



# SERVICE DATA

## POWER BLOWER

### ECHO: ES-250ES

(Serial number : P32837000001 - P32837999999)

(Serial number : P49738000001 - P49738999999)

(Serial number : P51338000001 - P51338999999)

(Serial number : P55440000001 - P55440999999)

#### 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.

#### CONTENTS

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

Reference No. 21-25M-02

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## 1 SERVICE INFORMATION

## 1-1 Specifications

Dimensions*	Length	mm (in)	330 (13.0)
	Width	mm (in)	280 (11.0)
	Height	mm (in)	345 (13.6)
Dry weight**		kg (lb)	5.7 (12.6)
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> )	25.4 (1.550)
	Bore	mm (in)	34.0 (1.339)
	Stroke	mm (in)	28.0 (1.102)
	Compression ratio	7.0	
Carburetor	Type	Diaphragm, horizontal-draft, with purge bulb	
	Model	Walbro WTA-33	
	Venturi size-Throttle bore	mm (in)	7.94 - 12.7 (0.31 - 0.50)
Ignition	Type	CDI (Capacitor discharge ignition) system	
	Spark plug	NGK BPMR8Y	
Exhaust	Muffler type	Spark arrester muffler with catalyst	
Starter	Type	ES (Effortless-Start)	
	Rope diameter x length	mm (in)	3.0 x 850 (0.12 x 33.5)
Fuel* <sup>1</sup>	Type* <sup>2</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: 0.5 (16.9) Usable capacity: 0.47 (15.9)
Blower	Fan type	Centrifugal, single stage	
	Blower pipe type	Fan head nozzle, Vacuum	
	Max. air volume (with pipes)	m <sup>3</sup> /min (cfm)	9.6 (339)
	Max. air velocity (with pipes)	m/s (mph)	81.7 (183)
	Nozzle outlet diameter	mm (in)	31 x 115.5 (1.2 x 4.5)

\*Without blower pipes    \*\*With blower pipes

\*<sup>1</sup> Refer to Operator's manual

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

1-2 Technical data

Engine			
Compression pressure	MPa (kgf/cm <sup>2</sup> ) (psi)		0.84 (8.6) (122)
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		2.5 - 3.0
Pole shoe air gaps	mm(in)		0.3 - 0.4 (0.012 - 0.016)
Ignition timing	at 1,000 r/min	°BTDC	25
	at 3,000 r/min	°BTDC	27
	at 8,000 r/min	°BTDC	28
PET-9000	Parameter 1		342
	Parameter 2		07
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 tool (S) P/N X645-000022 (Carb. adjustment tool P/N Y089-000094)
Carburetor adjustment			
1) Initial setting			
H mixture needle	turn out		2 3/4
L mixture needle	turn out		1 3/4
Throttle adjust screw	turn in* <sup>1</sup>		1/2
Engine warm-up	Idle - WOT : Total	sec.	10 - 50 : 180
2) Find idle maximum speed			Adjust L mixture needle to maximum idle speed
3) Set idle maximum speed w/ TAS		r/min	3,400
4) Set idle speed by turning L mixture needle CCW		r/min	3,000
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 : 20
7) Verify final engine speed with standard equipment		r/min	Idle: 2,700 - 3,300 WOT: 6,600 - 7,200 ( <b>with Vacuum pipe</b> ) WOT: 7,300 - 7,400 ( <b>with Fan head nozzle pipe</b> )

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

\*<sup>1</sup> Set throttle adjust screw to the point that its tip just contacts throttle plate before initial setting.

## 1-3 Torque limits

Descriptions		Size	kgf•cm	N•m	in•lbf
Starter system	Starter pulley	M8	160 - 200	16 - 20	140 - 175
	Starter case	M5*	15 - 30	1.5 - 3	13 - 25
Ignition system	Ignition coil	M4	35 - 50	3.5 - 5	30 - 45
	Spark plug	M 14	130 - 170	13 - 17	113 - 150
Fuel system	Carburetor	M5	30 - 45	3 - 4.5	25 - 40
	Intake insulator	M5	50 - 70	5 - 7	45 - 60
	Fuel tank	M5*	40 - 60	4 - 6	35 - 50
Engine	Crankcase	M5**	70 - 110	7 - 11	60 - 95
	Cylinder	M5**	70 - 110	7 - 11	60 - 95
	Cylinder cover	M5	60 - 80	6 - 8	50 - 70
	Cylinder cover with lead	M5	40 - 60	4 - 6	35 - 50
	Engine mount	M4	30 - 45	3 - 4.5	25 - 40
	Engine cover	M5	35 - 50	3.5 - 5	30 - 45
	Muffler	M5	70 - 80	7 - 8	60 - 70
Others	Outer fancase	M5†	35 - 50	3.5 - 5	30 - 45
	Fan	M8	140 - 160	14 - 16	120 - 140
	Fan hub	M8*	160 - 200	16 - 20	140 - 175
	Eye plate	M5	50 - 70	5 - 7	45 - 60
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

\* Apply thread locking sealant (See below)

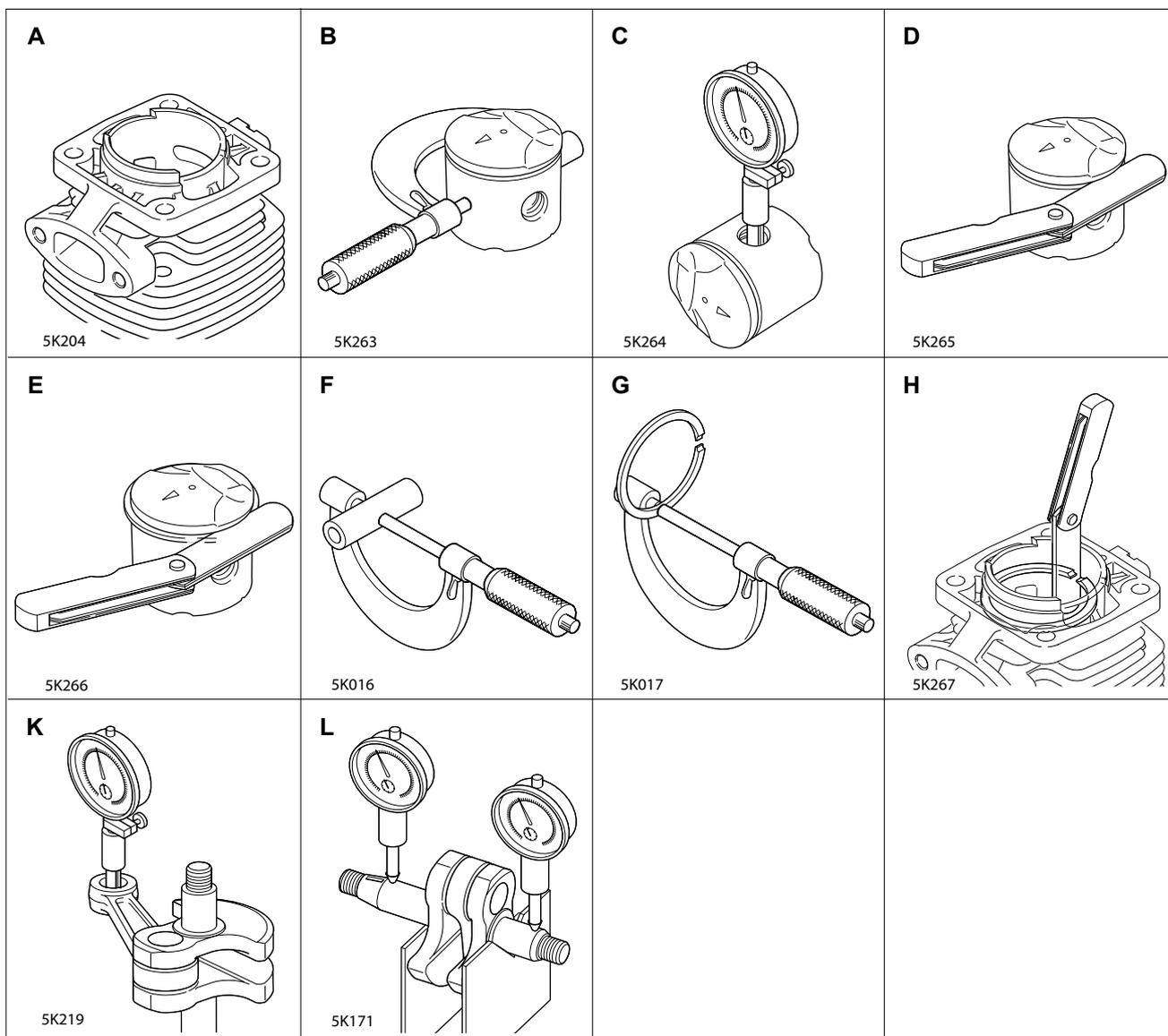
\*\* The torque differences among four bolts should not exceed 20 kgf•cm (2N•m, 17in•lbf) on one cylinder or crankcase.

† Tapping screw

## 1-4 Special repairing materials

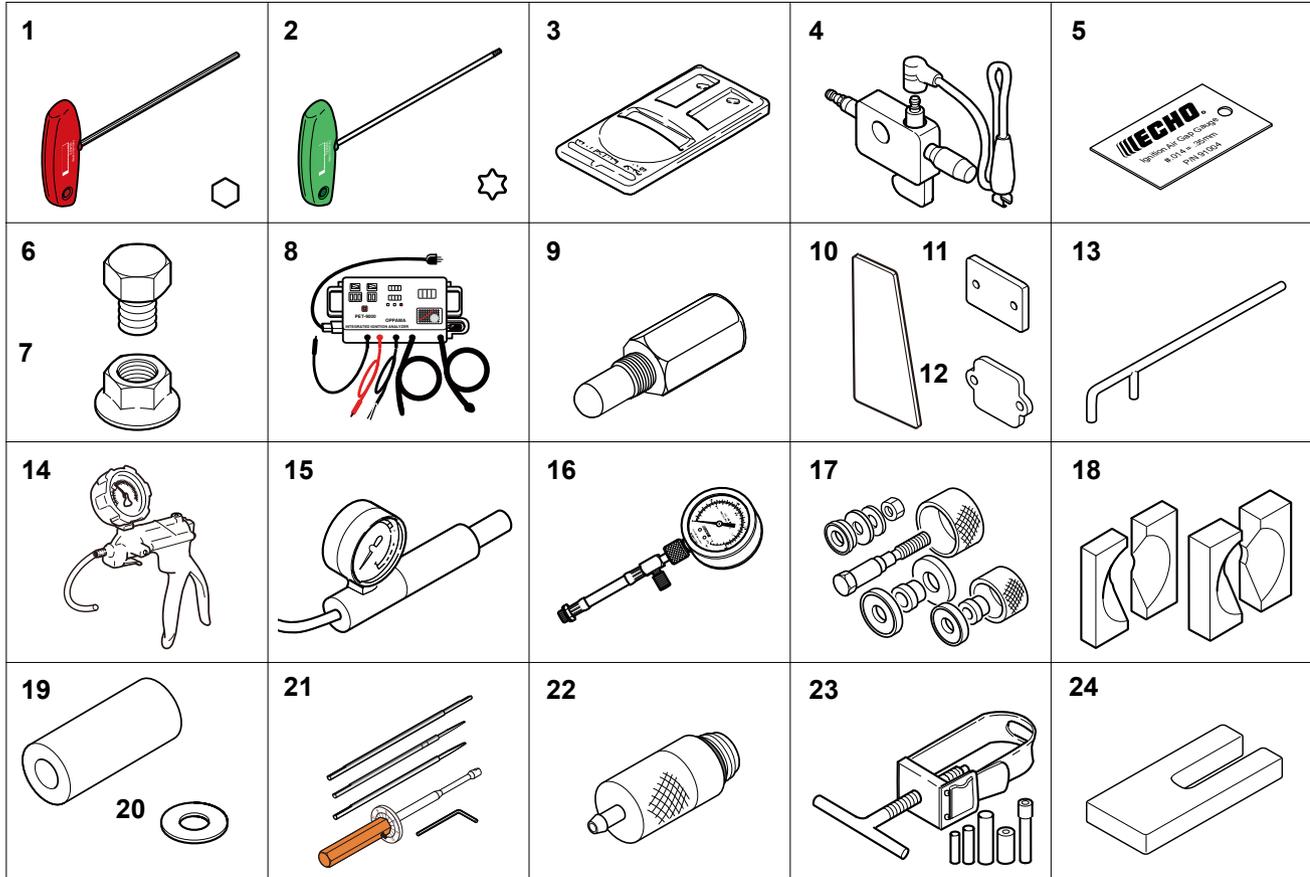
Material	Location	Remarks
Grease	Rewind spring	EPNOC AP2 (Lithium based grease) P/N X695-000060
	Starter center post	
Thread locking sealant	Starter case	Loctite #242, ThreeBond #1324 or equivalent
	Fun hub	
	Fuel tank	

1-5 Service limits



Description		mm (in)	
A	Cylinder bore	When plating is worn and aluminium can be seen	
B	Piston outer diameter	Min.	33.91 (1.335)
C	Piston pin bore	Max.	8.035 (0.3163)
D	Piston ring groove	Max.	1.3 (0.051)
E	Piston ring side clearance	Max.	0.1 (0.004)
F	Piston pin outer diameter	Min.	7.98 (0.3142)
G	Piston ring width	Min.	1.15 (0.045)
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)

## 1-6 Special tools



Key	Part Number	Description	Reference
1	X602-000360	T-hex. wrench 4 mm	Removing and installing hex. head bolt
2	X602-000340	Torx wrench (T27)	Removing and installing torx bolt
3	897802-33330	Tachometer PET-1000R	Measuring engine speed to adjust carburetor
4	897800-79931	Spark tester	Checking ignition system
5	91004	Module air gap gauge	Adjusting pole shoe air gaps
6	900100-08008	Bolt	Removing magneto rotor (flywheel)
7	V265-000200	Flange nut	Removing magneto rotor (flywheel)
8	900300	Ignition Analyzer: PET-9000	Measuring Ignition timing, Primary/Secondary voltage engine speed
9	X644-000020	Piston stopper	Locking crankshaft rotation
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	897712-04630	2-pin wrench	Removing and installing pawl carrier
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	897726-16431	Oil seal tool	Installing crankcase oil seals
20	363018-00310	Washer	Installing crankcase oil seal (t: 1.0 mm)
21	Y089-000094	Carburetor adjustment tool	Adjusting carburetor
22	A131-000150	Pressure connector	Testing crankcase and cylinder leakage
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