SERVICE DATA

CHAIN SAW

ECHO:

CS-590

(Serial number : C25812000001-C25812999999)
(Serial number : C25913000001-C25913999999)
(Serial number : C69015000001-C69015999999)

CS-600P

(Serial number : C22312000001-C22312999999)
(Serial number : C22413000001-C22413999999)

shindaiwa:

591

(Serial number : C36112000001-C36112999999)
(Serial number : C36213000001-C36213999999)
(Serial number : C69115000001-C69115999999)

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. 401-30 (Model : CS-600P) contains lots of information for servicing this model.

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Reference No. **01-59C-02**
REVISED: 201702
ISSUED: 201201

1 SERVICE INFORMATION

1-1 Specifications

Model			CS-600P	CS-590, 591
Dimensions	Length	mm(in)	448 (17.6)	
	Width	mm(in)	246 (9.7)	245 (9.6)
	Height	mm(in)	296 (11.7)	292 (11.5)
Dry weight*		kg(lb)	6.0 (13.2)	
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		7.2	
Carburetor	Type		Diaphragm horizontal-draft	
	Model		Walbro HDA-268	
	Venturi size-Throttle bore	mm(in)	15.08 - 19.03 (0.594 - 0.749)	
Ignition	Type		CDI (Capacitor discharge ignition) system Digital magneto	
	Spark plug		BPMR8Y (S/N 12 series: BPM8Y)	
Starter	Type		Automatic rewind starter	
	Rope diameter x length	mm(in)	4.0 x 950 (0.15 x 37.4)	
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.)	0.57 (19.3)	
Exhaust	Muffler type		Spark arrester muffler	
Clutch	Type		Inboard clutch: Centrifugal, 3-shoe slide with 3-tension spring	
Guide bar / Saw chain lubrication type			Automatic with volume adjuster	
Oil	Tank capacity	L (U.S.fl.oz.)	0.3 (10.1)	
Sprocket	Type		Floating rim	spur
	Number of teeth		7	
	Pitch	in	3/8	

* Without guide bar and saw chain.

Cutting devices ECHO CS-600P, CS-590								
Guide bar	Type		16D0PS3860	----	18D0PS3866	20D0PS3870	24D0PS3881	27D0PS3893
			16D0PD3860	----	----	20D0PD3870	24D0PD3881	----
			----	18D0AS3864	----	20D0AS3870	----	----
	Called length	in	16	18	18	20	24	27
	Gauge	in	0.050					
Saw chain	Type		Oregon 72V, 72LPX, 72LGX					
	Number of drive links		60	64	66	70	81	93
	Pitch	in	3/8					
	Gauge	in	0.050					

Cutting devices shindaiwa 591						
Guide bar	Type		S18D0AS3864	S20D0AS3870	----	----
			----	S20D0PS3870	S24D0PS3881	S27D0PS3893
	Called length	in	18	20	24	27
	Gauge	in	0.050			
Saw chain	Type		Oregon 72LPX			
	Number of drive links		64	70	81	93
	Pitch	in	3/8			
	Gauge	in	0.050			

1-2 Technical data

Engine			
Compression pressure		MPa (kgf/cm^2) (psi)	1.01 (10.3) (146)
Clutch engagement speed		RPM	4,000
Engagement Minimum†		RPM	3,500
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 3,000 RPM	°BTDC	6
	at 8,000 RPM	°BTDC	24
PET-9000	Parameter 1		332
	Parameter 2		05
Chain oil discharge volume		mL/min (US.fl.oz./min)	Adjustable: 1.5 - 13 (0.05 - 0.39) 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)	Flush with diaphragm seat
Limiter cap / plug			Limiter cap P/N P003-000010
Tool to adjust mixture needles			Screwdriver 2.5 mm
Carburetor adjustment			
1) Initial setting	H mixture needle	turn out	3/4
	L mixture needle	turn out	1 3/4
	Throttle adjust screw	turn in*1	1
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	3,600
4) Set idle speed by turning L mixture needle CCW		RPM	2,800
5) Confirm H mixture needle position before WOT setting		RPM	Turn H mixture needle CCW to confirm engine speed decreases less than 11,500
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 engine speed should fall within: 12,100 - 12,300
7) Verify final engine speed with standard equipment		RPM	Idle: 2,600 - 3,200 WOT: 11,800 - 12,800

(continued)

1-2 Technical data (continued)

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		M5*†	60 - 90	6 - 9	50 - 80
	Starter center shaft screw		M5*	30 - 45	3 - 4.5	25 - 40
	Starter case		M5	50 - 70	5 - 7	45 - 60
Ignition system	Magneto rotor (Flywheel)		M8	230 - 270	23 - 27	200 - 235
	Ignition coil		M4	60 - 90	6 - 9	50 - 80
	Spark plug		M14	130 - 170	13 - 17	113 - 150
Fuel system	Carburetor		M5	30 - 45	3 - 4.5	25 - 40
	Intake bellows		M5	60 - 90	6 - 9	50 - 80
Clutch	Clutch hub		LM10	300 - 400	30 - 40	250 - 350
Engine	Crankcase		M5†	60 - 90	6 - 9	50 - 80
	Cylinder		M5†	70 - 110	7 - 11	60 - 95
	Cylinder cover		M5	60 - 90	6 - 9	50 - 80
	Muffler		M5*	70 - 110	7 - 11	60 - 95
	Muffler lid		M4	15 - 25	1.5 - 2.5	13 - 22
Others	Auto-oiler		M4	35 - 50	3 - 5	25 - 45
	Compression spring	Cushion bracket	M5	30 - 40	3 - 4	25 - 35
		Crank case	M5	60 - 80	6 - 8	50 - 70
		Front handle	M5	40 - 60	4 - 6	35 - 50
			M6	40 - 50	4 - 5	35 - 45
	Rear handle		M5	40 - 60	4 - 6	35 - 50
	Brake lever (Hand guard)	(Starter side)	M5	30 - 50	3 - 5	25 - 40
		(Sprocket side)	M5	60 - 90	6 - 9	50 - 80
	Brake cover		M5*	40 - 60	4 - 6	35 - 50
	Sprocket guard plate		M4*	15 - 25	1.5 - 2.5	13 - 22
	Spike		M4	60 - 90	6 - 9	50 - 80
	Ignition switch		M10	15 - 30	1.5 - 3	13 - 25
	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
			M8	110 - 150	11 - 15	95 - 130

LM: Left-hand thread

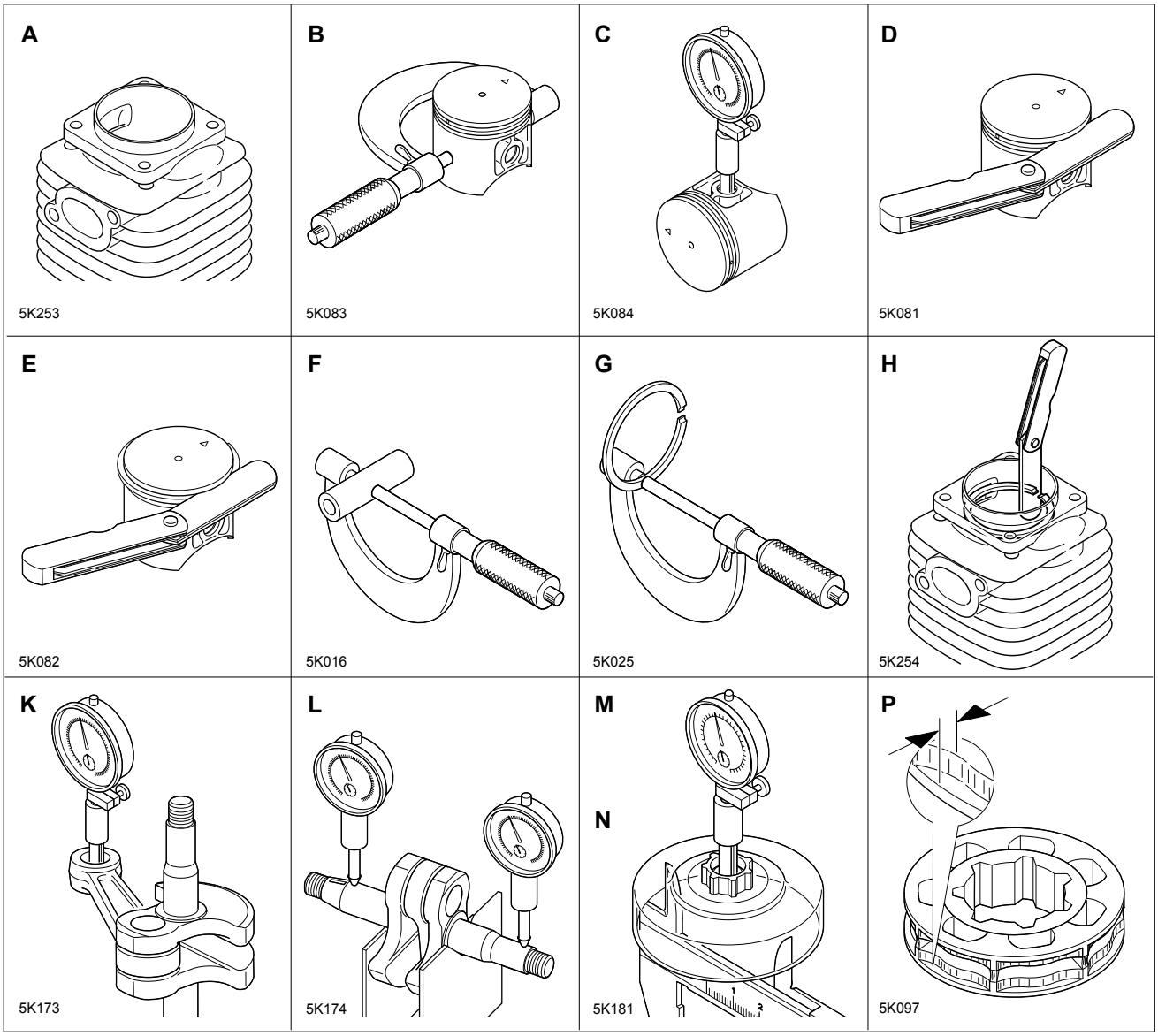
*Thread locking sealant (See next page)

† The torque difference between four bolts should not exceed 20 kgf•cm (2N•m, 17in•lbf) per bolt.

1-4 Special repairing materials

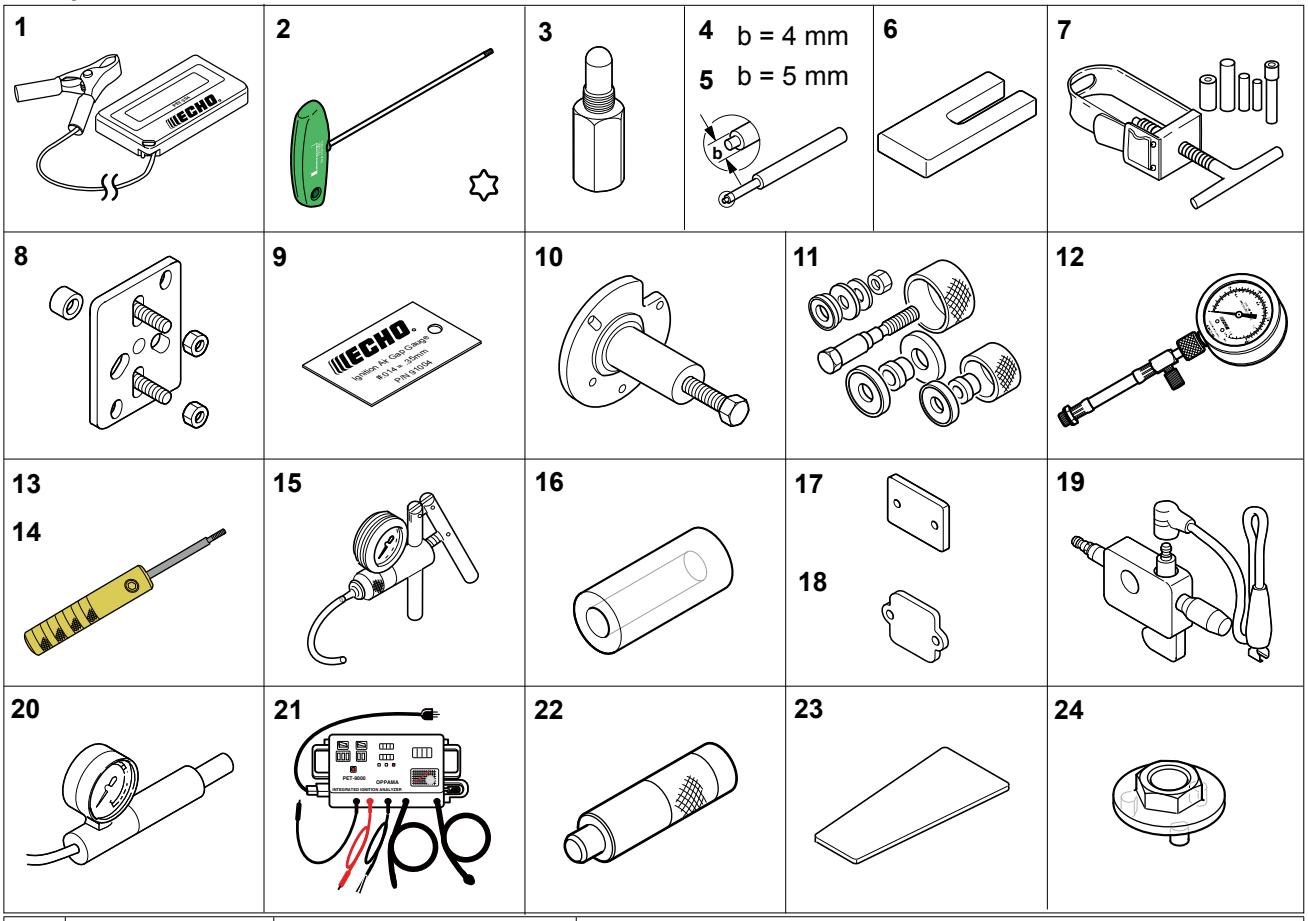
Material	Location	Remarks
Adhesive	Guide bar stud	Loctite #609, ThreeBond 1373 or equivalent
	Starter center shaft screw	Loctite #222, ThreeBond 1342 or equivalent
Grease	Auto-oiler worm	Lithium based grease or ECHO XTended Protection ™ Lubricant
	Clutch needle bearing	
	Rubber cushion, inside	
	Choke knob	
	Rewind spring	
	Oil seal inner lips	
	Starter center shaft	
	Brake cover	
	Chain brake (metal contact part)	Molybdenum grease (approx. 1 gram)
Thread locking sealant	Muffler	Loctite #242, ThreeBond #1324 or equivalent
	Sprocket guard plate	
	Starter pawl	

1-5 Service Limits



Description			mm (in)
A	Cylinder bore		When plating is worn and aluminum 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. 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. 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	G310-000050	Tachometer PET-304	Measuring engine speed
2	X602-000340	Torx wrench (T27)	Removing and installing bolt
3	897537-30130	Piston stopper	Locking crankshaft rotation
4	897724-01361	Spring pin tool (4 mm)	Removing and installing spring pin (4 mm dia)
5	897724-02831	Spring pin tool (5 mm)	Removing and installing spring pin (5 mm dia)
6	897719-02830	Piston holder	Making piston steady to remove and install piston / rings
7	897702-30131	Piston pin tool	Removing and installing piston pin
8	897501-03938	Puller	Removing magneto rotor
9	91004	Module air gap gauge	Adjusting pole shoe air gaps
10	897502-19830	Crankcase tool	Separating crankcase
11	897701-14732	Bearing tool	Removing and installing ball bearings on crankcase
12	91037	Compression gauge	Measuring cylinder compression
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	91139	Pressure tester	Testing crankcase leakages
16	897726-16431	Oil seal tool	Installing starter side oil seal
17	897826-16131	Pressure rubber plug	Plugging intake port to test crankcase / cylinder leakages
18	897827-16131	Pressure plate	Plugging intake port to test crankcase / cylinder leakages
19	897800-79931	Spark tester	Checking ignition system
20	897803-30133	Pressure tester	Testing carburetor leakages
21	900300	Ignition Analyzer: PET-9000	Measuring Ignition timing, Primary/Secondary voltage engine speed
22	897714-12330	Oil seal tool	Installing crankcase side oil seal
23	91041	Pressure rubber plug	Plugging exhaust port to test crankcase / cylinder leakages
24	897505-16133	Clutch tool	Removing and installing clutch assembly