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SERVICE DATA

CHAIN SAW

CS-370ES

(Serial number : 37000001 and after)

STAGE Ⅱ MODEL

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.

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Reference No. **01-36E-00**
ISSUED: 200703

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KIORITZ CORPORATION

1 SERVICE INFORMATION

1-1 Specifications

Model			**CS-370ES**
Dimensions	Length*	mm(in)	393 (15.5)
	Width	mm(in)	245 (9.6)
	Height	mm(in)	277 (10.9)
Dry weight*		kg(lb)	4.6 (10.1)
Engine	Type		KIORITZ, air-cooled, two-stroke, single cylinder
	Rotation		Clockwise as viewed from the output end
	Displacement	$cm^3(in^3)$	36.3 (2.22)
	Bore	mm(in)	38.0 (1.50)
	Stroke	mm(in)	32.0 (1.26)
	Compression ratio		7.6
Carburetor	Type		Diaphragm horizontal-draught, with auto-return choke**
	Model		Walbro WT-820A
	Venturi size-Throttle bore	mm(in)	13.5 - 15.85 (0.532 - 0.624)
Ignition	Type		Digital Magneto : CDI system
	Spark plug		BPMR8Y
Starter	Type		ES (effortless)-start
	Rope diameter x length	mm(in)	3.0 x 900 (0.14 x 35.4)
Fuel	Type		Premixed two-stroke fuel
	Mixture ratio		50 : 1 (2 %)
	Petrol		Minimum 89 octane petrol
	Two-stroke air cooled engine oil		ISO-L-EGD (ISO/CD13738), JASO FC
	Tank capacity	L (U.S.fl.oz.)	0.41 (13.9)
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.)	0.28 (9.5)
Auto oiler	Type		clutch related type
Sprocket	Type		Spur
	Number of teeth		6
	Pitch	in	3/8

* Without guide bar and saw chain.
** Auto-return choke is on switch bracket.

Cutting devices				
Guide bar	Type		30RC50M-3/8	35RC50M-3/8
	Called length	cm	30	35
	Gauge	in	0.050	
Saw chain	Type		OREGON 91VG	
	Number of drive links		47	53
	Pitch	in	Low profile 3/8	
	Gauge	in	0.050	

1-2 Technical data

Engine			
Idling speed		r/min	2400 - 2900
Wide open throttle speed*		r/min	11500 - 12500
Clutch engagement speed		r/min	3800 - 4300
Compression pressure		MPa (kgf/cm^2) (psi)	1.02 (10.4) (148)
Ignition system			
Spark plug gap		mm(in)	0.6 - 0.7 (0.024 - 0.028)
Minimum secondary voltage at 1000 r/min		kV	15
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 3000 r/min	°BTDC	10
	at 8000 r/min	°BTDC	32
	at 10,000 r/min	°BTDC	34
	at 12,500 r/min	°BTDC	32
Carburetor			
Idle adjust screw initial setting		turns in**	1 5/8
L mixture needle initial setting		turns back	1 1/4
H mixture needle initial setting		turns back	2 3/8
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 center.

* With 35 cm 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	M5**	25 - 35	2.5 - 3.5	22 - 30
Ignition system	Magneto rotor (Flywheel)	M8	250 - 290	25 - 29	220 - 250
	Ignition coil	M5	40 - 60	4 - 6	35 - 50
	Ignition switch	M14	15 - 30	1.5 - 3	13 - 26
	Spark plug	M14	150 - 170	15 - 17	130 - 150
Fuel system	Carburettor	M5	30 - 45	3 - 4.5	26 - 40
	carburetor elbow	M5**	20 - 30	2 - 3	17 - 26
	Intake bellows	M5	30 - 45	3.0 - 4.5	26 - 40
Clutch	Clutch hub	LM10	300 - 400	30 - 40	260 - 350
Engine	Crankcase***	M5*	70 - 110	7 - 11	60 - 95
	Engine mount	M5	70 - 110	7 - 11	60 - 95
	Muffler	M5	80 - 110	8 - 11	70 - 95
	Cylinder cover	M5	25 - 45	2.5 - 4.5	22 - 40
Others	Auto-oiler	M4	20 - 35	2.5 - 3.5	17 - 30
	Front handle	M5**	45 - 65	4.5 - 6.5	40 - 55
	Rear handle assembly	M5	30 - 50	3 - 5	26 - 45
		M4	35 - 50	3.5 - 5	30 - 45
	Handle lid	M4	10 - 20	1 - 2	9 - 17
	Brake lever (Hand guard)	M5**	10 - 20	1 - 2	9 - 17
		M4**	45 - 65	4.5 - 6.5	40 - 55
	Sprocket guard plate	M4**	10 - 20	1 - 2	9 - 17
	Chain catcher	M5	45 - 60	4.5 - 6	40 - 52
	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

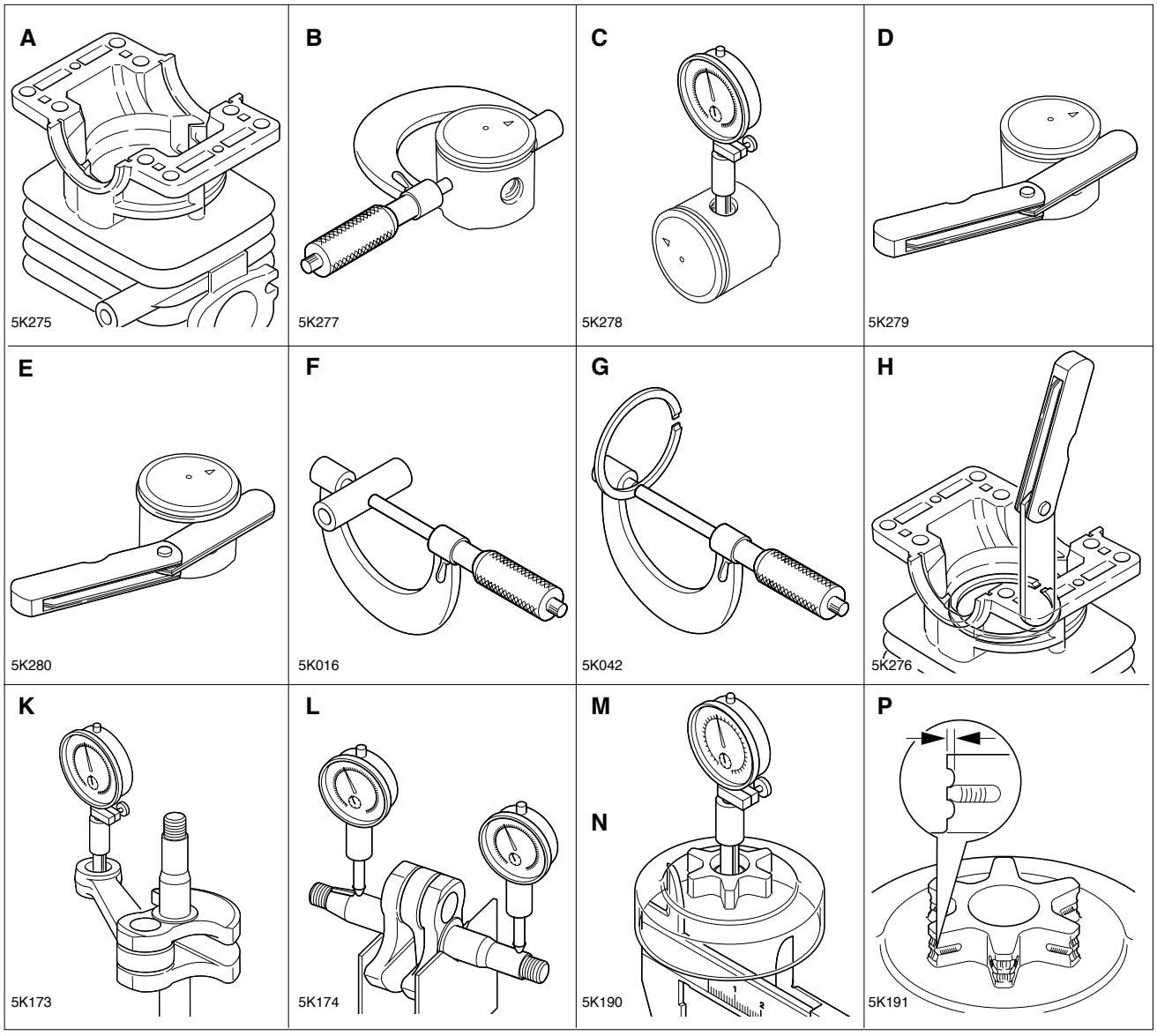
LM: Left-hand thread *Apply thread locking sealant (See below) ** Tapping screw

*** The torque differences among four bolts should not exceed 20 kgf•cm (2N•m, 17in•lbf) on crankcase

1-4 Special repairing materials

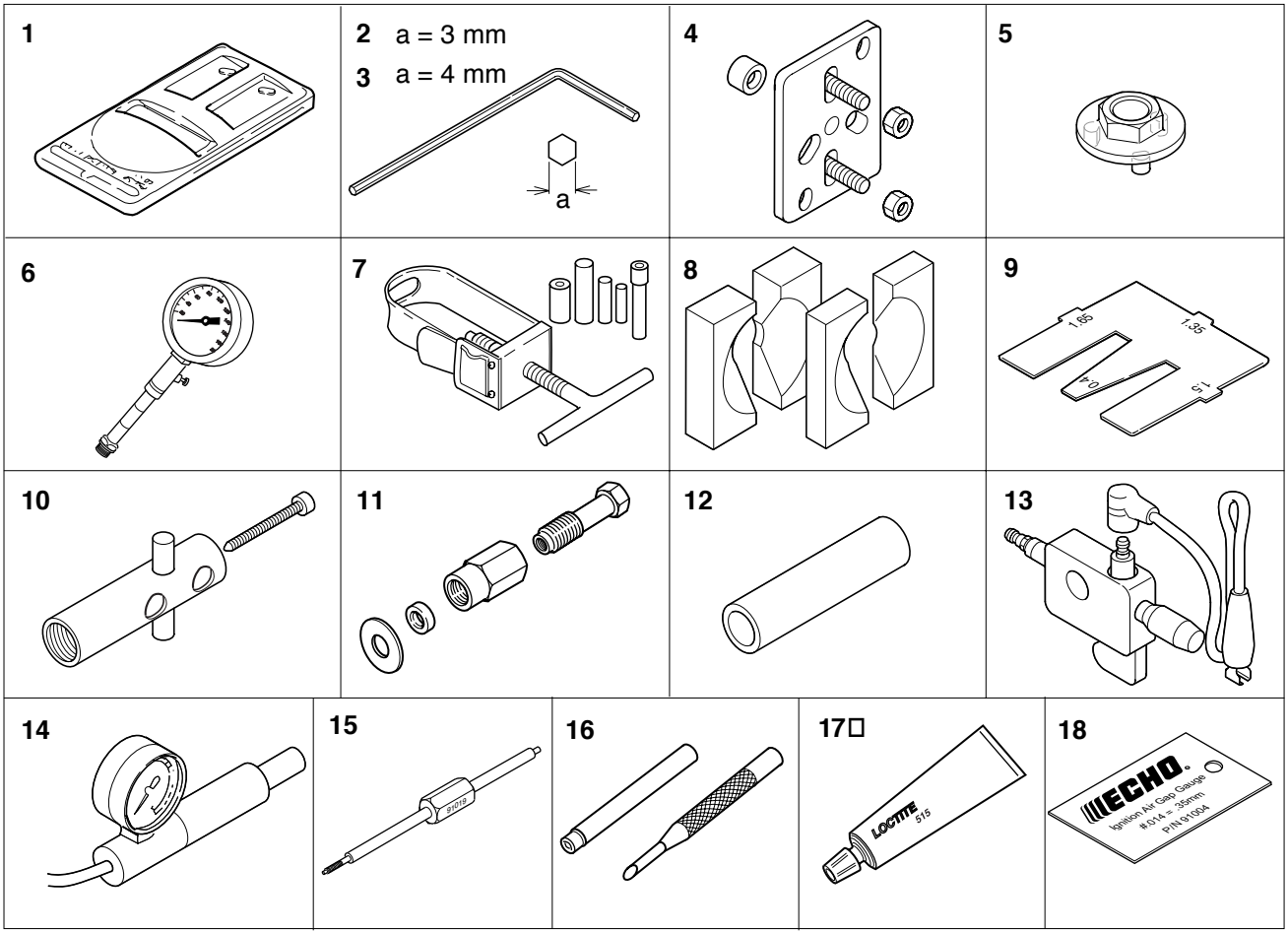
Material	Location	Remarks
Adhesive	Ball bearing outer / crankcase	Loctite #675 or equivalent
	Pulse pipe joint	
	Cushions	Loctite #424, ThreeBond #1741 or equivalent
Liquid gasket	Crankcase seams	Loctite #515 or equivalent
Grease	Auto-oiler worm	Lithium based grease
	Clutch needle bearing	
	Handle cushions	
	Rewind spring	
	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.	37.91 (1.493)
C	Piston pin bore	Max.	9.075 (0.3573)
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.	8.98 (0.3535)
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.	12.025 (0.4734)
L	Crankshaft runout	Max.	0.05 (0.002)
M	Sprocket bore	Max.	13.07 (0.5146)
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	990511-30017	Tachometer PET-1000	Measuring engine speed
2	895612-79920	L-hex wrench (3 mm)	Removing and installing hex. socket bolts (M4)
3	895610-79920	L-hex wrench (4 mm)	Removing and installing hex. socket bolts (M5)
4	897501-03938	Puller	Removing magneto rotor
5	897505-16133	Clutch tool	Removing and assembling clutch assembly
6	91007	Compression gauge	Measuring cylinder compression
7	897702-30131	Piston pin tool	Removing and installing piston pin
8	897701-06030	Bearing wedge	Removing and crankshaft ball bearings
9	897563-19830	Metering lever gauge	Measuring metering lever height on carburetor
10	897708-19835	Worm puller	Removing auto-oiler worm
11	Y089-000010	Worm inserter	Installing auto-oiler worm : Crankshaft thread LM8x1.25
12	897726-09130	Oil seal tool	Installing oil seals
13	897800-79931	Spark tester	Checking ignition system
14	897803-30133	Pressure tester	Testing carburettor and crankcase leakage
15	91019	Limiter cap tool	Removing and installing limiter cap
16	500-500	Welch plug tool	Removing and installing welch plug tool
17	990610-00051	Loctite #515	Applying crankcase seam
18	91004	Module air gap gauge	Adjusting pole shoe air gaps

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, and properly tensioned.

NOTE : In order to achieve proper carburettor adjustment, 30 or 35 cm bar and chain should be installed on the unit. Otherwise serious engine damage will occur due to overspeeding.

B. Set L and H mixture needles full anticlockwise. Start and run engine for two minutes alternating engine speed between WOT for 5 seconds and idle for 5 seconds. Adjust idle speed screw to 2,700 +/- 150 r/min. Adjust H mixture needle to 12,000 +/- 500 r/min. If engine does not run correctly after this adjustment, proceed to the next step 2-2.

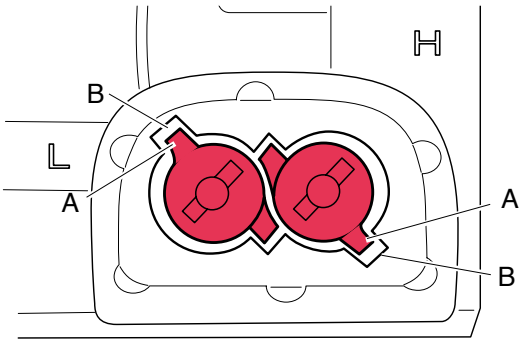
IMPORTANT : After adjusting carburettor according to the steps 2-2 and 2-3, the limiter cap(s) must be installed on L and H mixture needle(s) to comply with Emission Directive.

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

Parts Required : (2) P/N P003-000010 limiter caps.

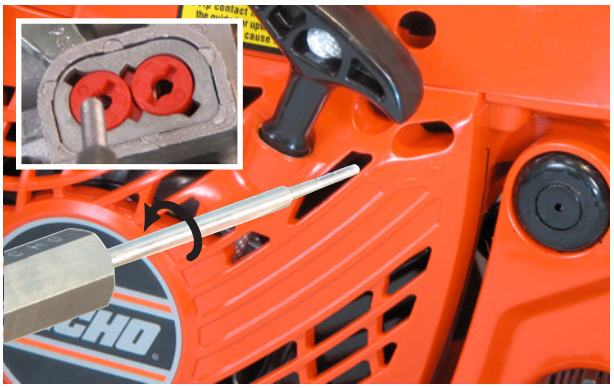
1. Turn the L and H mixture needles anticlockwise to rich side stop to align limiter cap tab (A) with locating slot (B), using 3 mm blade screwdriver.

NOTE : If cap tabs (A) misalign with locating slots (B), there is a chance to strip thread.



(continued)

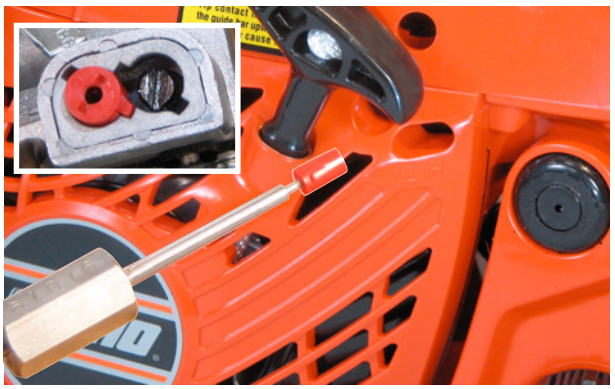
2-2 Presetting idle adjust screw. L mixture needle and H mixture needle (continued)



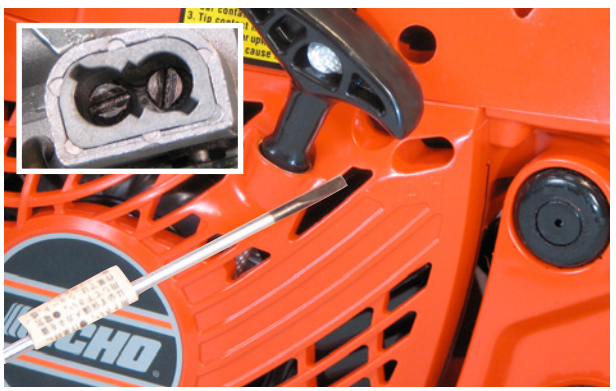
2. Screw threaded end of limiter cap removal tool 91019 with 2.5 mm left-hand thread into center hole of limiter cap anticlockwise until tab of the limiter cap just comes out of the locating slot.

NOTE : DO NOT COMPLETELY REMOVE LIMITER CAP FROM CARBURETTOR!
If the limiter cap was 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 removal tool into center hole of the limiter cap. As a result, the thread of the limiter cap would be stripped. Use 3 mm diameter thread wood screw to remove the stripped limiter cap.

3. Remove the limiter cap removal tool from the limiter cap by turning the tool clockwise, leaving the limiter cap in place.



4. Screw threaded end of limiter cap removal tool 91019 into center hole of the other limiter cap anticlockwise until the limiter cap is removed from the mixture needle completely. Remove the limiter cap from limiter cap removal tool turning clockwise, and screw thread of limiter cap removal tool 91019 into center hole of previous limiter cap to pull out completely.



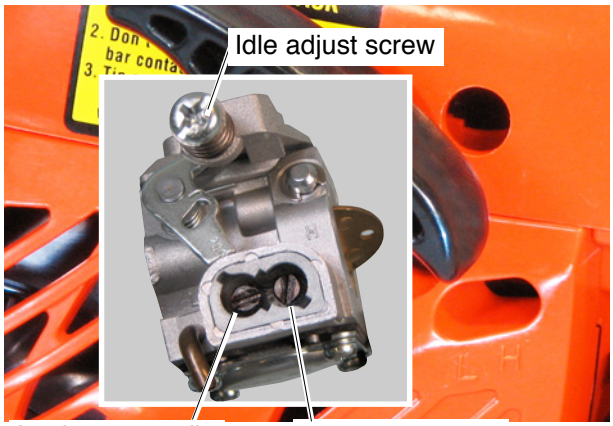
5. Turn L and H mixture needles clockwise until lightly seated, and then turn out both mixture needles following turns.

L mixture needle : 1 1/4, H mixture needle : 2 3/8

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

6. Remove air filter cover and air filter to see that idle adjust screw contacts the throttle plate. Turn idle adjust screw anticlockwise and set the screw until the tip just contacts the throttle plate. Then turn idle adjust screw 1 5/8 turns clockwise. Reinstall air filter, and air filter cover.

2-3 Adjusting carburettor



1. Start engine and warm it up at idle for one minute. Turn H mixture needle anticlockwise until engine speed drops to approx. 11,000 r/min.

2. Warm it up well for 100 sec alternating engine speed between WOT (Wide Open Throttle) for 5 seconds and idle for 5 seconds .

NOTE : Do not run engine at high speed without load longer than 5 seconds, or engine damage may occur.

3. Adjust L mixture needle with 3 mm blade screwdriver to reach maximum engine speed just before lean drop off.

4. Set idle engine speed to 3,800 r/min by turning idle adjust screw. Engine speed should be stable at 3,800 +/- 50 r/min after idle adjust screw adjustment.

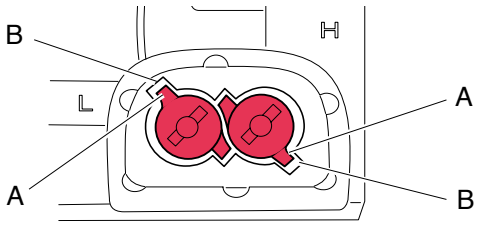
5. Turn L mixture needle anticlockwise reducing engine idle speed 1,200 r/min to set idle speed at 2,600 r/min. The engine idle speed range is 2,500 - 2,800 r/min.

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.

6. Make sure WOT engine speed is approx. 11,000 r/min. If WOT engine speed is over 11,000 r/min, 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.

7. After adjusting carburettor, screw new limiter cap on the thread of the limiter cap removal tool 91019 (C) anticlockwise approx. 2 turns as shown, and put the limiter caps on L and H mixture needles respectively. And then press the caps on L and H mixture needles with opposite side of the limiter cap tool (C).

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.

8. Start engine, and verify engine idle speed ranges from 2,400 to 2,900 r/min, and WOT engine speed ranges from 11,500 to 12,500 r/min. Make sure chain does not rotate when engine is idling. When final adjustment is completed, the engine should idle, accelerate smoothly, and attain WOT per above specification.

NOTE : Initial carburettor setting (idle adjust screw, L and H mixture needles) shown on page 3 and 8 is to start the engine after restoration or carburettor change. Idle adjust screw, L and H mixture 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.