



SERVICE DATA

HEDGE TRIMMER

HCR-161ES

HCR-171ES

(Serial number : 36000001-36999999)

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.

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Reference No. **12-21N-01**

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KIORITZ CORPORATION

1 SERVICE INFORMATION

1-1 Specifications

Model			HCR-161ES	HCR-171ES
Dimensions	Length	mm(in)	1158 (45.5)	1263 (49.7)
	Width	mm(in)	275 (10.82)	
	Height	mm(in)	203 (7.99)	
Dry weight		kg(lb)	5.4 (11.8)	5.6 (12.3)
Engine	Type		KIORITZ, air-cooled, two-stroke, single cylinder	
	Rotation		Clockwise 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		5.9	
Carburettor	Type		Rotary type : Diaphragm, horizontal-draught, with primer	
	Model		ZAMA RB-K86	
Ignition	Type		CDI (Capacitor discharge ignition) system Slope advance ignition system combined with electronic speed governor	
	Spark plug		BPM8Y	
Exhaust	Muffler type		Spark arrestor muffler	
Starter	Type		ES (effortless-start)	
	Rope diameter x length	mm(in)	3.0 x 830 (1/8 x 32 5/8)	
Fuel	Type		Premixed two-stroke fuel	
	Mixture ratio		50 : 1 (2%)	
	Petrol		Minimum 89 octane	
	Two-stroke engine oil		ISO-L-EGD (ISO/CD13738), JASO FC/FD	
	Tank capacity	L (U.S.fl.oz.)	0.5 (16.9)	
Clutch	Type		Centrifugal, 2-shoe slide	
Handle	Type	Front	Loop with hand guard	
		Rear	Grip with throttle trigger	
Gear case	Reduction ratio		5.75	
	Gear tooth		Spur	
	Lubrication		Lithium based grease or ECHO LUBE™	
Cutter	Type		Double reciprocating, Double edge blade	
	Effective length	mm(in)	623 (24.5)	728 (28.6)
	Pitch	mm(in)	35 (1.38)	
	Height	mm(in)	21 (0.83)	
	Thickness	mm(in)	2.5 (0.098)	
	Lubrication		Apply oil every 4 hours of use	

* Refer to Operator's manual

1-2 Technical data

Model		HCR-161ES	HCR-171ES
Engine			
Idling speed	r/min	3000 - 3600	
Wide open throttle speed	r/min	10500 - 12000	
Clutch engagement speed	r/min	4700 - 5500	
Compression pressure	MPa (kgf/cm ²) (psi)	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	15	
Primary coil resistance	Ω	300 - 400	
Secondary coil resistance	kΩ	2.4 - 3.2	
Pole shoe air gaps	mm (in)	0.30 - 0.40 (0.012 - 0.016)	
Ignition timing	at 1500r/min	°BTDC	19.0
	at 3000r/min	°BTDC	27.0
	at 8000r/min	°BTDC	42.0
	at 12000r/min	°BTDC	11.0
Carburettor			
Venturi Size	mm(in)	9.0 (0.354)	
Throttle Bore	mm(in)	10.5 (0.413)	
Idle speed screw initial setting	turn in*	3	
L mixture needle initial setting	turns back	2 3/4	
H mixture needle initial setting	turns back	1 1/8	
Test Pressure, minimum	MPa (kgf/cm ²) (psi)	0.05 (0.5) (7.0)	
Metering lever height	mm (in)	0.1 - 0.25 (0.004-0.01) lower than diaphragm seat	

BTDC: Before top dead centre.

* Set idle speed screw to the point that its tip just contacts throttle plate before initial setting.

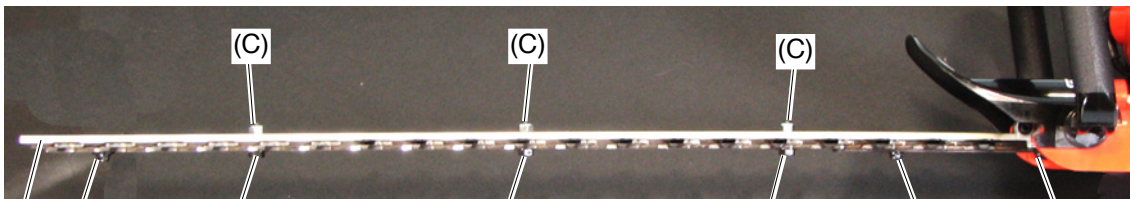
1-3 Torque limits

Descriptions		Size	kgf·cm	N·m	in·lbf
Starter system	Pawl assembly and nut	M 8	160 - 200	16 - 20	140 - 175
	Starter case	M 4*	14 - 28	1.4 - 2.8	13 - 25
Ignition system	Ignition coil	M 4	35 - 50	3.5 - 5	30 - 45
	Spark plug	M 14	130 - 170	13 - 17	115 - 150
Fuel system	Carburettor	M 5	30 - 45	3 - 4.5	26 - 40
	Intake insulator	M 5*	50 - 70	5 - 7	45 - 60
	Fuel tank	M 5*	50 - 70	5 - 7	45 - 60
Clutch	Clutch hub	M 8	160 - 200	16 - 20	140 - 175
	Clutch housing	M 4*	30 - 50	3 - 5	26 - 45
Engine	Crankcase	M 5**	70 - 110	7 - 11	60 - 95
	Cylinder	M 5**	70 - 110	7 - 11	60 - 95
	Muffler	M 5	60 - 100	6 - 10	50 - 90
	Engine mount on gear case	M 6	80 - 120	8 - 12	70 - 105
Gear case	Bottom cover	M 4	30 - 50	3 - 5	26 - 45
Cutter	Cutter bolts (A)	M 6	See NOTE below		
	Cutter nuts (C)	M 6	50 - 70	5 - 7	45 - 60
	Cutter support (B)	M 5	50 - 70	5 - 7	45 - 60
Handle	Rear handle set	M 5	50 - 80	5 - 8	45 - 70
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

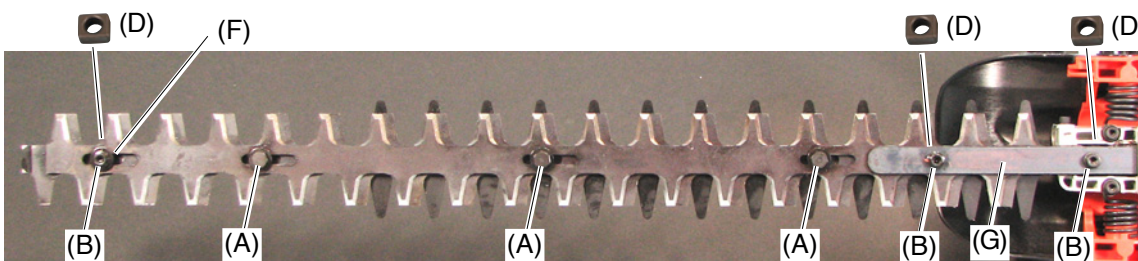
* Apply thread locking sealant (See next page).

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

NOTE : To adjust cutter clearance, fasten 3 pcs of cutter bolts (A) 0.5 - 1.5 N·m, and back 1/2 turns (180°) anticlockwise. Then tighten the nuts (C) 5 - 7 N·m holding cutter bolts (A) with spanner. Fasten other cutter bolts (B) 5 - 7 N·m. Spacers (D) are installed on bolts (B) between cutter support (E) and side washer (F)/ eye plate (G).



Side view



Back side view

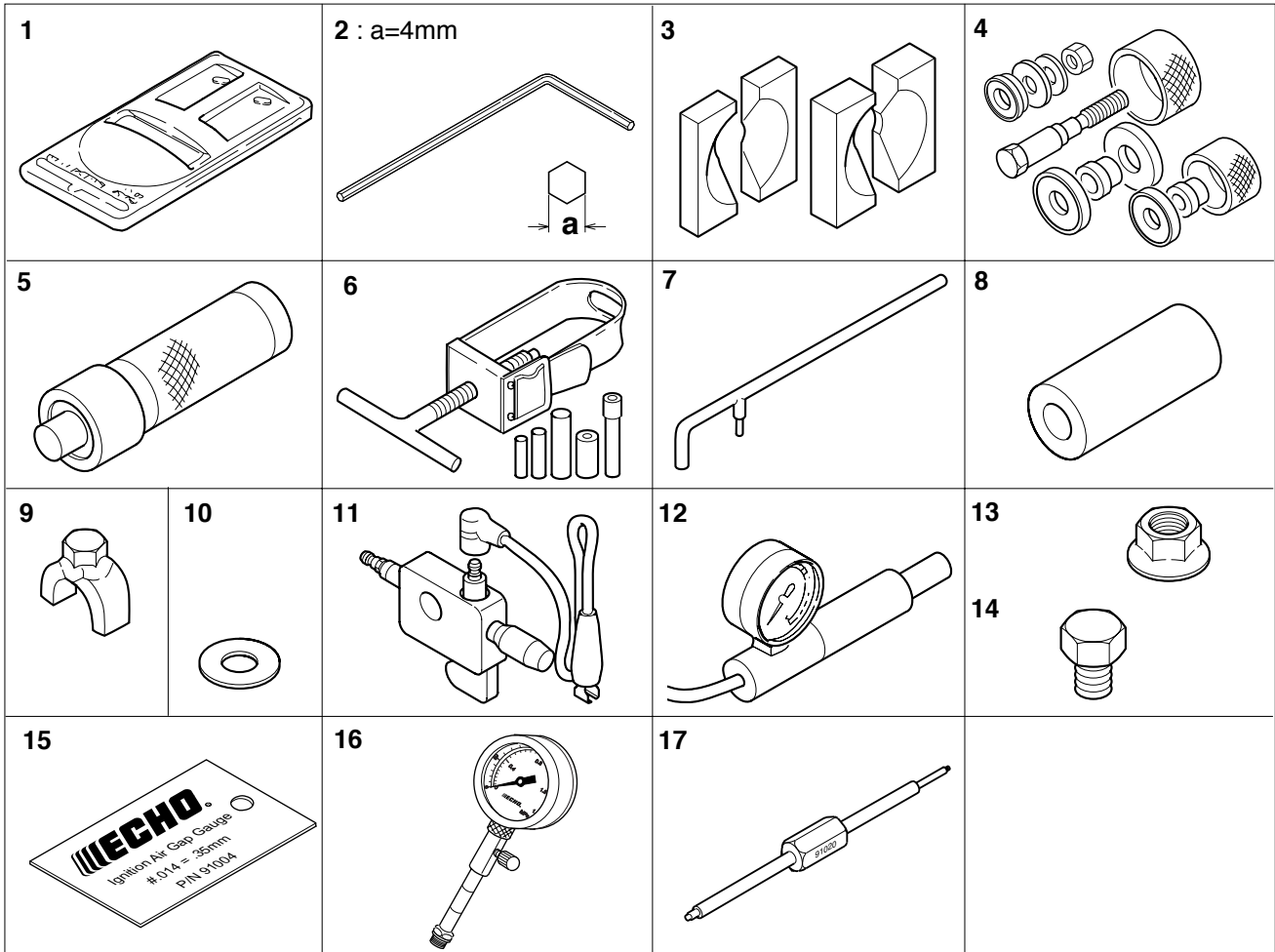
1-4 Special repairing materials

Material	Location	Remarks
Grease	Gear case	Lithium based grease or ECHO LUBE™
	Rewind spring	
	Starter center post	
	Oil seal inner lips	
Thread locking sealant	Starter case	Loctite #222, ThreeBond 1342 or equivalent
	Intake insulator	
	Fuel tank	
	Clutch housing	Loctite #242, ThreeBond 1324 or equivalent

1-5 Service Limits

Description		mm (in)
Cylinder bore		When plating is worn and aluminum can be seen
Piston outer diameter	Min.	32.10 (1.264)
Piston pin bore	Max.	8.030 (0.3161)
Piston ring groove	Max.	1.6 (0.063)
Piston ring side clearance	Max.	0.1 (0.004)
Piston pin outer diameter	Min.	7.970 (0.3138)
Piston ring width	Min.	1.45 (0.057)
Piston ring end gap	Max.	0.5 (0.02)
Con-rod small end bore	Max.	12.025 (0.4734)
Crankshaft runout	Max.	0.03 (0.001)
Clutch drum bore	Max.	51.5 (2.03)

1-6 Special tools



Key	Part Number	Description	Used for:
1	897801-33330	Tachometer (PET-1000)	Measuring engine speed to adjust carburettor
2	895610-79920	L-hex wrench (4 mm)	Removing and installing hex. socket bolts (M5)
3	897701-06030	Bearing wedge	Removing ball bearings on crankshaft
4	897701-14732	Bearing tool	Removing and installing crankcase bearings
5	897718-02830	Bearing tool	Installing clutch drum ball bearing in gear case
6	897702-30131	Piston pin tool	Removing and installing piston pin (Use 8 mm dia. adapter)
7	897712-07930	2-pin wrench	Removing and installing pawl carrier
8	897726-16431	Oil seal tool	Installing crankcase oil seals
9	897731-04920	Clutch tool	Removing and installing clutch assembly
10	363018-00310	Washer	Installing crankcase oil seal of starter side
11	990511-30023	Spark tester	Checking ignition system
12	897803-30133	Pressure tester	Checking carburettor and crankcase leakages
13	433019-12330	Flange nut	Removing magneto rotor (flywheel)
14	900100-08008	Bolt	Removing magneto rotor (flywheel)
15	91004	Module air gap gauge	Adjusting pole shoe air gaps
16	91037	Compression gauge	Measuring cylinder compression
17	91020	Limiter plug tool	Removing and installing plug

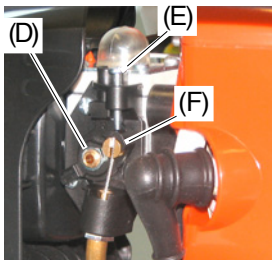
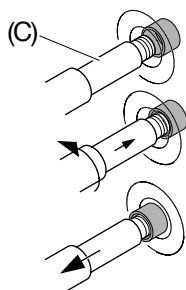
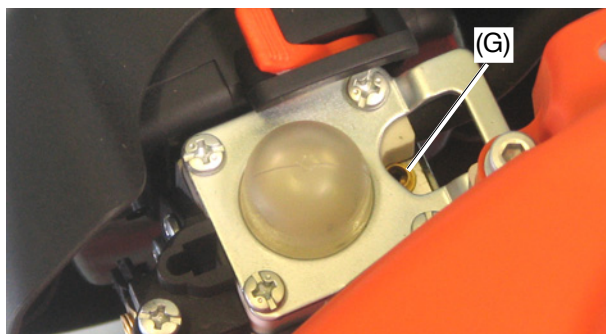
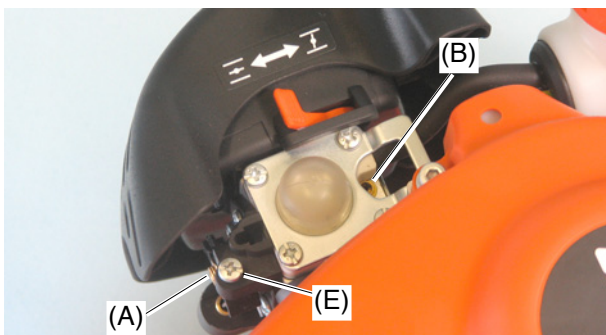
2 CARBURETTOR ADJUSTMENT PROCEDURE

2-1 General adjusting rules

- A. 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” or “JASO-FC/FD” 2 stroke oil.
 6. The gear case assembly with blade set must be installed for proper engine loading.
- B. Start and run engine for 3 minutes alternating rpm between WOT and idle every 10 seconds. Adjust idle speed screw to 3,300 +/- 200 r/min. If engine does not run correctly after this adjustment, proceed to the next step 2-2.

IMPORTANT : After adjusting carburettor according to the steps 2-2 and 2-3, the limiter plug(s) must be installed in Idle and hi speed (H) mixture needle(s) hole(s) to comply with Emission Directive.

2-2 Initial idle adjust screw, idle mixture needle and hi speed (H) mixture needle settings



Parts Required : (2) limiter plug P/N P005-001270

1. Remove the plugs from idle mixture needle (A) and hi speed mixture needle hole (B) using limiter plug tool (C) as follows.

(1)Put limiter plug tool (C) on limiter plug in mixture needle hole.

(2)Screw limiter plug tool anticlockwise 2 turns slowly into limiter plug while pushing the tool.

(3)Pull out limiter plug tool with the limiter plug from mixture needle hole.

(4)Repeat plug removal procedure for the other mixture needle.

NOTE : When plug is damaged and left in the hole, use needle or pin-shaped tool to scrape.

2. Turn Idle mixture needle (D) and hi speed mixture needle (G) clockwise until lightly seated. And then turn out both needles following turns.

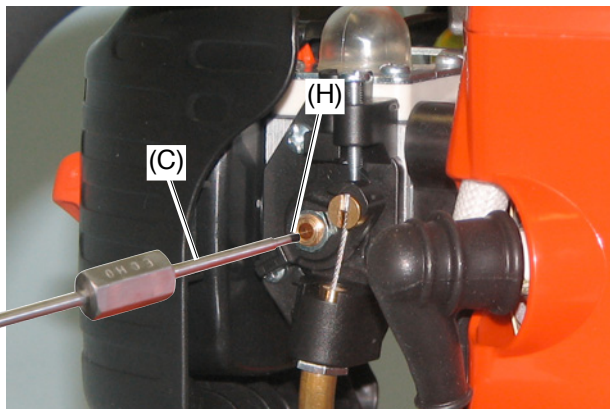
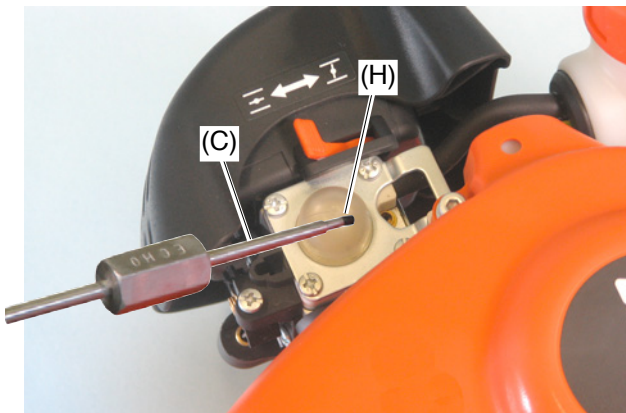
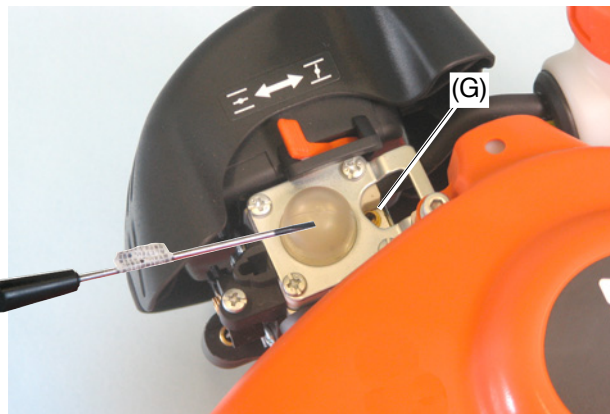
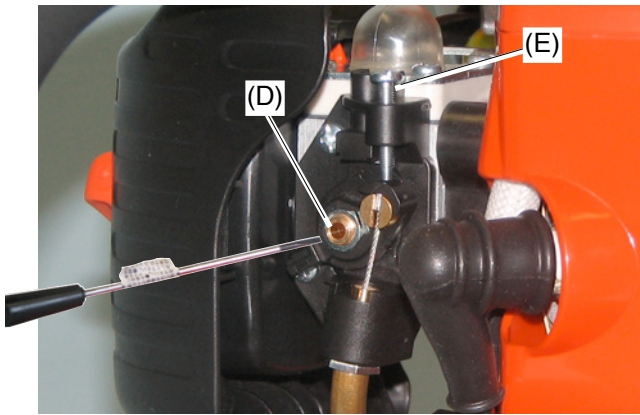
Idle mixture needle : 2 3/4

Hi speed (H) mixture needle:1 1/8

3. Turn idle adjust screw (E) anticlockwise until the tip just touches throttle plate (F). Then turn it in clockwise 3 turns.

NOTE : Initial carburettor setting (Idle adjust screw, idle and hi mixture needles) shown here is to start the engine after restoration or carburettor change. Idle adjust screw, idle and hi needles turn for designated engine revolution through procedures indicated here may vary. As long as idle and WOT engine speed is set in given range, variance would be ignorable.

2-3 Adjusting carburettor



1. Start engine and warm it up alternating r/min between WOT and idle every 10 seconds for 1 minute.

2. Adjust idle mixture needle (D) and obtain maximum idle speed just before lean drop off with 2.5 mm blade small screw driver.

3. Set idle speed to 4,600 r/min by turning idle adjust screw (E). Engine speed should be stable at 4,600 +/- 50 r/min after idle adjust screw (E) adjustment.

4. Turn idle mixture needle (D) anticlockwise to reduce idle speed 1,300 to 1,700 r/min in the range of 2,900 to 3,300 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.

5. Turn idle adjust screw (E) clockwise to increase idle engine speed to range of 3,100 to 3,500 r/min.

6. Adjust hi speed mixture needle (G) to obtain maximum WOT engine speed just before lean drop off using 2.5mm wide blade screw driver.

7. Turn hi speed mixture needle anticlockwise to reduce WOT engine speed 200 +/- 100 r/min.

8. Start engine again and make sure engine runs in the range of 3,000 to 3,600 r/min at idling and the range of 10,500 to 12,000 r/min at WOT. Also make sure cutting device would not turn at engine idle speed and suitable acceleration.

9. After adjusting carburettor, insert and secure new plug(s) (H) P005-001270 deep in the needle holes per the Emission directive using limiter plug tool (C).

IMPORTANT : The limiter plugs must be installed idle and hi speed mixture needles to comply with Emission Directive.

NOTE : Engine WOT, and idle engine speed in field operation may vary from final adjustment specifications due to changing ambient conditions, fuel, and engine loads. Safe engine speed variances should be within the WOT and Idle speed ranges listed in Section 1-1, otherwise the carburettor should be readjusted.