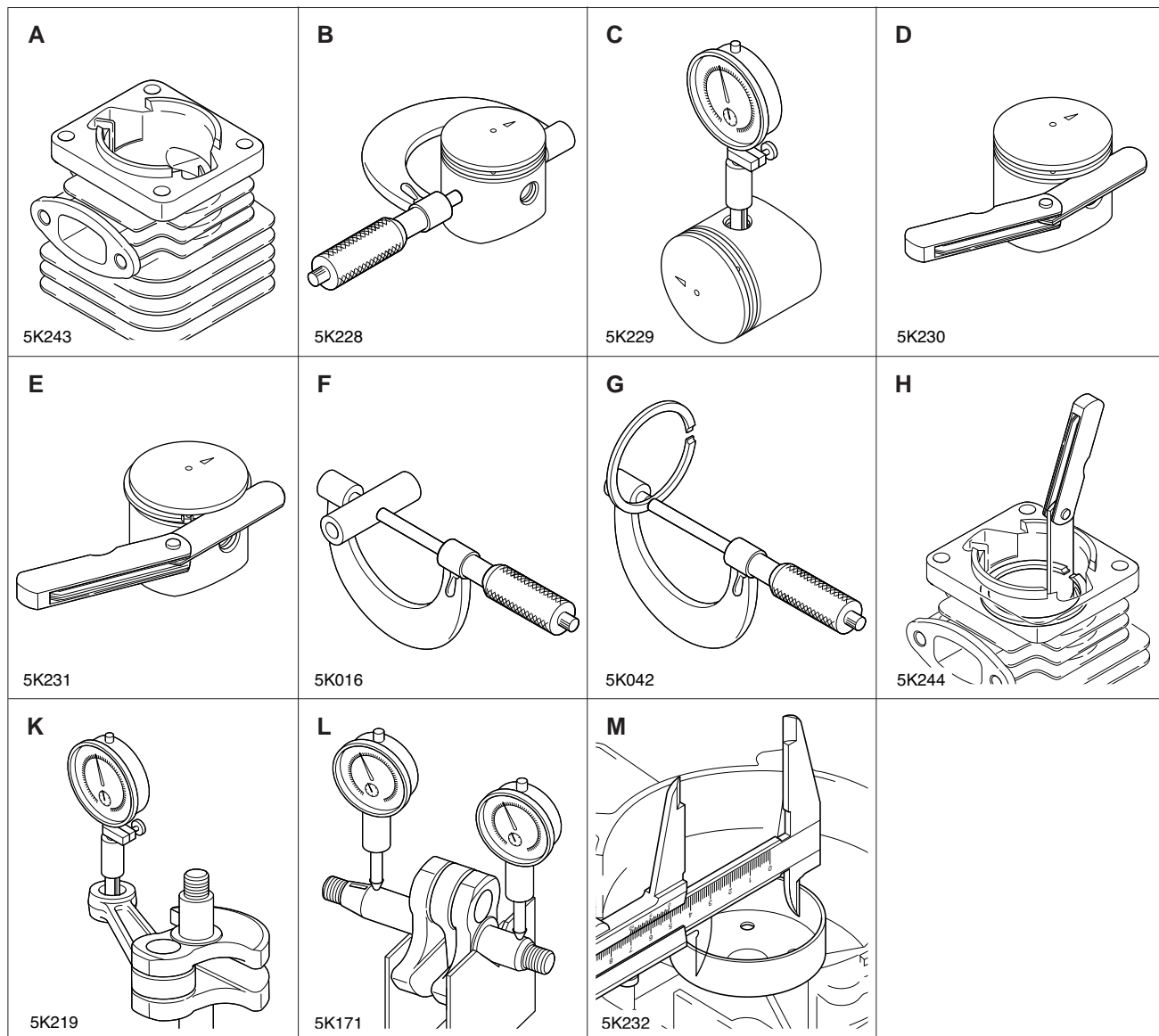
LM: Left-hand thread. \* Apply thread locking sealant. (See below)

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

## 1-4 Special repairing materials

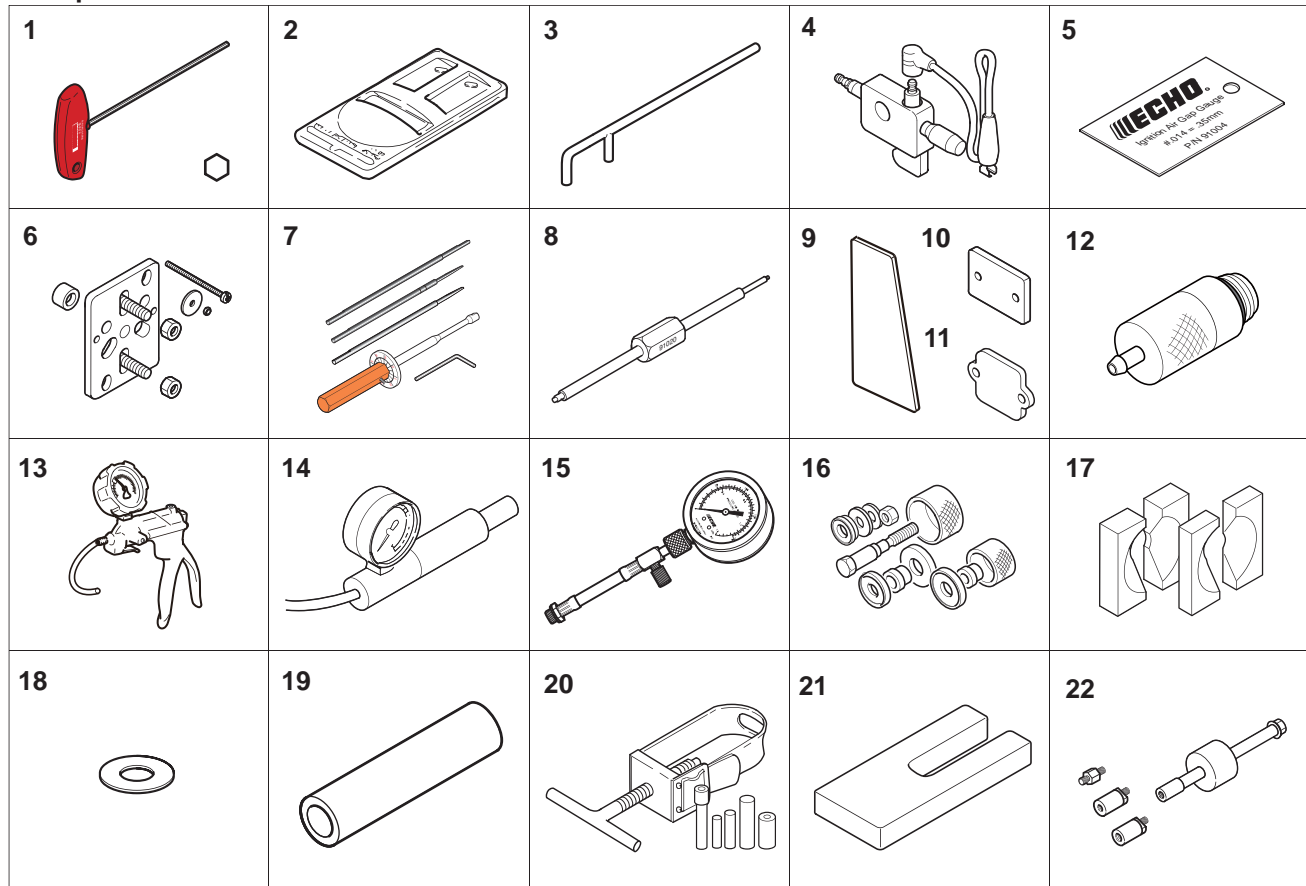
Material	Location	Remarks
Grease	Drive shaft	EPNOC AP2 (Lithium based grease) P/N X695-000060
	Gear case	
	Rewind spring	
	Starter center post	
	Oil seal inner lips	
Thread locking sealant	Starter case	Loctite #675 or equivalent
	Fuel tank	
	Ignition coil	Loctite #222, Three Bond #1342 or equivalent
	Fan cover	
	Top guard	
	Stand	
	Muffler cover	
Muffler	Loctite #242, ThreeBond #1324 or equivalent	

1-5 Service limits



Description		mm (in)	
A	Cylinder bore	When plating is worn and aluminum can be seen	
B	Piston outer diameter	Min.	33.90 (1.335)
C	Piston pin bore	Max.	9.035 (0.3557)
D	Piston ring groove	Max.	1.65 (0.065)
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.	12.025 (0.4734)
L	Crankshaft runout	Max.	0.02 (0.001)
M	Clutch drum bore	Max.	65.5 (2.58)

## 1-6 Special tools



Key	Part Number	PDescription	Reference
1	X602-000360	T-hex. wrench (4 mm)	Removing and installing hex. head bolt (M5)
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	Y089-000111	Puller	Removing magneto rotor (flywheel) and crankcase
7	Y089-000094	Carburetor adjustment tool	Adjusting carburetor
8	91020	Limiter plug tool	Removing and installing limiter plug
9	91041	Pressure rubber plug	Plugging exhaust port to test crankcase/cylinder leakages
10	897826-16131	Pressure rubber plug	Plugging intake port to test crankcase/cylinder leakages
11	897827-16131	Pressure plate	Plugging intake port to test crankcase/cylinder leakages
12	A131-000150	Pressure connector	Testing crankcase and cylinder leakage
13	91149	Pressure / vacuum tester	Testing crankcase / cylinder leakages
14	897803-30133	Pressure tester	Testing carburetor and crankcase leakage
15	91037	Compression gauge	Measuring cylinder compression
16	897701-14732	Bearing tool	Removing and installing ball bearings on crankcase
17	897701-02830	Bearing wedge	Removing ball bearings on crankshaft
18	363018-00310	Washer	Installing crankcase oil seal
19	897726-21430	Oil seal tool	Installing crankcase oil seal (starter side)
20	897702-30131	Piston pin tool	Removing and installing piston pin
21	897719-02830	Piston holder	Making piston steady to remove and install piston/ring
22	P021-044870	PTO shaft puller	Removing PTO shaft