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## REF: Carburetor, Intake Manifold & Exhaust

# Keihin Carb Upgrades & Aftermarket - For Butterfly and CV Types

## Idle Speed Screw

### Factory Idle Speed Screw - Modding

You can stick a dime in the adjuster screw slot and braze it to the screw to make future adjustments by hand.



### CVP Extended Idle Speed Screw

Below is a CVP stainless steel idle speed screw for Harley CV and Keihin butterfly style carburetors. With the extended thumbscrew, idle speed can be adjusted by hand.

It's also slotted for a large tipped screwdriver if longer reach is still needed.

It also includes a stainless steel spring.

For use on all Harley CV40 and Keihin butterfly style carbs 1981-2006. <sup>2)</sup>

Long idle speed screw on a Keihin CV. <sup>3)</sup>



## Needle & Emulsion Tube

Changes in the needle and emulsion tubes from aftermarket vendors may modify the (stock/oem) AFR from just off idle thru wide-open throttle. The length and size of the needle as it moves thru the needle jet along with the size and placement of the holes in the emulsion tube, will determine the air-fuel ratio of the fuel. Along with the other operating parts of the carb, they affect how well the engine operates under each varying condition.

CV Performance offers two aftermarket needles, Velocity & N65, and one emulsion tube, Velocity. The CVP N65 is designed as an equivalent alternative to the Keihin N65C needle, which HD & Keihin have stopped producing. The Velocity Needle & Velocity Emulsion tube are designed to provide a different AFR.

Using unknown parts or parts designed to radically alter the carb operation to favor one specific enhancement will often complicate or degrade the overall smooth operation of the carb.



4)

# Idle Mixture Screw - IMS - Aftermarket & Mods

## CVP EZ-Just IMS

The EZ-Just mixture screw can be a handy upgrade. It allows you to get your fingers on the larger screw head rather than using a small screwdriver as required with the stock idle mixture screw. The EZ-Just is compatible for L76-87 or 88-06 version Keihin CV carbs.<sup>5)</sup>

You can buy packing (spring, washer & o-ring) from CVP if your OEM parts have been damaged or are not functioning properly - BUT - Check your local regulations before changing IMS Settings or using aftermarket parts. **Please note:** "It is a violation of federal law to tamper with or disable any emission or noise control device. That is your PSA for the day."<sup>6)</sup>

**Proper Screw Setting** - The taper of the CVP EZ-Just screw has a longer and wider profile versus the OEM screw. This results in a different fuel flow ratio per turn compared to the OEM screw. This still allows finding the right turns setting with the CVP EZ-Just, but it won't necessarily be the same number of turns as the OEM screw.

No one should simply pick a particular number of turns out from a light seat as a final setting. Picking a starting point is appropriate, but you really need to use the Idle Drop Method of tuning to find the right number of turns for the Idle Mixture Screw. Variations in the idle port orifice (due to wear or damage, etc.) along with variations in the different screws (OEM, CVP, Chinese aftermarket, etc.) makes it important to rely on the Idle Drop Method of tuning, rather than simply picking a number of turns. Any number of recommended turns out on the IMS screw, whether using OEM or aftermarket parts, is only an initial starting point and not specified as a final, properly tuned setting.

The final setting should always be based on the preference of the individual engine setup as found by the Idle Drop Method.

[CLICK HERE](#) for an explanation of the Idle Drop Method at the CV carb tuning page in the Sportsterpedia.

The pic below shows the taper dims from both the OEM and CVP IMS screw. Although different from each other, both are capable of reaching a proper adjustment of the fuel mixture for correct idle operation.



If you still have the factory plug over the mixture screw, you'll need to drill it out to access the screw. To keep from drilling too far into the plug, you can use some electrical tape around the drill bit to mark the depth to drill.

Then pry the plug out using a pick or you could twist a small sheet metal screw into the hole to pull the plug out.

With the plug removed clean the area around the mixture screw so no metal fragments remain.



8) Circled area is where you drill out the plug.



9)

The EZ-Just mixture screw must be threaded in completely (lightly seated) prior to backing out and making final adjustments.

Typically between 10-12 full rotations of the screw to seat.

If you can see more than 1-2 threads after seating the screw, the screw is not screwed in completely.

This could result in the screw falling out during operation.

If you have trouble fully threading the EZ-Just, this indicates the inside threads of the carburetor need cleaning or have a damaged thread inside.

Working the screw in/out with light machine oil (3-In-1 or other) will often help work past any carbon build up inside the carburetor threads.

The packing for the EZ-Just is the same as OEM:  
screw, spring, washer, O-ring.





10)

**CVP EZ-Just IMS Used on 1988-06 CV40 Carbs** This screw is billed as “Easily tune and adjust your idle mixture without burning your hands or fumbling with a screwdriver.” <sup>11)</sup>

This is not entirely true as you have to get your hand between the exhaust and air cleaner.

Tuning and installation tips here at [CV Performance.com](https://www.cvp-performance.com/).

The carburetor will need to be removed from the manifold so refer to your factory shop manual for this procedure. With the carburetor removed, place upside down on a sturdy work surface.

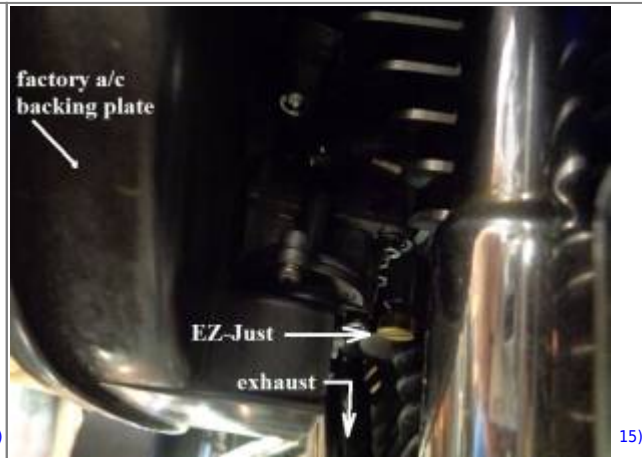
The float bowl doesn't need to be removed unless you have to issues removing the factory packing and/or need to blow out the passageway.

If you take off the bowl, be sure to check the float setting before reinstalling the bowl.

EZ-Just Screw in it's 'lightly seated' position. <sup>12)</sup>



As installed on bottom of carb. <sup>13)</sup>



## CVP Easy-Just IMS - Modding

From RandallIM of the XLForum<sup>16)</sup> - Here is how I indexed my screw. I filed some small flats on a small nail, and JB Welded it in the slot. I left the small end sticking out a bit so I can feel both ends.



## Factory IMS - Modding

Several mods to the thumbscrew have been done to make counting turns while turning the screw easier.

The aftermarket thumb screw head doesn't have a slot for a screwdriver (which can serve for visual positioning).

A small hole drilled off center will give a visual position of the screw for adjustment later. <sup>17)</sup>





This replacement needle makes it so much easier to adjust the idle mixture. <sup>18)</sup>

However, it is easier to count the turns by hand with this mod.

A spigot was added to the face of the knob.

The needle was screwed in all the way to gentle seat.

Then the side nearest the air cleaner (right of bike) was marked to index when to stop turning to the right.

The needle was then removed, drilled and tapped (10 BA) for the spigot.

You can also drill hole through the knob from side to side and Superglue a screw in it. <sup>19)</sup>

The EZ-Just makes it easy to adjust the idle mixture by hand without a screwdriver.

But, if you've gone 3 to 3-1/2 turns out, then change to the next biggest slow jet. <sup>20)</sup>

Spigot installed to count the turns. <sup>21)</sup>



### Factory IMS - Modded Head

This was done to extend the factory idle mixture screw.

A piece of 3/16" brass tubing and a knurled nut from the hardware store.

Factory idle mixture screw extended. <sup>22)</sup>



## Velocity Stack

A velocity stack has been used (between the air cleaner and carb) to reduce turbulence while increasing velocity for optimal fuel mixture.<sup>23)</sup>

It doesn't block or reduce air flow and is supposed to greatly improve mileage by encouraging a more complete burn of the air/fuel mixture.

"Bolt-on performance that installs in minutes" although no performance enhancements have been found while using them.

Aluminum type velocity stacks like the "V-Ductor" from CV Performance have been used and tested to find no HP gains from them. Some may still cite 'peace of mind' and there is no downside to using it other than the price.

It requires a total of 2 gaskets (included) to install.<sup>24)</sup>

This is a "V-Ductor" from CV Performance.<sup>25)</sup>



- Remove the air cleaner backing plate.
- Place a gasket onto the backing plate, then the V-Ductor and another gasket (2 supplied in the kit).
- The smaller end of the cone faces into the carb.
- Install the new assembly onto the carb and torque to factory specs.

- backing plate with as normal against the V-Ductor. Installation of your air box will vary depending upon the



## Replacing the Plastic Fuel Inlet Fitting with a Brass 90 Degree Fitting

The factory fuel elbow found on Keihin carburetors has been prone to cracking and leaking.

Also the manner in which the plastic elbow is formed onto a brass insert restricts flow.

It's made of a combination of molded plastic on the outside with a brass nipple installed on the inside of the carb.

The plastic attached to the brass nipple can crack or break off when removing the original crimp clamp or if over tightened.

Stress can also break it while removing / installing the carb if the attached hose gets caught on something and pulled.

Replacing the factory elbow with a brass one can increase gas flow (especially with a vacuum-less petcock).

Factory plastic fuel inlet elbow on Keihin CV. <sup>26)</sup>



Keihin butterfly (non CV). Here is on way to do it. Break the plastic off and run a hose on the factory brass nipple. <sup>27)</sup>



Replacing the the hipple with a brass elbow is detailed below.

## Tools

- 1/4"x20 tap
- Tap handle
- (2)-7/16" wrenches
- 1/4"x20 bolt w nut and washer
- Spacer (or a socket can be used instead)
- Hammer
- Bench vise with soft jaws (can be optional but handy)



28)

## Part Considerations

- Brass 90° elbow

You need an elbow designed for this application for best results.

The MoCo may still sell both an OEM and brass inlet (27371-76a) that can be pressed in (arbor press or large vise).

You can search the brass elbow part number online. Some catalogs carry an OEM replacement inlet but it has the same plastic elbow (not recommended).

While others sell a brass inlet made from a 2-piece design (also not recommended).



CV Performance sells a solid elbow and a hose clamp as a kit.

You can also buy a kit on the internet / Ebay that includes the tap, bolt and spacer setup along with a solid elbow.

Or check your local Harley Dealership for a replacement elbow.

CV Performance elbow <sup>29)</sup>



Aftermarket kit off Ebay. <sup>30)</sup>



There are differences in these two elbows and those differences can be a factor in how it is installed. However, either will work fine. Below are some considerations when installing.

The CV Performance elbow has a shorter end going into the carb than the other one. It's also tapered. This allows you to set the elbow horizontally into the carb without a tilt and get a loose fit to adjust the direction before pressing it in.

The other elbow is more consistent with the original length, not tapered and will provide more holding area through the entire shaft.

But it will sit in the hole at a tilt until it is pressed in somewhat so the angle needs to set before you install it too far in the hole.

The CVP elbow has a flat at the bend for ease installing it in a bench vise although with the taper, it is relatively easy to tap in place with a wrench or hammer.





## The Process

The carb below is a Keihin CV from a 98 S model but the process for replacing the elbow is the same for all Keihin carbs.

It's a fairly simple job to replace the fuel inlet.

Instructions are also here at the CVP website: <https://cv-performance.com/harley-fuel-elbow-replacement>



**Notes:**

While working on the carburetor or any fuel system, care should be taken to keep away from any open flame or heat source.

Never try to loosen carburetor parts using heat.

Do not use brute force or methods other than a puller.

Do not remove the inlet from the carb using a drill or vise grips.

This could damage the body or distort, crack or broaden the hole where the new inlet presses into.

Follow all safety precautions.

The following instructions are provided as a basic guide and assumes no liability for any damages or injury.

Never work on a carburetor or related fuel system in the presence of an open flame or heat source.

**Prep:**

The cover doesn't necessarily have to be removed, but it's best to be able to blow out the passage with it off.

Be sure to first mark or note the position/angle of the factory elbow before removing it.

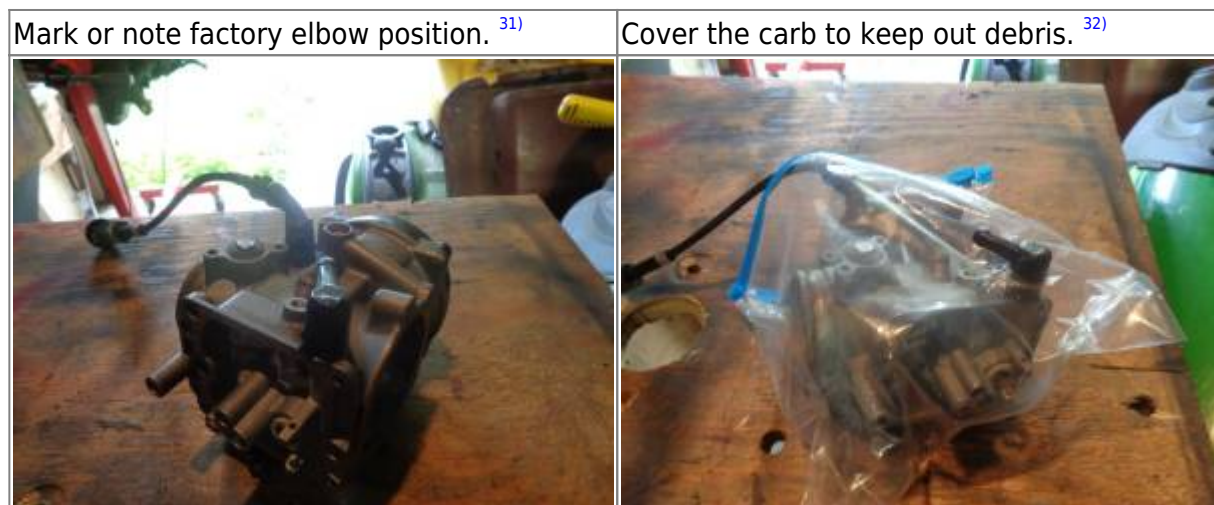
The replacement elbow should be installed in the same direction to keep your original fuel hose routing.

In order to remove the original fuel inlet you must first break off the plastic molded elbow.

Don't be shy, get out your favorite hammer or pliers and simply snap the plastic portion off of the carb.

It is important to first note the angle/position of the original elbow so the fuel line is routed correctly when reinstalling a new elbow.

You'll be using a hammer to break off the plastic elbow so make sure to cover the carb to keep out any debris generated.

**CAUTION:**

Never heat a carburetor to remove or loosen parts.

Holding the carb in your hand with the plastic fitting on a bench / table won't jolt the body / insides as much.

Using a hammer, strike the upper part of the 90° elbow past the 90° joint (nothing but plastic here).

The plastic may break off in various ways, thus the plastic bag over the carb was used here. <sup>33)</sup>



Once the end is broken, you can try peeling the plastic off the brass nipple to expose the end. <sup>34)</sup>



Assemble the 1/4"-20 tap, tap handle and lube the tap. The I.D. of the nipple is already sufficient to accept the tap.

(no drilling required)

Insert the tap into the nipple and begin threading it clockwise turning in approximately 1/4".

Tapping threads all the way through is not necessary as you only need enough for the bolt to grab while pulling the nipple out.

To prevent excess brass particles from falling back into the carburetor with the bowl on;

It is advisable to hold the carb with the inlet piece facing down so that particles fall away rather than being pushed into the bowl.

This is not necessary with the bowl off as you can blow the passage out from the inside.



Remove all brass cuttings / particles after tapping and before continuing.



35)

**Assemble the puller:**

I pre-made puller was bought for the pics below.

But you can also use a 1/4"x20 threaded rod about a foot long screwed into the fitting.

Then slip a thin piece of pipe nipple over the rod with a washer and nut onto the end of the rod. <sup>36)</sup>

Place the spacer (or deep socket) over the brass nipple.

Thread the nut onto the bolt up to the screw head then add the washer.

Insert this assembly through the spacer and thread the bolt a few turns into the tapped brass piece.

You only need a few threads in to grab.

With a wrench begin to turn the nut down (clockwise) forcing the screw to lift the brass piece out.

It may be easier to hold the bolt with one wrench and turn the nut with another.

Once the piece begins to move it will pull out like butter. <sup>37)</sup>

Once the nipple is out, you may have to 'pop' the spacer of as it may wedge against the carb.

A socket may be used as a spacer with the appropriate length bolt.



38)





Thoroughly clean the fuel insert passage to make sure it is free of any brass filings.  
Soapy water will wash away any fine particles and not harm the internal parts.  
Compressed air will also blow out the passage.  
Be sure the carburetor is clean and dry.



39)

Installing the new fuel elbow will vary depending upon brand or type of elbow used.  
Position the inlet elbow in the same direction as the original so that the hose can be routed correctly.  
If installing a solid brass or CVP inlet and a press is not available, simply tap the inlet into the carburetor with a small mallet.  
You may also place a piece of wood over the elbow and tap in with a regular hammer.  
The smooth end presses into the carb and the barbed end is meant to grip the fuel hose.  
If you're to tap the elbow in, hold the carb in one hand and tap with the other.  
This will take the blow off the carb body and internals.

Double check alignment before installing. <sup>40)</sup>Tap the elbow in with a hammer. <sup>41)</sup>Or pull it in with a vise with soft jaws. <sup>42)</sup>

The brass inlet will self-seal when pressed in as long as the carb inlet passage hole is free of debris and not damaged, stretched, or cracked.

A thin layer of blue locktite may be applied around the fitting to help seal.

But care should be taken not to allow any to drip back into the fuel passage as it will damage the rubber tip on the float needle (plunger). <sup>43)</sup>

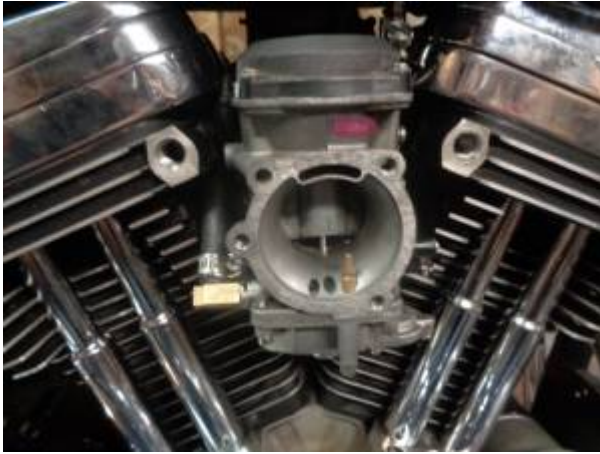




Blow the passage out again to ensure of no debris before installing the bowl. <sup>44)</sup>







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photo by DDDDYlan of the XLFORUM, annotated by Hippysmack

2)

<https://cv-performance.com/harley-idle-speed-screw>

3) 10) 26) 28) 29) 30) 31) 32) 35) 39) 40) 41) 42)

photo by Hippysmack

4)

pics from BestCoastXL at

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-intake-and-exhaust/sportster-motorcycle-air-intake-carburetor-efi-fuel-and-exhaust/202758-should-i-buy-carb-parts-from-amazon-rather-than-cv-performance-no-you-should-not?t=2079965> - Annotated by IXL2Relax

5)

<https://cv-performance.com/ez-just-mixture-screw-81-87-harley-keihin>

6)

XLForum member - chrishajer

7)

photo by Hippysmack, OEM dims by John Harper

8) 9)

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11)

<https://cv-performance.com/ez-just-mixture-screw>

12)

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17)

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18) 20)

Folkie of the XLFORUM

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23)

<https://cv-performance.com/v-ductor>

25)

<https://cv-performance.com/v-ductor-installation>

27)

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