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SERVICE DATA

CHAIN SAW

CS-260TES
CS-270WES

(Serial number : 36000001 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, illustrations and directions in this SERVICE DATA are based on the latest products information available at the time of publication.

ECHO SERVICE MANUAL Ord. 401-22(Model : CS-2600) contains lots of information for servicing this model.

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Reference No. **00-26C-01**
REVISED: 200804
ISSUED: 200703

KIORITZ CORPORATION

1 SERVICE INFORMATION

1-1 Specifications

Model			CS-260TES	CS-270WES
Dimensions	Length*	mm(in)	257 (10.1)	380 (15.0)
	Width	mm(in)	219 (8.6)	220 (8.7)
	Height	mm(in)	210 (8.3)	230 (9.1)
Dry weight*		kg(lb)	2.9 (6.3)	3.1 (6.8)
Engine	Type		KIORITZ, air-cooled, two-stroke, single cylinder	
	Rotation		Clockwise as viewed from the output end	
	Displacement	$cm^3(in^3)$	26.9 (1.641)	
	Bore	mm(in)	35 (1.378)	
	Stroke	mm(in)	28 (1.102)	
	Compression ratio		6.4	
Carburettor	Type		Diaphragm horizontal-draught with auto-return choke	
	Model (Walbro)		WT-843	WT-845
	Venturi size-Throttle bore	mm(in)	9.53 - 14.3 (0.375 - 0.563)	
Ignition	Type		Digital Magneto : CDI system	
	Spark plug		BPMR-7A	
Starter	Type		ES (Effortless)-start	
	Rope diameter x length	mm(in)	3.5 x 750 (0.14 x 29.5)	
Fuel	Type		Premixed two-stroke fuel	
	Mixture ratio		50 : 1 (2 %)	
	Petrol		Minimum 89 octane petrol (RON)	
	Two-stroke air cooled engine oil		ISO-L-EGD (ISO/CD13738), JASO FC	
	Tank capacity	L (U.S.fl.oz.)	0.24 (8.1)	
Clutch	Type		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.)	0.16 (5.4)	
Auto oiler	Type		clutch related type	
Sprocket	Type		Spur	
	Number of teeth		6 (Sproket nose bar), 8 (for Carving bar)	
	Pitch	in	3/8 (Sproket nose bar), 1/4 (for Carving bar)	

* Without guide bar and saw chain.

Cutting devices			Sproket nose bar			Carving
Guide bar	Type		20RC50-3/8	25RC50S-3/8	30RC50M-3/8	25C50
	Called length	cm	20	25	30	25
	Gauge	in	0.050			
Saw chain	Number of drive link		35	40	47	60
	Pitch	in	3/8			1/4
	Gauge	in	0.050			

1-2 Technical data

Model			CS-260TES	CS-270WES
Engine				
Idling speed		r/min	2800 - 3600	
Operating speed		r/min	8500 - 9000	
High speed (No load full throttle)*		r/min	11000 - 12500	
Clutch engagement speed		r/min	4450 - 4750	
Compression pressure		MPa (kgf/cm^2) (psi)	0.85 (8.7) (124)	
Ignition system				
Spark plug gap		mm(in)	0.6 - 0.7 (0.024 - 0.028)	
Minimum secondary voltage at 1500 r/min		kV	15	
Secondary coil resistance		kΩ	1.2 - 1.8	
Pole shoe air gaps		mm(in)	0.30 - 0.40 (0.012 - 0.016)	
Ignition timing	at 1500 r/min	°BTDC	25	
	at 3000 r/min	°BTDC	20	
	at 8000 r/min	°BTDC	36	
	at 12000 r/min	°BTDC	25	
Carburettor				
Idle adjust screw initial setting		turns in**	2 1/8	
L mixture needle initial setting		turns back	1 5/8	
H mixture needle initial setting		turns back	1 7/8	
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	
Chain oil discharge volume at 7000 r/ min		mL/min(U.S.fl.oz./min)	Adjustable: 1.5 - 13 (0.05 - 0.40) (Factory set 7 mL/min)	

BTDC: Before top dead centre.

*With 25cm guide bar and saw chain.

** Set idle speed screw to the point that its tip just contacts throttle plate before initial setting.

1-3 Torque limits

Descriptions		Size	kgf•cm	N•m	in•lbf
Starter system	Starter pawl	M5*	40 - 60	4 - 6	35 - 50
	Starter case	M4**	10 - 20	1 - 2	9 - 18
Ignition system	Magneto rotor (Flywheel)	M8	160 - 200	16 - 20	140 - 175
	Ignition coil	M5*	30 - 45	3.0 - 4.5	26 - 40
	Spark plug	M14	130 - 170	13 - 17	115 - 150
Fuel system	Carburettor	M5	30 - 45	3.0 - 4.5	26 - 40
	Intake bellows	M5	35 - 50	3.5 - 5.0	30 - 44
Clutch	Clutch hub	LM10	230 - 260	23 - 26	200 - 230
Engine	Crankcase	M5*†	55 - 95	5.5 - 9.5	48 - 83
	Engine mount	M5	70 - 110	7 - 11	60 - 95
	Dust cover (Only CS-260TES)	M4**	10 - 20	1 - 2	9 - 18
	Muffler	M5	70 - 100	7 - 10	60 - 90
	Muffler cover	M4**	10 - 20	1 - 2	9 - 18
Others	Auto-oiler	M4	15 - 25	1.5 - 2.5	13 - 22
	Front handle	M5**	20 - 40	2 - 4	18 - 35
	(CS-260TES)	M4**	10 - 20	1 - 2	9 - 18
	(CS-270WES)	M4**	8 - 12	0.8 - 1.2	7 - 10
	Top handle (CS-260TES)	M4**	10 - 20	1 - 2	9 - 18
	Rear handle (CS-270WES)	M4**	10 - 20	1 - 2	9 - 18
	Top handle assembly (CS-260TES)	M4**	20 - 30	2 - 3	18 - 26
	Rear handle assembly (CS-270WES)	M4**	20 - 30	2 - 3	18 - 26
	Brake lever (Hand guard)	M5	25 - 45	2.5 - 4.5	22 - 40
	Chain catcher	M5**	20 - 40	2 - 4	18 - 35
	Guide bar stud	M8	180 - 250	18 - 25	130 - 220
	Guide bar	M8	200 - 230	20 - 23	175 - 200
Regular bolt, nut and screw		M3	6 - 10	0.6 - 1.0	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

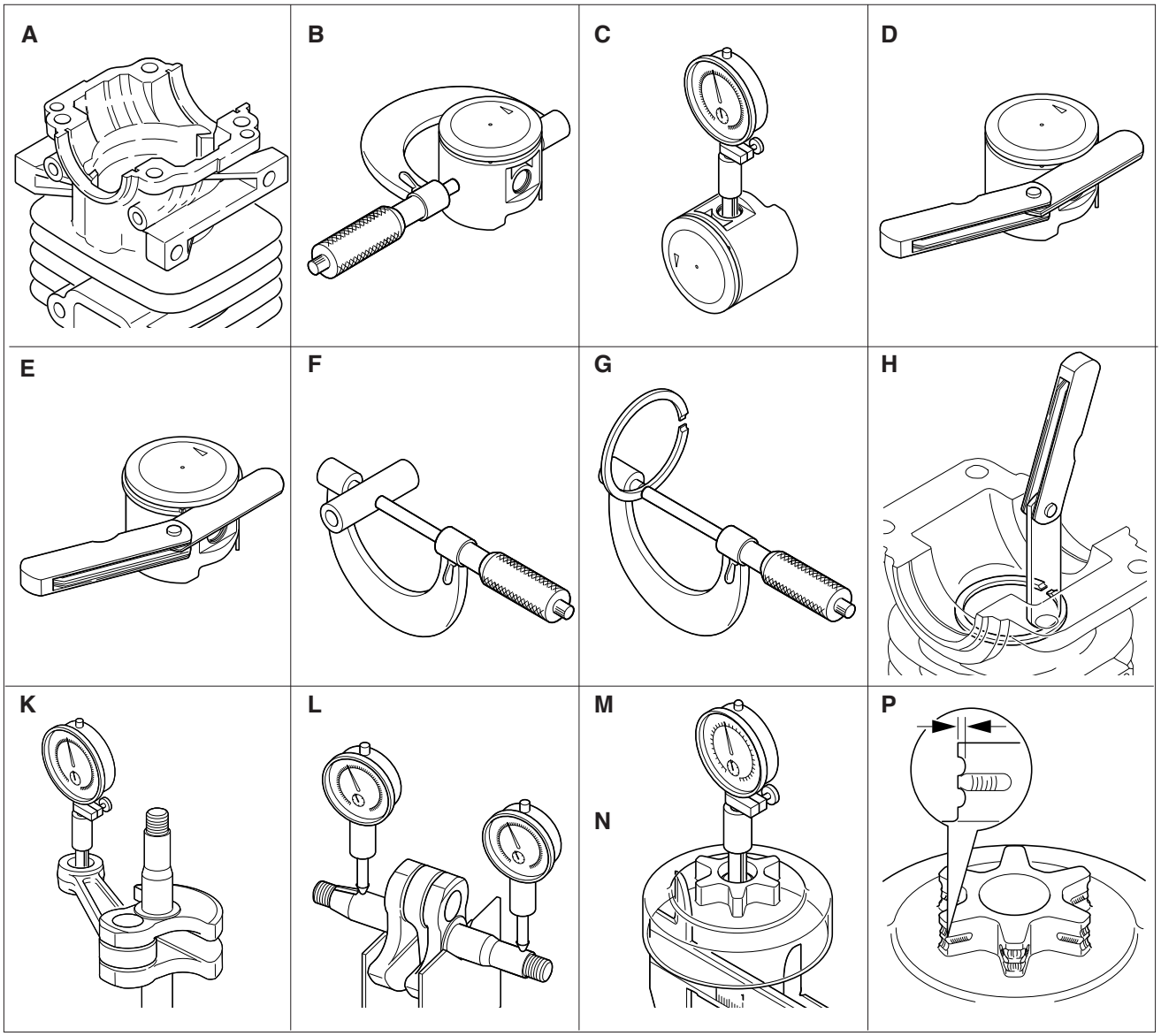
LM: Left-hand thread *Apply thread locking sealant (See next page) ** Tapping screw

† The torque differences among four bolts should not exceed 20 kgf•cm (2Nm, 17in•lbf) on one cylinder or crankcase.

1-4 Special repairing materials

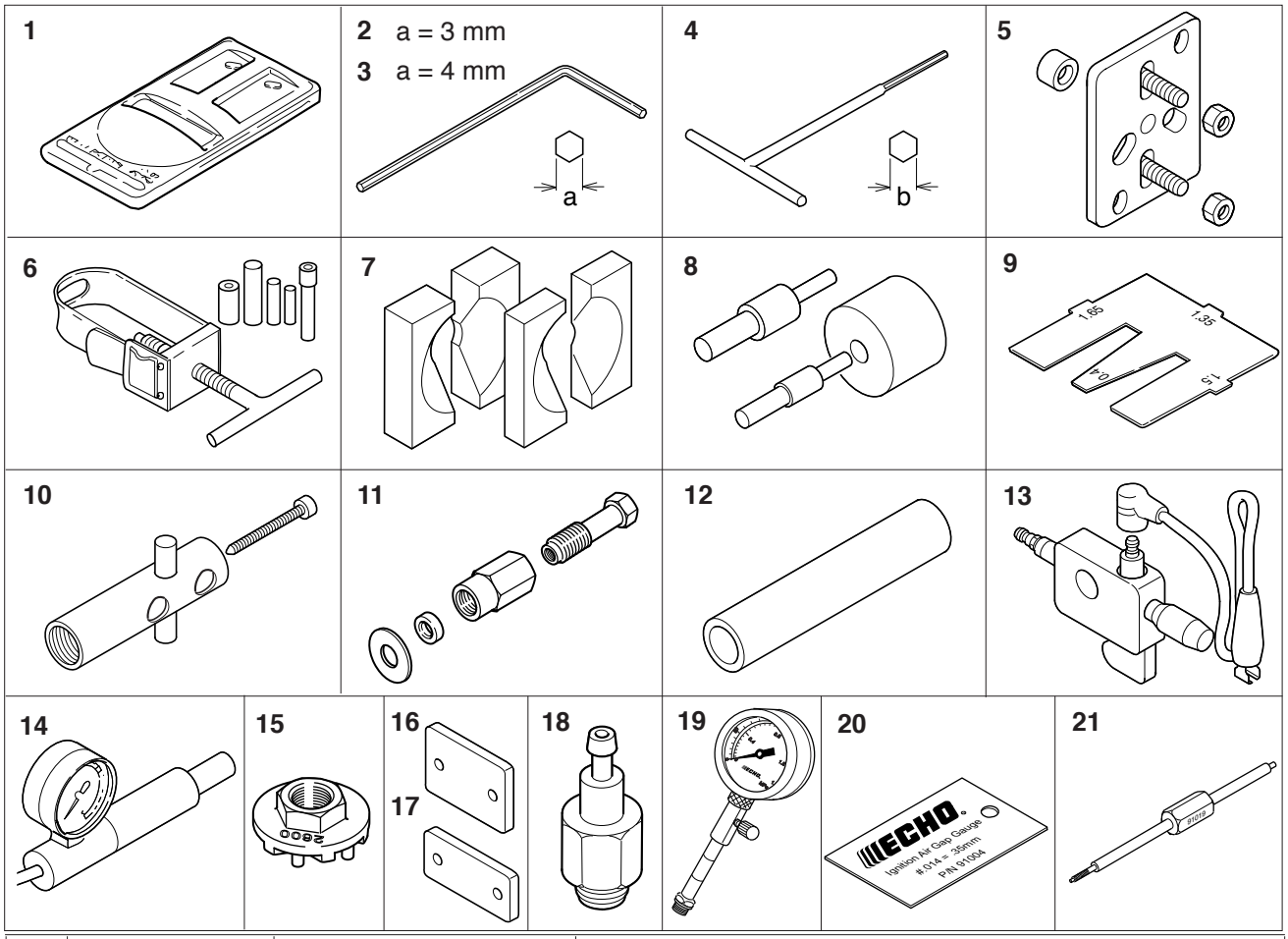
Material	Location	Remarks
Adhesive	Ball bearing outer / crankcase	Loctite #675 or equivalent
Liquid gasket	Crankcase seams	Loctite #515: 990610-00051 or equivalent
Thread locking sealant	Starter pawl screws	Loctite #242, Three bond 1324 or equivalent
	Ignition coil	Loctite #222, Three bond 1342 or equivalent
	Crankcase bolts	
Grease	Auto-oiler worm	Lithium based grease
	Clutch needle bearing	
	Rear handle cushion	
	Rewind spring	
	Starter center shaft	
	Chain brake (metal contact part)	Molybdenum grease (approx. 1 gram)

1-5 Service Limits



			mm (in)
A	Cylinder bore		When plating is worn and aluminium can be seen
B	Piston outer diameter	Min.	34.91 (1.374)
C	Piston pin bore	Max.	8.030 (0.3161)
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.	7.980 (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.	11.025 (0.4341)
L	Crankshaft runout	Max.	0.02 (0.001)
M	Sprocket bore	Max.	0.05 (0.0020)
N	Clutch drum bore	Max.	55.5 (2.19)
P	Sprocket wear limit	Max.	0.5 (0.02)

1-6 Special tools



Key	Part Number	Description	Used for:
1	897801-33330	Tachometer PET-1000	Measuring engine speed to adjust carburettor
2	895612-79920	L-hex wrench (3 mm)	Removing and installing hex. socket bolt (M4)
3	895610-79920	L-hex wrench (4 mm)	Removing and installing hex. socket bolt (M5)
4	897559-02831	T-hex wrench (4 mm)	Removing and installing hex. socket bolt (M5)
5	897501-03938	Puller	Removing magneto rotor
6	897702-30131	Piston pin tool	Removing and installing piston pin
7	897701-06030	Bearing wedge	Removing and crankshaft ball bearings
8	897705-11520	Bearing tool	Replacing needle bearing on con-rod small end
9	897563-19830	Metering lever gauge	Measuring metering lever hight on carburettor
10	897708-19835	Worm puller	Removing auto-oiler worm
11	Y089-000010	Worm inserter	Installing auto-oiler worm
12	897726-09130	Oil seal tool	Installing oil seals
13	897800-79931	Spark tester	Checking ignition system
14	897803-30132	Pressure tester	Testing carburettor and crankcase leakage
15	X640-000011	Clutch tool	Removing and assembling clutch assembly
16	897826-16131	Pressure rubber plug	Plugging intake port to test crankcase / cylinder leakages
17	897828-12330	Pressure rubber plug	Plugging intake port to test crankcase / cylinder leakages
18	897835-16131	Pressure connector	Checking crankcase and cylinder leakages
19	91037	Compression gauge	Measuring cylinder compression
20	91004	Module air gap gauge	Adjusting pole shoe air gaps
21	91019	Limiter cap tool	Removing and installing limiter cap

2 CARBURETTOR ADJUSTMENT PROCEDURE

2-1 General adjusting rules

A. Before starting the unit for adjustment, check the following items.

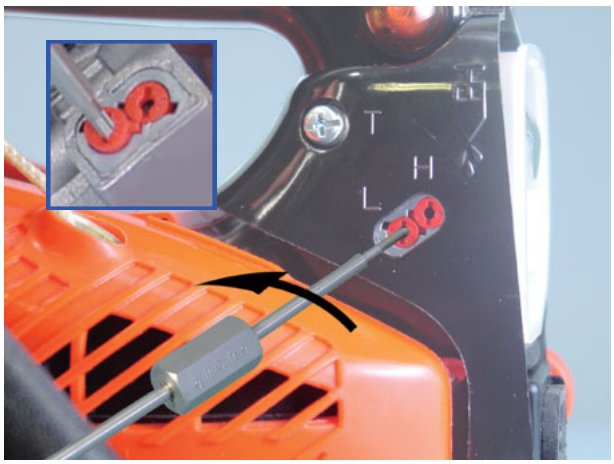
1. The correct spark plug must be clean and properly gapped.
2. The air filter element must be clean and properly installed.
3. The muffler exhaust port must be clear of carbon.
4. The fuel lines, tank vent and fuel filter are in good condition and clear of debris.
5. The fuel is fresh (> 89 octane : RON) and properly mixed at 50 : 1 with “ISO L-EGD” or “JASO FC” 2-stroke oil.
6. The recommended bar and chain must be installed to the power head, and properly tensioned.

NOTE : Make sure of proper installation of guide bar and saw chain when adjusting carburettor, or serious engine damage will occur due to overspeeding.

B. Adjust carburettor turning L and H mixture needles with limiter caps within the moving range (approx. 90°) and idle adjust screw. When engine does not run correctly after this adjustment, proceed to the next step (2-2).

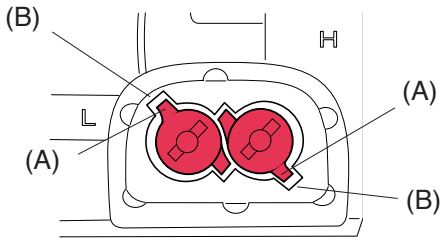
C. After adjusting carburettor according to the steps 2-2 and 2-3, the limiter cap(s) must be installed on L and/or H mixture needle(s) to comply with Emission Directive.

2-2 Presetting idle adjust screw, L mixture needle and H mixture needle



Tools Required : Small screwdriver with 2.5 mm blade, electronic tachometer P/N 897801-33330, limiter cap removal tool with 2.5 mm left-hand thread P/N 91019. Parts Required : (2) limiter caps P/N P003-000010.

1. Turn the L and H mixture needles anticlockwise to rich side stop and meet limiter caps tabs (A) with locating slot (B), using 3 mm blade screw driver.

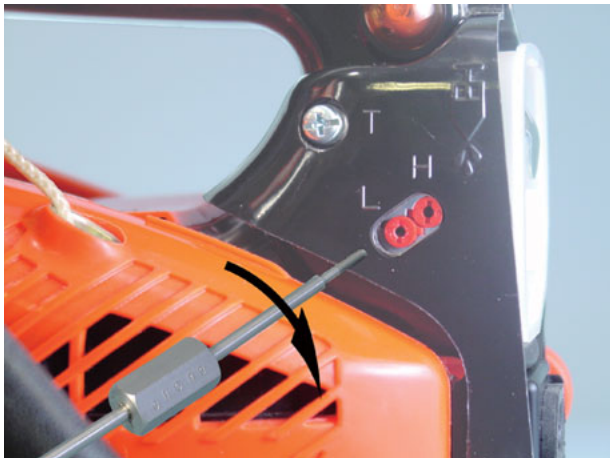


2. Screw left hand thread of limiter cap tool 91019 into centre hole of limiter cap anticlockwise until tab of the limiter cap just come out from locating slot.

NOTE : If cap tabs (A) misalign with locating slots (B), there is a chance to strip thread. When the thread is stripped by limiter cap tool, screw 3 mm wood screw in the stripped centre hole of the limiter cap, and pull off the cap.

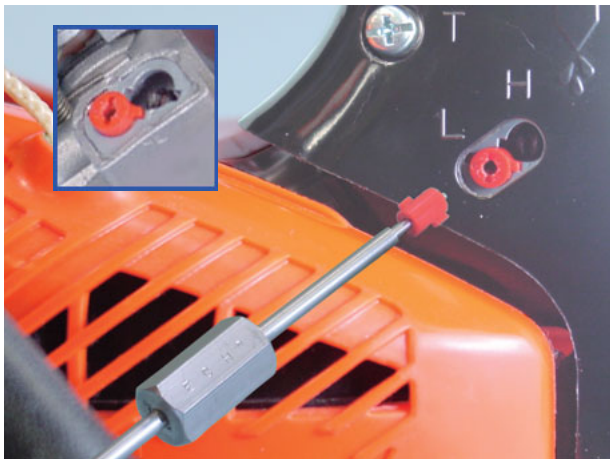
(continued)

2-2 Presetting idle adjust screw, L mixture needle and H mixture needle (continued)



3. Remove the limiter cap tool from the limiter cap turning the tool clockwise as the limiter cap is remained there.

NOTE : If the limiter cap were pulled out completely, there is a chance that the other mixture needle would turn and limiter cap tab would misalign with locating slot when screwing the limiter cap tool into centre hole of the other limiter cap.



4. Screw thread of limiter cap tool 91019 into other centre hole of the other limiter cap anticlockwise until the limiter cap is come out from the mixture needle completely. Remove the limiter cap from limiter cap tool turning clockwise. Screw thread of limiter cap tool 91019 into centre hole of previous limiter cap to pull out completely.

5. Turn L and H mixture needle clockwise until lightly seated, and then turn both mixture needles anticlockwise following turns.

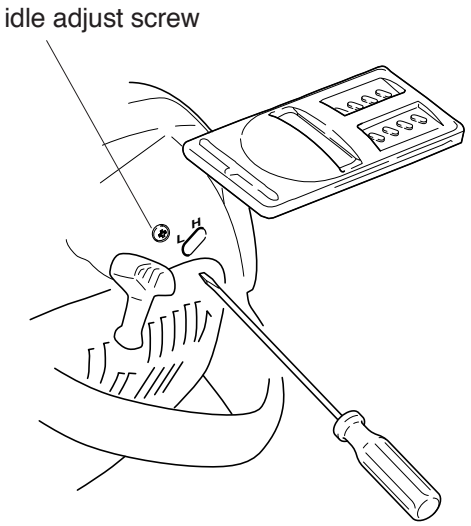
L mixture needle : 1 5/8, H mixture needle : 1 7/8

NOTE : If needles are forced during seating, damage to carburettor may occur.

6. CS-260TES : Remove cleaner lid and cleaner case to confirm throttle plate on carburettor visually. CS-270WES : Remove cleaner lid to confirm throttle plate on carburettor visually.

7. Turn idle adjust screw anticlockwise and set the screw until the tip to just contact throttle plate. Then turn idle adjust screw 2 1/8 turns clockwise. Install all removed parts.

2-3 Adjusting carburettor



1. Start engine and warm it up well for 70 seconds as follows.
   (1) 5 seconds at idle and 5 seconds at WOT.
   (2) 5 seconds at idle and 5 sedonds at WOT.
   (3) 5 seconds at idle and 10 seconds at WOT.
Repeat above (1) to (3) again.

2. Using 2.5 mm wide blade screw driver, adjust L mixture needle to obtain maximum idle speed.

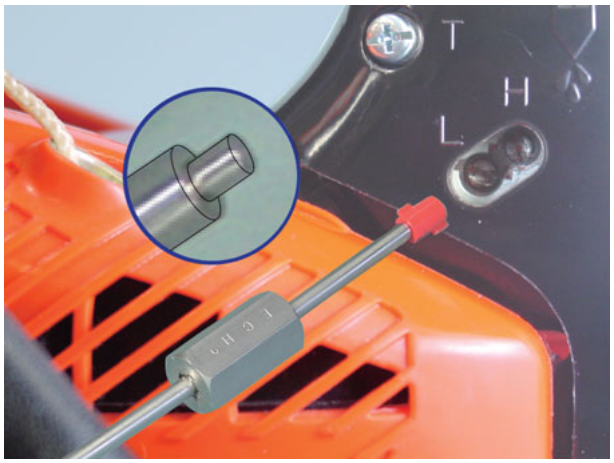
3. Set idle speed to 4,400 r/min by turning idle adjust screw.

4. Turn L mixture needle anticlockwise to reduce engine idle speed 1,000 to 1,100 r/min to set idle speed in the range of 3,300 to 3,400 r/min.

NOTE : Engine speed must be allowed to stabilize a minimum of 20 seconds after each adjustment of L mixture needle to assure accurate tachometer readings.

5. Turn H mixture needle anticlockwise until engine speed drops to approx. 11,000 r/min. Turn H mixture needle 1/8 turn increments clockwise at idle engine speed, then squeeze throttle trigger and check WOT engine speed. If the WOT engine speed is less than 11,500 r/min, turn H mixture needle 1/8 turn clockwise again, and check WOT engine speed. The final WOT engine speed should fall within the11,700 to 12,300 r/min range.

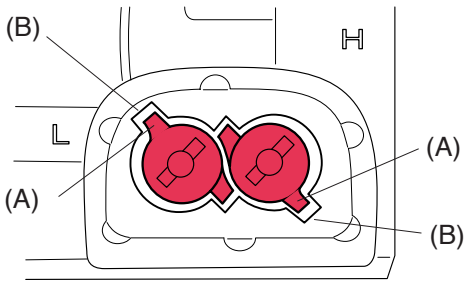
NOTE : During H mixture needle adjustment, do not run engine at high speed without load longer than 10 seconds.



6. After adjusting carburettor, put new limiter cap on the other side of limiter cap tool as shown, and press the limiter caps to the bottoms on L and H mixture needles respectively.

NOTE : Align the limiter cap's tabs (A) with locating slots (B) in extended housing of carburettor.

IMPORTANT : The limiter caps must be installed L and H mixture needles to comply with Emission Directive.



7. Start engine again and make it sure engine runs at idle speed in the range of 2,800 to 3,600 r/min and at WOT engine speed in the range of 11,500 to 12,500 r/min. Also make it sure chain would not turn at engine idle speed and suitable acceleration.

NOTE : Initial carburettor setting (Idle adjust screw, L and H mixture needles) shown here is to start the engine after restoration or carburettor change. Idle adjust screw, L and H needles turn for designated engine revolution through procedures indicated here may vary. As long as idle and WOT engine speed is set in given range, variance would be ignorable.