



SERVICE DATA

CHAIN SAW

ECHO: CS-501P

(Serial number : C36712000001-C36712999999)

(Serial number : C36813000001-C36813999999)

(Serial number : C68515000001-C68515999999)

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. **01-50F-01**

REVISED: 201702

ISSUED: 201604

1 SERVICE INFORMATION

1-1 Specifications

Dimensions	Length*	mm(in)	395 (15.6)
	Width	mm(in)	235 (9.3)
	Height	mm(in)	290 (11.4)
Dry weight*		kg(lb)	4.7 (10.4)
Engine	Type		YAMABIKO, air-cooled, two-stroke, single cylinder
	Rotation		Clockwise as viewed from the output end
	Displacement	cm ³ (in ³)	50.2 (3.063)
	Bore	mm(in)	44.0 (1.732)
	Stroke	mm(in)	33.0 (1.299)
	Compression ratio		7.2
Carburetor	Type		Diaphragm horizontal-draft
	Model		Walbro WT-1141
	Venturi size-Throttle bore	mm(in)	13.5 - 15.85 (0.531 - 0.624)
Ignition	Type		CDI (Capacitor discharge ignition) system
	Spark plug		BPMR8Y (S/N 12 series: BPM8Y)
Starter	Type		Automatic Rewind
	Rope diameter x length	mm(in)	3.8 x 910 (0.15 x 35.8)
Fuel	Type		Premixed two-stroke fuel
	Mixture ratio		50 : 1 (2 %)
	Gasoline		Minimum 89 octane gasoline
	Two-stroke air cooled engine oil		ISO-L-EGD (ISO/CD13738), JASO M345-FC/FD
	Tank capacity	L (U.S.fl.oz.)	0.5 (16.9)
Exhaust	Muffler type		Spark arrester muffler
Clutch	Type		Centrifugal type
Guide bar / Saw chain lubrication type			Automatic with volume adjuster
Oil	Tank capacity	L (U.S.fl.oz.)	0.28 (9.5)
Auto oiler	Type		Clutch driven type
Sprocket	Type		Floating rim
	Number of teeth		7
	Pitch	in	0.325

* Without guide bar and saw chain.

Cutting devices				
Guide bar	Type	16F0LD3366	18F0LD3372	20F0LD3378
	Called length	in 16	18	20
	Gauge	in	0.050	
Saw chain	Type	OREGON 20LPX, 20BPX		
	Number of drive links	66	72	78
	Pitch	in	0.325	
	Gauge	in	0.050	

1-2 Technical data

Engine			
Compression pressure	MPa (kgf/cm ²) (psi)	0.95 (9.7) (138)	
Clutch engagement speed	RPM	3,900	
Engagement Minimum [†]	RPM	3,400	
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	1.5 - 2.2	
Pole shoe air gaps	mm (in)	0.3 - 0.4 (0.012 - 0.016)	
Ignition timing	at 3,000 RPM	°BTDC	20
	at 8,000 RPM	°BTDC	32
	at 10,000 RPM	°BTDC	34
Chain oil discharge volume at 7,000 RPM	mL/min (US.fl.oz./min)	Adjustable: 3.0 - 16.5 (0.12 - 0.65) (Factory set: 7 mL/min)	
Carburetor			
Test Pressure, minimum	MPa (kgf/cm ²) (psi)	0.05 (0.5) (7.0)	
Metering lever height	mm(in)	1.65 (0.06) lower than diaphragm seat	
Limit cap / plug		Limit cap P/N P003-000010	
Tool to adjust mixture needles		Screwdriver 2.5 mm	
Carburetor adjustment			
1) Initial setting			
H mixture needle	turn out	3 5/8	
L mixture needle	turn out	1 7/8	
Throttle adjust screw	turn in ^{*1}	1 3/4	
Engine warm-up	Idle - WOT : Total	sec.	5 - 5 : 100
2) Find idle maximum speed			Adjust L mixture needle to maximum idle speed ^{*2}
3) Set idle maximum speed w/ TAS		RPM	3,500
4) Set idle speed by turning L mixture needle CCW		RPM	2,700
5) Confirm H mixture needle position before WOT setting		RPM	Turn H mixture needle CCW to confirm engine speed decreases less than 13,000
6) WOT setting		RPM	Turn H mixture needle CW in 1/8 turn increments with the engine at idle, then accelerate to WOT and check engine speed. The engine speed should fall within: 13,300 - 13,600
7) Verify final engine speed with standard equipment		RPM	Idle: 2,300 - 3,100 WOT: 13,000 - 14,000

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

[†] If clutch engagement speed is lower than minimum clutch engagement speed, replace clutch assembly with new one.

^{*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

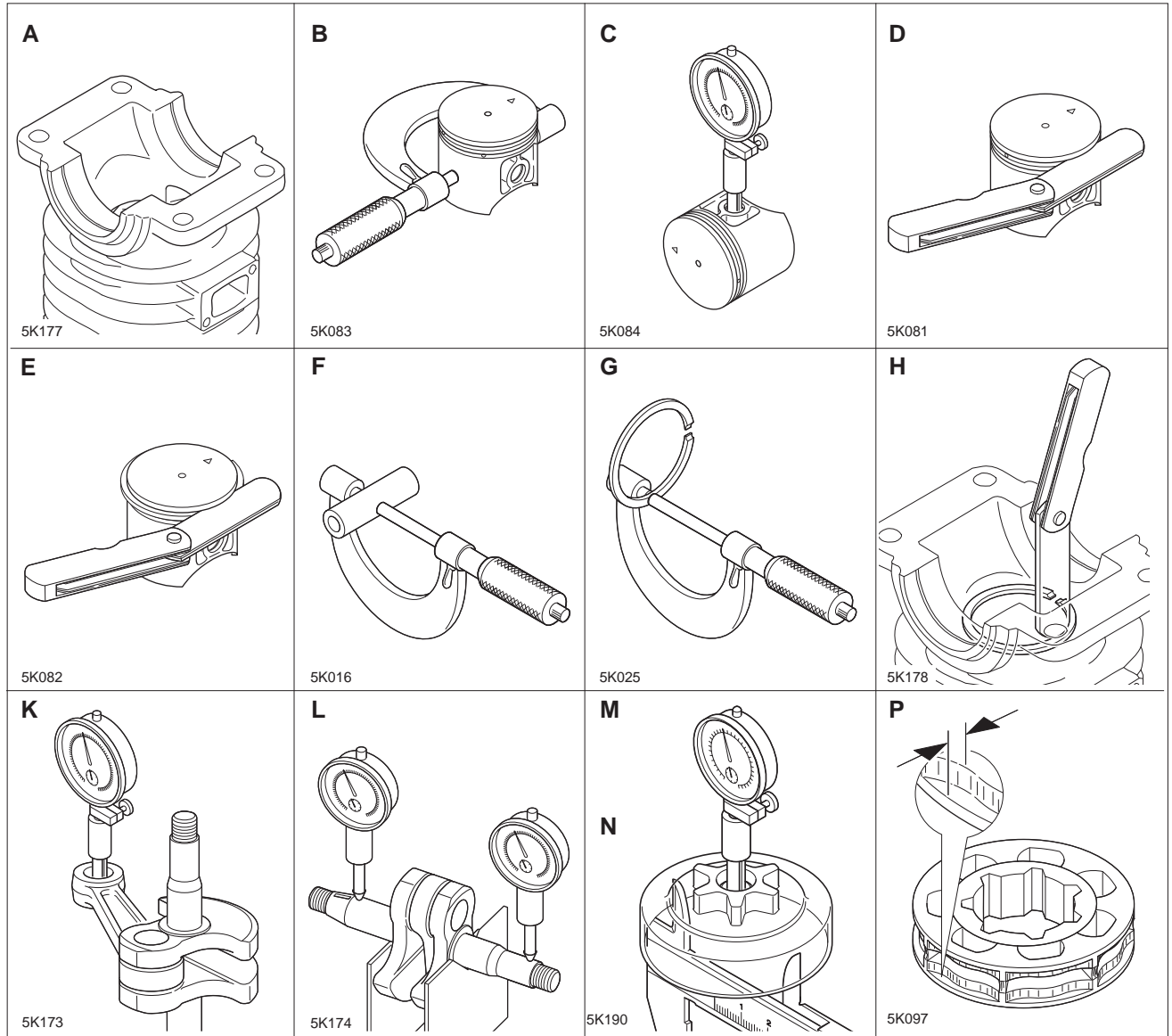
Descriptions		Size	kgf•cm	N•m	in•lbf	
Starter system	Starter pawl assembly	M5	90 - 120	9 - 12	80 - 105	
	Starter case	M5	20 - 30	2 - 3	18 - 25	
Ignition system	Magneto rotor (Flywheel)	M8	150 - 170	15 - 17	130 - 150	
	Ignition coil	M4	30 45	3 4.5	25 40	
	Igniton switch	M10	20 - 30	2 - 3	18 - 25	
	Spark plug	M14	130 - 170	13 - 17	113 - 150	
Fuel system	Carburetor	M5	20 - 30	2 - 3	18 - 25	
	Elbow	M4	20 - 30	2 - 3	18 - 25	
	Intake insulator	M4	20 - 30	2 - 3	18 - 20	
Clutch	Clutch shoe	LM10	280 - 300	28 - 30	245 - 265	
	Clutch drum	M8	150 - 170	15 - 17	130 - 150	
Engine	Crankcase	M5	70 - 90	7 - 9	60 - 80	
	Muffler	M5	70 - 90	7 - 9	60 - 80	
	Cylinder	M5	70 - 90	7 - 9	60 - 80	
	Cylinder cover	M5	25 - 35	2.5 - 3.5	22 - 30	
Others	Auto-oiler	M4	30 - 45	3 - 4.5	25 - 40	
	Oiler cover	M4	30 - 45	3 - 4.5	25 - 40	
	Crankcase (at oil bypass)	M5	55 - 70	5.5 - 7	48 - 60	
	Cushion	M5	20 - 30	2 - 3	18 - 25	
	Front handle	M5	40 - 55	4 - 5.5	35 - 48	
		M4	30 - 45	3 - 4.5	25 - 40	
	Rear handle assembly	(M side)	M5	40 - 55	4 - 5.5	35 - 48
		(D side)	M5	40 - 55	4 - 5.5	35 - 48
		Handle lid	M4	20 - 30	2 - 3	18 - 25
	Brake lever	(D side)	M5	40 - 60	4 - 6	35 - 40
		(M side)	M5	50 - 70	5 - 7	45 - 60
	Brake cover	M4	10 - 20	1 - 2	9 - 18	
	Washer (at brake band)	M4	15 - 25	1.5 - 2.5	13 - 22	
	Sprocket guard plate	M4	15 - 25	1.5 - 2.5	13 - 22	
	Chain catcher	M5	50 - 70	5 - 7	45 - 60	
	Spike	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		

LM: Left-hand thread

1-4 Special repairing materials

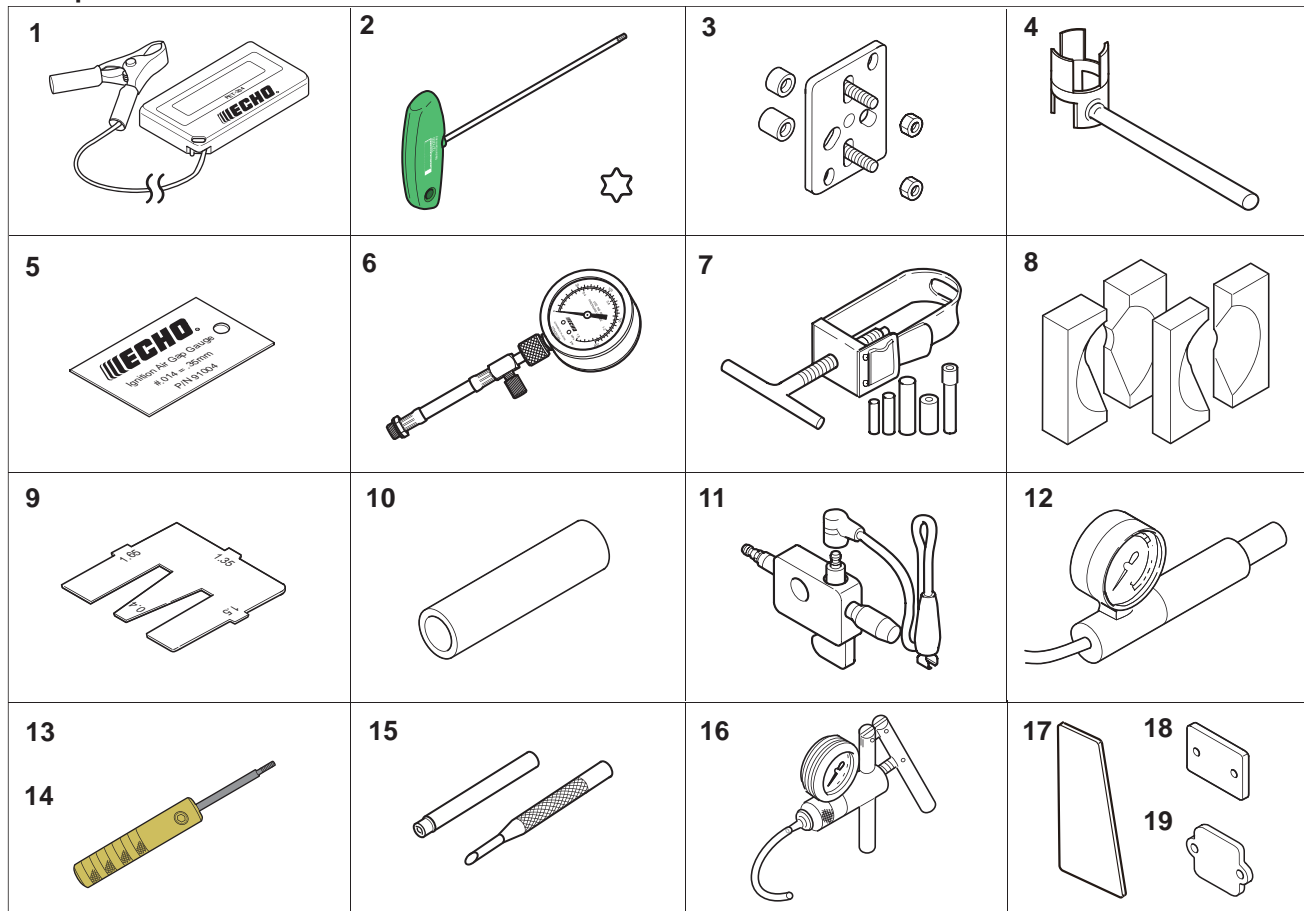
Material	Location	Remarks
Adhesive	Cushion	Loctite #406 (424) or equivalent
Grease	Auto-oiler worm	Lithium based grease or ECHO XTended Protection™ Lubricant
	Clutch needle bearing	
	Choke knob	
	Oil seal inner lips	
	Chain brake (metal contact part)	
	Throttle rod	
	Bevel gear, Screw, Chain tensioner	

1-5 Service Limits



Description		mm (in)	
A	Cylinder bore	When plating is worn and aluminum can be seen	
B	Piston outer diameter	Min.	43.87 (1.727)
C	Piston pin bore	Max.	11.025 (0.4341)
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.	10.98 (0.4323)
G	Piston ring width	Min.	1.45 (0.057)
H	Piston ring end gap	Max.	0.8 (0.03)
K	Con-rod small end bore	Max.	15.025 (0.5915)
L	Crankshaft runout	Max.	0.02 (0.001)
M	Sprocket bore	Max.	12.75 (0.5020)
N	Clutch drum bore	Max.	73.5 (2.89)
P	Sprocket wear limit	Max.	0.5 (0.02)

1-6 Special tools



Key	Part Number	Description	Reference
1	G310-000050	Tachometer PET-304	Measuring engine speed to adjust carburetor
2	X602-000340	Torx wrench (T27)	Removing and installing bolt
3	Y089-000110	Puller	Removing magneto rotor
4	X640-000370	Clutch spanner	Removing and assembling clutch assembly
5	91004	Module air gap gauge	Adjusting pole shoe air gaps
6	91037	Compression gauge	Measuring cylinder compression
7	897702-30131	Piston pin tool	Removing and installing piston pin
8	897701-02830	Bearing wedge	Removing ball bearings on crankshaft
9	897563-19830	Metering lever gauge	Measuring metering lever height on carburetor
10	897726-21430	Oil seal tool	Installing oil seals and clutch plate
11	897800-79931	Spark tester	Checking ignition system
12	897803-30133	Pressure tester	Testing carburetor and crankcase leakages
13	91075	Limiter cap removal tool	Removal limiter cap (Left hand thread 2.5 mm)
14	91076	Limiter cap removal tool	Removal limiter cap (Left hand thread 3.0 mm)
15	500-500	Welch plug tool	Removing and installing welch plug
16	91139	Pressure / vacuum tester	Testing crankcase / cylinder leakages
17	91041	Pressure rubber plug	Plugging exhaust port to test crankcase / cylinder leakages
18	897826-16131	Pressure rubber plug	Plugging intake port to test crankcase / cylinder leakages
19	897827-16131	Pressure plate	Plugging intake port to test crankcase / cylinder leakages