



SERVICE DATA

CHAIN SAW

ECHO:
CS-310

(Serial number : C04511000001-C04511999999)
(Serial number : C04612000001-C04612999999)
(Serial number : C33113000001-C33113999999)
(Serial number : C04713000001-C04713999999)
(Serial number : C32914000001-C32914999999)
(Serial number : C33014000001-C33014999999)
(Serial number : C67815000001-C67815999999)
(Serial number : C67915000001-C67915999999)

shindaiwa:
305s

(Serial number : C37113000001-C37113999999)
(Serial number : C37014000001-C37014999999)
(Serial number : C68015000001-C68015999999)

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.

ECHO SERVICE MANUAL Ord. 401-33 (Model : CS-310) contains lots of information for servicing this model.

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Reference No. **01-30A-01**
REVISED : 201702
ISSUED: 200811

1 SERVICE INFORMATION

1-1 Specifications

Model		CS-310	305s
Dimensions	Length*	mm(in)	396 (15.6)
	Width	mm(in)	232 (9.1)
	Height	mm(in)	273 (10.7)
Dry weight*		kg(lb)	4.0 (8.8)
Engine	Type	YAMABIKO, air-cooled, two-stroke, single cylinder	
	Rotation	Clockwise as viewed from the output end	
	Displacement	cm ³ (in ³)	30.5 (1.861)
	Bore	mm(in)	36.0 (1.417)
	Stroke	mm(in)	30.0 (1.181)
	Compression ratio	6.7	
Carburetor	Type	Diaphragm horizontal-draft with auto-return choke	
	Model	Walbro WT-946 or WT-1089**	Walbro WT-1089
	Venturi size-Throttle bore	mm(in)	11.11 - 14.3 (0.437 - 0.562)
Ignition	Type	CDI (Capacitor discharge ignition) system, Digital magneto	
	Spark plug	NGK BPM8Y (S/N 13 and 15 series: BPMR8Y)	
Starter	Type	Automatic rewind	
	Rope diameter x length	mm(in)	3.5 x 900 (0.14 x 35.4)
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.)	0.25 (8.5)
Exhaust	Muffler type	Spark arrester muffler with catalyst or Spark arrester muffler**	Spark arrester muffler
Clutch	Type	Centrifugal, 3-shoe slide with 3-tension spring	
Guide bar / Saw chain lubrication type		Pencil type Automatic oil pump	
Oil	Tank capacity	L (U.S.fl.oz.)	0.26 (8.8)
Sprocket	Type	Spur	
	Number of teeth	6	
	Pitch	in	3/8

* Without guide bar and saw chain.

** Prefix code: C331/C330/C679

Cutting devices					
Guide bar	Part No.	12A0CD3745	14A0CD3752	16A0CD3757	
	Called length	in	12	14	16
	Gauge	in	0.050		
Saw chain	Type	OREGON 91VG / 91PX			
	Number of drive links	45	52	57	
	Pitch	in	3/8		
	Gauge	in	0.050		

1-2 Technical data

Engine			
Compression pressure	MPa (kgf/cm ²) (psi)	0.88 (9.0) (128)	
Clutch engagement speed	RPM	4,200	
Engagement Minimum [†]	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)
Secondary coil resistance	kΩ	1.9 - 2.3	
Pole shoe air gaps	mm (in)	0.3 - 0.4 (0.012 - 0.016)	
Ignition timing	at 1,000 RPM	°BTDC	14
	at 3,000 RPM	°BTDC	12
	at 8,000 RPM	°BTDC	33
	at 10,000 RPM	°BTDC	35
	at 12,000 RPM	°BTDC	33
PET-9000 Parameter	#1		321
	#2		06
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	
Limiter cap / plug		Limiter cap P/N P003-000010	
Tool to adjust mixture needles		Screwdriver 2.5 mm	
Carburetor adjustment			
Carburetor Type		WT-946	WT-1089
1) Initial setting	H mixture needle	turn out	2 1/4
	L mixture needle	turn out	2 1/2
	Throttle adjust screw	turn in* ¹	7/8
Engine warm-up	Idle - WOT : Total	sec.	5 - 5 : 120
2) Find idle maximum speed			Adjust L mixture needle to maximum idle speed* ²
3) Set idle maximum speed w/ TAS		RPM	3,700
4) Set idle speed by turning L mixture needle CCW		RPM	3,200
5) Confirm H mixture needle position before WOT setting		RPM	Turn H mixture needle CCW to confirm engine speed decreases less than 12,500
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 final engine speed should fall within: 12,750 - 12,950
7) Verify final engine speed with standard equipment		RPM	Idle: 2,800 - 3,600 WOT: 12,000 - 13,000
Chain oil discharge volume	mL/min(UK.fl.oz./min)	Adjustable: 1.5 - 13 (0.05 - 0.46) (Factory set: 7 mL/min)	

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 clutch engages during adjustment process 2), decrease engine speed by turning TAS CCW until clutch disengages and then redo 2).

1-3 Torque limits

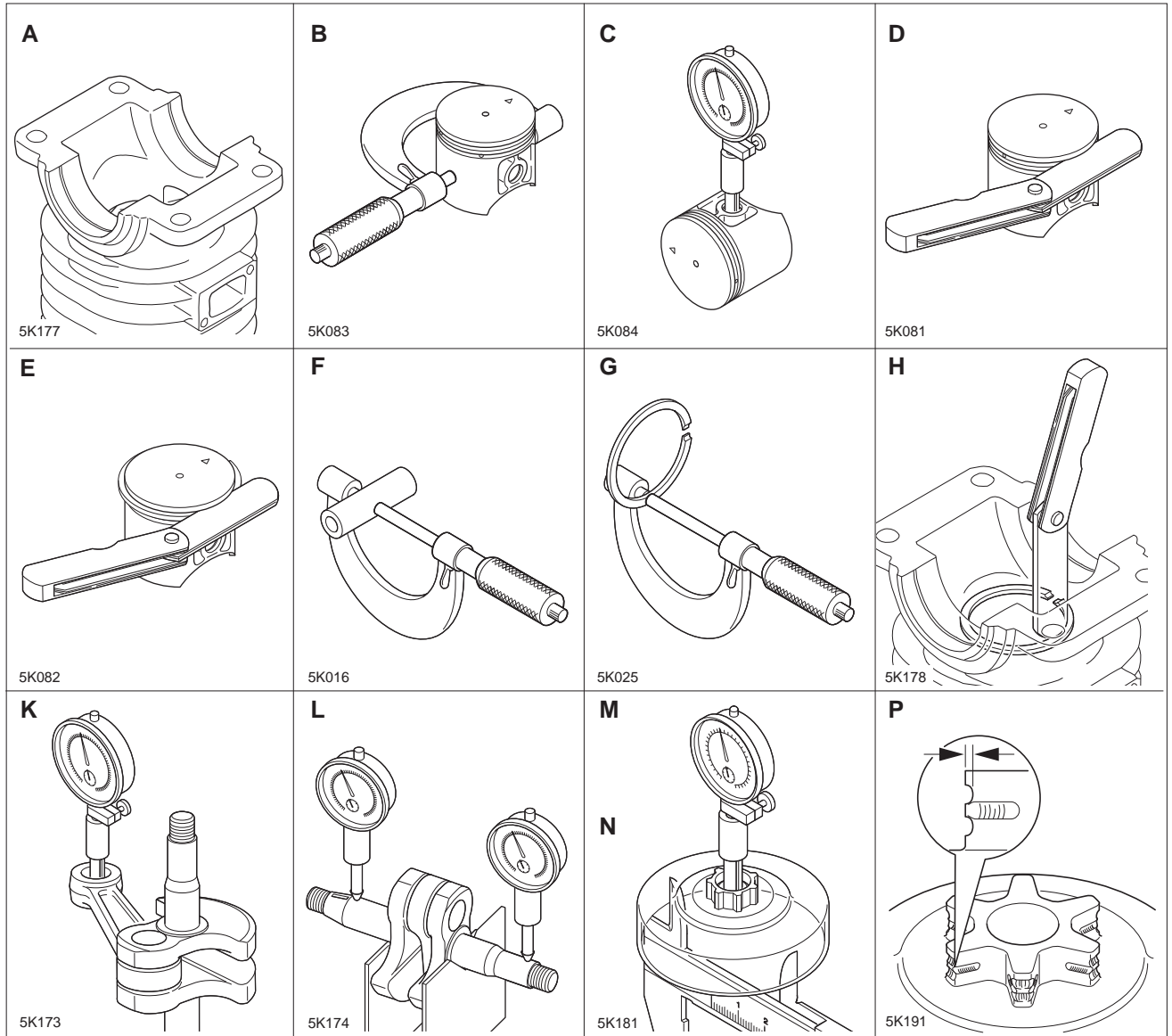
Descriptions	Size	kgf·cm	N·m	in·lbf	
Starter system	Starter pawl	M5*	30 - 45	3 - 4.5	26 - 40
	Starter case	M5**	35 - 50	3.5 - 5	30 - 45
Ignition system	Magneto rotor (Flywheel)	M8	250 - 290	25 - 29	220 - 255
	Ignition coil	M5*	30 - 45	3 - 4.5	26 - 40
	Ignition switch	M10	15 - 30	1.5 - 3	13 - 26
	Spark plug	M14	130 - 170	13 - 17	110 - 150
Fuel system	Carburetor	M5**	35 - 50	3.5 - 5	30 - 45
		M5**	30 - 45	3 - 4.5	26 - 40
Clutch	Clutch hub	LM10	230 - 260	23 - 26	200 - 230
Engine	Crankcase	M5*	60 - 80	6 - 8	60 - 70
	Engine mount	M5**	70 - 110	7 - 11	60 - 95
	Muffler	M5	70 - 90	7 - 9	60 - 80
	Intake insulator	M5	50 - 70	5 - 7	45 - 60
Others	Front handle	M5**	30 - 50	3 - 5	26 - 45
	Rear handle assembly	M5**	30 - 50	3 - 5	26 - 45
	Brake lever	M4	25 - 35	2.5 - 3.5	22 - 30
	Sprocket guard	M4**	10 - 20	1 - 2	9 - 17
	Guide bar	M8	200 - 230	20 - 23	175 - 200
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 *Apply special repairing materials ** Tapping screw

1-4 Special repairing materials

Material	Location	Remarks
Adhesive	Ball bearing outer / crankcase	Loctite #675 or equivalent
	Stud bolt	
Liquid gasket	Crankcase seam part	ThreeBond 1207D
Thread locking sealant	Starter pawl	Loctite #242, ThreeBond #1324 or equivalent
	Engine mount	
	Ignition coil	
Grease	Clutch needle bearing	Lithium based grease
	Starter center shaft	
	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.	35.91 (1.414)
C	Piston pin bore	Max.	8.035 (0.3163)
D	Piston ring groove	Max.	1.5 (0.063)
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.	1.45 (0.057)
H	Piston ring end gap	Max.	0.5 (0.02)
K	Con-rod small end bore	Max.	12.000 (0.4724)
L	Crankshaft runout	Max.	0.01 (0.001)
M	Sprocket bore	Max.	10.80 (0.4252)
N	Clutch drum bore	Max.	61.5 (2.42)
P	Sprocket wear limit	Max.	0.5 (0.02)

1-6 Special tools

1		2		3		4		5	
6		7		8		10		11	
12		13		9		15		17	
14		16		19		18			
15		20		21					

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 torx bolt
3	91073	Auto-oiler installer	Installing pencil type auto-oiler
4	897800-79931	Spark tester	Checking ignition system
5	91004	Module air gap gauge	Adjusting pole shoe air gaps
6	Y089-000110	Puller	Removing magneto rotor
7	500-500	Welch plug tool (Walbro)	Removing and installing welch plug
8	91075	Limiter cap removal tool	Removing limiter cap (Left hand thread 2.5 mm)
9	91076	Limiter cap removal tool	Removing limiter cap (Left hand thread 3.0 mm)
10	897563-19830	Metering lever gauge	Measuring metering lever height on carburetor
11	897505-16133	Clutch tool	Removing and installing clutch assembly
12	91041	Pressure rubber plug	Plugging exhaust port to test crankcase / cylinder leakages
13	897826-16131	Pressure rubber plug	Plugging intake port to test crankcase / cylinder leakages
14	897827-16131	Pressure plate	Plugging intake port to test crankcase / cylinder leakages
15	91139	Pressure / vacuum tester	Testing crankcase / cylinder leakages
16	897803-30133	Pressure tester	Testing carburetor and crankcase leakages
17	91037	Compression gauge	Measuring cylinder compression
18	897701-02830	Bearing wedge	Removing ball bearings on crankshaft
19	897726-09130	Oil seal tool	Installing crankcase oil seals
20	897702-30131	Piston pin tool	Removing and installing piston pin
21	900300	Ignition Analyzer: PET-9000	Measuring ignition timing, Primary / Secondary voltage