



SERVICE DATA

CHAIN SAW

ECHO: CS-621SX

shindaiwa: 601sx

(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.

SERVICE MANUAL Ref. 401-31 (Model : CS-600) contains lots of information for servicing these models.

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Reference No. **01-59I-00**
ISSUED : 201912



1 SERVICE INFORMATION

1-1 Specifications

Dimensions	Length*	mm(in)	448 (17.6)
	Width	mm(in)	246 (9.7)
	Height	mm(in)	296 (11.7)
Dry weight*		kg(lb)	6.3 (13.9)
Engine	Type	YAMABIKO, air-cooled, two-stroke, single cylinder Ventilated piston, Semi-automatic decompression	
	Rotation	Clockwise as viewed from the output end	
	Displacement	cm ³ (in ³)	59.8 (3.649)
	Bore	mm(in)	45.0 (1.772)
	Stroke	mm(in)	37.6 (1.480)
	Compression ratio	7.1	
Carburetor	Type	Diaphragm, horizontal-draft	
	Model	Walbro HDA-346	
	Venturi size-Throttle bore	mm(in)	15.88 - 19.03 (0.625 - 0.749)
Ignition	Type	CDI (Capacitor discharge ignition) system, Digital magneto	
	Spark plug	NGK BPMR8Y	
Exhaust	Muffler type	Spark arrester muffler	
Starter	Type	Automatic rewind	
	Rope diameter x length	mm(in)	4.0 x 950 (0.15 x 37.4)
Fuel	Type**	Mixed two-stroke fuel	
	Mixture ratio	50 : 1 (2%)	
	Gasoline	Minimum 89 octane	
	Two-stroke air cooled engine oil	ISO-L-EGD (ISO/CD13738), JASO FC/FD	
	Tank capacity	L (UK.fl.oz.)	0.65 (22.0)
Clutch	Type	Inboard clutch : Centrifugal, 3-shoe slide with 3-tension spring	
Guide bar / Saw chain lubrication type			Adjustable automatic oiler
Oil	Tank capacity	L (UK.fl.oz.)	0.3 (10.1)
Auto oiler	Type	Clutch driven type	
Sprocket	Type	Floating rim	
	Number of teeth	7	
	Pitch	in	3/8

* Without guide bar and saw chain.

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

1-1 Specifications (continued)

Cutting devices					
Guide bar	Type	S45R73-64AA	S50R73-72AA	S60R73-84AA	
	Called length	cm	45	50	60
	Gauge	in	0.058		
Saw chain	Type	Oregon 73LPX, 73EXL Carlton A2LM			
	Number of drive links	64	72	84	
	Pitch	in	3/8		
	Gauge	in	0.058		

1-2 Technical data

Engine			
Compression pressure	MPa (kgf/cm ²) (psi)	0.83 (8.4) (120)	
Clutch engagement speed	r/min	4000	
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	7
	at 9250 r/min	°BTDC	24
Carburetor			
Test Pressure, minimum	MPa (kgf/cm ²) (psi)	0.05 (0.5) (7.0)	
Metering lever height	mm(in)	Flush with diaphragm seat	
Limiter cap / plug		Limiter cap P/N P003-000010	
Tool to adjust mixture needles		Screwdriver 2.0 mm	
Carburetor adjustment			
Fuel type		Mixed two-stroke fuel	Premixed alkylate fuel
1) Initial setting	H mixture needle	turn out	1 1/2
	L mixture needle	turn out	1 7/8
	Throttle adjust screw	turn in* ¹	3
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	r/min		3700 3600
4) Set idle speed by turning L mixture needle CCW	r/min		2900 2800
5) Confirm H mixture needle position before WOT setting			Turn H mixture needle CCW to confirm engine speed decreases less than or equal to 12000 r/min.
6) WOT setting			Turn H mixture needle CW in 1/8 turn increment with the engine at idle, then accelerate to WOT and check engine speed. The final engine speed should fall within r/min 12500 - 12700
7) Verify final engine speed with standard equipment	r/min		Idle: 2400 - 3500 WOT: 12100 - 13200
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	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

*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**	60 - 90	6 - 9	52 - 80	
	Starter center shaft screw	M5*	30 - 45	3 - 4.5	26 - 40	
	Starter plate (Rewind spring case)	M4†	20 - 30	2 - 3	17 - 26	
	Starter case	M5	70 - 90	7 - 9	60 - 80	
Ignition system	Magneto rotor	M8	230 - 270	23 - 27	200 - 235	
	Ignition coil	M5†	60 - 90	6 - 9	52 - 80	
	Spark plug	M14	130 - 170	13 - 17	110 - 150	
Fuel system	Carburetor	M5	30 - 40	3 - 4	26 - 35	
	Intake bellows	M5†	60 - 90	6 - 9	52 - 80	
Clutch	Clutch shoe	LM12	400 - 500	40 - 50	350 - 435	
Engine	Crankcase	M5†	60 - 90	6 - 9	52 - 80	
	Cylinder	M5	70 - 110	7 - 11	60 - 95	
	Cylinder cover	M5†	60 - 90	6 - 9	52 - 80	
	Muffler	Cylinder side	M5	70 - 110	7 - 11	60 - 95
		Crankcase side	M5**	70 - 110	7 - 11	60 - 95
	Muffler plate	M4	15 - 25	1.5 - 2.5	13 - 22	
	Decompression valve	M10	60 - 80	6 - 8	52 - 70	
Others	Auto-oiler	M4†	30 - 50	3 - 5	26 - 45	
	Compression spring	Cushion bracket	M6†	40 - 60	4 - 6	35 - 52
		Crankcase	M5†	60 - 80	6 - 8	52 - 70
		Front handle	M6†	40 - 55	4 - 5.5	35 - 48
	Front handle	M5†	40 - 60	4 - 6	35 - 52	
	Rear handle	M5†	40 - 60	4 - 6	35 - 52	
	Spike	Crankcase side (upper)	M5	90 - 110	9 - 11	80 - 95
		Crankcase side (lower)	M5*	90 - 110	9 - 11	80 - 95
		Sprocket side	M5*	90 - 110	9 - 11	80 - 95
	Brake lever (Hand guard)	Clutch side	M5†	80 - 90	8 - 9	70 - 80
		Starter side	M5†	30 - 50	3 - 5	26 - 45
	Brake cover	M5†	40 - 60	4 - 6	35 - 52	
	Chain catcher	M5†*	60 - 90	6 - 9	52 - 80	
	Sprocket guard plate		M3*	6 - 10	0.6 - 1	5 - 9
			M4†	30 - 50	3 - 5	26 - 45
	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 (See next page)

** Precoat bolt: If the coat is peeled off, replace new one or apply thread locking sealant. (See next page)

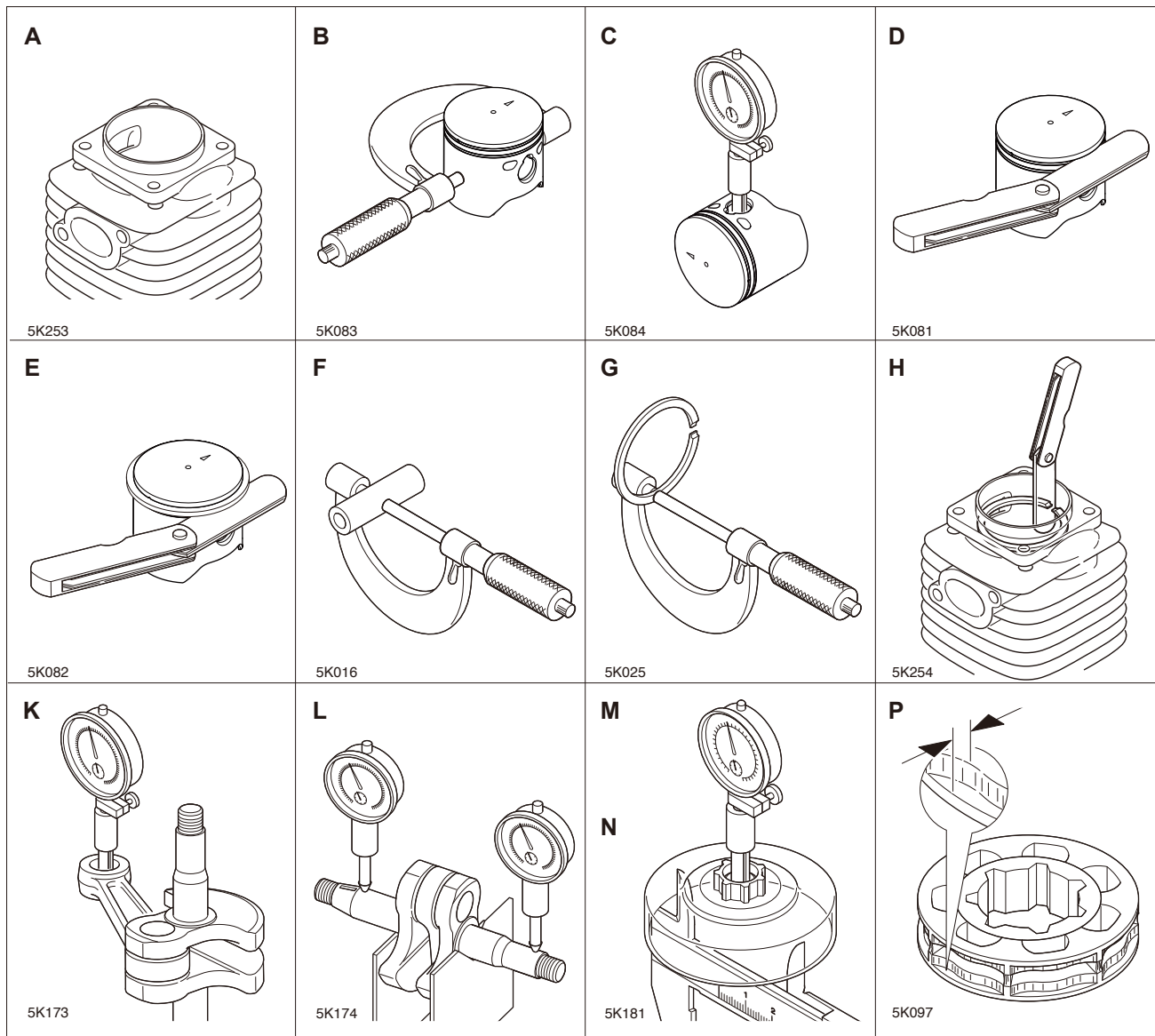
† Tapping screw

1-4 Special repairing materials

Material	Location	Remarks
Adhesive	Stud bolt	Loctite #675 or equivalent
Thread locking sealant	Starter center shaft screw	ThreeBond #1344J or equivalent
	Chain catcher	
	Spike crankcase side (lower)	Loctite #272 or equivalent
	Spike sprocket side	
	Muffler crankcase side (re-use*)	
	Sprocket guard plate screw (M3)	ThreeBond #1324N or equivalent
Starter pawl (re-use*)		
Grease	Clutch needle bearing	EPNOC AP2 (Lithium based grease) P/N X695-000060
	Recoil starter	
	Oil seal inner lips	Molybdenum grease (approx.1 gram)
	Chain brake (metal contact part)	

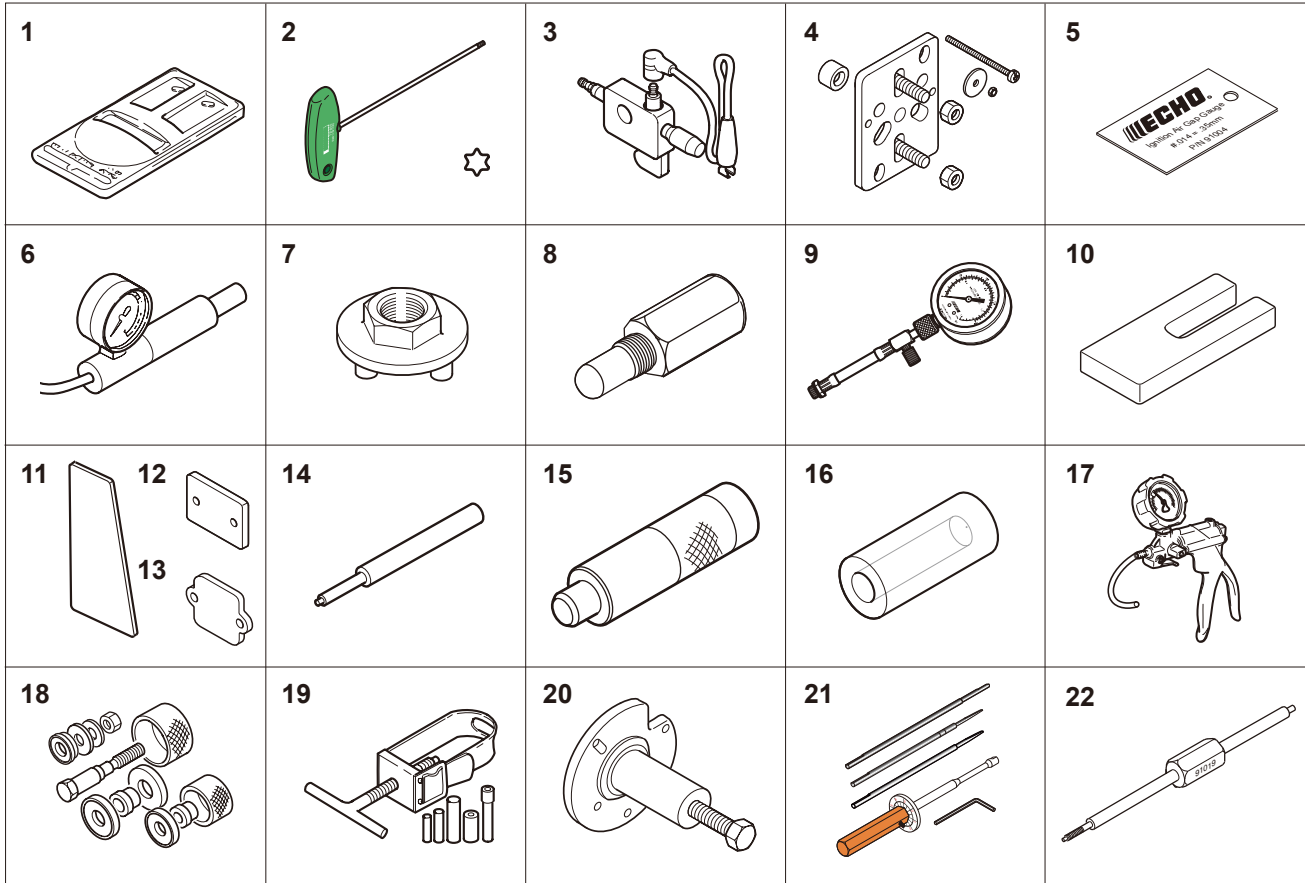
* If old thread locking sealant is left in threads, correct torque may not be secured. In case old thread locking sealant is left, remove it.

1-5 Service Limits



Description		mm (in)
A	Cylinder bore	When plating is worn and aluminium can be seen
B	Piston outer diameter	Min. 44.90 (1.768)
C	Piston pin bore	Max. 11.030 (0.4343)
D	Piston ring groove	Max. 1.3 (0.051)
E	Piston ring side clearance	Max. 0.15 (0.006)
F	Piston pin outer diameter	Min. 10.98 (0.4323)
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. 15.025 (0.5915)
L	Crankshaft runout	Max. 0.01 (0.001)
M	Sprocket bore	Max. 13.90 (0.5472)
N	Clutch drum bore	Max. 71.5 (2.81)
P	Sprocket wear limit	Max. 0.5 (0.02)

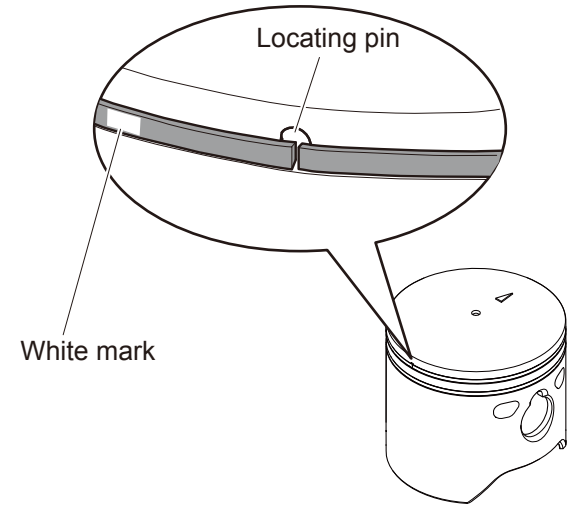
1-6 Special tools



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 Torx bolt
3	897800-79931	Spark tester	Checking ignition system
4	Y089-000111	Puller	Removing magneto rotor (flywheel)
5	91004	Module air gap gauge	Adjusting pole shoe air gaps
6	897803-30133	Pressure tester	Testing carburetor and crankcase leakage
7	897505-16133	Clutch tool	Removing and installing clutch assembly
8	X644-000020	Piston stopper	Locking crankshaft rotation
9	91037	Compression gauge	Measuring cylinder compression
10	897719-02830	Piston holder	Making piston steady to remove and install piston/ring
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	897724-01361	Spring pin tool	Removing and installing spring pin (4 mm)
15	897714-12330	Oil seal tool	Installing crankcase oil seal (crankcase side)
16	897726-16431	Oil seal tool	Installing crankcase oil seal (starter side)
17	91149	Pressure / vacuum tester	Testing tank vent and crankcase leakages
18	897701-14732	Bearing tool	Removing and installing ball bearings on crankcase
19	897702-30131	Piston pin tool	Removing and installing piston pin
20	897502-19830	Crankcase tool	Separating crankcase
21	Y089-000095	Carburetor adjustment tool	Adjusting carburetor
22	91019	Limiter cap tool	Removing and installing limiter cap

2 SERVICE HINT

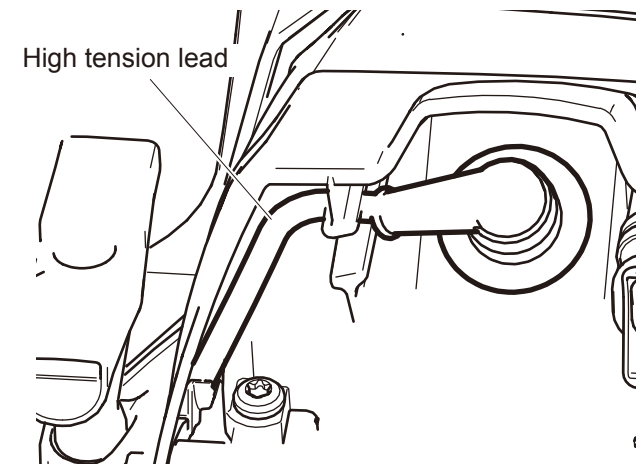
2-1 Installing piston rings



1. Install new piston rings on piston, ensuring the end gaps of piston rings are properly positioned around locating pins as shown.

NOTE: Make sure that white marks of piston rings are positioned on the left side of the end gaps as shown.

2-2 Installing spark plug cap



1. Install spark plug cap on cylinder.

NOTE: Make sure that the high tension lead is correctly routed through the ribs of the cylinder cover as shown.

