



# SERVICE DATA

## CHAIN SAW

# ECHO: CS-2511T

**(Serial number : C7021500001 - C70215999999)**

**(Serial number : C7191500001 - C71915999999)**

**(Serial number : C8011500001 - C80115999999)**

### 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. **00-25C-02**

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## 1 SERVICE INFORMATION

## 1-1 Specifications

Dimensions	Length*	mm(in)	243 (9.6)
	Width	mm(in)	205 (8.1)
	Height	mm(in)	196 (7.7)
Dry weight*		kg(lb)	2.3 (5.1)
Engine	Type		YAMABIKO, air-cooled, two-stroke, single cylinder
	Rotation		Clockwise as viewed from the output end
	Displacement	cm <sup>3</sup> (in <sup>3</sup> )	25.0 (1.525)
	Bore	mm(in)	35.0 (1.378)
	Stroke	mm(in)	26.0 (1.024)
	Compression ratio		7.9
Carburetor	Type		Diaphragm horizontal-draft with separated purge bulb
	Model		Walbro WT-1208
	Venturi size-Throttle bore	mm(in)	11.11-14.3 (0.437-0.563)
Ignition	Type		CDI (Capacitor discharge ignition) system, Digital magneto
	Spark plug		NGK CMR7H
Starter	Type		i-30
	Rope diameter x length	mm(in)	3.0 x 720 (0.12 x 28.3)
Fuel	Type		Premixed 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 M345-FC/FD
	Tank capacity	L (UK.fl.oz.)	0.19 (6.7)
Exhaust	Muffler type		Spark arrester muffler or Spark arrester muffler with catalyst
Clutch	Type		Centrifugal type, 3-shoe slide with 3-tension spring
Guide bar / Saw chain lubrication type			Adjustable automatic oil pump
Oil	Tank capacity	L (UK.fl.oz.)	0.14 (4.7)
Auto oiler	Type		Clutch related type
Sprocket	Type		Spur
	Number of teeth		6-tooth
	Pitch	in	3/8 pitch
Spike			Option (P/N: C304000000)

\* Without guide bar and saw chain.

Cutting devices						
Guide bar	Type	12A0CD3745	12A4CD3745	C30H25-68CL	14A0CD3752	14A4CD3752
	Called length	in	12			14
	Gauge	in	0.050			
Saw chain	Type	OREGON 91PXL, 90PX, 25AP				
	Number of drive links	45	68	52		
	Pitch	in	3/8			
	Gauge	in	0.050			

## 1-2 Technical data

Engine			
Compression pressure	MPa (kgf/cm <sup>2</sup> ) (psi)		1.03 (10.5) (150)
Clutch engagement speed	RPM		4,300
Engagement Minimum <sup>†</sup>	RPM		3,900
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)
Pole shoe air gaps	mm(in)		0.3 - 0.4 (0.012 - 0.016)
Ignition timing	at 1,000 RPM	°BTDC	9
	at 3,000 RPM	°BTDC	12
	at 10,000 RPM	°BTDC	29
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 plug / cap			Limiter cap P003000010
Tool to adjust mixture needles			Screwdriver 2.0 mm
Carburetor adjustment			
1) Initial setting			
H mixture needle	turn out		1 3/4
L mixture needle	turn out		2 3/4
Throttle adjust screw	turn in* <sup>1</sup>		1
Engine warm-up	Idle - WOT : Total	sec.	5 - 5 : 100
2) Find idle maximum speed			Adjust L mixture needle to maximum idle speed* <sup>2</sup>
3) Set idle maximum speed w/ TAS			RPM 4,100
4) Set idle speed by turning L mixture needle CCW			RPM 3,300
5) Confirm H mixture needle position before WOT setting			Turn H mixture needle CCW to confirm engine speed decreases less than 12,000 RPM
6) WOT setting			Turn H mixture needle CW and set engine speed within 12,500 - 12,700 RPM
7) Final WOT setting			Turn H mixture needle CW by : 1/2
8) Verify final engine speed with standard equipment			Idle: 2,800 - 3,600 WOT: 12,700 - 13,400
Chain oil discharge volume			Adjustable: 1.5 - 13 (0.05 - 0.46) (Factory set: 7 mL/min)
	mL/min(UK.fl.oz./min)		

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

<sup>†</sup> If clutch engagement speed is lower than minimum clutch engagement speed, replace clutch assembly with new one.

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

\*<sup>2</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

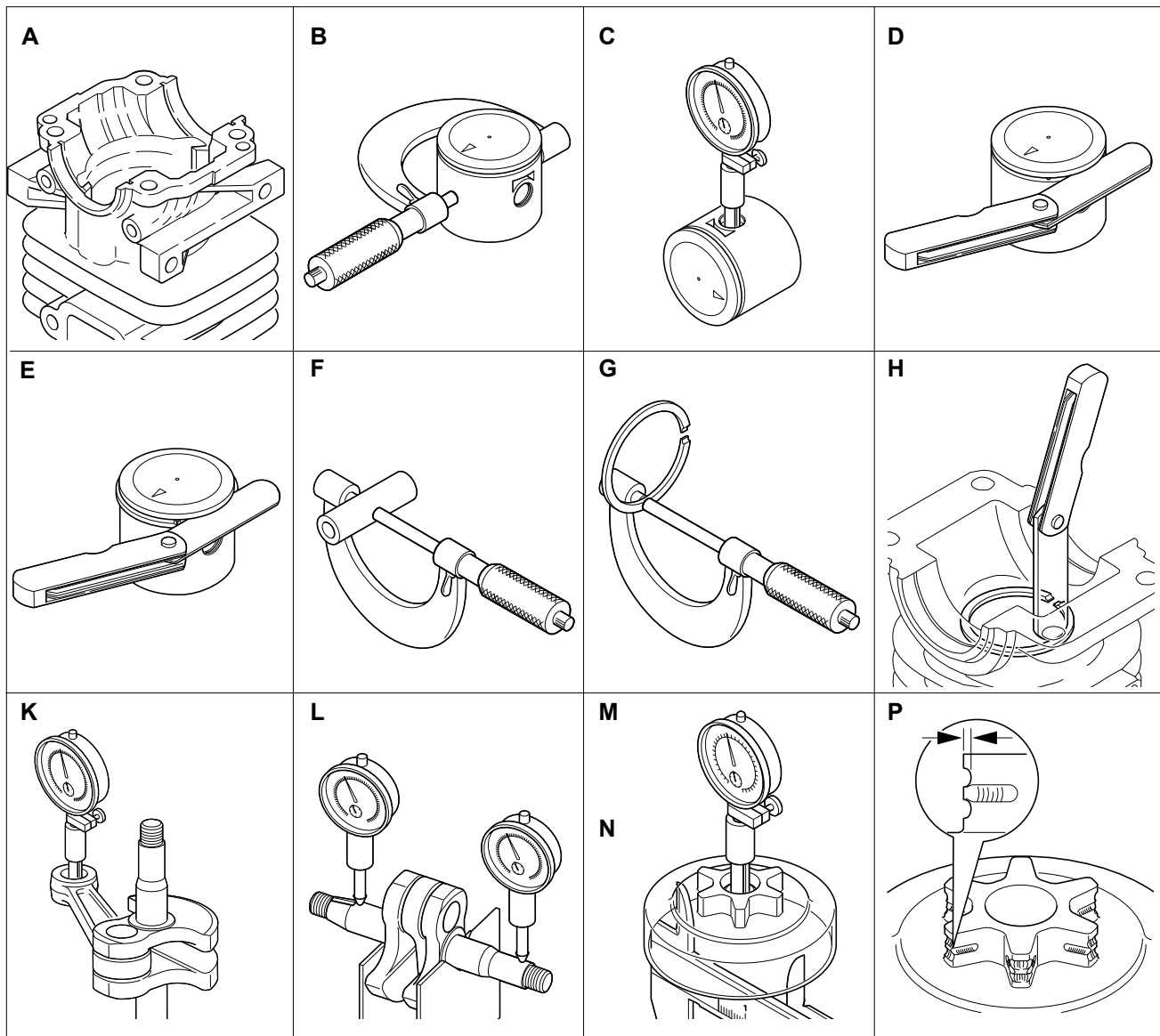
Descriptions		Size	kgf•cm	N•m	lbf•in
Starter system	Starter pawl	M5	30 - 45	3 - 4.5	25 - 40
	Starter case	M4	20 - 30	2 - 3	20 - 25
Ignition system	Flywheel (Magneto rotor)	M8	250 - 290	25 - 29	220 - 255
	Ignition coil	M4*	30 - 45	3 - 4.5	25 - 40
	Ignition switch	M3*	3 - 5	0.3 - 0.5	3 - 4
	Spark plug	M10	100 - 150	10 - 15	90 - 135
Fuel system	Carburetor	M5	30 - 45	3 - 4.5	25 - 40
	Intake bellows	M4	30 - 45	3 - 4.5	25 - 40
Clutch	Clutch hub	LM8	250 - 290	25 - 29	220 - 255
Engine	Crankcase	M4	30 - 45	3 - 4.5	25 - 40
	Cylinder	M4	30 - 45	3 - 4.5	25 - 40
	Engine mount	M4	35 - 50	3.5 - 5	20 - 45
	Muffler	M5	60 - 90	6 - 9	55 - 80
	Muffler cover	M4	20 - 30	2 - 3	20 - 25
Others	Auto-oiler	M4	30 - 45	3 - 4.5	25 - 40
	Rear handle lid	M4	20 - 35	2 - 3.5	20 - 30
	Front handle (front side)	M5	30 - 40	3 - 4	25 - 35
	Front handle (rear side)	M4	20 - 30	2 - 3	20 - 25
	Spring	M4	20 - 35	2 - 3.5	20 - 30
	Brake cover	M4	20 - 30	2 - 3	20 - 25
	Sprocket guard plate (Sprocket guard side)	M4	20 - 30	2 - 3	20 - 25
	Brake lever (Hand guard)	M5	30 - 45	3 - 4.5	25 - 40
	Chain catcher	M5	30 - 45	3 - 4.5	25 - 40
	Stud bolt	M8*	150 - 200	15 - 20	130 - 220
	Bolt (at guide bar mount)	M5	30 - 45	3 - 4.5	25 - 40
	Guide bar nut	M8	120 - 150	12 - 15	105 - 135
	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	

LM: Left-hand thread \*Apply thread locking sealant described in "1-4 Special repairing materials"

## 1-4 Special repairing materials

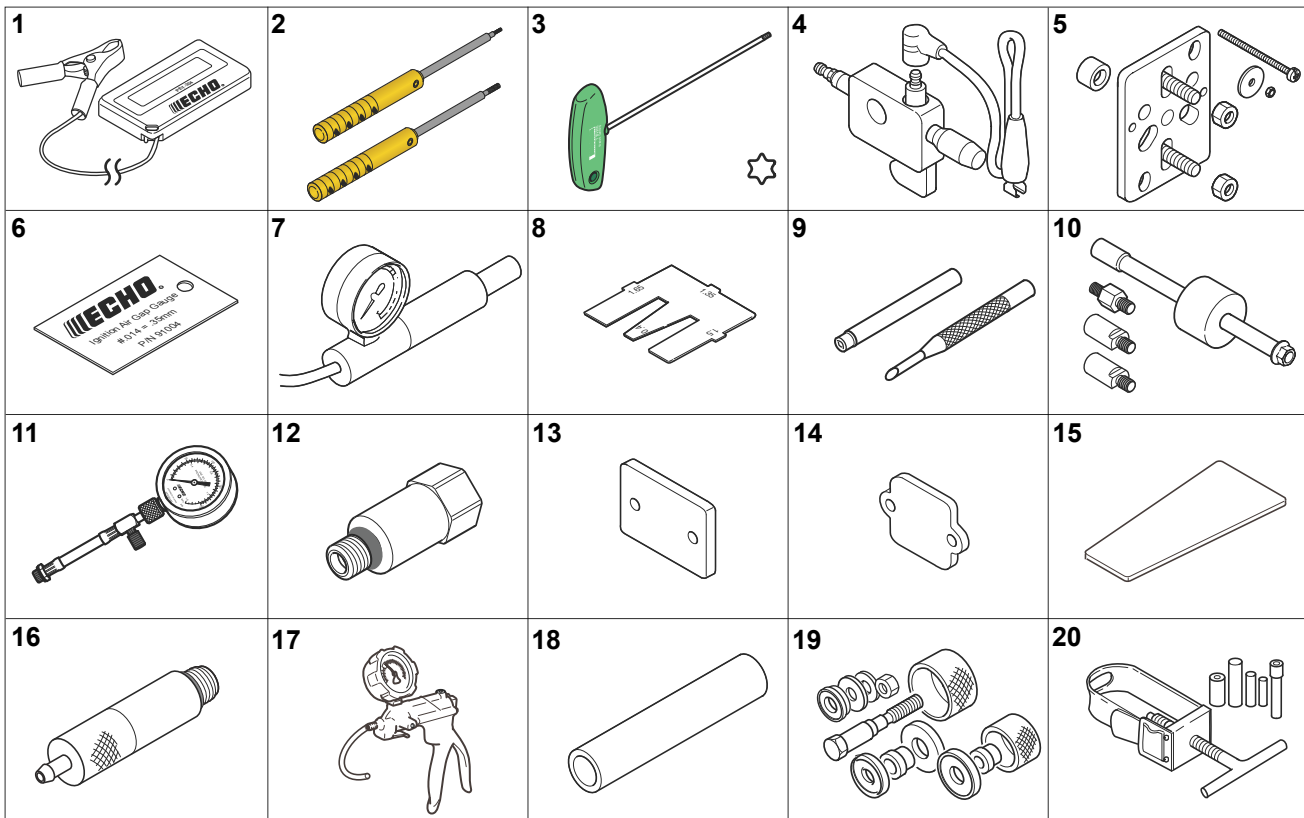
Material	Location	Remarks
Thread locking sealant	Stud bolt	Loctite® #242 or equivalent
	Ignition coil	Loctite® #222, ThreeBond #1342 or equivalent
	Ignition switch	Loctite® #242, ThreeBond #1324 or equivalent
Grease	Recoil starter	Lithium based grease or ECHO XTended Protection™ Lubricant
	Needle bearing, clutch	
	Worm gear	
	Auto-oiler	
	Oil seal lip	
	Chain brake (metal contact part)	Molybdenum grease (approx.1 gram)

1-5 Service limits



Description			mm (in)	
A	Cylinder bore		When plating is worn and aluminum can be seen	
B	Piston outer diameter	Min.	34.92	(1.375)
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.	11.03	(0.4341)
L	Crankshaft runout	Max.	0.02	(0.001)
M	Sprocket bore	Max.	13.07	(0.5146)
N	Clutch drum bore	Max.	53.5	(2.11)
P	Sprocket wear limit	Max.	0.5	(0.02)

## 1-6 Special tools



Key	Part Number	Description	Reference
1	G310000050	PET 304 Tachometer	Measuring engine speed to adjust Carburetor
2	91077	Limiter Cap Remover Kit	Removing and installing limiter cap
3	X602000340	Torx wrench (T27)	Removing and installing Torx bolt
4	PET4000EC	PET-4000 Spark Checker	Checking ignition system
5	Y089000111	Puller	Removing magneto rotor and crankcase
6	91004	Ignition Air Gap Gauge	Adjusting pole shoe air gaps
7	89780330133	Standard Pressure Tester	Testing Carburetor and crankcase leakage
8	89756319830	Metering lever gauge	Measuring metering lever height on Carburetor
9	500500	Welch plug tool	Removing and installing welch plug
10	P021044870	PTO shaft puller	Removing plug from auto-oiler assembly
11	91147	Compression gauge	Measuring cylinder compression
12	91151	10mm Adaptor	Measuring cylinder compression(for 10mm dia. spark plug)
13	89782616131	Pressure rubber plug	Plugging intake port to test crankcase / cylinder leakages
14	89782716131	Pressure plate	Plugging intake port to test crankcase / cylinder leakages
15	91041	Pressure rubber plug	Plugging exhaust port to test crankcase / cylinder leakages
16	91081	10mm Pressure Test Plug	Checking crankcase and cylinder leakages
17	91149	Pressure/Vacuum Pump	Testing tank vent and crankcase leakages
18	89772609130	Oil seal tool	Installing oil seals
19	89770114732	Bearing tool	Removing and installing ball bearings on crankcase
20	89770230131	Piston pin tool	Removing and installing piston pin