



SERVICE DATA

SHRED 'N' VAC LEAF SHREDDER

ES-2100

ES-2400

(Serial number : 36000001 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 products information available at the time of publication.

ECHO SERVICE MANUAL Ord. 403-11 (Model : PB-2100, PB-2110, ES-2100, ES-2400) contains lots of information for servicing this model.

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Reference No. **21-21G-00**
ISSUED: 200411



KIORITZ CORPORATION

1 SERVICE INFORMATION

1-1 Specifications

Model		ES-2100	ES-2400	
Dimensions	Length*	mm(in)	285 (11.1)	
	Width	mm(in)	330 (12.7)	
	Height	mm(in)	340 (13.4)	
Dry weight	kg(lb)	4.4(9.7)**, 5.5 (12.1)***		
Engine	Type	KIORITZ, air-cooled, two-stroke, single cylinder		
	Rotation	Anticlockwise as viewed from the output end		
	Displacement	cm ³ (in ³)	21.2 (1.294)	23.6 (1.440)
	Bore	mm(in)	32.2 (1.268)	34.0 (1.339)
	Stroke	mm(in)	26.0 (1.024)	26.0 (1.024)
	Compression ratio		7.0	6.3
Carburettor	Type	Diaphragm horizontal-draught with primer (purge bulb)		
	Model	ZAMA C1U-K43B	ZAMA C1U-K44B	
	Venturi size-Throttle bore	mm(in)	7 - 14 (0.276 - 0.551)	8 - 14 (0.315 - 0.551)
Ignition	Type	CDI (Capacitor discharge ignition) system		
	Spark plug	RCJ-7Y		
Starter	Type	Automatic rewind		
	Rope diameter x length	mm(in)	3.0 x 1000 (0.12 x 39.4)	
Fuel	Type	Premixed two-stroke fuel		
	Mixture ratio	50 : 1 (2 %)		
	Petrol	Minimum 89 octane petrol (RON)		
	Two-stroke air cooled engine oil	ISO-L-EGD (ISO/CD13738), JASO FC		
	Tank capacity	L (U.S.fl.oz.)	0.5 (16.9)	
Handle	Type	Rear	Grip	Rubber Grip
	Blower	Fan type	Centrifugal, single stage	
Blower	Max. air volume (with pipes)	m ³ /min (ft ³ /min)	7.0 (247.2)**	7.6 (268.4)**
	Max. air velocity (with pipes)	m/s (mph)	65 (145)**	64 (143)**
	Blower pipe length	mm (in)	Straight 425 (16.73)	
		mm (in)	Fan head nozzle 420 (16.54)	
	Blower nozzle size, (inner)	mm (in)	117 x 26 (4.6 x 1.02) oval shape	
	Fan head nozzle		Standard	
	Vacuum	Shredding knife		with
Vacuum pipe ID x L		mm(in)	110 x 880 (4.33 x 34.65)	
Dust bag capacity		liter(ft ³)	60 (2.1)	
Volume reduction ratio(Leaves)			12	

* Without blower pipes

** With fan head nozzle

*** With all blower pipes and suction pipe

1-2 Technical data

Model		ES-2100	ES-2400
Engines			
Idling speed	r/min	2400 - 3200	
Wide open throttle speed*	r/min	6900 - 8100	7500 - 8800
Compression pressure	MPa (kgf/cm ²) (psi)	0.72 (7.4) (105)	0.69 (7.0) (100)
Ignition system			
Spark plug gap	mm (in)	0.6 - 0.7 (0.024 - 0.028)	
Minimum secondary voltage at 1500 r/min	kV	16	
Secondary coil resistance	kΩ	1.2 - 1.8	
Pole shoe air gaps	mm (in)	0.3 - 0.4 (0.012 - 0.016)	
Ignition timing	°BTDC	28	
Carburettor			
Idle adjust screw initial setting	turn in**	1 3/8	2 1/2
L mixture needle initial setting	turn back	1 1/2	1 1/2
H mixture needle initial setting	turn back	1 1/2	1 3/4
Test Pressure, minimum	MPa (kgf/cm ²) (psi)	0.05 (0.5) (7.0)	
Metering lever height	mm (in)	0.1 - 0.25 (0.004-0.010) lower than diaphragm seat	

BTDC: Before top dead centre.

* With all blower pipes.

** Set idle adjust screw to contact throttle plate before initial setting.

1-3 Torque limits

Descriptions		Size	kgf•cm	N•m	in•lbf
Starter system	Starter pawl	M8	80 - 100	8 - 10	70 - 85
	Starter case	M4*	25 - 35	2.5 - 3.5	22 - 30
Ignition system	Ignition coil	M4	35 - 50	3.5 - 5.0	30 - 45
	Spark plug	M14	150 - 170	15 - 17	130 - 150
Fuel system	Carburettor insulator	M5*	25 - 40	2.5 - 4.0	22 - 35
	Carburettor	M5	35 - 45	3.5 - 4.5	30 - 40
Engine	Crankcase	M5	70 - 110	7 - 11	60 - 95
	Cylinder	M5	70 - 110	7 - 11	60 - 95
	Engine mount	M4*	35 - 50	3.5 - 5.0	30 - 45
	Muffler	M5	60 - 100	6 - 10	50 - 85
Others	Fan case	M5†	30 - 45	3.5 - 4.5	26 - 40
	Fan hub	M8*	160 - 200	16 - 20	140 - 175
	Fan	M8	160 - 200	16 - 20	140 - 175
Regular bolt, nut, and screw		M3	6 - 10	0.6 - 1.0	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

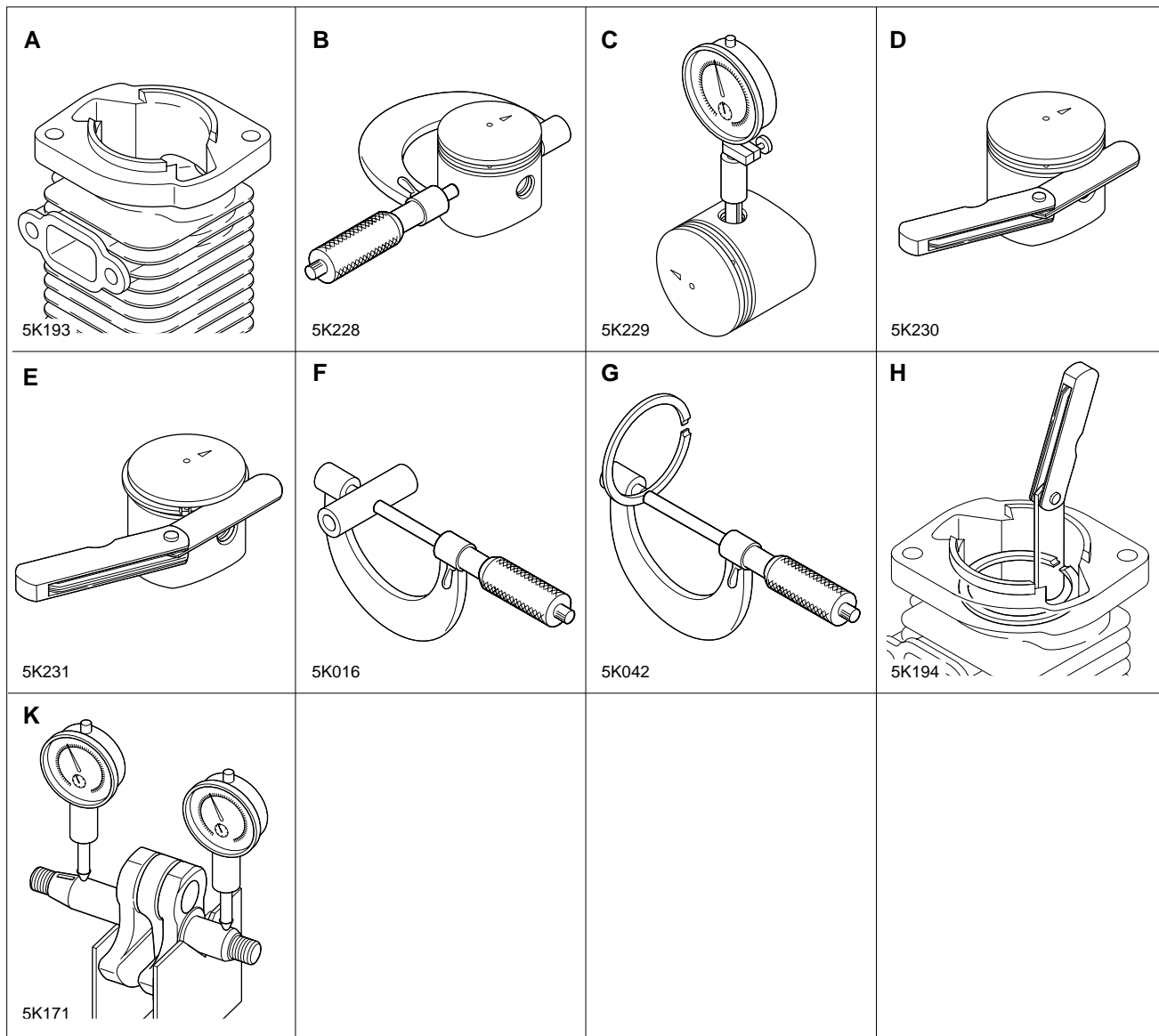
* Apply thread locking sealant (See below)

† Tapping screw

1-4 Special repairing materials

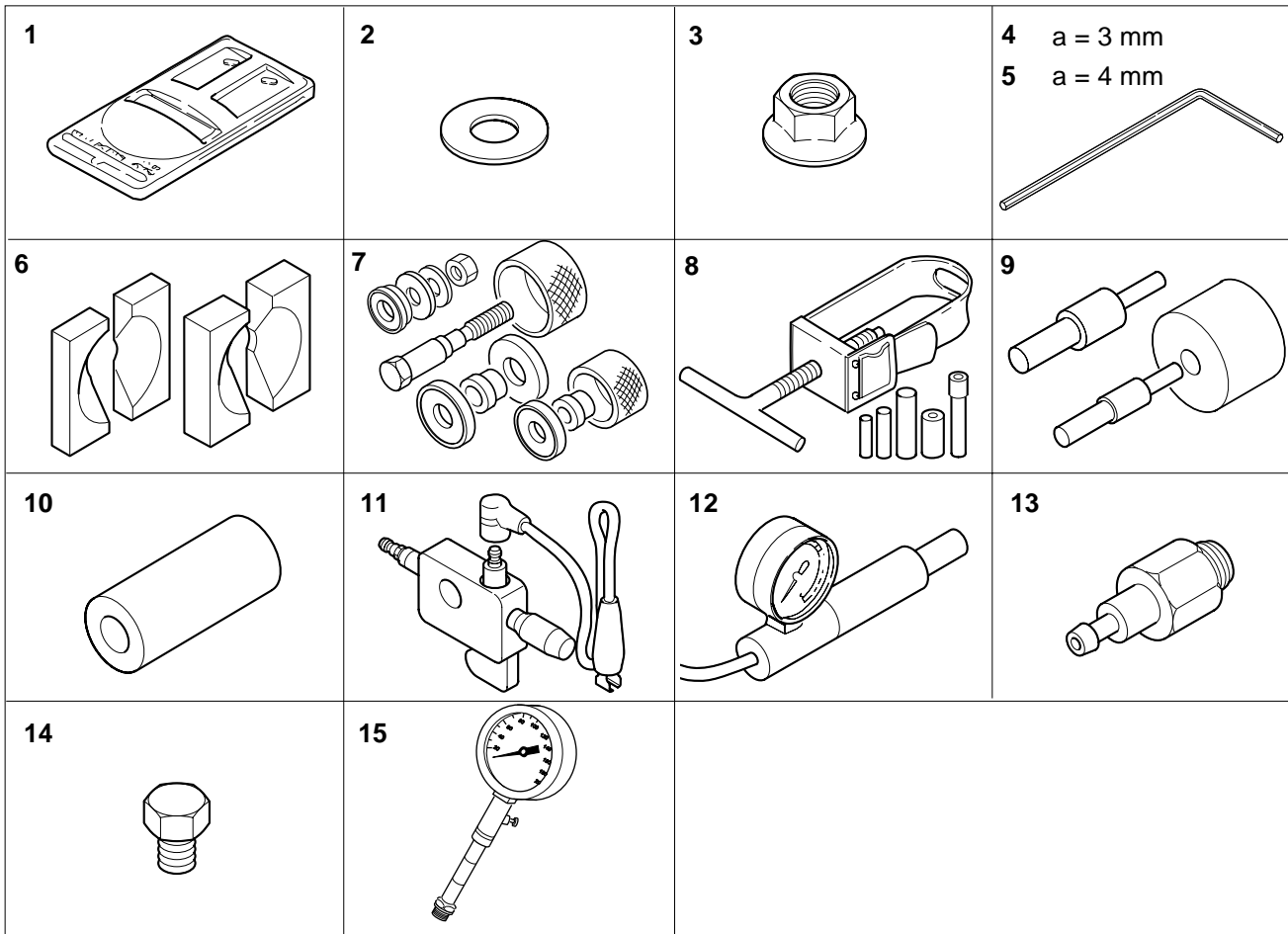
Material	Location	Remarks
Thread locking sealant	Starter case bolts	Loctite #242, ThreeBond 1324 or equivalent
	Ignition coil	
	Carburettor insulator screws	
	Engine mount	
	Fan hub	
	Fan	
Grease	Rewind spring	Lithium based grease
	Starter center shaft	

1-5 Service Limits



Description			ES-2100	ES-2400
A	Cylinder bore		When plating is worn and aluminium can be seen	
B	Piston outer diameter	Min.	32.11 (1.264)	33.91 (1.335)
C	Piston pin bore	Max.	8.030 (0.3161)	8.030 (0.3161)
D	Piston ring groove	Max.	1.6 (0.063)	1.6 (0.063)
E	Piston ring side clearance	Max.	0.1 (0.004)	0.1 (0.004)
F	Piston pin outer diameter	Min.	7.970 (0.3138)	7.970 (0.3138)
G	Piston ring width	Min.	1.45 (0.057)	1.45 (0.057)
H	Piston ring end gap	Max.	0.5 (0.02)	0.5 (0.02)
K	Crankshaft runout	Max.	0.05 (0.002)	0.05 (0.002)

1-6 Special tools



Key	Part Number	Description	Used for:
1	897801-33330	Tachometer PET-1000	Measuring engine speed to adjust carburettor
2	363018-00310	Washer	Installing crankcase oil seal of starter side
3	433019-12330	Flange nut	Removing magneto rotor (flywheel)
4	895612-79920	L-hex wrench (3 mm)	Removing and installing hex. socket bolt (M4)
5	895610-79920	L-hex wrench (4 mm)	Removing and installing hex. socket bolt (M5)
6	897701-06030	Bearing wedge	Removing and crankshaft ball bearings
7	897701-14732	Bearing tool	Removing and installing crankcase ball bearings
8	897702-30131	Piston pin tool	Removing and installing piston pin
9	897705-11520	Bearing tool	Removing and installing con-rod small end needle bearing
10	897714-24330	Oil seal tool	Installing oil seals
11	897800-79931	Spark tester	Checking ignition system
12	897803-30132	Pressure tester	Testing carburettor and crankcase leakage
13	897835-16131	Pressure connector	Checking crankcase and cylinder leakages
14	900100-08008	Bolt	Removing magneto rotor (flywheel)
15	91007	Compression gauge	Measuring cylinder compression

2 EMISSION ADJUSTMENT GUIDE

2-1 General adjusting rules

Before starting the unit for adjustment, check the following items.

1. The correct spark plug must be clean and properly gapped.
2. The air filter element must be clean and properly installed.
3. The muffler exhaust port must be clear of carbon.
4. The fuel lines, tank vent and fuel filter are in good condition and clear of debris.
5. The fuel is fresh (> 89 octane : RON) and properly mixed at 50 : 1 with "ISO L-EGD" 2 stroke oil.
6. All blower pipes are installed for proper engine loading.

2-2 Presetting idle adjust screw, L mixture needle and H mixture needle



1. Turn L mixture needle clockwise until lean stop to cut easily.
2. Using a sharp knife, give triangle cut between the stopper wings. Also cut the H limiter cap.

NOTE : Be careful when cutting caps, otherwise injury may result.



3. Pull the caps off with pliers.

NOTE : Do not rock back and forth when removing, otherwise the needle may be damaged.

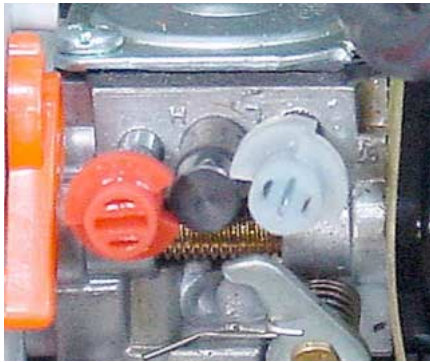
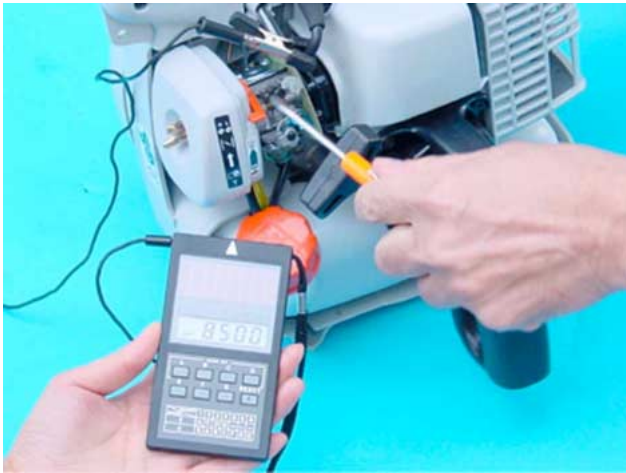
4. Turn H and L mixture needles clockwise until lightly seated.

NOTE : Do not over tighten needles, otherwise needles tip and seat damage may occur.

5. Turn L mixture needle anticlockwise 1 1/2 turns. Turn H mixture needle anticlockwise 1 1/2 turns (ES-2100), 1 3/4 turns (ES-2400).

6. Turn idle adjust screw anticlockwise and set the screw until the tip to just contact throttle plate. Then turn it clockwise 1 3/8 turns (ES-2100), 2 1/2 turns (ES-2400).

2-3 Adjusting carburettor



1. Start engine and warm it up well for about 3 - 5 minutes with cycle of 50 seconds at WOT (Wide Open Throttle) and 10 seconds at idling.

2. Adjust H mixture needle to obtain maximum engine speed at WOT. And then turn H mixture needle clockwise until the engine speed starts to drop.

3. When the engine speed starts to drop, turn H mixture needle anticlockwise to obtain maximum engine speed again. And then turn H mixture needle anticlockwise further to reduce engine speed 10 to 20 r/min (ES-2100), 30 to 40 r/min (ES-2400) from maximum engine speed.

4. Adjust the L mixture needle to obtain maximum idle speed.

5. Set idle speed in the range of 2,950 to 3,050 r/min by turning idle adjust screw.

6. Turn L mixture needle anticlockwise to reduce engine idle speed 200 to 300 r/min and set engine idle speed in the range of 2,650 to 2,850 r/min.

NOTE : Engine speed must be allowed to stabilize a minimum of 20 seconds after each adjustment of L mixture needle to assure accurate tachometer readings.

7. After adjusting carburettor, install White limiter cap on L mixture needle and Red limiter cap on H mixture needle as shown.

NOTE : Before installing limiter caps, warm caps in 90 °C hot water for smooth installation. Make it sure to use pliers or appropriate instrument to take warmed up cap out from the water.

8. Tap respective limiter caps to the bottoms as shown.

9. Start engine again and make it sure engine runs in the range of 2,400 to 3,200 r/min at idling and the range of 6,900 to 8,100 r/min (ES-2100), 7,500 to 8,800 r/min (ES-2400) at WOT. Also make it sure suitable acceleration.