



SERVICE MANUAL

CARBURETOR ADJUSTMENT

REVISED JAN 2019
Ref. No. 400-09

INTRODUCTION

To achieve efficient engine performance without any engine trouble such as poor engine performance, over heating, etc., the correct carburetor adjustment is required.

Furthermore, in the country where an Emission directive/regulation is enforced, the correct carburetor adjustment is required to meet emission regulations.

When servicing ECHO/shindaiwa product, follow the adjustment procedure in this manual together with "**SERVICE DATA Reference No. 90-ZCx-xx: Carburetor Adjustment Table**" to adjust carburetor correctly.

IMPORTANT: After adjusting carburetor, the limiter caps/plug(s) must be installed on L and H mixture needle(s) to comply with Emission directive/regulation.

IMPORTANT: Carburetor adjustments with limiter cap/plug removed must be conducted by Authorized ECHO/shindaiwa dealers only.

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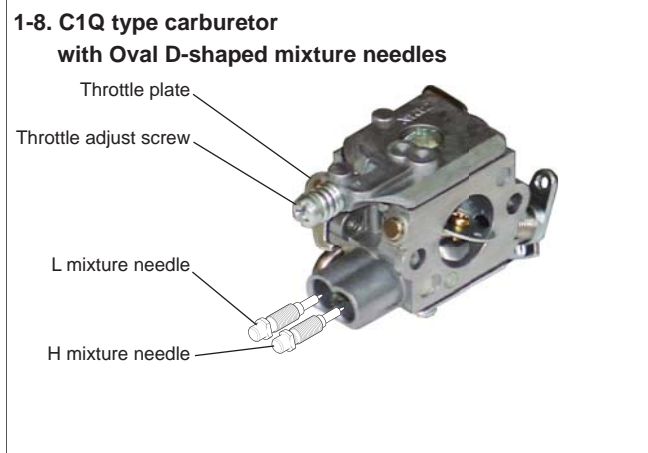
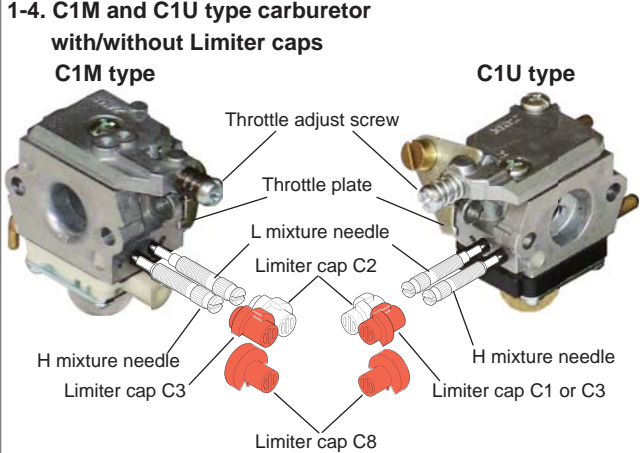
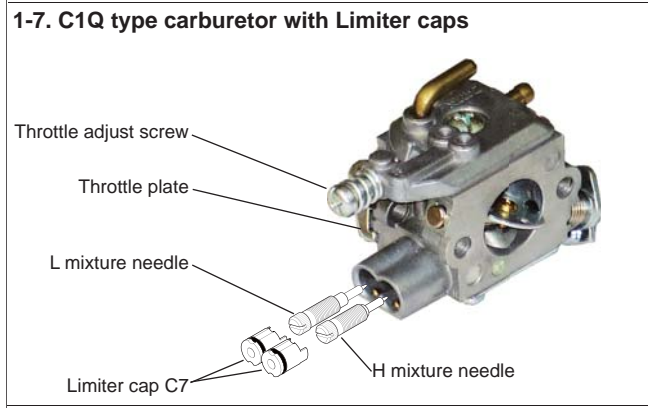
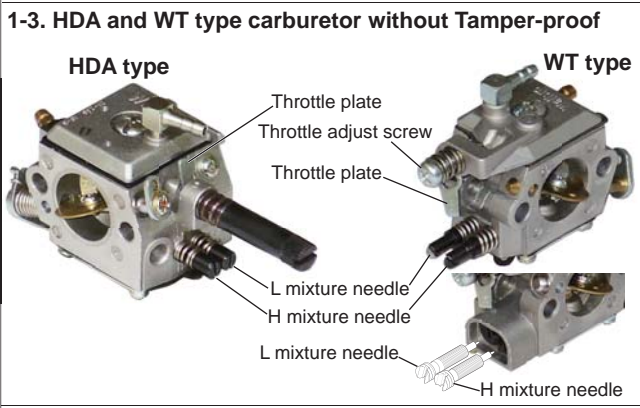
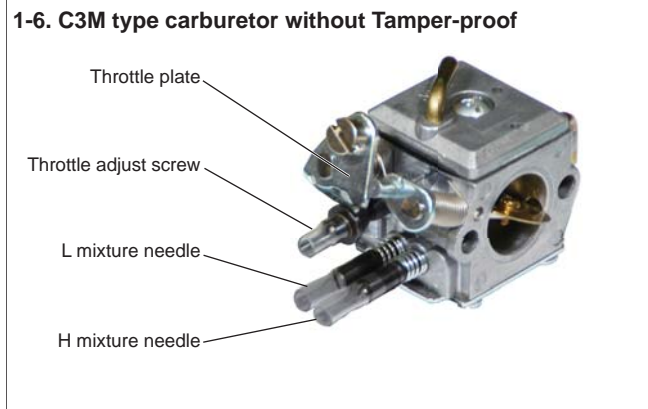
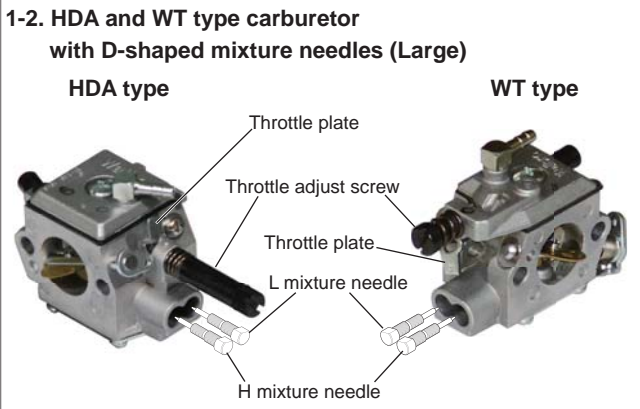
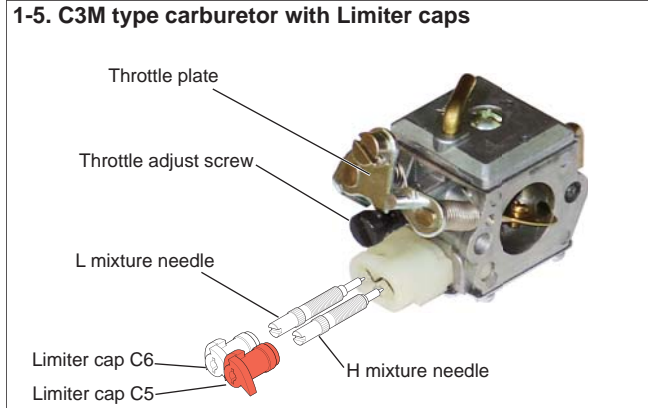
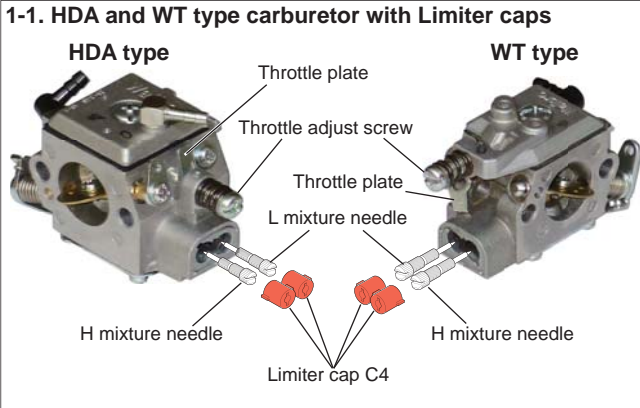
YAMABIKO CORPORATION

**7-2 SUEHIROCHO 1-CHOME OHME CITY
TOKYO 198-8760 JAPAN**

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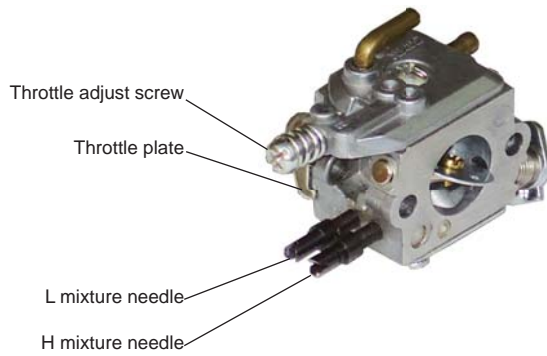
1. CARBURETOR TYPE and PART DESCRIPTION RELATED to CARBURETOR ADJUSTMENT

Several types of carburetor are adopted on ECHO & shindaiwa engine powered products depending on the product application.

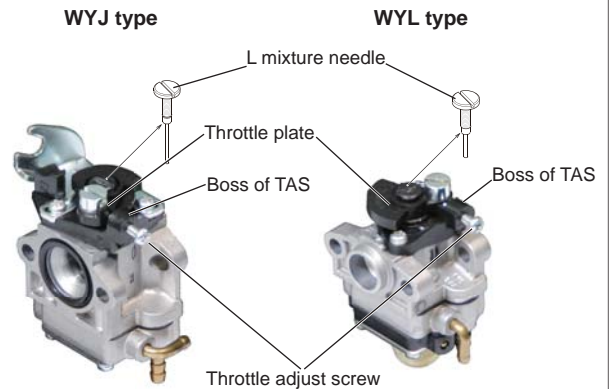


1 CARBURETOR TYPE and PART DESCRIPTION RELATED to CARBURETOR ADJUSTMENT(Continued)

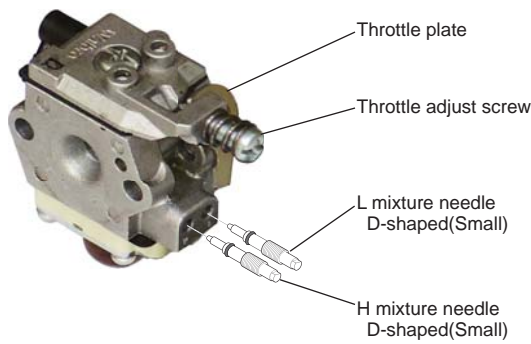
1-9. C1Q type carburetor without Tamper-proof



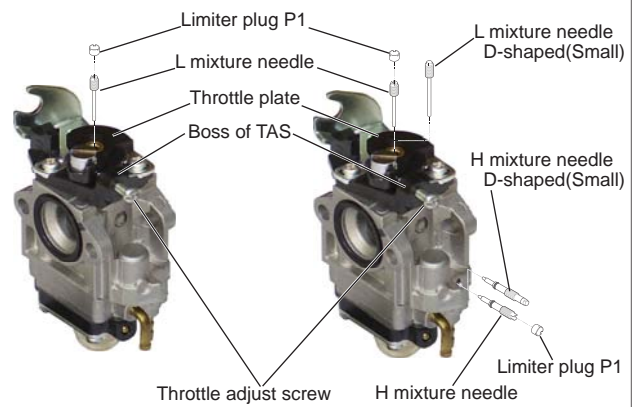
1-13. WYJ and WYL type carburetor without Tamper-proof



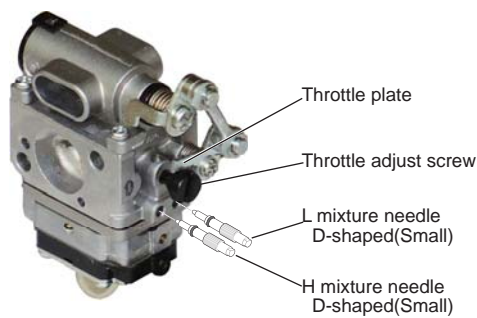
1-10. WTA type carburetor with D-shaped mixture needles (Small)



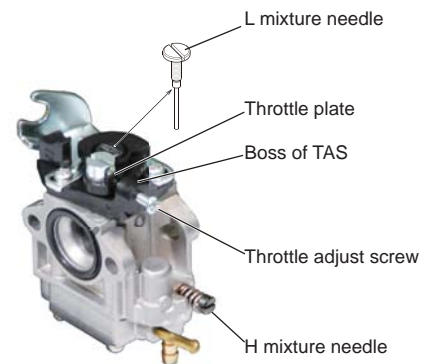
1-14. WYK type carburetor with Tamper-proof



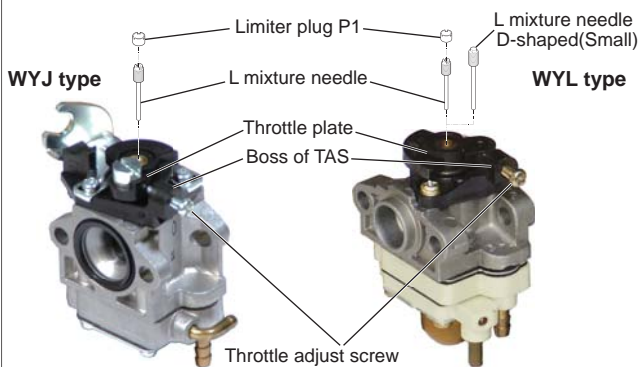
1-11. WLA type carburetor with D-shaped mixture needles (Small)



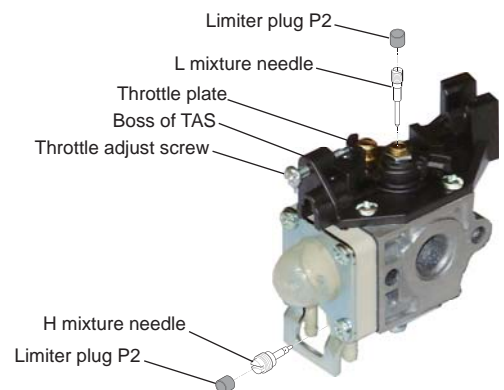
1-15. WYK type carburetor without Tamper-proof



1-12. WYJ and WYL type carburetor with Fix main jet and Tamper-proof on L-mixture needle

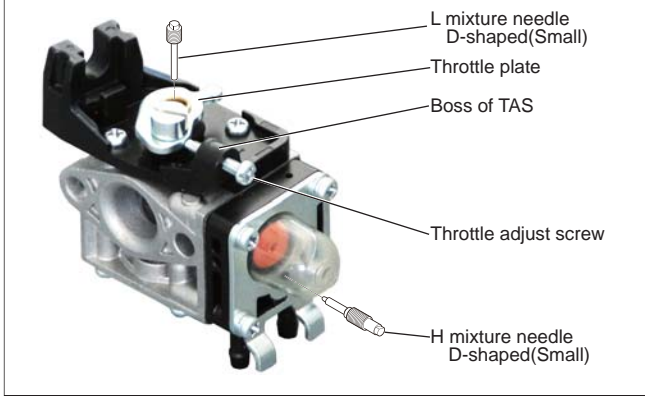


1-16. RB type carburetor with Limiter plugs

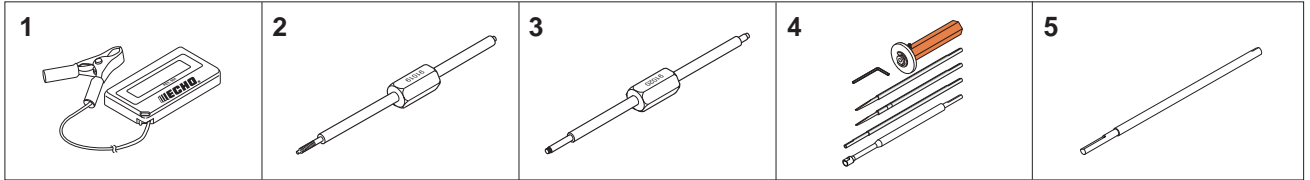


1 CARBURETOR TYPE and PART DESCRIPTION RELATED to CARBURETOR ADJUSTMENT(Continued)

1-17. WYG type Carburetor with Tamper-proof



2. SPECIAL TOOL FOR CARBURETOR ADJUSTMENT



Key	Part Number	Description	Reference
1	PET304	Tachometer PET-304	Measuring engine speed to adjust carburetor
2	91019	Limiter cap tool	Removing and installing Limiter cap
3	91020	Limiter plug tool	Removing and installing Limiter plug
4	Y089-000094	Carburetor adjustment tool	Adjusting carburetor
5	X603-000070	D-shaped tool (M)	Adjusting carburetor

To adjust carburetor, standard tools may be required such as Phillips-head screw driver and/or flat-blade screw driver.

3. REMOVING and INSTALLING LIMITER CAP and LIMITER PLUG

Limiter caps or limiter plug(s) have been installed on L (and H) mixture needle(s) of several types of carburetor to ensure compliance with Emission directive/regulation.

When adjusting carburetor, limiter caps or limiter plug(s) should be removed.

Follow the procedure in this section to remove and install limiter caps or limiter plug(s).

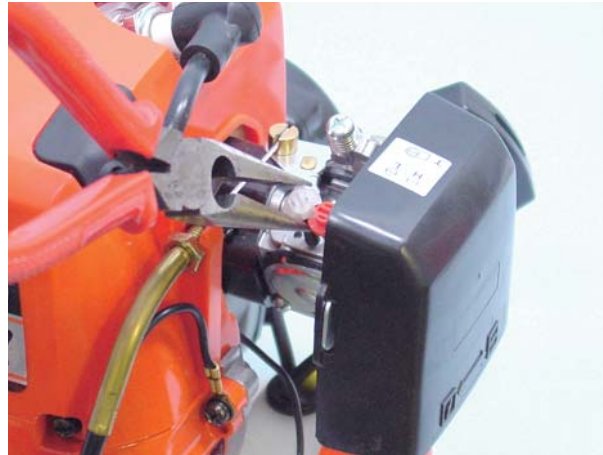
IMPORTANT: After adjusting carburetor, limiter caps or limiter plug(s) must be installed on L (and H) mixture needle(s) to comply with Emission directive/regulation.

3-1. Limiter cap and limiter plug reference chart

	Reference number	Part Number	Shape		Reference number	Part Number	Shape
Limiter cap	C1	A259-000030		Limiter cap	C6	P005-001530	
	C2	125329-09860			C7	A259-000050	
	C3	125329-39030			C8	125329-08560	
	C4	P003-000010			C9	A259-000040	
	C5	P005-001520		Limiter plug	P1	A259-000000	
					P2	P005-001270	

3-2 Limiter caps C1, C2, C3, C8 and C9

Removing



(1) Turn L mixture needle clockwise to lean side stop to cut easily.

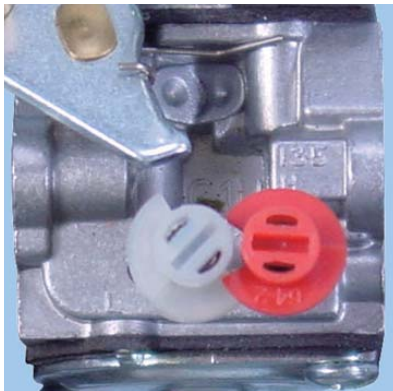
(2) Using a sharp knife, give triangle cut (A) between the stopper wings. Also cut the H limiter cap.

NOTE : Be careful when cutting caps, otherwise injury may result.

(3) Pull the caps off using pliers.

NOTE : Do not rock the caps back and forth when removing, otherwise the needle may be damaged.

Installing



(1) After adjusting carburetor, install white limiter cap on L mixture needle and red limiter cap on H mixture needle as shown.



NOTE : Before installing limiter caps, warm caps in 90°C hot water for smooth installation.

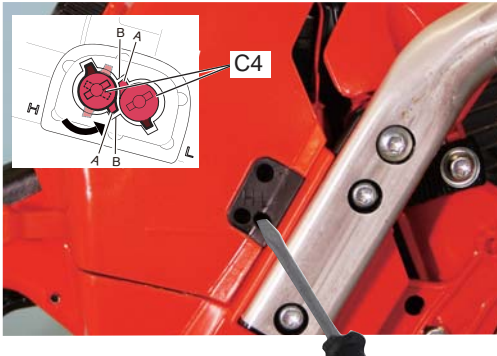
Make sure to use pliers or appropriate instrument to take warmed up cap out from the water to avoid scald burn.



(2) Tap respective limiter caps to the bottoms as shown.

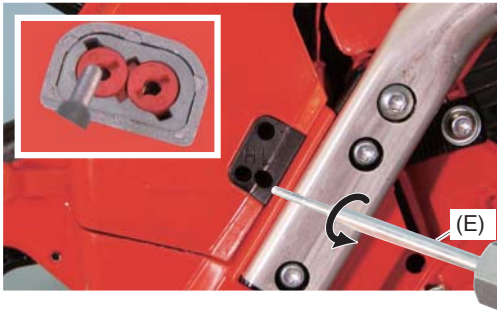
3-3. Limiter cap C4

Removing



(1) Turn L and H mixture needles with limiter caps (C4) counterclockwise to rich side stop to align limiter cap's tabs (A) with locating slots (B), using 2.5 to 4.0 mm blade screwdriver.

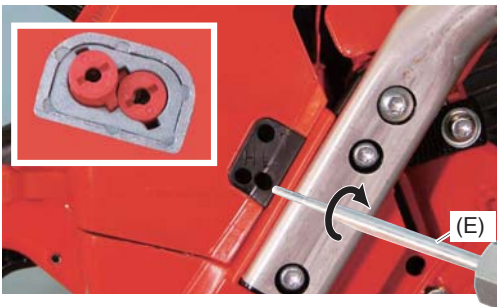
NOTE : If cap's tabs (A) are misaligned with locating slots (B), the cap cannot be removed and the center hole threads will be stripped.



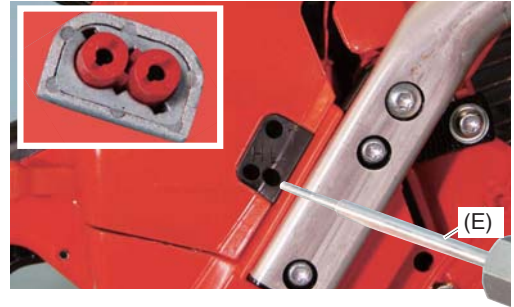
(2) Screw limiter cap tool P/N 91019(E) counterclockwise into center hole of limiter cap until tab of limiter cap comes out of locating slot as shown in the below picture.

NOTE : DO NOT REMOVE LIMITER CAPS COMPLETELY FROM CARBURETOR.

If the first limiter cap is removed completely, the second limiter cap can be misaligned while inserting limiter cap tool(E).

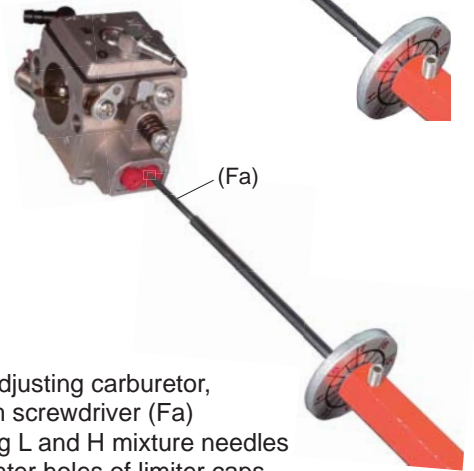
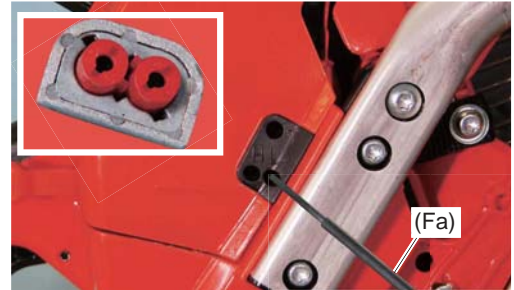


(3) Remove tool from limiter cap by turning clockwise, leaving limiter cap in place.



(4) Repeat step 2 to 3 for pulling the other limiter cap until tab of limiter cap comes out of locating slot as shown.

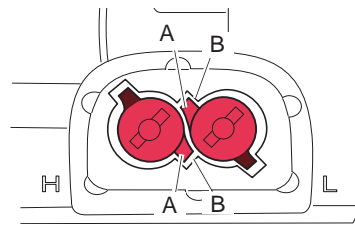
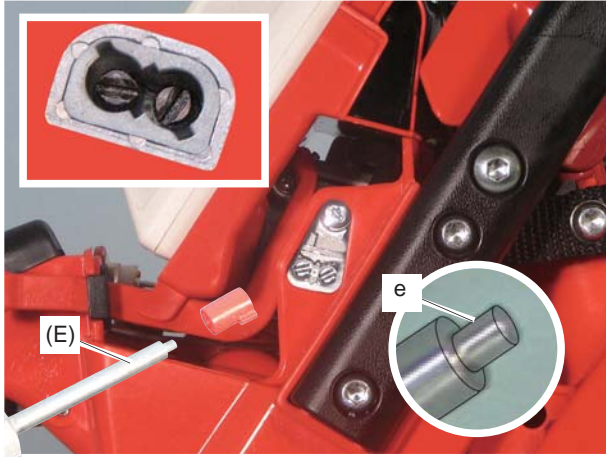
Remove tool from limiter cap by turning tool clockwise, leaving limiter cap in place.



(5) When adjusting carburetor, use 2.0 mm screwdriver (Fa) for adjusting L and H mixture needles through center holes of limiter caps.

The center holes of limiter caps can be used as a guide of 2.0 mm driver for carburetor adjustments.

3-3. Limiter cap C4 (continued)

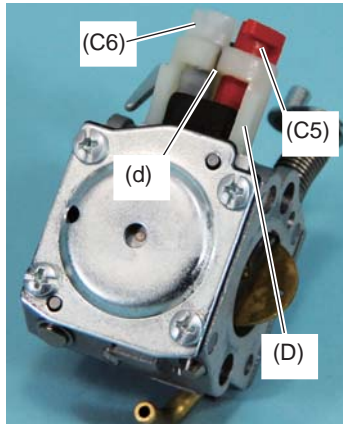
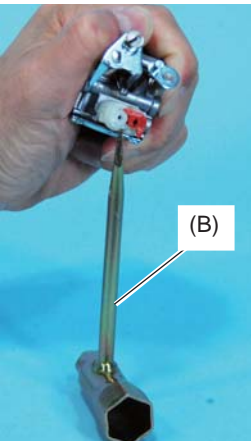


Installing

(1) After adjusting carburetor, remove old limiter caps and put new limiter cap(C4) on the mixture needles using the other end(e) of limiter cap tool(E) aligning the limiter cap's tab(A) with locating slot(B) in extended housing of carburetor.

Gently press the caps onto L and H mixture needles. Fully seat caps until flush with housing of carburetor.

3-4. Limiter caps C5 and C6



Removing

(1) Remove carburetor(A) from body.

(2) Insert spark plug wrench(B) into slit(d) of needle housing(D) to open the slit(: approx. 3 mm). And pull red limiter cap(C5) a little using long-nose pliers(P) as shown in Fig.1 and Fig.2.

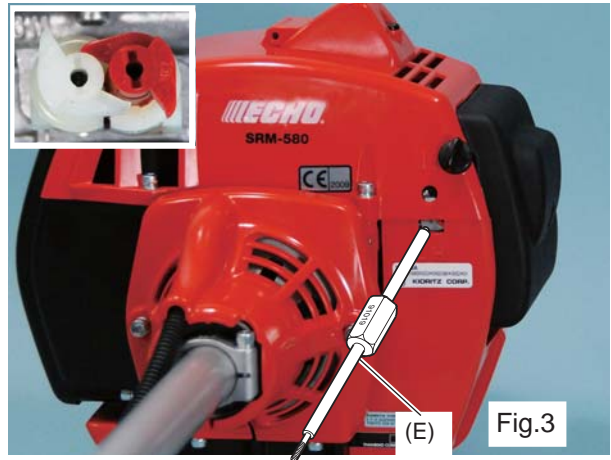
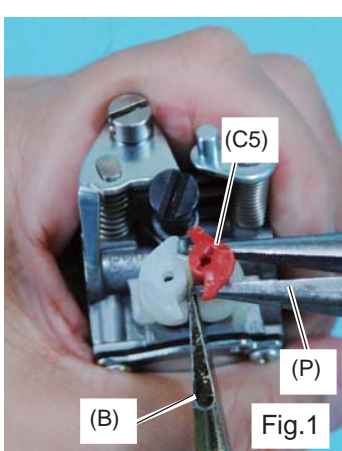
(3) Repeat step 2 to pull white limiter cap(C6) to the same level as red cap(C5).

NOTE : After pulling red/white limiter caps, the caps should be free from L and H mixture needles as shown in Fig.2 as tentative position.

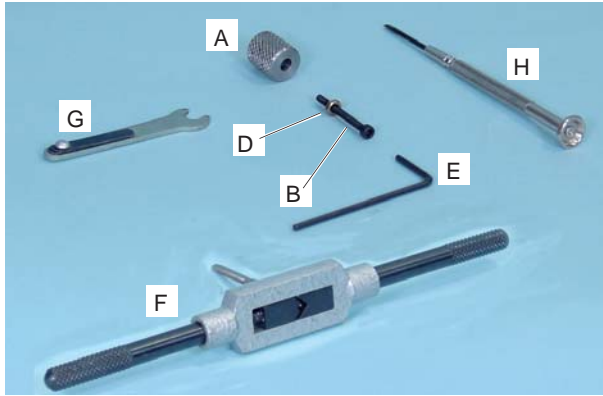
Install carburetor on the unit and adjust carburetor using the center holes of limiter caps as a guide of 2.0 mm driver.

Installing

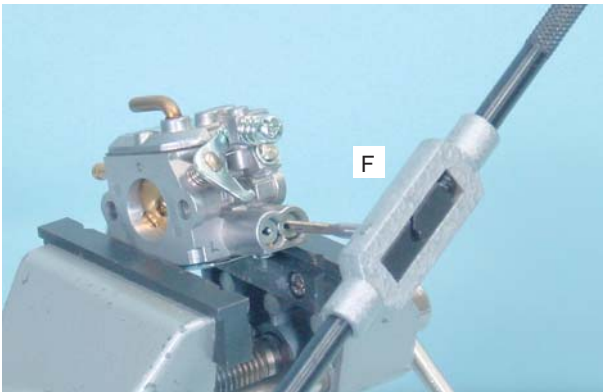
(1) After adjusting carburetor, turn red and white limiter caps counterclockwise to rich side stop then press limiter caps (C5) and (C6) to bottoms using limiter cap tool(E) as shown in Fig.3.



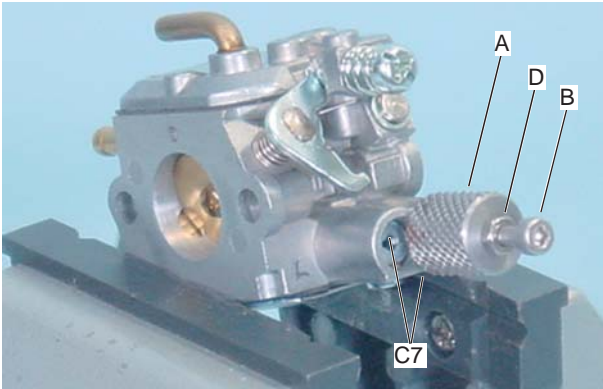
3-5. Limiter cap C7
Removing



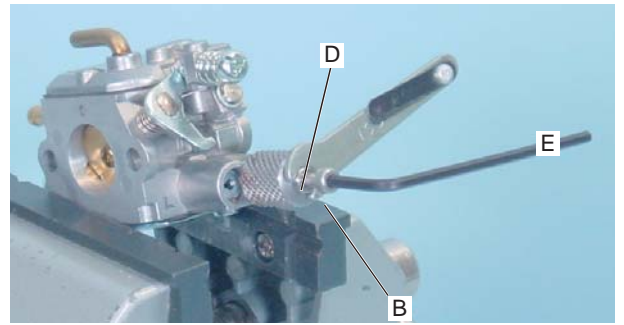
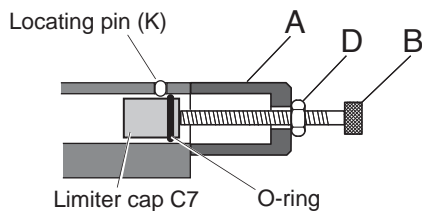
- (1) Tools required**
 A. Plug extractor body B. 2.5 mm Hexagonal socket bolt
 D. Nut E. L-wrench (2 mm) F. 2.5 mm hand tap
 G. Magneto spanner (6 mm) H. 1.5 mm blade screw driver



- (2)** Remove carburetor from unit.
(3) Make M2.5 x 0.5 mm pitch thread using M2.5 hand tap (F).

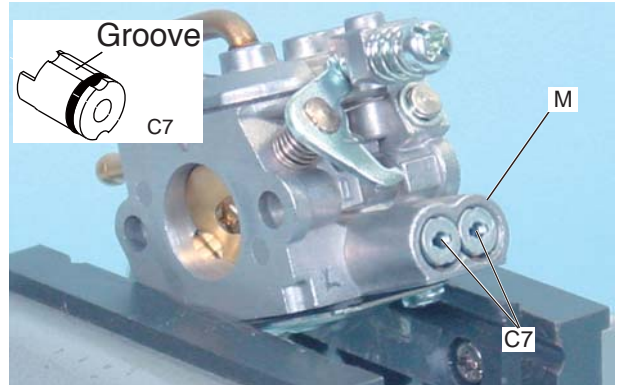


- (4)** Fit the nut(D) on hex. socket bolt(B) near the bolt head. Place extractor body(A) over the limiter cap(C7). Pass the bolt (B) with nut (D) through the hole of the extractor body(A), and screw the bolt in the limiter cap(C7) 5 turns.



- (5)** While holding bolt (B) with L wrench (E), turn the nut (D) clockwise to take out the limiter cap (C7).

- (6)** Repeat step No.3 to No.5 for the other limiter cap removal.



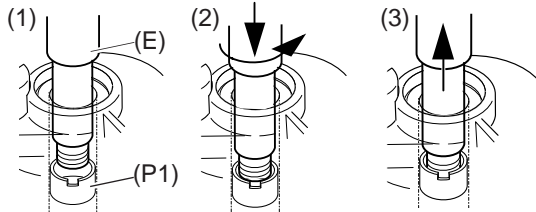
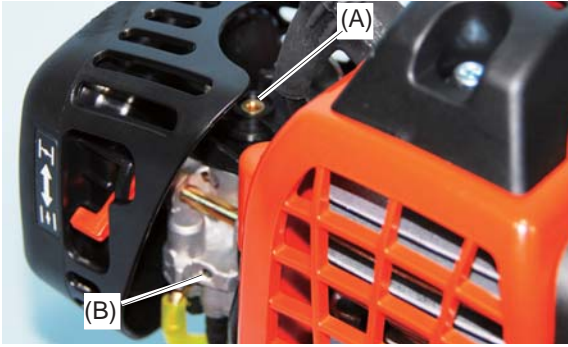
- (7)** Temporarily insert new limiter caps(C7) on both L and H mixture needles aligning grooves on limiter cap(C7) to locating pin(K) on extension housing(M) of carburetor. Make sure that limiter cap face is leveled with the face of extension housing(M). Do not push the limiter caps deeply at this moment, otherwise adjustment of H and L mixture needles will be impossible.
 The center holes of limiter caps(C7) can be used as a guide of 2.0 mm driver for the carburetor adjustment.

Installing



- (1)** After adjusting carburetor, remove old limiter caps and press the new caps(C7) onto L and H mixture needles as shown.

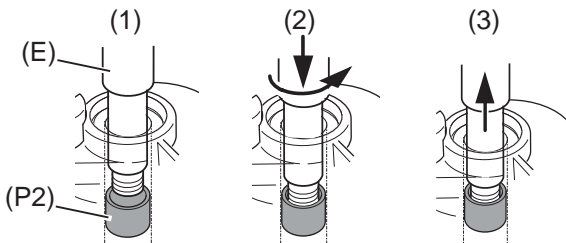
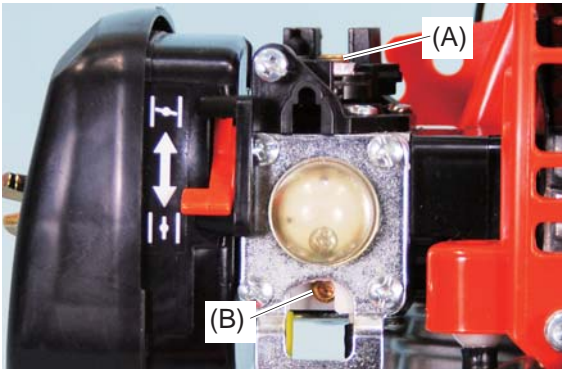
3-6. Limiter plug P1 Removing



Remove plugs from L mixture needle hole (A) and H mixture needle hole (B) using limiter plug tool 91020(E) as follows.

- (1) Put limiter plug tool (E) on limiter plug in mixture needle hole.
- (2) With pushing down, slowly turn limiter plug tool counterclockwise two turns into limiter plug.
- (3) Pull out limiter plug tool with the limiter plug from mixture needle hole.
- (4) Repeat step (1) to (3) to remove the other plug.

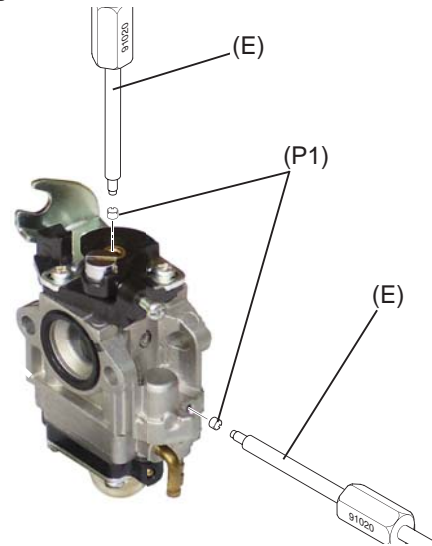
3-7. Limiter plug P2 Removing



Remove plugs from L mixture needle hole (A) and H mixture needle hole (B) using limiter plug tool 91020 (E) as follows.

- (1) Put limiter plug tool (E) on limiter plug in mixture needle hole.
- (2) With pushing down, slowly turn limiter plug tool counterclockwise two turns into limiter plug.

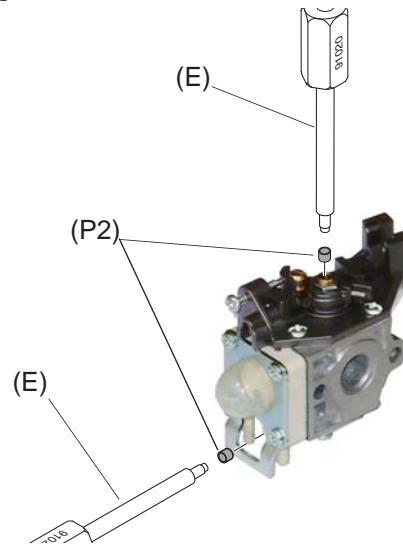
Installing



After adjusting carburetor, insert new plug(s) (P1) A259-000000 in the needle hole(s) using limiter plug tool 91020 (E).

- (3) Pull out limiter plug tool with the limiter plug, from mixture needle hole.
- (4) Repeat step (1) to (3) to remove the other plug.

Installing



After adjusting carburetor, insert new plug(s) (P2) P005-001270 in the needle holes per the Emission Directive using limiter plug tool 91020 (E).

4. CARBURETOR ADJUSTMENT PROCEDURE

4-1. General adjustment rules

Before starting the unit for adjustment, check the following items:

- (1) Check that correct spark plug is installed and the spark plug is clean and properly gapped.
- (2) The air filter is clean and properly installed.
- (3) The muffler exhaust port is 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 and properly mixed at 50:1 with "ISO L-EGD" or "JASO FC/FD" 2-stroke oil.
- (6) For proper engine loading, the recommended cutting attachment or standard accessory should be installed.

Chain saw : Standard guide bar and saw chain must be installed, and properly tensioned.

Trimmer & brushcutter: Cutting head recommended on **SERVICE DATA Reference No. 90-ZCx-xx** should be installed and prepared.

Duster/Mist blower and Blower: All blower pipes and/or accessories should be assembled on the unit.

Sprayer: The spraying hose and nozzle must be installed and the chemical tank should be filled with water. The pump should be adjusted to rated pressure.

NOTE: After carburetor adjustment, verify clutch engagement speed. If it is less than 1.25 times the idle speed, adjust the idle speed by turning TAS counterclockwise (except Duster/Mist blower and Blower).

4-2. Adjustment of Chain saw and Engine cutter

Before starting engine, check the unit as described in Section 4-1, "General adjustment rules".


When limiter caps are installed on mixture needles, remove the caps following instruction in "Section 3" before adjusting Carburetor .

Refer to **SERVICE DATA Reference No. 90-ZCx-xx** for Carburetor adjustment of each model.

Use the suitable tools for adjustment according to column "Tool to adjust mixture needles(Table 2)" on the **SERVICE DATA**.

SERVICE DATA Reference No. 90-ZCx-xx

2. Chain saw, Engine cutter Carburetor adjustment Table



2. Chain saw, Engine cutter Carburetor Adjustment Table

Table 1: Limiter cap/plug

Part Number	Shape
C4 P003-000010	
C7 A259-000050	

Fig.1: idle setting

Fig.2: WOT setting

Fig.4: WOT setting

Table 2: Tool

a		d	
b		e	

Model (Spec. code)	Carburetor Model (Parts No.)	Limiter cap/plug (Table 1)	Tool to adjust mixture needles (Table 2)	Step 1: Initial settings			Minimum warm-up time Idle - WOT: Total (sec.)	Idle setting: Fig.1 Step 2 & 3		WOT setting: Fig.2 Step 5 & 6	WOT setting: Fig.4 Step 7	Step 8: Verify final engine speed with standard equipment	
				H mixture needle	L mixture needle	Throttle Adjust Screw*1 (TAS)		Step 2	Step 4	Step 7	Final Idle range (r/min)	Final WOT range with shield (r/min)	
CS-2510TES (37)	WT-1153 - (A021-004520)	-	d	Turn clockwise until lightly seated, then turn CCW. 2 5/8	Turn clockwise until lightly seated, then turn CCW. 1 7/8	1 5/8	5 - 5 : 100	4000	3200	12400 - 12600	1/4	2800 - 3600	12700 - 13100
CS-2511TES (37) With Sticker label	WT-1153- (A021-004520) WT-1153B (A021-004522)	-	d	2 5/8 2	1 7/8 2 1/2	1 5/8 1 1/2	5 - 5 : 100	4200	3200	12500 - 12700	1/2	2800 - 3600	12700 - 13400

Tool to adjust mixture needles (Table 2)

Adjustment process Step 1: Initial setting

Warm-up time before adjustment

Idle setting: Fig.1 Steps 2 & 3

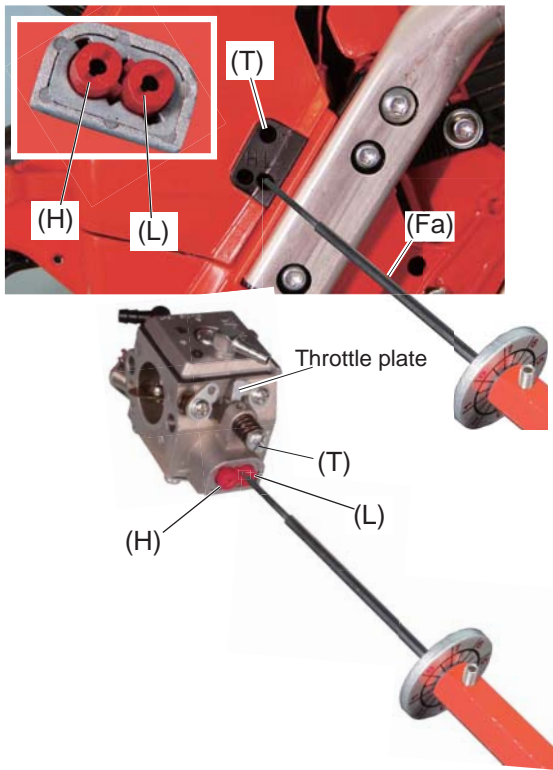
Idle setting: Fig.1 Step 4

WOT setting: Fig.2 Steps 5 & 6

WOT setting: Fig.4 Step 7

Step 8: Verify final engine speed

4-2-1. Initial setting throttle adjust screw, L mixture needle and H mixture needle (Step 1)



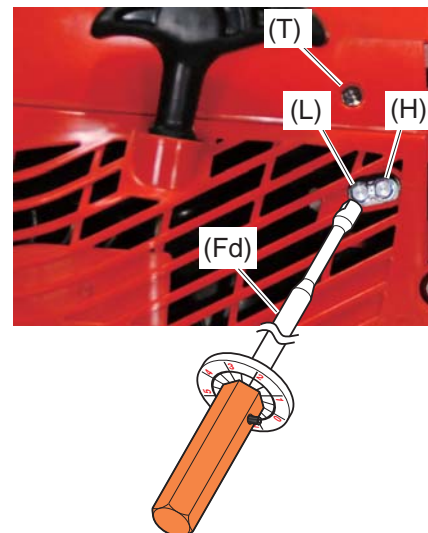
(1) Turn L and H mixture needles clockwise until lightly seated, then turn both mixture needles counterclockwise as listed in “Adjustment process Step 1” on the **SERVICE DATA**.

NOTE : If needles are overtightened during seating, damage to needle tip and carburetor body seat may occur.

(2) Remove cleaner lid and air filter to see that throttle adjust screw(T) contacts the throttle plate. Turn the screw(T) counterclockwise until its tip no longer touches the throttle plate. Then turn the screw(T) clockwise until its tip just comes into contact with the plate again. Finally, turn the screw(T) clockwise for respective number of rotations as listed in “Adjustment process Step 1” on the **SERVICE DATA**.

Reinstall air filter, and cleaner lid.

NOTE: The initial carburetor settings for throttle adjust screw, L and H mixture needles are intended to start and run the engine before final carburetor adjustments are made. The actual number of turns required for engine operation may vary.



4-2-2. Adjusting carburetor

A. Engine warm up

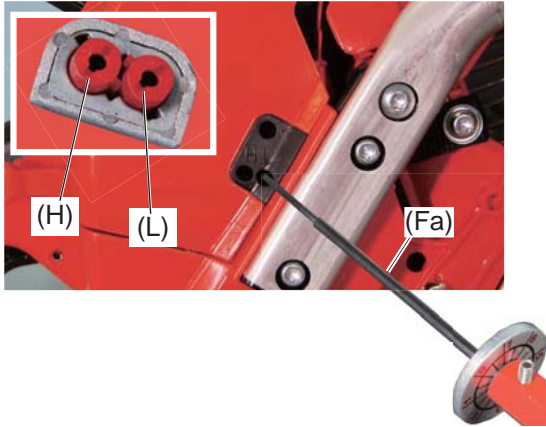
To assure accurate carburetor adjustments, the engine temperature must be fully and completely stabilised.

Start engine and warm it up for 120 seconds alternating engine speed between idle and Wide Open Throttle (WOT) every 5 seconds.

NOTE: Above is general warm-up procedure. For some models, the procedure is different from the above. Follow the listed warm-up time in column “Minimum warm-up time” on **SERVICE DATA Reference No. 90-ZCx-xx**.

When engine runs lean side at WOT, engine damage may occur. Turn H mixture needle counterclockwise to confirm engine speed decreases at WOT. Then set the engine speed at less than or equal to lower value of speed range in column “**WOT setting: Fig.2 Steps 5 & 6**” on the **SERVICE DATA**.

NOTE: Do not run engine at WOT without load (cutting) longer than 10 seconds, or engine damage may occur.



B. Idle setting Fig.1

Refer to column "Idle setting: Fig.1" on **SERVICE DATA Reference No. 90-ZCx-xx.**

Step 2: Adjust L mixture needle using suitable tool to reach maximum engine r/min just before lean drop-off.
(Turn L mixture needle clockwise until the engine speed goes up and starts to drop. When the engine speed starts to drop, turn the needle counterclockwise to obtain maximum engine speed.)

If chain starts to rotate during adjustment, decrease engine speed by turning throttle adjust screw counterclockwise until chain stops and then readjust L mixture needle.

Repeat this until chain no longer rotates after the L mixture needle adjustment.

Step 3: Set idle speed to the value listed in column "Idle setting: Fig.1 Steps 2 & 3" by turning throttle adjust screw. Engine speed should be stable within +/- 50 r/min after throttle adjust screw adjustment.

Step 4: Turn L mixture needle counterclockwise reducing engine idle speed to the value in column "Idle setting: Fig.1 Step 4".

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

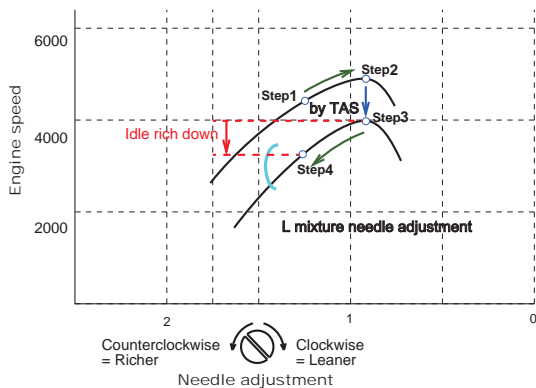


Fig.1: Idle setting

C. Wide Open Throttle (WOT) setting Fig.2 & 4

Step 5: Before adjustment, WOT engine speed should be less than or equal to lower value of speed range in column "WOT setting: Fig.2 Steps 5 & 6" on the **SERVICE DATA.** If engine speed is higher, lower the speed turning H mixture needle counterclockwise.

Step 6: Turn H mixture needle clockwise in 1/8 turn increments with the engine at idle. After each adjustment, accelerate to WOT, and check engine speed. Adjust H mixture needle to reach WOT engine speed within the range listed in column "WOT setting: Fig.2 Steps 5 & 6".

Step 7: For some models, to make final WOT engine speed adjustment, turn H mixture needle clockwise by value shown in column "WOT setting: Fig.4 Step 7" with the engine at idle. After each adjustment, accelerate to WOT, and check engine speed.

Stop and restart engine, and verify engine idle speed, smooth acceleration to WOT engine speed. The chain must not turn at idle.

The final engine speed should fall within the range listed in column "Step 8: Verify final engine speed with standard equipment".

IMPORTANT: The new limiter caps must be installed on L and H mixture needles after adjusting Carburetor. If limiter caps are installed originally, to comply with Emission directive/regulation.

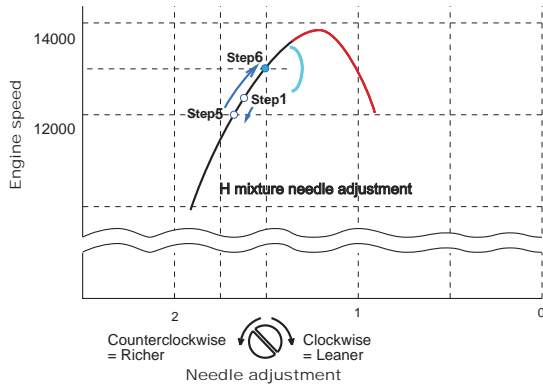


Fig.2: WOT setting

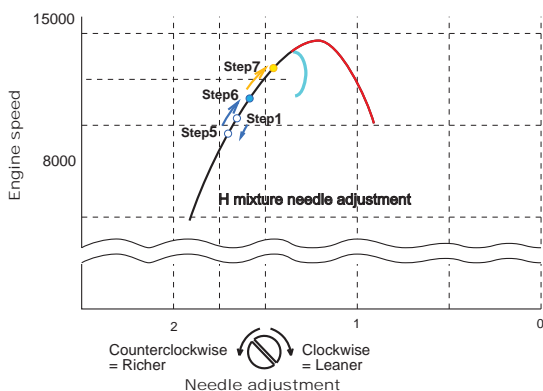


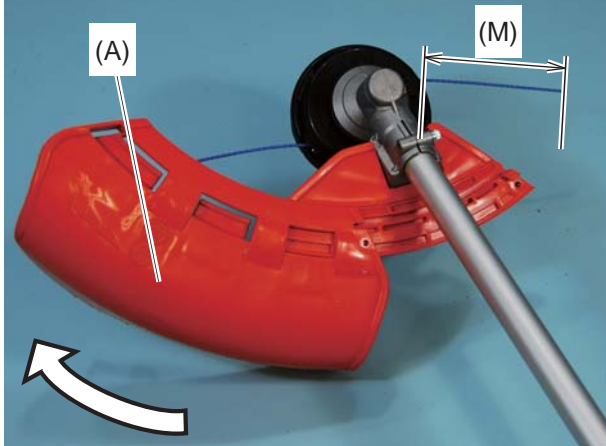
Fig.4: WOT setting

4-3. Adjustment of Trimmer/Brushcutter, Clearing saw, Hedge trimmer, Shafted hedge trimmer, Pro-attachment series, Multi-tool system, Pruner, Engine drill, Earth auger and Sprayer

Before starting engine, check the unit as described in Section 4-1, "General adjustment rules".

For proper engine loading to adjust Carburetor correctly, the cutting attachment or standard accessory should be installed.

For trimmer & brushcutter: Cutting head recommended on **SERVICE DATA Reference No. 90-ZCx-xx** should be installed and prepared. When using the other cutting head and nylon line, the nylon line length must be adjusted in the WOT settings.



When the nylon line length (M)* indicated in column "Nylon head: Line length or Blade diameter (mm)" on the **SERVICE DATA**, is longer than standard length with shield, remove shield(A) then expand and cut nylon lines to the indicated length.

For Pruner: Load adapter should be installed and prepared. Refer to **Technical Information No. Y2018-658** for more detailed.

For sprayer: Standard hose and nozzle must be installed and the chemical tank should be filled with water. The pump should be adjusted to rated pressure.

When limiter caps/plug(s) are installed on mixture needle(s), remove the caps/plug(s) following instruction in "Section 3" before adjusting Carburetor,

Use the suitable tools for adjustment according to column "Tool to adjust mixture needles(Table 2)" on the **SERVICE DATA**.

* From eyelet on nylon head

SERVICE DATA Reference No. 90-ZCx-xx

3. Trimmer/Brushcutter, Clearing saw Carburetor adjustment Table



3. Trimmer/Brushcutter, Clearing saw Carburetor Adjustment Table

Table 1: Limiter cap/plug

Part Number	Shape	Part Number	Shape
C1 A259-000030		C6 P005-001530	
C2 125329-09860		P1 A259-000000	
C5 P005-001520		P2 P005-001270	

Table 2: Tool

a		c	
b		d	

Fig.1: Idle setting

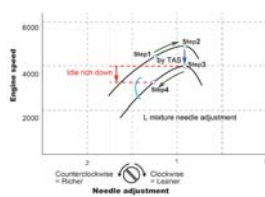


Fig.2: WOT setting

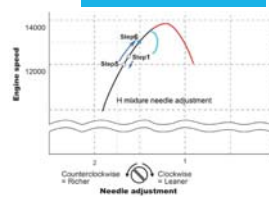
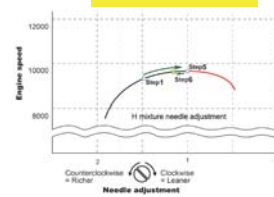


Fig.3: WOT setting



Model (Spec. code)	Carburetor Model (Parts No.)	Limiter cap/plug (Table 1)	Tool to adjust mixture needles (Table 2)	With Shield or Without Shield	Nylon head (Line dia.): Line length or Blade diameter (mm)	Adjustment Process →			Minimum warm-up time Idle - WOT: Total (sec.)	Idle setting: Fig.1		WOT setting: Fig.2		WOT setting: Fig.3		Step 7: Verify final engine speed with standard equipment			
						H mixture needle	L mixture needle	Throttle Adjust Screw* (TAS)		Step 2 & 3	Step 4	Step 5 & 6	Step 5 & 6	Final Idle range (r/min)	Final WOT range with shield (r/min)				
GT-2150 (36) GT-2150SI (36)	C1U-K53B (125200-52436)	L: C2 H: C1	b		F4 (3.0): Cut by shield knife	Turn clockwise until lightly seated, then turn CCW.	Turn clockwise until lightly seated, then turn CCW.	Turn clockwise until lightly seated, then turn CCW.	1 1/4	1 1/4	2 1/2	10 - 50: 180	3550	2750	7500 - 8000	-	-	2300 - 3000	7500 - 8000
GT-220ES (36, 37)	RB-K87 (A021-001462) RB-K93 (A021-001692)	P2	b		G137 (3.0): Cut by shield knife	Turn clockwise until lightly seated, then turn CCW.	Turn clockwise until lightly seated, then turn CCW.	Turn clockwise until lightly seated, then turn CCW.	1 3/8	2 3/4	1 1/2	5 - 10: 180	3800	3000	-	7300	10 - 30	2600 - 3400	7000 - 8000
GT-222ES (37)	RB-K113 (A021-003881)	P2	b		G137 (3.0): 130	Turn clockwise until lightly seated, then turn CCW.	Turn clockwise until lightly seated, then turn CCW.	Turn clockwise until lightly seated, then turn CCW.	1 1/8	3 7/8	8 7/8**	10 - 50: 180	3700	2300 Increase 3000 by TAS See NOTE below.	-	8000	10 - 30	2600 - 3400	6700 - 7700

Tool to adjust mixture needles (Table 2)

Nylon head (Line length): Line length or Blade diameter

Adjustment process Step 1: Initial setting

Warm-up time before adjustment

Idle setting: Fig.1 Steps 2 & 3

Idle setting: Fig.1 Step 4

WOT setting: Fig.3 Steps 5 & 6

WOT setting: Fig.2 Steps 5 & 6

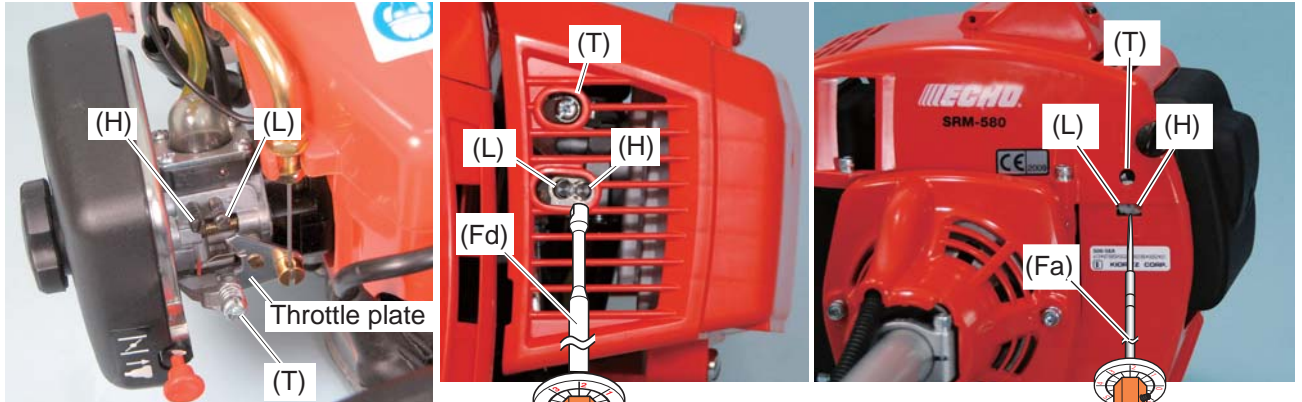
Step 7: Verify final engine speed

CARBURETOR ADJUSTMENT

4-3-1. Initial setting throttle adjust screw, L (and H) mixture needle(s) (Step 1)

NOTE: The initial Carburetor settings for throttle adjust screw, L and H mixture needles are intended to start and run the engine before final Carburetor adjustments are made. The actual number of turns required for engine operation may vary.

A. C1U, C1Q, C3M and WT type Carburetor



(1) Turn L and H mixture needles clockwise until lightly seated, then turn both mixture needles counterclockwise as listed in “Adjustment process Step 1” on the **SERVICE DATA**.

NOTE : If needles are overtightened during seating, damage to needle tip and Carburetor body seat may occur.

(2) Remove cleaner lid and air filter if required to see that throttle adjust screw(T) contacts the throttle plate.

Turn the screw(T) counterclockwise until its tip no longer touches the throttle plate. Then turn the screw(T) clockwise until its tip just comes into contact with the plate again. Finally, turn the screw(T) clockwise for the respective number of rotations as listed in “Adjustment process Step 1” on the **SERVICE DATA**.

Reinstall air filter, and cleaner lid when removed.

B. RB type Carburetor



(1) Turn L and H mixture needles clockwise until lightly seated, then turn both mixture needles counterclockwise as listed in “Adjustment process Step 1” on the **SERVICE DATA**.

NOTE : If needles are overtightened during seating, damage to needle tip and Carburetor body seat may occur.

(2) Remove cleaner lid and air filter if required to see that throttle adjust screw(T) contacts the throttle plate.

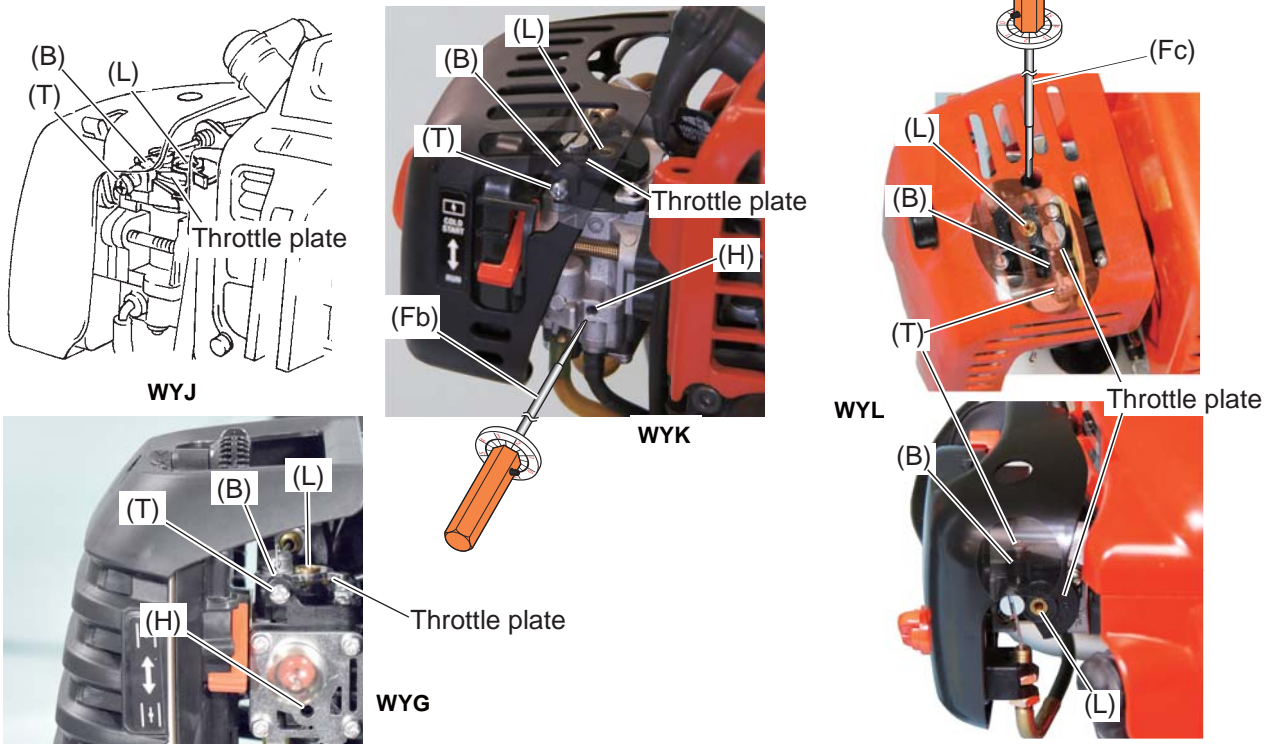
Turn the screw (T) counterclockwise until its tip no longer touches the throttle plate. Then turn the screw(T) clockwise until its tip just comes into contact with the plate again. Finally, turn the screw(T) clockwise for the respective number of rotations as listed in “Adjustment process Step 1” on the **SERVICE DATA**.

For some models, turn throttle adjust screw (T) clockwise until its head touches boss (B), then turn it counterclockwise as indicated in “Adjustment process Step 1” on the **SERVICE DATA**.

Reinstall air filter, and cleaner lid when removed.

4-3-1. Initial setting throttle adjust screw, L (and H) mixture needle(s) (Step 1) (Continued)

C. WYG, WYJ, WYK and WYL type Carburetor



(1) L mixture needle: Turn L mixture needle(L) counterclockwise until a clicking sound is heard. Then, turn the needle(L) clockwise for the respective number of rotations as listed in “**Adjustment process Step 1**” on the **SERVICE DATA**.

(2) H mixture needle: Turn H mixture needle(H) clockwise until lightly seated, then turn the needle(H) counterclockwise as listed in “**Adjustment process Step 1**” on the **SERVICE DATA**.

NOTE : If needles are overtightened during seating, damage to needle tip and Carburetor body seat may occur.

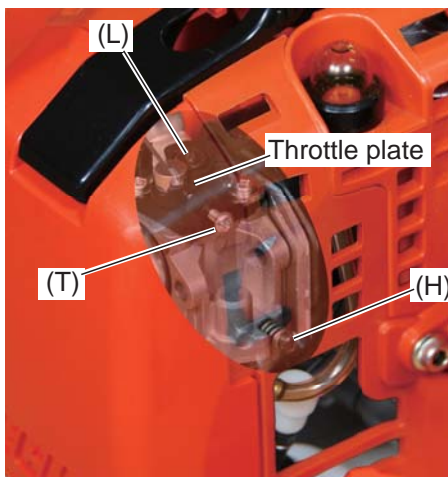
(3) Remove cleaner lid and air filter if required to see that throttle adjust screw(T) contacts the throttle plate. Turn the screw(T) counterclockwise until its tip no longer touches the throttle plate.

Then turn the screw(T) clockwise until its tip just comes into contact with the plate again. Finally, turn the screw(T) clockwise for the respective number of rotations as listed in “**Adjustment process Step 1**” on the **SERVICE DATA**.

For some models, turn throttle adjust screw (T) clockwise until its head touches boss (B), then turn it counterclockwise as indicated in “**Adjustment process Step 1**” on the **SERVICE DATA**.

Reinstall air filter, and cleaner lid when removed.

D. WYJ, WYK and WYL type Carburetor without tamper-proof



(1) Turn L (and H) mixture needle(s) clockwise until lightly seated, then turn both mixture needles counterclockwise as listed in “**Adjustment process Step 1**” on the **SERVICE DATA**.

NOTE : If needles are overtightened during seating, damage to needle tip and Carburetor body seat may occur.

(2) Turn throttle adjust screw(T) counterclockwise until its tip no longer touches the throttle plate. Then turn the screw(T) clockwise until its tip just comes into contact with the plate again. Finally, turn the screw(T) clockwise for the respective number of rotations as listed in “**Adjustment process Step 1**” on the **SERVICE DATA**.

4-3-2. Adjusting Carburetor

A. Engine warm up

To assure accurate Carburetor adjustments, the engine temperature must be fully and completely stabilised,

(1) Hedge trimmer and Trimmer/brushcutter with nylon line head: Start engine and warm it up for 180 seconds alternating engine speed between idle for 10 seconds and Wide Open Throttle (WOT) for 50 seconds.

(2) Shafted hedge trimmer, Pro-attachment/Multi-tool system and Pruner: Start engine and warm it up for 120 seconds alternating engine speed between idle for 5 seconds and Wide Open Throttle (WOT) for 5 seconds.

NOTE: Above is general warm-up procedure. For some models, the procedure is different from the above. Follow the listed warm-up time in column "Minimum warm-up time" on **SERVICE DATA Reference No. 90-ZCx-xx**.

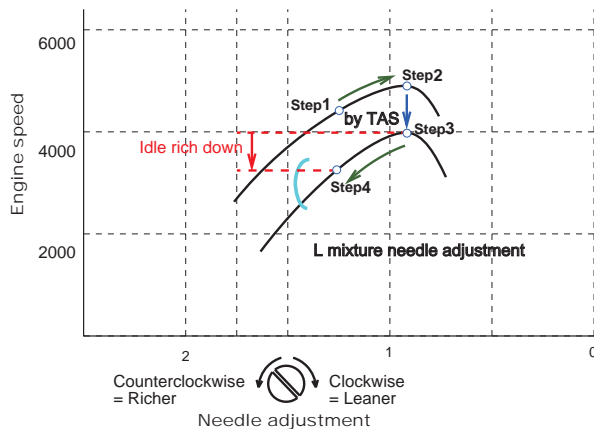


Fig.1: Idle setting

B. Idle setting Fig.1

Refer to column "Idle setting: Fig.1" on **SERVICE DATA Reference No. 90-ZCx-xx**.

Step 2: Adjust L mixture needle using suitable tool to reach maximum engine r/min just before lean drop-off.

(Turn L mixture needle clockwise until the engine speed goes up and starts to drop. When the engine speed starts to drop, turn the needle counterclockwise to obtain maximum engine speed.)

If clutch engages during adjustment process step 2, decrease engine speed by turning throttle adjust screw counterclockwise until clutch disengages and then redo step 2.

Repeat this until clutch no longer engages after the step 2 adjustment.

Step 3: Set idle speed to the value listed in column "Idle setting: Fig.1 Steps 2 & 3" by turning throttle adjust screw(T). Engine speed should be stable within +/- 50 r/min after throttle adjust screw adjustment.

Step 4: Turn L mixture needle counterclockwise reducing engine idle speed to the value in column "Idle setting: Fig.1 Step 4".

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

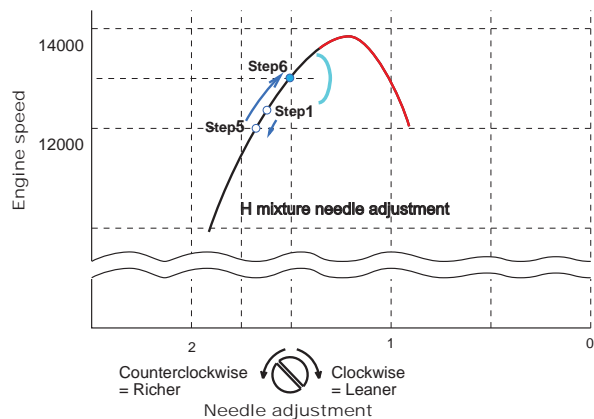
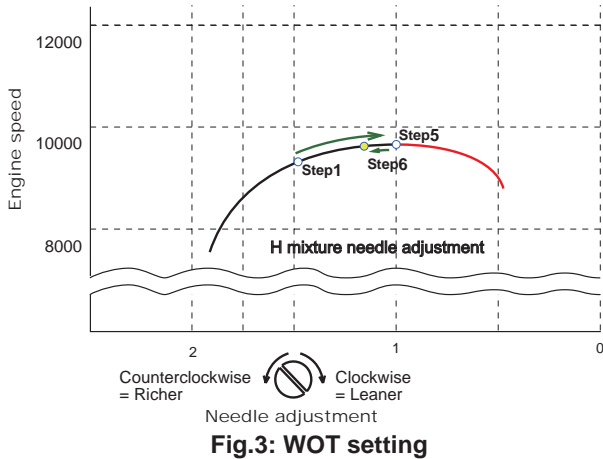


Fig.2: WOT setting

C. Wide Open Throttle (WOT) setting Fig.2

Step 5: Before adjustment, WOT engine speed should be less than or equal to lower value of speed range in column "WOT setting: Fig.2 Steps 5 & 6" on the **SERVICE DATA**. If engine speed is higher, lower the speed turning H mixture needle counterclockwise.

Step 6: Adjust WOT engine speed in the range listed in column "WOT setting: Fig.2 Steps 5 & 6". by turning H mixture needle clockwise.



D. Wide Open Throttle (WOT) setting Fig.3

Step 5: Adjust H mixture needle(H) to reach maximum WOT engine speed just before lean drop-off. (Turn H mixture needle clockwise until the engine speed goes up and starts to drop. When the engine speed starts to drop, turn the needle counterclockwise to obtain maximum engine speed.)

Step 5': When using the other nylon head and nylon line, adjust nylon line length to obtain the value listed in column "WOT setting : Fig.3 step 5".

Step 6: Then turn H mixture needle(H) counterclockwise to decrease WOT speed or turn H mixture needle(H) counterclockwise by value shown in column "WOT setting: Fig.3 Step 6".

NOTE: Numeral with hashmark (#) like "#34" in column "Step 1: Initial setting, H mixture needle" on the SERVICE DATA is the size of fix main jet. The Carburetors on these models don't have adjustable H needles. Verify WOT engine speed ranges in column "Step 7 : Verify final engine speed with standard equipment"

IMPORTANT: When limiter caps/plug(s) are installed originally, the new limiter caps/plug(s) must be installed on the needle(s) after adjusting Carburetor to comply with Emission directive/regulation.

4-4. Adjustment of Mist blower (MB), Blower and Shred 'N' Vac

Before starting engine, check the unit as described in Section 4-1, "General adjustment rules".

For proper engine loading to adjust Carburetor correctly, all blower pipes or accessories should be installed.

When limiter caps/plug(s) are installed on mixture needle(s), remove the caps/plug(s) following instruction in "Section 3" before adjusting Carburetor,

Use the suitable tools for adjustment according to column "Tool to adjust mixture needles(Table 2)" on SERVICE DATA Reference No. 90-ZCx-xx.

SERVICE DATA Reference No. 90-ZCx-xx 6. Duster/Mist blower, Blower, Shed 'N' Vac, Sprayer Carburetor Adjustment Table

ECHO

Table 1: Limiter cap/plug

Part Number	Shape	Part Number	Shape
C2 125329-09860		C8 125329-08560	
C3 125329-39030		P1 A259-000000	
C4 P003-000010		P2 P005-001270	

Table 2: Tool

a		c	
b			

6. Duster/Mist blower, Blower, Shred 'N' Vac, Sprayer Carburetor Adjustment Table

Fig.1: Low speed setting

Fig.3: WOT setting

Adjustment Process →				Step 1: Initial settings			Minimum warm-up time Idle - WOT: Total (sec.)	Low speed setting: Fig.1		WOT setting: Fig.3		Step 7: Verify final engine speed with standard equipment	
Model (Spec. code)	Carburetor Model (Parts No.)	Limiter cap/plug (Table 1)	Tool to adjust mixture needles (Table 2)	H mixture needle	L mixture needle	Throttle Adjust Screw*1 (TAS)		Step 2 & 3	Step 4	Step 5 & 6	Final Idle range (r/min)	Final WOT range with shield (r/min)	
DM-4610 (36)	WYK-200 (A021-001041)	P1	b	3 1/4	12*	-	10 - 50 : 180	3300	2800	20	2500 - 3000	7000 <	

Tool to adjust mixture needles (Table 2)

Adjustment process Step 1: Initial setting

Warm-up time before adjustment

Low speed setting: Fig.1 Steps 2 & 3

Low speed setting: Fig.1 Step 4

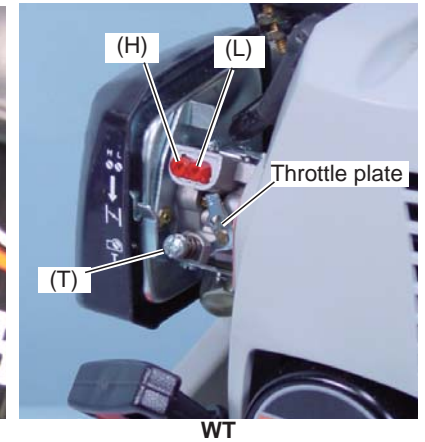
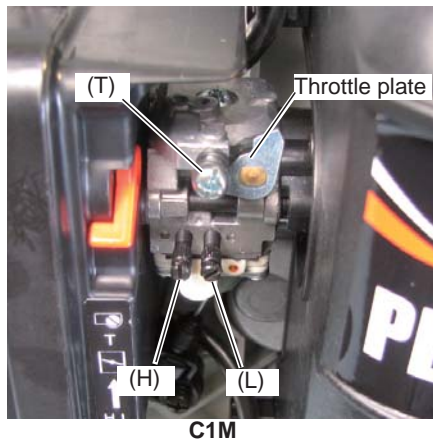
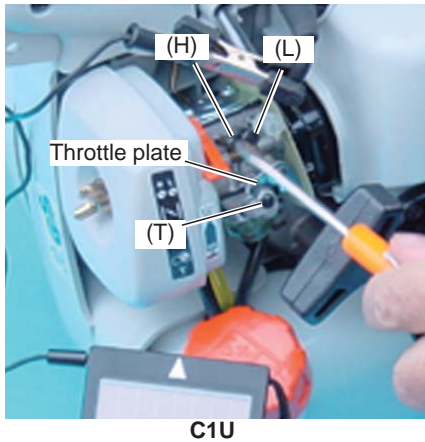
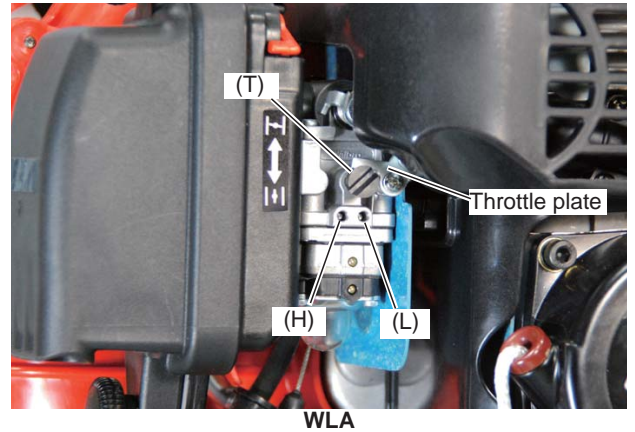
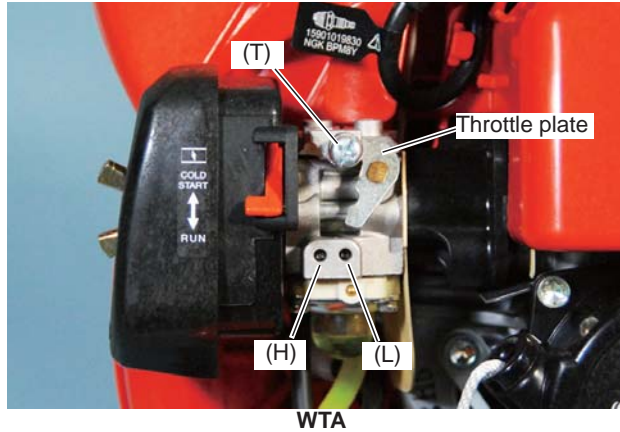
WOT setting: Fig.3 Steps 5 & 6

Step 7: Verify final engine speed

4-4-1 Initial setting throttle adjust screw, L mixture needle and H mixture needle (Step 1)

NOTE: The initial Carburetor settings for throttle adjust screw, L and H mixture needles are intended to start and run the engine before final Carburetor adjustments are made. The actual number of turns required for engine operation may vary.

A. WTA, WLA, C1U, C1M and WT type Carburetor

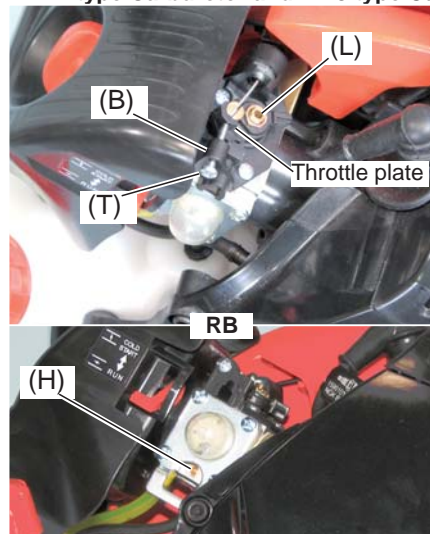


(1) Turn L and H mixture needles clockwise until lightly seated then turn both mixture needles counterclockwise as listed in "Adjustment process Step 1" on SERVICE DATA Reference No. 90-ZCx-xx.

NOTE : If needles are overtightened during seating, damage to needle tip and Carburetor body seat may occur.

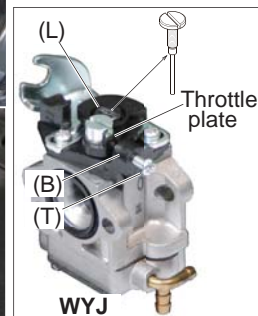
(2) Turn throttle adjust screw (T) counterclockwise until its tip no longer touches the throttle plate. Then turn the screw(T) clockwise until its tip just comes into contact with the plate again. Finally, turn the screw(T) clockwise for the respective number of rotations as listed in "Adjustment process Step 1" on the SERVICE DATA.

B. RB type Carburetor and WYJ type Carburetor without tamper-proof



(1) Turn L (and H) mixture needle(s) clockwise until lightly seated, then turn both mixture needles counterclockwise as listed in "Adjustment process Step 1" on the SERVICE DATA.

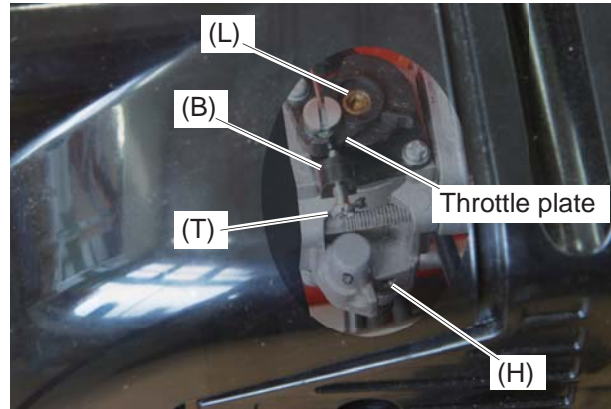
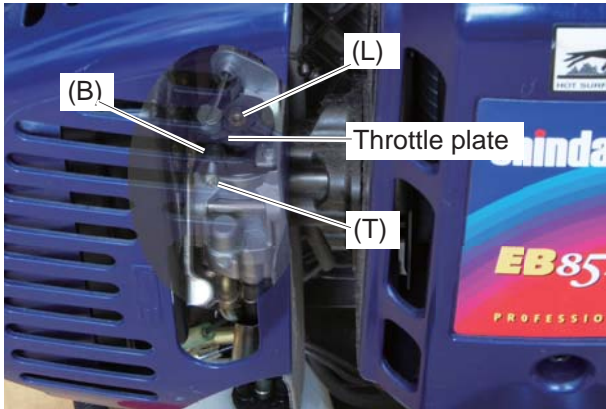
NOTE : If needles are overtightened during seating, damage to needle tip and Carburetor body seat may occur.



(2) Turn throttle adjust screw(T) counterclockwise until its tip no longer touches the throttle plate. Then turn the screw(T) clockwise until its tip just comes into contact with the plate again. Finally, turn the screw(T) clockwise for the respective number of rotations as listed in "Adjustment process Step 1" on the SERVICE DATA.

For some models, turn throttle adjust screw (T) clockwise until its head touches boss (B), then turn it counterclockwise as indicated in "Adjustment process Step 1" on the SERVICE DATA.

C. WYJ, WYK and WYL type Carburetor



(1) L mixture needle: Turn L mixture needle(L) counterclockwise until a clicking sound is heard. Then, turn the needle(L) clockwise for the respective number of rotations as listed in “**Adjustment process Step 1**” on the **SERVICE DATA**.

(2) H mixture needle: Turn H mixture needle(H) clockwise until lightly seated, then turn the needle(H) counterclockwise as listed in “**Adjustment process Step 1**” on the **SERVICE DATA**.

NOTE : If needles are overtightened during seating, damage to needle tip and Carburetor body seat may occur.

(3) Remove cleaner lid and air filter if required to see that throttle adjust screw(T) setting.

Turn the screw(T) counterclockwise until its tip no longer touches the throttle plate. Then turn the screw(T) clockwise until its tip just comes into contact with the plate again. Finally, turn the screw(T) clockwise for the respective number of rotations as listed in “**Adjustment process Step 1**” on the **SERVICE DATA**.

For some models, turn throttle adjust screw (T) clockwise until its head touches boss (B), then turn it counterclockwise as listed in “**Adjustment process Step 1**” on the **SERVICE DATA**.

Reinstall air filter, and cleaner lid when removed.

4-4-2 Adjusting Carburetor

A. Engine warm up

To assure accurate Carburetor adjustments, the engine temperature must be fully and completely stabilised.

Start engine and warm it up for 180 seconds alternating engine speed between low speed for 10 seconds and Wide Open Throttle (WOT) for 50 seconds.

NOTE: Above is general warm-up procedure. For some models, the procedure may differ from the above. In that case, follow the listed warm-up time in column “Minimum warm-up time” on **SERVICE DATA Reference No. 90-ZCx-xx**.

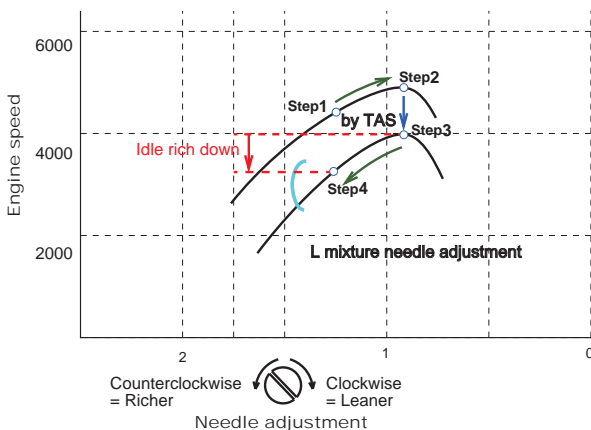


Fig.1: Low speed setting

B. Low speed setting Fig.1

Refer to column “**Low speed setting: Fig.1**” on the **SERVICE DATA**.

Step 2: Adjust L mixture needle using suitable tool to reach maximum engine r/min just before lean drop-off.

(Turn L mixture needle clockwise until the engine speed goes up and starts to drop. When the engine speed starts to drop, turn the needle counterclockwise to obtain maximum engine speed.)

Step 3: Set low speed to the value listed in column “**Low speed setting: Fig.1 Steps 2 & 3**” by turning TAS (throttle adjust screw)(T). Engine speed should be stable within +/- 50 r/min after throttle adjust screw adjustment.

Step 4: Turn L mixture needle counterclockwise reducing engine low speed to the value in column “**Low speed setting: Fig.1 Step 4**”.

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

C. Wide Open Throttle (WOT) setting Fig.3

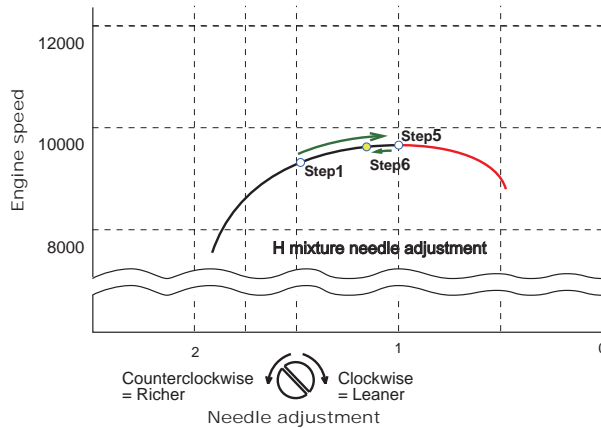


Fig.3: WOT setting

Step 5: Adjust H mixture needle(H) to reach maximum WOT engine speed just before lean drop-off.

(Turn H mixture needle clockwise until the engine speed goes up and starts to drop. When the engine speed starts to drop, turn the needle counterclockwise to obtain maximum engine speed.)

Step 6: Then turn H mixture needle(H) counterclockwise to decrease WOT speed or turn H mixture needle(H) counterclockwise by value shown in column “WOT setting: Fig.3 Steps 5 & 6”.

NOTE: Numeral with hashmark (#) like “#50” in column “Step 1: Initial setting, H mixture needle” on the **SERVICE DATA** is the size of fix main jet. The Carburetors on these models don't have adjustable H needles. Verify WOT engine speed ranges in column “WOT setting: Fig.3 Steps 5 & 6 : WOT engine speed (r/m) with standard pipe”

IMPORTANT: When limiter caps/plug(s) are installed originally, the new limiter caps/plug(s) must be installed on the needle(s) after adjusting Carburetor to comply with Emission directive/regulation.

4-5. Adjustment of Duster/Mist blower (DM)

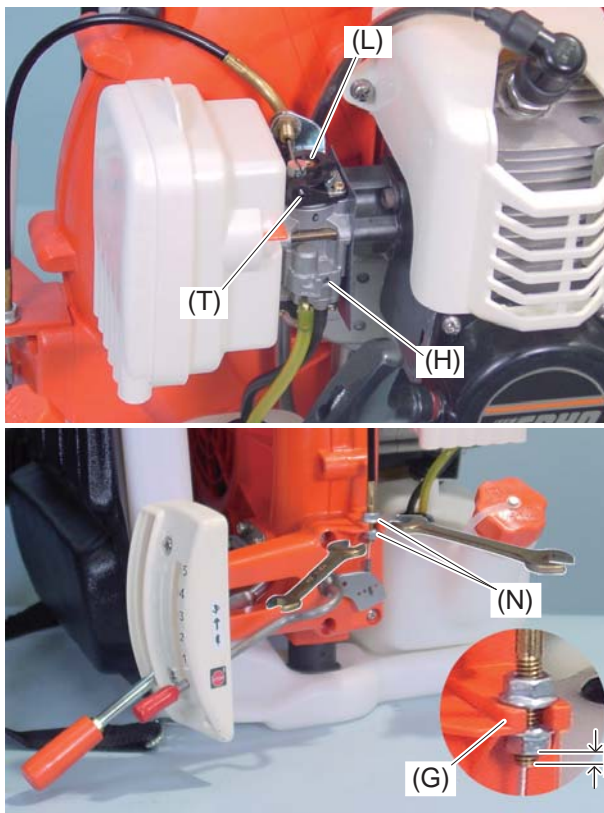
Before starting engine, check the unit as described in Section 4-1, “General adjustment rules”.

For proper engine loading to adjust Carburetor correctly, all blower pipes should be installed.

When limiter caps/plug(s) are installed on mixture needle(s), remove the caps/plug(s) following instruction in “Section 3” before adjusting Carburetor.

Use the suitable tools for adjustment according to column “Tool to adjust mixture needles(Table 2)” on **SERVICE DATA Reference No. 90-ZCx-xx**.

4-5-1 Initial setting throttle adjust screw, L mixture needle, (H mixture needle) (Step 1) and throttle cable nuts



(1) L mixture needle: Turn L mixture needle(L) counterclockwise until a clicking sound is heard. Then turn the needle(L) clockwise for the respective number of rotations as listed in “Adjustment process Step 1” on **SERVICE DATA Reference No. 90-ZCx-xx**.

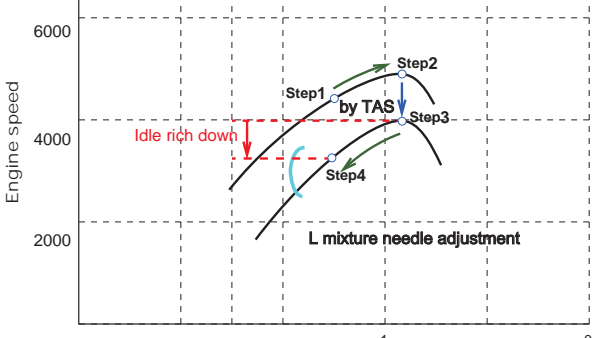
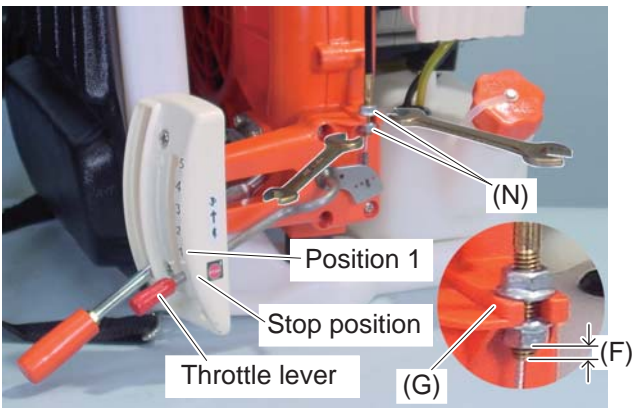
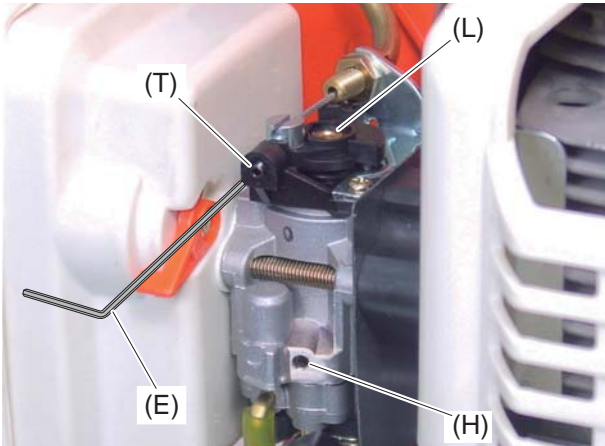
(2) H mixture needle: When H mixture needle is equipped, turn the needle(H) clockwise until lightly seated, then turn the needle(H) counterclockwise as listed in “Adjustment process Step 1” on the **SERVICE DATA**.

NOTE : If needles are overtightened during seating, damage to needle tip and Carburetor body seat may occur.

(3) Turn throttle adjust screw (T) counterclockwise until its tip just touches throttle plate. Then turn it in clockwise as listed in “Adjustment process Step 1” on the **SERVICE DATA** using 1.5 mm hexagonal L wrench.

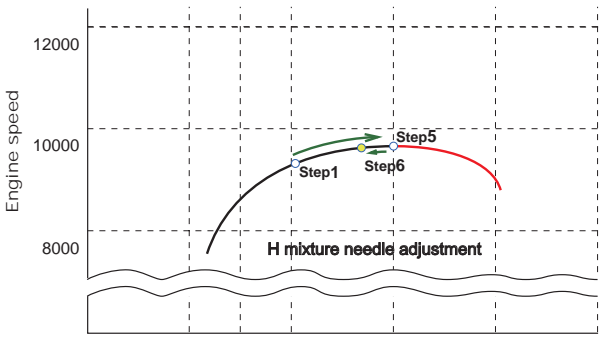
(4) Adjust length (F) to 2 to 3 millimetres, and tighten 2 throttle cable nuts (N) on dial bracket (G).

4-5-2 Adjusting Carburetor



Counterclockwise = Richer
 Clockwise = Leaner

Needle adjustment
Fig.1: Low speed setting



Counterclockwise = Richer
 Clockwise = Leaner

Needle adjustment
Fig.3: WOT setting

A. Engine warm up

To assure accurate Carburetor adjustments, the engine temperature must be fully and completely stabilised.

(1) Set the throttle lever at position 1. Start engine and warm it up well for 3 minutes alternating engine speed between low speed for 10 seconds and Wide Open Throttle (WOT) for 50 seconds.

(2) Confirm that the engine stops when throttle lever is stop position.

NOTE : If engine doesn't stop, adjust TAS (Throttle Adjust Screw) (T) using 1.5 mm hexagonal L wrench (E).

B. Low speed setting Fig.1

Refer to column "**Low speed setting: Fig.1**" on the **SERVICE DATA**.

Set the throttle lever at position 1, and restart engine.

Step 2: Adjust L mixture needle (L) to obtain maximum low speed just before lean drop-off. (Turn L mixture needle clockwise until the engine speed goes up and starts to drop. When the engine speed starts to drop, turn the needle counterclockwise to obtain maximum engine speed.)

Step 3: Set low speed to the value listed in column "**Low speed setting: Fig.1 Steps 2 & 3**" by adjusting throttle cable nuts (N) on dial bracket (G) with 10 mm spanners.

NOTE :

To lower the low speed, lengthen the length (F).

To increase the low speed, shorten the length (F).

Step 4: Turn L mixture needle counterclockwise reducing engine low speed to the value in column "**Low speed setting: Fig.1 Step 4**".

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

C. Wide Open Throttle (WOT) setting Fig.3

Step 5: Adjust H mixture needle(H) to reach maximum WOT engine speed just before lean drop-off.

(Turn H mixture needle clockwise until the engine speed goes up and starts to drop. When the engine speed starts to drop, turn the needle counterclockwise to obtain maximum engine speed.)

Step 6: Then turn H mixture needle(H) counterclockwise to decrease WOT speed or turn H mixture needle(H) counterclockwise by value shown in column "**WOT setting: Fig.3 Steps 5 & 6**".

NOTE: Numeral with hashmark (#) like "#47" in column "**Step 1: Initial setting, H mixture needle**" on the **SERVICE DATA** is the size of fix main jet. The Carburetors on these models don't have adjustable H needles. Verify WOT engine speed ranges in column "**WOT setting: Fig.3 Steps 5 & 6 : WOT engine speed (r/m) with standard pipe**"

IMPORTANT: When limiter caps/plug(s) are installed originally, the new limiter caps/plug(s) must be installed on the needle(s) after adjusting Carburetor to comply with Emission directive/regulation.

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Published by
YAMABIKO Corp.
Tokyo Japan

1510