

TO: ALL ECHO DISTRIBUTORS AND DEALERS
FROM: ECHO PRODUCT SERVICE
DATE: March 21, 2013
SUBJECT: **EMISSION** Limiter Cap Service and Carburetor Adjustment of the: CS-590
Equipped with Walbro Carburetor HDA-268A

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Revised: 8/6/2013

The carburetor on the above listed model has been factory preset to meet EPA and C.A.R.B. emissions regulations. Limiter caps have been installed on the Hi and Lo fuel adjustment needles to insure compliance with these regulations. Should the limiter caps have to be removed to service the Hi and Lo adjustment needles, or a new carburetor installed, the following service procedures and carburetor needle adjustments must be performed to properly keep the unit within regulation.

<u>MODEL</u>	<u>SERIAL NUMBER</u>
CS-590	C25812001001- C25812999999
CS-590	C25913001001- C25913999999

Tools Required : Small screwdriver with 2.5 mm blade, electronic tachometer P/N G310000050, limiter cap removal tool with 2.5 mm left-hand thread P/N 91075 and 3 mm left-hand thread P/N 91076. Parts Required : (2) limiter caps P/N P003000010.

GENERAL ADJUSTMENT RULES:

- A.** Before starting the unit for adjustment, check the following items:
- Check spark plug for correct heat range and that plug is clean and properly gapped.
U.S. Spark Plug - BPM-8Y CAN Spark Plug - BPMR-8Y Gap: .026 in (0.65 mm)
 - The air filter element must be clean and properly installed.
 - The muffler spark arrester screen and exhaust port must be clear of carbon.
 - The fuel lines, tank vent and fuel filter are in good condition and clear of debris.
 - The fuel is fresh (> 89 octane : RON+MON/2) and properly mixed at 50 : 1 with "ISO L-EGD" or "JASO M345/FD" 2-stroke oil.
 - The recommended bar and chain combination must be installed to the powerhead, and properly tensioned.

NOTE: In order to achieve proper carburetor adjustment, a 20 inch bar and chain should be installed, otherwise serious engine damage can occur due to overspeeding.

B. Carburetor Adjustment with limiter caps installed

WARNING

Always operate unit in a clear work area. Keep hands clear of moving cutting attachment during adjustment otherwise serious bodily injury may occur.

Set Lo and Hi mixture needles fully counterclockwise (CCW). Start and run engine for two minutes alternating engine speed between Wide Open Throttle (WOT) for 5 seconds and idle for 5 seconds. Adjust idle speed screw to 2,800 +/- 150 RPM. Adjust Hi mixture needle to 12,500 +/- 300 RPM. If engine does not run correctly after this adjustment, adjust carburetor without limiter caps installed.

C. Limiter Cap Removal

1. Turn the Lo and Hi mixture needles (CCW) to rich side stop to align limiter cap tab (A) with locating slot (B).

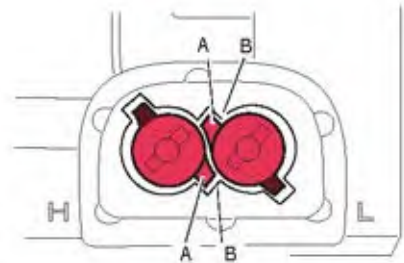
NOTE : If cap tabs (A) mis-align with locating slots (B), the cap cannot be removed and the center hole threads will strip. If center hole threads strip, use 3 mm limiter cap removal tool P/N 91076 to remove the limiter cap.

2. Screw 2.5 mm limiter cap removal tool P/N 91075 (CCW) into center hole of either limiter cap until tab of the limiter cap just comes out of the locating slot.

NOTE : DO NOT COMPLETELY REMOVE LIMITER CAP FROM CARBURETOR! If the first limiter cap is removed completely, the second limiter cap can be misaligned while inserting the cap removal tool.

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

4. Screw 2.5 mm limiter cap removal tool P/N 91075 (CCW) into center hole of remaining limiter cap until the limiter cap is removed from the mixture needle completely. Remove the limiter cap from limiter cap removal tool by turning (CW), then screw limiter cap removal tool into center hole of previous limiter cap to remove completely.



D. Carburetor Adjustment without limiter caps installed.

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

IMPORTANT : After adjusting carburetor according to these instructions, the limiter cap(s) must be installed on Lo and Hi mixture needle(s) to comply with Emission Regulations.

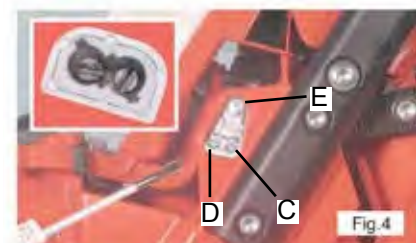
1. Turn Lo and Hi mixture needles (CW) until lightly seated, then turn both mixture needles (CCW) for initial setting as follows :
Lo mixture needle : 2, Hi mixture needle : 3/4

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

2. Remove air cleaner lid and air filter to expose the idle adjust screw and throttle plate. Turn Idle adjust screw (E) (CCW) until the tip just contacts the throttle plate. Then turn Idle adjust screw 2-3/8 turns (CW). Reinstall air filter, and air cleaner lid.
3. Start and warm engine for 1 minute alternating engine speed between (WOT) and idle every 5 seconds. Turn Hi mixture needle (D) (CCW) until engine speed drops to approx. 11,500 RPM at (WOT).

NOTE : Do not run engine at high speed without load longer than 10 seconds, or engine damage may occur.

4. Adjust Lo mixture needle (C) to reach maximum engine RPM just before lean drop off.
5. Set idle speed to 3,600 RPM by turning Idle adjust screw (E). Engine RPM should be stable at 3,600 +/- 50 RPM after adjustment.
6. Turn Lo mixture needle (C) (CCW) reducing engine idle speed 800 RPM to set idle speed at 2,800 RPM. The idle speed range should be 2,700 - 2,900 RPM.



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

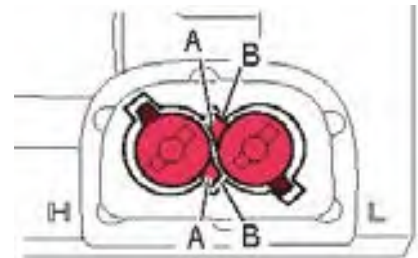
7. Before (WOT) adjustment, engine speed should be 11,500 RPM or less. If RPM is higher, turn Hi mixture needle (CCW) until 11,500 RPM is achieved. To make the final (WOT) engine speed adjustment, turn the Hi mixture needle (CW) in 1/8 turn increments with the engine at idle. After each adjustment, accelerate to (WOT), and check RPM. The final RPM should fall within 12,100 - 12,500 RPM range. Stop engine.

NOTE : When Hi mixture needle is turned completely (CW), the engine will continue to run. If engine speed at WOT is above 13,300 RPM, adjust Hi mixture needle (CCW) and set maximum engine speed at less the 13,000 RPM.

8. Start engine, and verify engine idle speed ranges from 2,600 to 3,200 RPM, and (WOT) engine speed ranges from 12,000 to 13,000 RPM. Make sure the chain does not rotate when engine is idling. When final adjustment is completed, the engine should idle, accelerate smoothly, and attain (WOT) per above specifications.

IMPORTANT : The limiter caps must be properly installed on Lo and Hi mixture needles to comply with Emission Regulations.

9. After adjusting carburetor, screw new limiter cap counter-clockwise on the limiter cap removal tool (F) (P/N 91075) approximately 2 turns as shown. Align the limiter cap tabs (A) with locating slots (B) in extended housing of carburetor and put the limiter caps on Lo and Hi mixture needles respectively. Gently press the caps onto Lo and Hi mixture needles (do not rock caps back and forth). Remove tool (F) then fully seat caps until flush with housing of carburetor.



IMPORTANT!

Correct idle speed is 2,600 - 3,200 RPM. If chain continues to move at idle, lower idle RPM using idle speed screw until chain stops moving. If unit will not idle below clutch engagement speed, check clutch, clutch springs and clutch drum for damage. Make sure chain is at rest at idle RPM before returning the unit to the customer.

Carburetor adjustments with removed limiter caps must be conducted by authorized emission certified dealers only. Limiter caps must be installed by a certified dealer before unit is put into service.

GENERAL NOTE: Limiter caps prevent the carburetor from over rich or lean adjustments that would allow the unit to exceed EPA and C.A.R.B emissions limits. The limiter caps do not prevent excessive lean adjustment which may cause premature engine failure. Recommended Hi speed engine RPM should not be exceeded in normal operation, or for extensive periods during engine adjustment.

ATTENTION!

The dealer must supply the unit to the customer in the original configuration, which includes having limiter caps in place.

Knowingly removing or rendering inoperative a device, element or design installed on or in a non-road engine which is in compliance with E. P. A. regulation is classified as tampering. Tampering is a violation of FEDERAL LAW, resulting in significant civil penalties (fines) of up to \$37,500 for each violation.

PRODUCT SERVICE DEPARTMENT