

by New-Industry.Art

**FMT-PRO2**

The Professional Fork Manipulation Tool – enhanced version 2

**Content of the FMT-PRO2 kit (in the picture above, from left to right)**

- |     |   |                     |
|-----|---|---------------------|
| 1.  | Cup with a hole in the middle, called         | <b>SHORT DRIVER</b> |
| 2.  | Concave ring, called                          | <b>RING</b>         |
| 3.  | Long pipe with flaps, called                  | <b>LONG DRIVER</b>  |
| 4.  | Fork shaped sleeve, called                    | <b>SPLIT DRIVER</b> |
| 5.  | Concentric short ring, called                 | <b>GUIDE</b>        |
| 6.  | Short cup with a hole in the middle, called   | <b>HEAD</b>         |
| 7.  | Axial thrust bearing, called                  | <b>BEARING</b>      |
| 8.  | Threaded rod with fixed nut connector, called | <b>ROD</b>          |
| 9.  | Bolt M6 , called                              | <b>BOLT</b>         |
| 10. | Upper left corner, two halves                 | <b>LBE</b>          |

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## General information

### Purpose of the FMT-PRO2 kit

FMT-PRO2 can manage almost all types of Headshok Excentric or Centric suspension forks (e.g. Lefty or Fatty) by Cannondale Headshok (1998-2018), regardless if there is a damper in it or removed. The Tool is designed for SYSTEM INTEGRATION headset, in standard headtube length of 134mm. Specific advantage of this design is GUIDED INSTALLATION. Mistake in alignment by amateur or pro-mechanic can result in damage. This tool kit eliminates that risk. Longer headset is not compatible with this kit, but compatible kit can be requested by special order. Same goes for shorter headset, where this kit can be used only by hammering, not by pulling. **FMT-PRO2 is designed for 7 jobs, but your imagination could find even more purposes:**

1. Extract fork from the bike frame/headtube.
2. Extract upper and lower headset bearing from bearing cup.
3. Extract bearing cup from bike frame /headtube..
4. Insert upper and lower headset bearing cup into headtube (bike frame).
5. Insert upper and lower headset bearing into belonging bearing cup
6. Insert fork into prepared headtube (bike frame).
7. Extract or install lower headset bearing onto the steerer shaft

### Material

This Tool kit is produced by fuse deposition technology on FDM 3Dprinter. Material is bioplastic/thermoplastic -Polylactic Acid, with additives to improve strength and resistance to crack - the "Plus", in tool version 2 enhanced with even stronger SUPER TOUGH variant. It's a very strong material, more resistant to impact than standard PETG thermoplastic. In general, PLA plastic is safer for environment than any other plastic material, can be composted by industrial process.

### Usage and care of the FMT-PRO2 kit

- **BEARING**, a needle thrust bearing, consists of three pieces: upper and lower pressure plate and a needle cage. Assemble the **BEARING** having pressure plates holding the needle cage in between, like a sandwich. Keep bearing components clean. No lubrication is needed because there is no high speed. However, a drop of chain lube oil is good for refreshment of metal contacts.
- For good performance of the Tool, mount your bike/frame firmly on a good bike stand. Flimsy bike stand could deteriorate Tool's efficiency.
- Fork and related bike parts should be completely cleaned before any work starts.
- Always use hammer with plastic head. Rubber or wooden head can do too, but do not use metal hammer. When hitting/hammering the Tool, always aim vertically to the centre of the Tool top.
- Don't attempt to modify/force flexible parts of a tool, by pulling or pushing. Tool material is not elastic, parts flex due to special design. Tool can break if forced by other means than the function suggest.
- Operational temperature is between +10°C and +40°C.  
Use beyond this limitation compromises the structural integrity of the Tool.
- If you have doubts about any aspect related to this Tool, ask Tool manufacturer for advice without hesitation.
- This Tool is designed to be used only for the jobs described in the beginning of this page - "Purpose of the FMT-PRO2 set". Any other usage will immediately cancel the warranty.
- Never use solvents of any kind to clean the Tool.
- Never wash the Tool in hot water. Wash in lukewarm water with hand soap. Rinse and dry with clean cloth.
- Never use hot air for drying. Pressurized air is acceptable, but not necessary.
- Clean Tool should be stored in house environment at temperatures not higher than +45°C
- Store dry. Avoid direct sunlight.

### Warranty

The warranty covers all production or material defects for one year after purchase. Warranty is valid only if all information and instructions in this document have been strictly followed. HeadShokExpert is not responsible for damage made by this tool. You use this Tool kit at your own risk.

## How to assemble tools

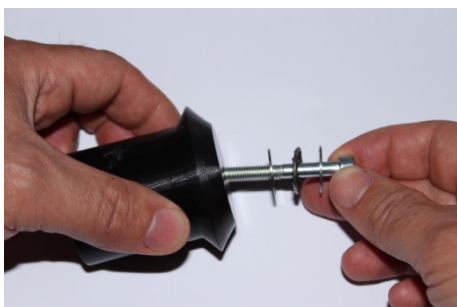
### 1. How to assemble the **INSTALLER 1**

- 1) **RING** has a groove on one end, where **SHORT DRIVER** should be connected.  
Connect **RING** and **SHORT DRIVER** together.

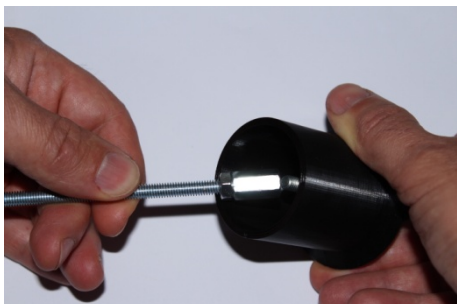


### 2. How to assemble the **INSTALLER 2**

- 1) Put the **BEARING** on the **BOLT** and push them through hole in **SHORT DRIVER**.

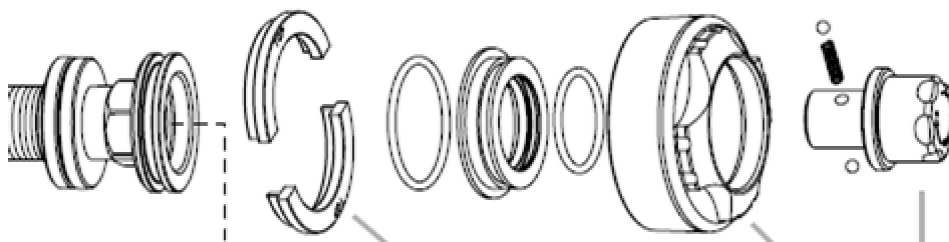


- 2) Screw the **BOLT** into the **ROD** inside the **SHORT DRIVER**, using your fingers only.



## Steps to remove excentric Headshok fork (Lefty) from bike - *model with removable clamps (older models)* -

1. Pay attention on original Cannondale user manual related to your specific Lefty model. You could find there some details specific to your model, which are not covered in this general instruction.
2. Hang bike on a bike stand and remove front brake calliper, remove the wheel.
3. Remove stem from the steerer. Try to immobilize handlebar somehow, so you don't scratch your frame, or damage cockpit components.
4. Release air pressure completely from the fork. Remove upper assembly of your fork, controls such as rebound knob and lock-out lever. Remove top collar, use Shimano BB tool (depending on the model). Pay attention to safely store away all parts of damper's upper assembly (half rings, etc)



5. Undo (do not remove) clamp bolts of the upper crown on both sides and remove the crown and the bearing seal. Remove bolts to apply new Loctite if required.
6. Place **SHORT DRIVER** on top of steerer tube and push it firmly by hand all the way down until it stops. This is the position where you will hammer it.
7. Hold the fork leg with one hand, while hitting the **SHORT DRIVER** with a hammer.
8. Observe if lower bearing remains on the steerer. If it does, your extraction job is done once you move down the steerer for 1cm by hitting it with the **SHORT DRIVER**. If lower bearing sits firmly in its lower bearing cup, use the **LONG DRIVER** to finish the extraction, as explained on next page, from step 7. Carefully keep the alignment of Lefty parallel with headtube, until you get it completely out. VIDEO INSTRUCTION is available to help you understand the explained procedure.

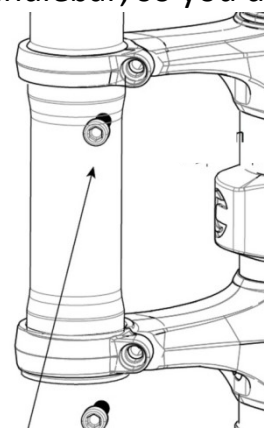
## Steps to remove excentric Headshok fork (Lefty) from bike - *model with non-removable clamps (newer models)* -

1. Pay attention on original Cannondale user manual related to your specific Lefty model. You could find there some details specific to your model, which are not covered in this general instruction.

2. Hang bike on a bike stand and remove front brake calliper, remove the wheel.

3. Remove stem from the steerer. Then try to somehow immobilize handlebar, so you don't scratch your frame, or damage cockpit components.

4. Undo (do not remove) clamp bolts of upper and lower crown.  
Remove bolts to apply new Loctite if required.



5. Place **SHORT DRIVER** on top of steerer tube and push it firmly by hand all the way down until it stops. This is the position where you will hammer it. This is not applicable for bended OPI stem/steerer system!
6. Hold the fork leg with one hand, while hitting the **SHORT DRIVER** with a hammer.
7. Once you move steerer by 1cm downwards, replace the **SHORT DRIVER** with a **LONG DRIVER** connected with **HEAD**, use it to push the steerer downwards
8. While holding the fork leg with one hand, hit the **HEAD** several times with hammer. After 5-6 hits, the steerer will be out, detached from the headtube assembly.
10. Pull out the **LONG DRIVER** carefully; hold Lefty firmly with other hand. Once the **LONG DRIVER** is out, Lefty will be free in your hand. Take care of the upper bearing seal. VIDEO INSTRUCTION is available to help you understand the explained procedure.

## Steps to remove a centric Headshok fork from bike

1. Remove the upper assembly of your fork (controls such as lock-out knob/lever). In case of DLR damper, always remove complete lock-out lever, even if it's two piece lever. It requires a 10mm hex socket for a nut that holds it. Various models have different designs -ask if in doubt.
2. If you want to leave the damper inside the fork, continue to the step 3. If you want to remove the damper, undo the upper clamp bolt of the stem on the fork side and remove the damper.
3. Hang bike on a bike stand and remove front brake calliper (disc brakes) or extend the cable of rim brake, so brake pads open wide. Or remove rim brakes completely. Remove front wheel.
4. Undo clamp bolt(s) of the stem on fork side and pull the stem up to remove it from fork's steerer tube. Try to immobilize handlebar somehow, so you don't scratch your frame, or damage cockpit components.
5. Place **SHORT DRIVER** on top of the steerer tube and push it firmly by hand all the way down until it stops. This is the position where you will hammer it.
6. Hold the fork leg with one hand, while hitting the **SHORT DRIVER** with a hammer. If you don't hold the leg, fork could fall on the ground.
7. Usually 4-5 hits are enough for full extraction. Full extraction equals fork movement of 1cm downwards. You'll feel then it is loose in your hand which holds the fork leg. Don't pull the fork down yet.
8. While still holding the fork with one hand, remove **SHORT DRIVER** and put it away. Place your palm on the top of steerer tube and follow the fork as it goes down by pulling down with lower hand. When upper hand reaches the frame, grasp the rubber bearing seal (the one with metal collar on the inside) and place it somewhere safe.
9. Pull the fork further down until you have it free in your hand.

It doesn't go out? Kind of stuck?

Continue to the next page.



## Steps to fully extract centric fork when lower bearing is stuck

Sometimes you will not be able to pull your centric fork completely out in the end of extraction process. Fork could get stuck half way down. That means the lower headset bearing didn't move along with the fork (steerer), it actually remained firmly in its cup (bike frame).

Continued from previous page...

10. Insert **LONG DRIVER** through the top headset bearing, with flaps upwards.
11. Check and make sure the Tool end is centred exactly over the fork top, not tilted sideways. Connect **HEAD** to the **LONG DRIVER**.
12. While holding a fork leg with one hand, hit the **HEAD** with hammer several times. After 5-6 hits, fork will appear loose in your supporting hand.
13. Pull the fork further down until you have it free in your hand.

## Extraction of headset bearings

### *- applicable for both centric and excentric Headshok -*

1. After step 13 you can extract the lower headset bearing. Have the **LONG DRIVER** (with **HEAD** attached) inserted inside the headtube with flaps towards the headtube. Press flaps with fingers to push **LONG DRIVER** through, and align it to pass through the lower bearing.
2. Place one hand beneath the headtube to catch the extracted bearing.
3. Use another hand to hit **HEAD** 3-4 times until you find extracted bearing in your lower hand.
4. Use similar procedure to extract the upper bearing if you want it out for service or inspection. Just do it upside-down. Insert **LONG DRIVER** (with **HEAD** attached) upwards from below of the head tube. VIDEO INSTRUCTION is available to help you understand the explained procedure.



## **Extraction of bearing cup from the headtube**

***- applicable for both centric and excentric Headshok, but not for integrated cup in carbon frame.-***

Bearing cup should be removed/replaced only if it gets damaged in crash or by bearing seizure. Or maybe you would like to paint your bike frame, or just maintain clean and lubricated contact surfaces. Explanation and presentation is available only in VIDEO INSTRUCTION (YouTube).

## **Insert headset bearing cup into the headtube**

***- applicable for both centric and excentric Headshok -***

When it comes to proper insertion of bearing cup into bike's headtube, FMT-PRO2 comes pretty handy here. You can do it in two ways. By hammer or by puller. Explanation and presentation is available only in VIDEO INSTRUCTION (YouTube).

## **Insert headset bearings into the bearing cup on a frame**

***- applicable for both centric and excentric Headshok -***

You can insert a headset bearing only if bearing cup is securely sitting in correct position in the bike frame (headtube). You can do it in two ways -by hammer, or by included puller screw - hammerless. Clear explanation and presentation is available in VIDEO INSTRUCTION only.

### **REMARKS:**

1. If you want to insert Headshok centric fork into bike frame, you should install only upper bearing into its cup. Lower bearing should always be sitting in its seat in the bottom of the steerer tube before you start insertion process.
2. If you want to insert Headshok excentric fork with removable crown clamps, you can do it with both bearings in their cups. You can also do it with lower bearing sitting in its seat, in the bottom of the steerer tube.
3. If you want to insert Headshok excentric fork with integrated crown clamps, you should always have both headset bearings properly installed in belonging bearings cups in headtube, before you start insertion process. Upper bearing should be covered with bearing seal.

## **Steps to insert a centric Headshok fork (Fatty) into a bike frame**

1. Make sure that lower headset bearing sits evenly at the very bottom of the steerer tube of your fork. Put some grease to cover the “bearing-cup” contact surfaces on bottom side, as well as on the outer steerer tube where upper bearing will sit.
2. Make sure both (upper and lower) headset cups sit flush with the frame.
3. Make sure the upper headset bearing is sitting flush within its cup, and lower is in the bottom of steerer tube (fork!).
4. Make sure the top assembly of the fork (fork action controls) is removed, as you’ve already done in first step of fork extraction.
5. There are two ways to drive the fork further in, to the complete insertion.  
Methods are described in following chapters, 5.1 and 5.2

5.1 -hammered way

5.2 -hammerless way

### 5.1. HAMMERED

**This method requires some hammering. It's universal insertion method for any centric Headshok fork, with or without damper installed.**

- 5.1.1. Push fork with your hand from below into prepared headtube of your bike. Try to push it harder, so it doesn't fall back by itself. Keep holding the fork with your hand until the end of the process.
- 5.1.2. Put the **INSTALLER 1** on top of fork and push it all the way down until it stops by itself.
- 5.1.3. Hit the top of **INSTALLER 1** with a hammer, while holding the leg of the fork with another hand, gently pushing it upwards. Usually 5-6 hits are enough for full insertion.
- 5.1.4. The fork is fully inserted when lower headset bearing is completely inserted into its lower bearing cup, not exposed at all. So keep hitting until you can confirm this.
- 5.1.5. Pull up the **INSTALLER 1** and remove it.
6. Your fork is installed now properly and you can continue with replacing bearing seal, stem and finally the fork controls.

**5.2. HAMMERLESS -Not applicable for DLR dampers and dampers without Lock-Out function!**

Headshok Dampers for centric forks have a threaded hole in the middle of the top part, where cover is mounted. If you have such a damper, you can use the following method without hammer, if you want to insert your fork with damper installed. Without damper properly installed in the fork, this method doesn't work, do it the HAMMERED way.

- 5.2.1. If you have a fork with an air spring, skip 5.2.1. and 5.2.9. Go to 5.2.2. If your fork has MCU or Coil spring, insert appropriate Allen key inside top hole and unscrew a spring adjusting headless screw from the inside. You should count how many turns it takes until it's completely out, so you can install it back to the exact same spring tension. Remove this headless screw and place it somewhere safe.
- 5.2.2. Push fork with your hand from below into the headtube of your bike. Try to push it harder, so it doesn't fall back by itself. Keep holding the fork with your hand until end of the process.
- 5.2.3. Put the **INSTALLER 1** on top of the fork and push it by hand down the steerer tube.
- 5.2.4. Insert the **BOLT** with a **BEARING** into the hole on top of the **INSTALLER 1**.
- 5.2.5. Guide **BOLT** with your fingers into the damper hole and screw it in.
- 5.2.6. Use Allen key and turn **BOLT** clockwise while holding the fork leg with the other hand. Observe how lower headset bearing is driven into its position.
- 5.2.7. **Indication of full insertion:** The fork is fully inserted when lower headset bearing is completely inside its lower bearing cup, unexposed. Keep turning **BOLT** until you can confirm this. If you feel unusual force at certain point while driving the fork in, stop immediately and check for possible cause of obstruction.  
**Stop turning the **BOLT** when you reach indication of full insertion.**  
**You will damage the damper if you continue turning!**
- 5.2.8. Unscrew and remove **BOLT** and **BEARING**.  
Pull up the **INSTALLER 1** and remove it.
- 5.2.9. Replace the headless screw and turn it inwards as many turns as you did while removing it.
6. Your fork is installed now properly and you can continue with replacing bearing seal, stem and finally the fork controls.

## Steps to insert excentric Headshok fork (Lefty) into a bike frame

### - *model with removable clamps (older models)* -

1. Pay attention on original Cannondale user manual related to your specific Lefty model. You could find there some details specific to your model, which are not covered in this general instruction.
2. Make sure that both headset bearings sit properly in belonging cups. If lower bearing remained on the bottom of the steerer, you can leave it there, it's not a problem. Put some grease to cover all contact surfaces (steerer-bearing-cup). Make sure both (upper and lower) headset cups sit fully inserted in the headtube (bike frame). Help yourself with FMT-PRO2 if that's not the case..
4. Pay attention on position of your cockpit cables, if you want them between fork and headtube. Insert the **LONG DRIVER** through the upper bearing, all the way down. Connect the steerer and **LONG DRIVER** together. **LONG DRIVER** will be a guide for the steerer, so steerer doesn't get misaligned while driven in.
5. Use a plastic hammer and hit the steerer from below until it pass the lower bearing. When it passes the lower bearing, it will be easy to push steerer by hand all the way up. Then remove the **LONG DRIVER**. VIDEO INSTRUCTION is available to help you understand the explained procedure.
6. There are two ways to drive the Lefty steerer further in, to the complete insertion. The hammered way: Hammer the fork all the way in, hitting the bottom of steerer with plastic hammer. Install the seal, the upper crown and fork controls. Then pump up the air, install wheel and brake. The hammerless way is described on next page.

**HAMMERLESS EXCENTRIC**

**This is a slower but safer and gentle method.**

1. Connect **INSTALLER 2** with **RING** . Place them on top of the steerer; push all the way down against the upper bearing, while holding the fork with other hand so it doesn't fall down.
2. Position the **HEAD** against bottom of steerer with conical end facing in.
3. Screw the **ROD** of **INSTALLER 2** into the **HEAD** and keep turning the **BOLT**
4. When you see the steerer is in the bearing all the way, or you feel higher force on the bolt, stop turning, your fork is installed. Unscrew the **INSTALLER 2** and remove tools. VIDEO INSTRUCTION is available to help you understand the explained procedure.
5. Install the seal, the upper crown, stem and fork controls. Then pump up the air, install wheel and brake

## Steps to insert excentric Headshok fork (Lefty) into a bike frame

### *- model with non-removable clamps (newer models) -*

1. Pay attention on original Cannondale user manual related to your specific Lefty model. You could find there some details specific to your model, which are not covered in this general instruction.
2. Make sure that both headset bearings sit properly in belonging cups. Put some grease to cover all contact surfaces (steerer-bearing). Make sure both (upper and lower) headset cups sit fully inserted in the headtube (bike frame). Help yourself with FMT-PRO2 if that's not the case.
3. Pay attention on position of your cockpit cables if you want them between fork and headtube. Align Lefty fork to sit properly, with headtube (+ upper seal!) in the middle of lower and upper crown. Once aligned, insert the **LONG DRIVER** from the top, all the way down. Connect the steerer and **LONG DRIVER** together. **LONG DRIVER** will be a guide for the steerer, so it doesn't get misaligned while driven in.
4. Use a plastic hammer and hit the steerer from below until it passes the lower bearing. When it passes the lower bearing, it will be easy to push steerer by hand all the way up. Then remove the **LONG DRIVER**.

There are two ways to drive this Lefty steerer further in, to the complete insertion. The hammered way and hammerless. Both are already explained in previous instruction (page 13-14).



## Extraction of lower headset bearing from the steerer with LBE tool

Steps to follow:

1. If you have disassembled your centric fork and have the steerer shaft separated on your work bench, you can use the same method as described on the next page. If you didn't disassemble the fork and remove steerer, place your fork to lie freely on the work bench. Work bench should have clean surface with no sharp objects or obstructions which could damage the paintjob or rubber boot.
2. If fork is excentric, skip to step 3. You should remove the upper zip tie on the rubber boot. Pull down the rubber boot by 5mm, to expose bearing completely and enable grasping it with the tool.
3. Connect both halves of **LBE** tool around the bearing. Grasp the assembled tool with your palm, so the thumb holds one half, while other fingers hold the other half.
4. Place a **SHORT DRIVER** over the steerer end.
5. While firmly holding the **LBE** in one hand, hit the **SHORT DRIVER** with hammer in the other hand. In few hits, the bearing will be extracted from the lower bearing seat.
6. Remove the **LBE** tool part, move bearing upwards until it reaches the upper seat.
7. Connect the **LBE** again around the steerer, this time below the bearing, but do not change the orientation of the **LBE**.
8. While firmly holding the **LBE** in one hand, hit the **SHORT DRIVER** with hammer in the other hand. In few hits, the bearing will pass the upper seat.
9. Remove tools and pull the bearing out from the steerer.

## Installation of lower headset bearing onto the steerer

Steps to follow:

1. Align the lower bearing on top of the steerer and push it by hand down against the upper bearing seat. Assemble the **INSTALLER-1** and use it to drive the bearing over the upper bearing seat. Use a plastic hammer.
2. Push the bearing down to the lower bearing seat by hand.
3. Push the **SPLIT DRIVER** down the steerer, to contact the bearing, with split end of the **SPLIT DRIVER** pointing upwards. Closed, round end of the **SPLIT DRIVER** should contact the lower bearing.
4. Place the **SHORT DRIVER** on the steerer top, push it down over the steerer top to touch the upside-down legs of the **SPLIT DRIVER**.
5. While firmly holding the fork in one hand (or the steerer stands alone on your wooden bench if removed from the fork), hit the **SHORT DRIVER** with hammer in the other hand. In few hits, the bearing will be in place, covering the lower bearing seat. By design and calculated tool length, you won't be able to push the bearing too far. For centric forks, if you install the bearing WITH a damper inside the steerer, you should use **INSTALLER-1** instead of **SHORT DRIVER** and observe bearing position carefully.
6. Remove all tools from the steerer shaft. The job is done. The steerer is now ready to be inserted into the headtube of your bike.