



# SERVICE DATA

## CHAIN SAW

### ECHO: CS-3510ES

(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.

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Reference No. **01-34H-00**  
**ISSUED : 202004**

### 1 SERVICE INFORMATION

#### 1-1 Specifications

Dimensions*	Length	mm(in)	386 (15.2)
	Width	mm(in)	233 (9.2)
	Height	mm(in)	271 (10.7)
Dry weight*		kg(lb)	3.7 (8.2)
Engine	Type	YAMABIKO, stratified scavenging, air-cooled, two-stroke, single cylinder	
	Rotation	Clockwise as viewed from the output end	
	Displacement	cm <sup>3</sup> (in <sup>3</sup> )	34.4 (2.099)
	Bore	mm(in)	40.0 (1.575)
	Stroke	mm(in)	27.4 (1.079)
	Compression ratio	7.4	
Carburetor	Type	Diaphragm, horizontal-draft	
	Model	WT-1240	
	Venturi size-Throttle bore	mm(in)	14.0 - 15.85 (0.551 - 0.624)
Ignition	Type	CDI (Capacitor discharge ignition) system, Digital Magneto	
	Spark plug	NGK BPMR8Y	
Exhaust	Muffler type	Spark arrester muffler	
Starter	Type	ES (Effortless-Start)	
	Rope diameter x length	mm(in)	3.5 x 910 (0.14 x 35.8)
Fuel	Type**	Mixed two-stroke fuel	
	Mixture ratio	50 : 1 (2 %)	
	Gasoline	Minimum 89 octane petrol	
	Two-stroke air cooled engine oil	ISO-L-EGD (ISO/CD13738), JASO FC/FD	
	Tank capacity	L (UK.fl.oz.)	0.28 (9.5)
Clutch	Type	Centrifugal type, 2-shoe slide with 2-tension spring	
Guide bar / Saw chain lubrication type		Pencil type, Automatic oil pump	
Oil	Tank capacity	L (UK.fl.oz.)	0.23 (7.8)
Auto oiler	Type	Pencil shape, Clutch driven type	
Sprocket	Type	Spur	
	Number of teeth	6	
	Pitch	in	3/8

\* Without guide bar and saw chain.

\*\* Premixed alkylate fuel for 2-stroke can be used.

Cutting devices							
Guide bar	Type	C30S90-45SA	C30S91-47ML	C35S90-52SA	C35S91-53ML	C40S91-58AL	
	Called length	cm	30		35		40
	Gauge	in	0.043	0.050	0.043	0.050	0.050
Saw chain	Type	Oregon: 90PX	Oregon: 91PX, 91VXL Carlton: N1C-BL	Oregon 90PX	Oregon: 91PX, 91VXL Carlton: N1C-BL	Oregon: 91PX, 91VXL Carlton: N1C-BL	
	Number of drive links	45	47	52	53	58	
	Pitch	in	3/8				
	Gauge	in	0.043	0.050	0.043	0.050	0.050

## 1-2 Technical data

Engine			
Compression pressure	MPa (kgf/cm <sup>2</sup> ) (psi)		0.99 (10.1) (143)
Clutch engagement speed	r/min		4500
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 - 2.9
Pole shoe air gaps	mm(in)		0.3 - 0.4 (0.012 - 0.016)
Ignition timing	at 3000 r/min	°BTDC	8
	at 8000 r/min	°BTDC	28
	at 10000 r/min	°BTDC	28
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
Limiter cap / plug			-
Tool to adjust mixture needles			D-shaped tool (L) P/N X645-000032 (Carb. adjustment tool P/N Y089-000095)

**IMPORTANT:** Use Tachometer PET-1000R to measure engine speed (Refer to 1-6 Special tools on page 6).

Carburetor adjustment			
1) Initial setting	H mixture needle	turn out	3 1/4
	L mixture needle	turn out	2 7/8
	Throttle adjust screw	turn in*1	1 1/8
Engine warm-up	Idle - WOT : Total	sec.	5 - 10 : 150
2) Find idle maximum speed			Adjust L mixture needle to maximum idle speed*2
3) Set idle maximum speed w/ TAS		r/min	3900
4) Set idle speed by turning L mixture needle CCW		r/min	3000
5) Confirm H mixture needle position before WOT setting			Turn H mixture needle CCW to confirm engine speed decreases less than or equal to 12500 r/min.
6) WOT setting		r/min	Turn H mixture needle CW in 1/8 turn increments with the engine at idle, then accelerate to WOT and check engine speed. The final engine speed should fall within: 13300 - 13600
7) Verify final engine speed with standard equipment		r/min	Idle: 2800 - 3500 WOT: 13000 - 13600
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.
Chain oil discharge volume at 7,000 r/min		mL/min (US.fl.oz./min)	Fixed: 6 (0.20)

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

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

\*2 If chain starts to rotate during adjustment process step 2), decrease engine speed by turning TAS CCW until chain stops and then redo step 2). Repeat this until chain no longer rotates after the adjustment step 2).

## 1-3 Torque limits

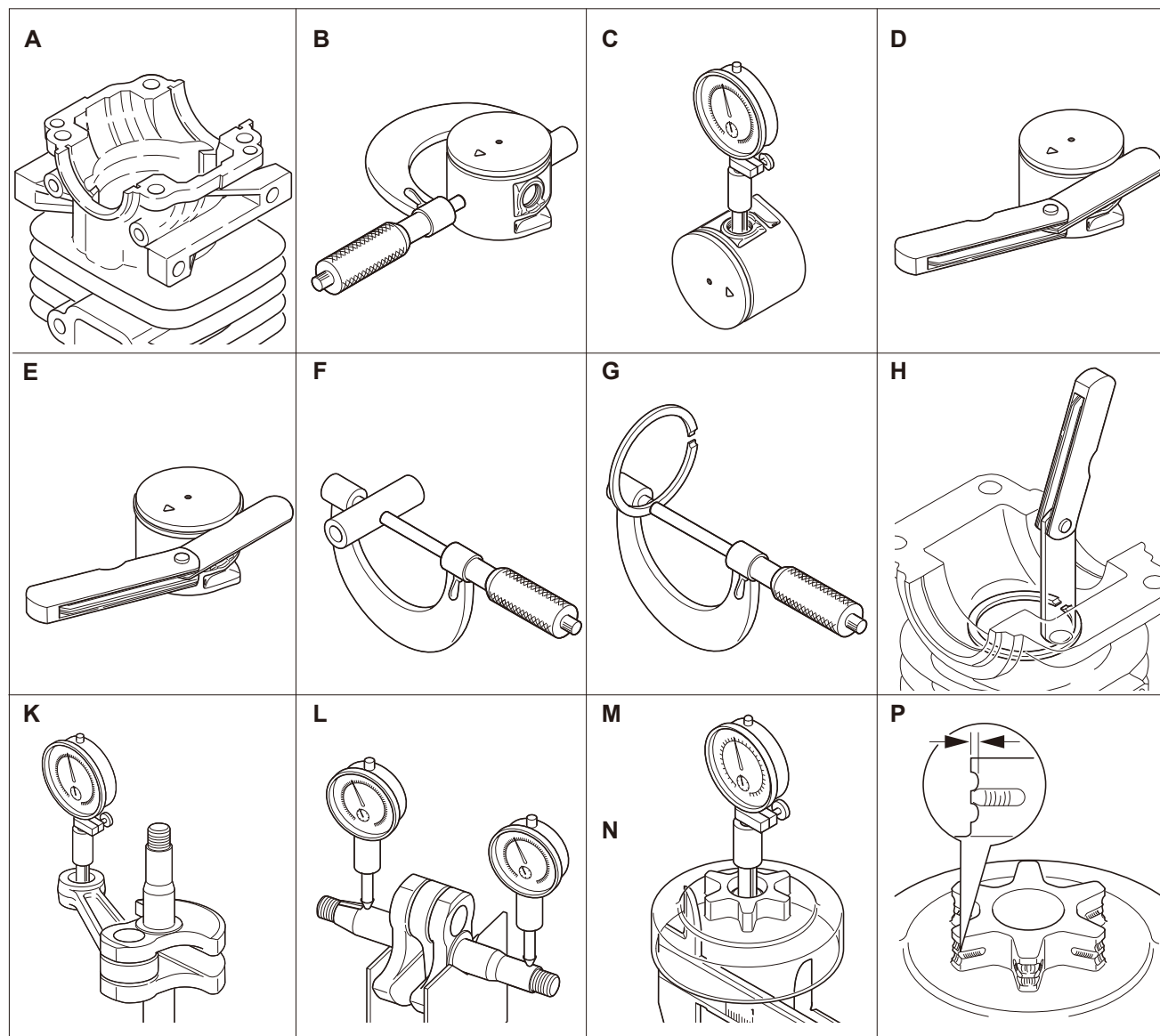
Descriptions		Size	kgf•cm	N•m	in•lbf
Starter system	Starter pawl	M5	30 - 45	3 - 4.5	26 - 40
	Starter case	M5†	35 - 50	3.5 - 5	30 - 45
Ignition system	Magneto rotor (Flywheel)	M8	250 - 290	25 - 29	220 - 255
	Ignition coil	M5	30 - 45	3 - 4.5	26 - 40
	Spark plug	M14	130 - 170	13 - 17	110 - 150
Fuel system	Carburetor	M5	30 - 45	3 - 4.5	26 - 40
Clutch	Clutch hub	LM8	230 - 260	23 - 26	200 - 230
Engine	Cylinder / Crankcase	M5	60 - 100	6 - 10	60 - 90
	Engine mount	M5	70 - 110	7 - 11	60 - 95
	Muffler	M5	70 - 90	7 - 9	60 - 80
	Intake insulator	M4	30 - 45	3 - 4.5	26 - 40
Handle	Rear handle assembly with compression spring	M5	50 - 75	5 - 7.5	45 - 65
		M5†	30 - 50	3 - 5	26 - 45
Others	Brake lever	M5	30 - 45	3 - 4.5	26 - 40
	Brake cover	M4†	15 - 25	1.5 - 2.5	13 - 22
	Guide bar nut	M8	200 - 230	20 - 23	175 - 200
Regular bolt, nut, and screw		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

LM: Left-hand thread †Tapping screw

## 1-4 Special repairing materials

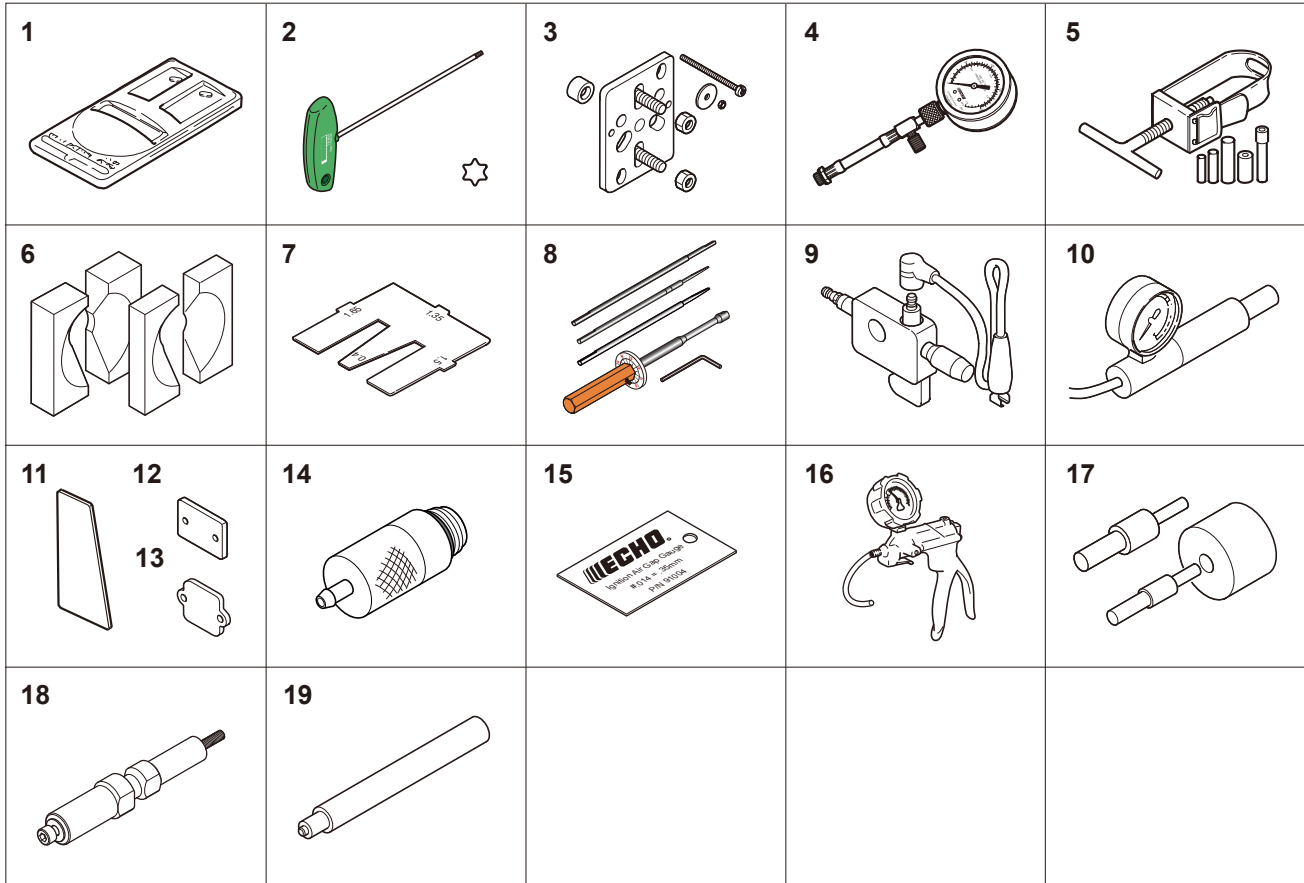
Material	Location	Remarks
Adhesive	Ball bearing outer / crankcase	Loctite #675 or equivalent
Liquid gasket	Crankcase seams	ThreeBond 1207D
Grease	Clutch needle bearing	EPNOC AP2 (Lithium based grease) P/N X695-000060
	Starter center shaft	
	Auto-oiler assembly gear part	
	Worm gear	
	Oil seal inner lips	

1-5 Service Limits



Description		mm (in)
A Cylinder bore		When plating is worn and aluminium can be seen
B Piston outer diameter	Min.	39.90 (1.571)
C Piston pin bore	Max.	9.035 (0.3557)
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.	8.98 (0.3535)
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.	13.000 (0.5118)
L Crankshaft runout	Max.	0.02 (0.001)
M Sprocket bore	Max.	12.80 (0.5039)
N Clutch drum bore	Max.	61.5 (2.42)
P Sprocket wear limit	Max.	0.5 (0.02)

## 1-6 Special tools



Key	Part Number	Description	Reference
1	897802-33330	Tachometer PET-1000R	Measuring engine speed to adjust carburetor
2	X602-000340	Torx wrench (T27)	Removing and installing bolt
3	Y089-000111	Puller	Removing magneto rotor
4	91037	Compression gauge	Measuring cylinder compression
5	897702-30131	Piston pin tool	Removing and installing piston pin
6	897701-02830	Bearing wedge	Removing ball bearings on crankshaft
7	897563-19830	Metering lever gauge	Measuring metering lever height on carburetor
8	Y089-000095	Carburetor adjustment tool	Adjusting carburetor
9	897800-79931	Spark tester	Checking ignition system
10	897803-30133	Pressure tester	Testing Carburetor and crankcase leakage
11	91041	Pressure rubber plug	Plugging exhaust port to test crankcase/cylinder leakages
12	897826-16131	Pressure rubber plug	Plugging intake port to test crankcase/cylinder leakages
13	897827-16131	Pressure plate	Plugging intake port to test crankcase/cylinder leakages
14	A131-000150	Pressure connector	Testing crankcase and cylinder leakage
15	91004	Module air gap gauge	Adjusting pole shoe air gaps
16	91149	Pressure / vacuum tester	Testing crankcase / cylinder leakages
17	897705-11520	Bearing tool	Replacing needle bearing on con-rod small end
18	Y089-000131	Auto-oiler puller	Removing pencil type Auto-oiler
19	91073A	Auto-oiler installer	Installing pencil type Auto-oiler