Tools for data recovery experts

Guide for using HddSurgery™ head change tools:

- ***HDDS Sea 2.5" Ramp Set***

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1. Introduction

This guide is intended as a short course in handling of our tools for professionals in data recovery. It is assumed that the user is experienced in data recovery and familiar with "traditional" ways of saving data. This manual should not be taken as a guide for training.

Using these tools without adequate software support is not recommended. It is recommended to use some of the proven systems for cloning, such as Ace Lab, Salvation Data, Copy-r and other products.

It is possible to recover data without HddSurgery™ tools. In many cases, the known processes of hard drive head replacement are effective and sufficient. The general idea behind HddSurgery™ tools was to make sure that the process of replacing damaged hard drive heads goes with no errors. The use of HddSurgery™ tools prevents the ferromagnetic read/write heads to come in any kind of contact with the platter i.e. disk surface or other read/write heads. Also, with some basic procedures and short training, it is possible to let junior data recovery technicians handle complex tasks. With the development of these tools, we are trying to eliminate the element of luck that usually accompanies the process of data recovery.

Experienced data recovery technicians or engineers can have great success even without our tools, but they can have absolute security only by using HddSurgery™ tools.

Non-contact head replacement implies that there is no contact between the heads, or between heads and platters in the process of dismounting the donor heads and mounting heads on the patient drive. Traditional techniques of replacing the heads imply contact between the heads and contact of heads with the platters in data area. These problems especially come to light on drives that have suffered some form of physical damage.

This tool doesn't solve the head compatibility problem. It will only assure that the head replacement goes easily. If you have questions about compatibility, you can send them to HddSurgery™ support team on support@hddsurgery.com

HddSurgery™ is not responsible for any eventual damage caused by usage of our tools.
HddSurgery™ is not responsible for the data stored on the patient or donor hard drives.

2. HddSurgery™ head replacement tools

HddSurgery™ **HDDS Sea 2.5" Ramp Set** is a set of head replacement tools which can be used to safely and easily replace heads on most of 2.5" Seagate hard drives which "park heads" on a ramp. Set contains 5 pairs of head replacement tools: **Sea 2.5" Ramp p1**, **Sea 2.5" Ramp p2a**, **Sea 2.5" Ramp p2b**, **Sea 2.5" Ramp p3** and **Sea 2.5" Ramp p4**.

▪ Sea 2.5" Ramp p1

This head replacement tool can be used on 2.5" Seagate hard drive model Momentus Thin with 1 platter.

▪ Sea 2.5" Ramp p2a

Sea 2.5" Ramp p2a head replacement tool can be used on the first type of Seagate 2.5" hard drive mechanics which includes models 4200.2, 5400.2, 5400.3, 5400.4 and Momentus PSD with 1 or 2 platters.

▪ Sea 2.5" Ramp p2b

Sea 2.5" Ramp p2b head replacement tool can be used on the second type of Seagate 2.5" hard drive mechanics which includes models 7200.3, 7200.4, 7200.5, 5400.5 and 5400.6 with 1 or 2 platters.

Sea 2.5” Ramp p3

Sea 2.5” Ramp p3 head replacement tool can be used on older 2.5” Seagate hard drive model FreePlay which has 3 platters. These hard drives usually came in external FreeAgent Go casings and had capacities of 750GB or 1TB.

Sea 2.5” Ramp p4

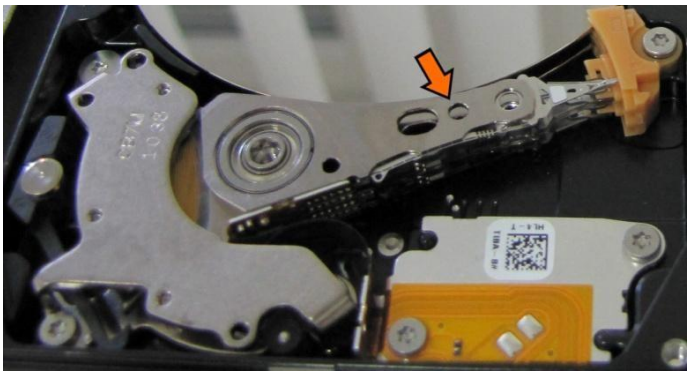
This head replacement tool can be used on new 2.5” Seagate hard drive model FreePlay with 4 platters and 7 or 8 heads. These hard drives usually come in external FreeAgent GoFlex casings with capacities larger than 1TB.

Choosing the correct tool

Seagate hard drives with 1 or 2 platters (not Momentus Thin) can have two types of mechanics. These two types of mechanics on can be easily recognized. When you remove the lid from a hard drive, perform a visual check to see which of the tools should be used.

- First type of these hard drives usually have one round hole near the center of the head arm through which the tool is mounted. On these hard drives, **Sea 2.5" Ramp p2a** tool should be used.

- Second type of these hard drives have one round hole on the head arm near the "tip" where the heads are and the tool is mounted through this hole. **Sea 2.5" Ramp p2b** tool should be used on these hard drives.



In this guide, we will explain only the functioning of **Sea 2.5" Ramp p2a** head replacement tool separately. For all other tools, the process of head replacement will be explained with **Sea 2.5" Ramp p2b** tool.

3. Supported models

HDDS Sea 2.5" Ramp Set

Most of supported Seagate hard drives don't have a definitive way to determine the type of mechanics only by their model name. Because of this, we will present a list of Seagate hard drives supported by the whole set.

5400.6	5400.5	5400.4	5400.3	Momentus Thin	Freeplay
ST9500325AS ST9320325AS ST9250315AS ST9160301AS ST9160314AS ST9120315AS ST980313AS ST9500325ASG ST9320325ASG ST9250315ASG ST9160314ASG ST980313ASG	ST9320320AS ST9160310AS ST980310AS ST9320320ASG ST9160310ASG ST980310ASG	ST9250827AS ST9200827AS ST9160827AS ST9120817AS	ST9160821AS ST9120822AS ST9100828AS ST980811AS ST960813AS ST940814AS ST9160821A ST9120822A ST9100828A ST980815A ST960815A ST940815A	ST500LT012 ST320LT007 ST320LT009 ST320LT012 ST320LT014 ST320LT020 ST250LT003 ST250LT007 ST250LT012 ST250LT021 ST500LM021	ST9750430AS ST9888430AS ST91000430AS ST1000LM010 ST1000LM002 ST1500LM003 **Kahuna 5400** ST500LM000

7200.4	7200.3	Momentus PSD	7200.5*	5400.2*	4200.2*
ST9500420AS ST9320423AS ST9250410AS ST9160412AS ST9500420ASG ST9320423ASG ST9250410ASG ST9160412ASG	ST9320421AS ST9250421AS ST9160411AS ST980411AS ST9320421ASG ST9250421ASG ST9160411ASG ST980411ASG	ST91608220AS ST91208220AS ST9808212AS	ST9750422AS ST9750421AS ST9750420AS ST9640422AS ST9640421AS ST9640420AS ST9500424AS ST9500423AS ST9750420ASG ST9640420ASG ST9500423ASG	ST9120821A ST9100824A ST98823A ST96812A ST94813A ST93811A ST9120821AS ST3100824AS ST98823AS ST96812AS ST94813AS ST93811AS	ST9100822A ST980821A ST960821A ST950212A ST9402113A ST930219A

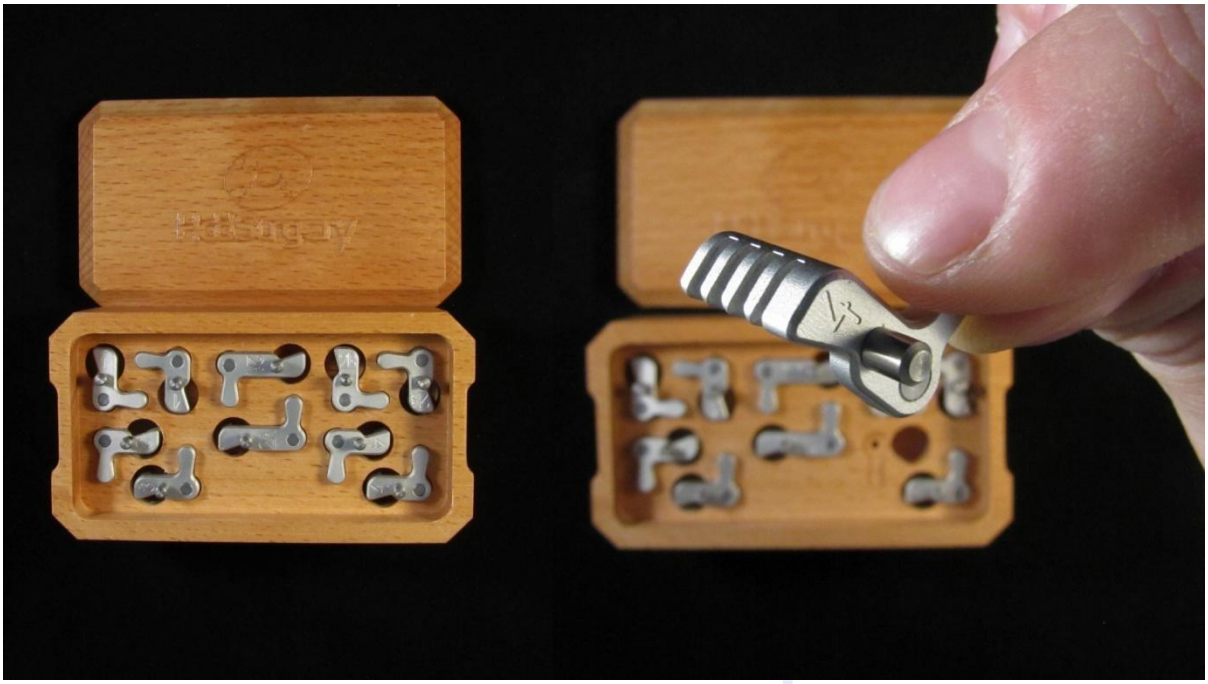
*Due to the large diversity in 2.5" Seagate hard drive mechanics, some tools will have a limited function on some models of these hard drives. Limited function will mean that the securing pin couldn't be used because the hole for it on the head arm has a slightly different shape or position.

4. Handling the tools

When not in use, the tools should always be kept in a wooden box delivered with the tools. This way of keeping the tools prevents any possible damage which could appear when not handled properly.

When taking the tool out of the box, always hold it for the shank. Never hold the tool in the part where the head lifting snouts are.

Due to the sensitivity of hard drive platters to dust and any kind of contamination, be sure to clean the tools before their use. Tools can be cleaned with a piece of cotton wool and alcohol. When cleaning the head lifting snouts, be extremely gentle.



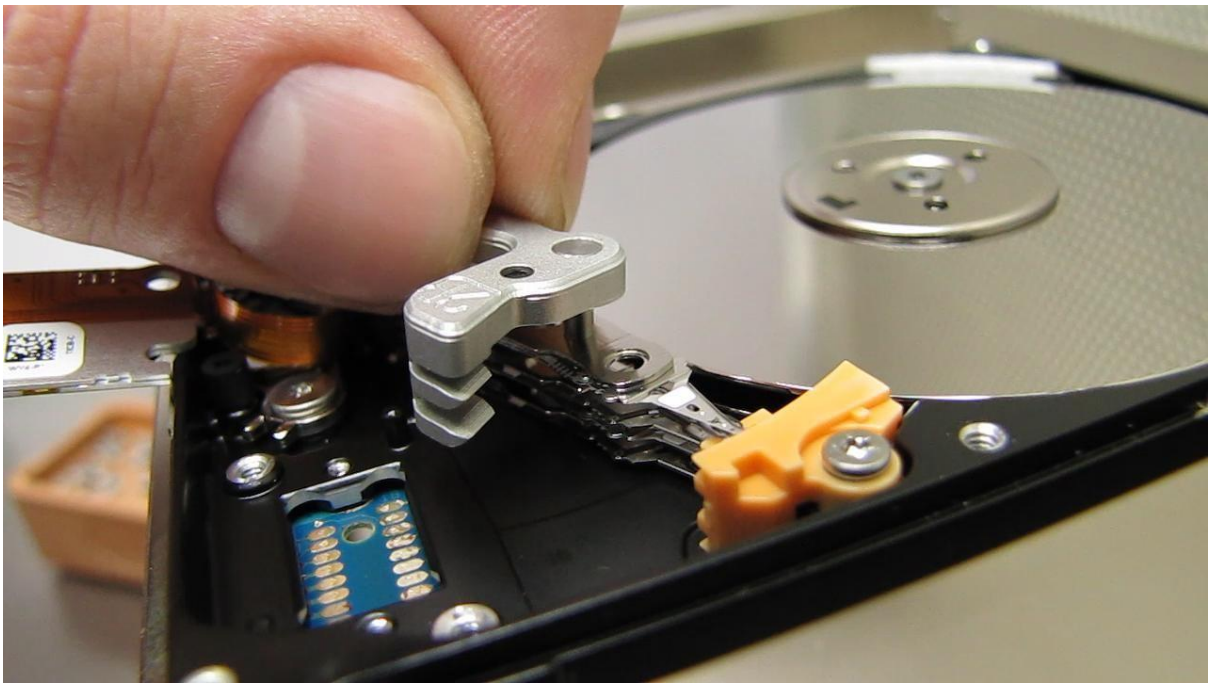
Picture 1. (handling the tools)

5. Head replacementprocess

Step 1 – Mounting the tool on actuator arm

Remove screws that are holding the flat cable connector and the magnet. Remove the magnet. Push the connector from the bottom upwards to release it. Pressure from below may cause the connector to pop out and possibly damage platters. Because of this, hold the top of connector with another hand while pushing it from the bottom.

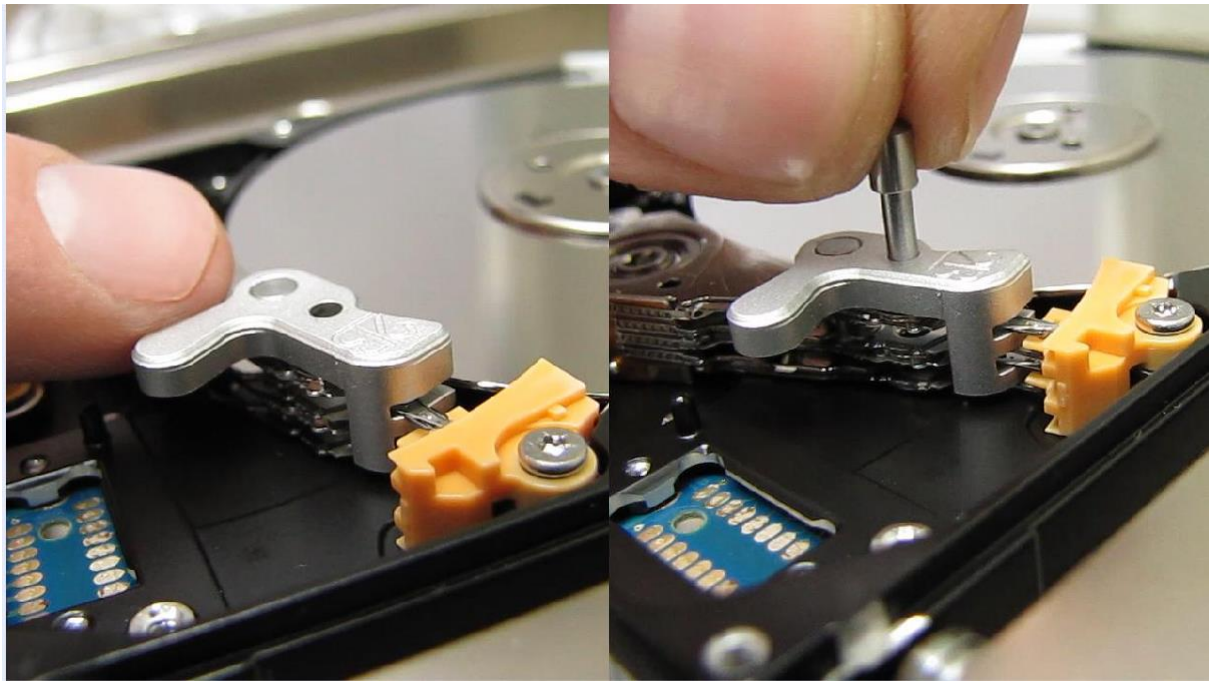
Carefully center the axis of the tool over the larger round hole near the “tip” of the head arm. Take care that the snouts stand away from the heads, and push the axis of the tool all the way down through the hole. Axis of the tool should go easily through this hole.



*Picture 2. (mounting the **Sea 2.5” Ramp p2b** tool)*

Step 2 – Securing the heads with the tool

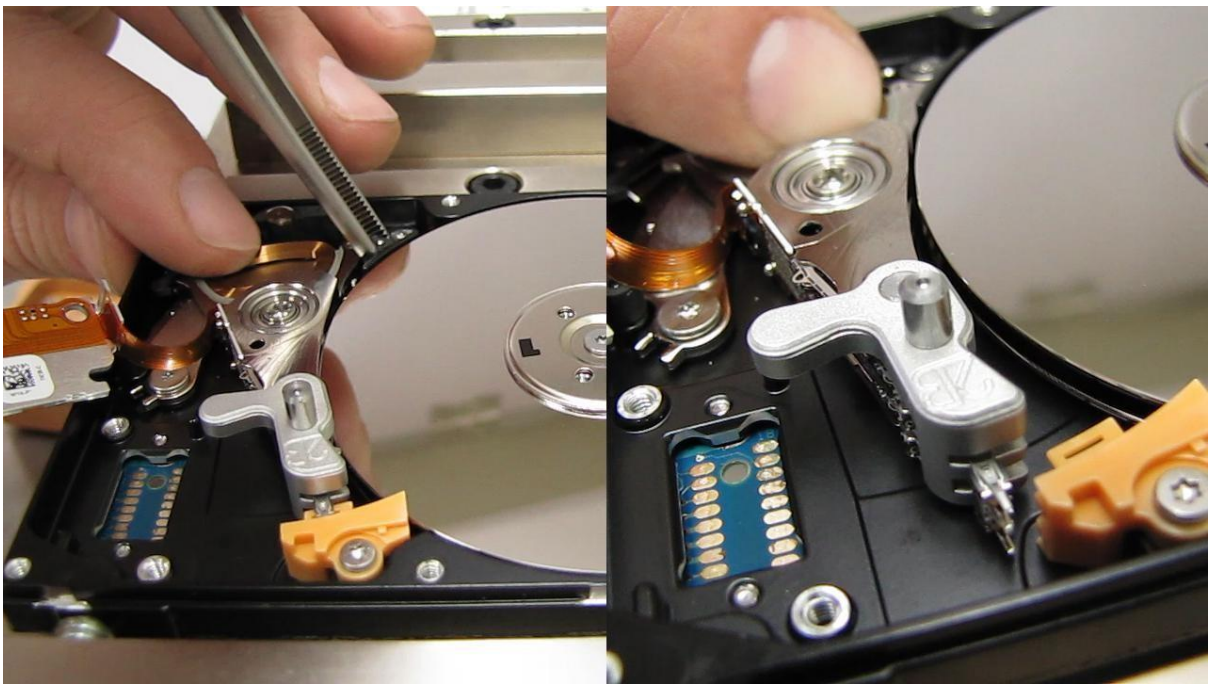
Push the tool so the snouts go between the heads. These snouts will keep the distance between the heads and assure that the heads don't touch each other. Secure the tool in this position with provided securing pin. Pin should go through the hole easily.



Picture 3. (securing the heads with the tool)

Step 3 – Moving the heads off the ramp

Remove the security brake and scroll the heads off the ramp. When heads are off the ramp, tool will prevent the heads from touching each other and head assembly can be safely and easily transferred to another drive.



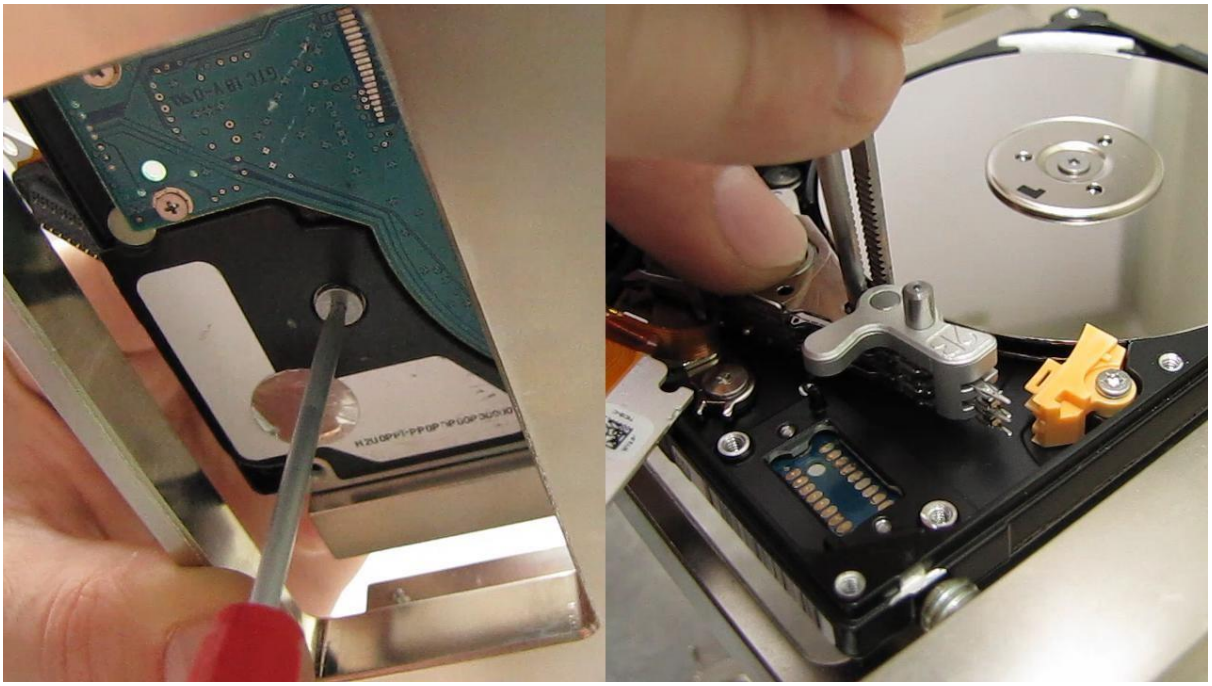
Picture 4. (moving the heads off the ramp)

Step 4 – Dismounting the heads

Unscrew and remove the screw that's holding the head arm connected to the hard drive casing. While unscrewing this screw, hold the head arm with your other hand to prevent the heads from going back to the ramp area.

To lift the head assembly, tweezers are needed. Use tweezers to grab the head assembly through some of the holes on the head arm. Pull the head arm up using the tweezers. To make sure that the head assembly goes straight up, use one finger to pull the back side of the head arm (side where the magnetic coil is) simultaneously. Don't try to dismount the heads by pulling the tool.

When using **Sea 2.5" Ramp p1** tool, supported hard drives don't have a tight connection to the casing (no screw) so the heads are just lifted.



Picture 5. (dismounting the heads)

Step 5 – Mounting the heads in a patient drive

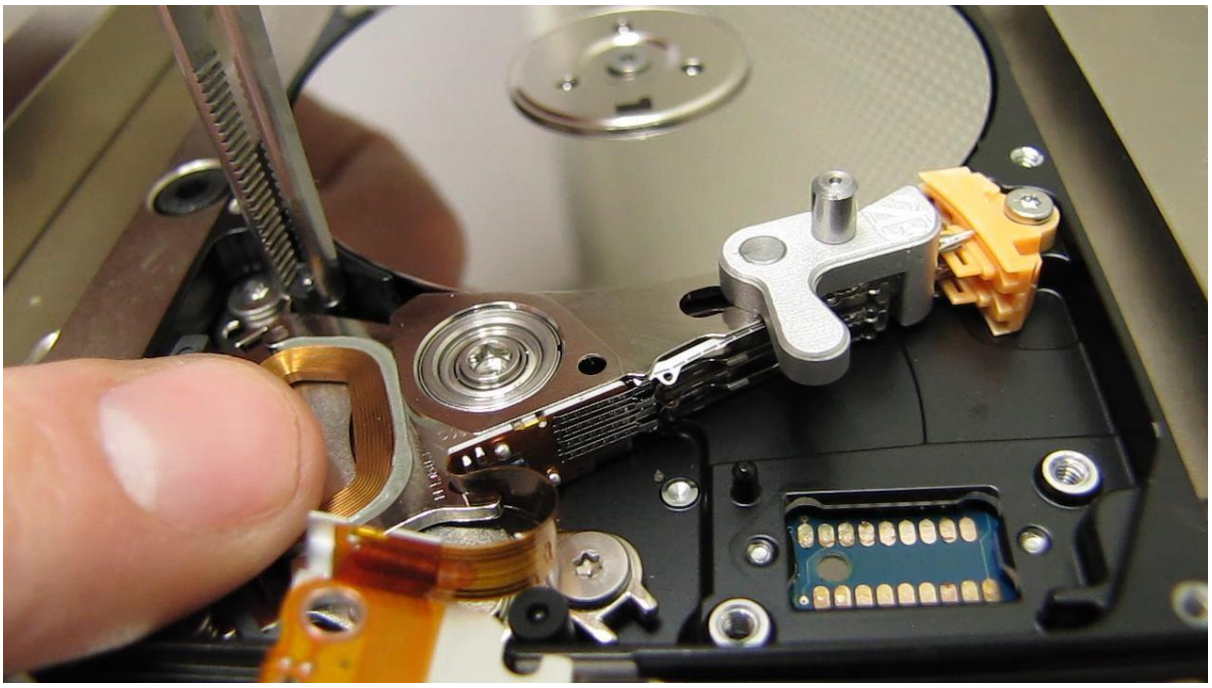
Place the head assembly to its place in a patient hard drive using the tweezers. Assist the process with your other hand.

When the head arm is in its place, screw the head arm from the bottom. Be sure to tighten this screw to assure good connection between the head arm and the hard drive casing.

Picture 6. (mounting the heads in a patient drive)

Step 6 – Moving the heads to the ramp

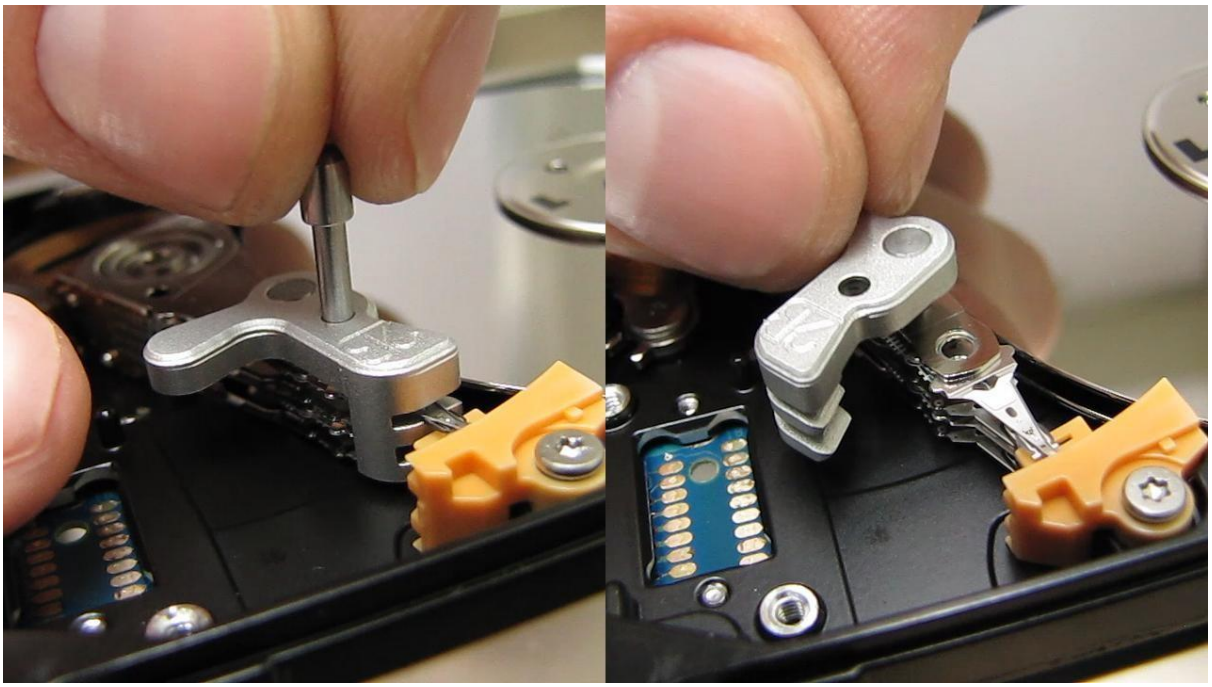
Push the heads over the ramp. While holding the heads on the ramp, return the security brake to its place.



Picture 7. (moving the heads to the ramp)

Step 7 – Dismounting the tool

Remove the security pin from the tool. Scroll the tool away from the heads. While holding the head arm in its place with one hand, pull the axis of the tool out of the hole to dismount the tool.



Picture 8. (dismounting the tool)

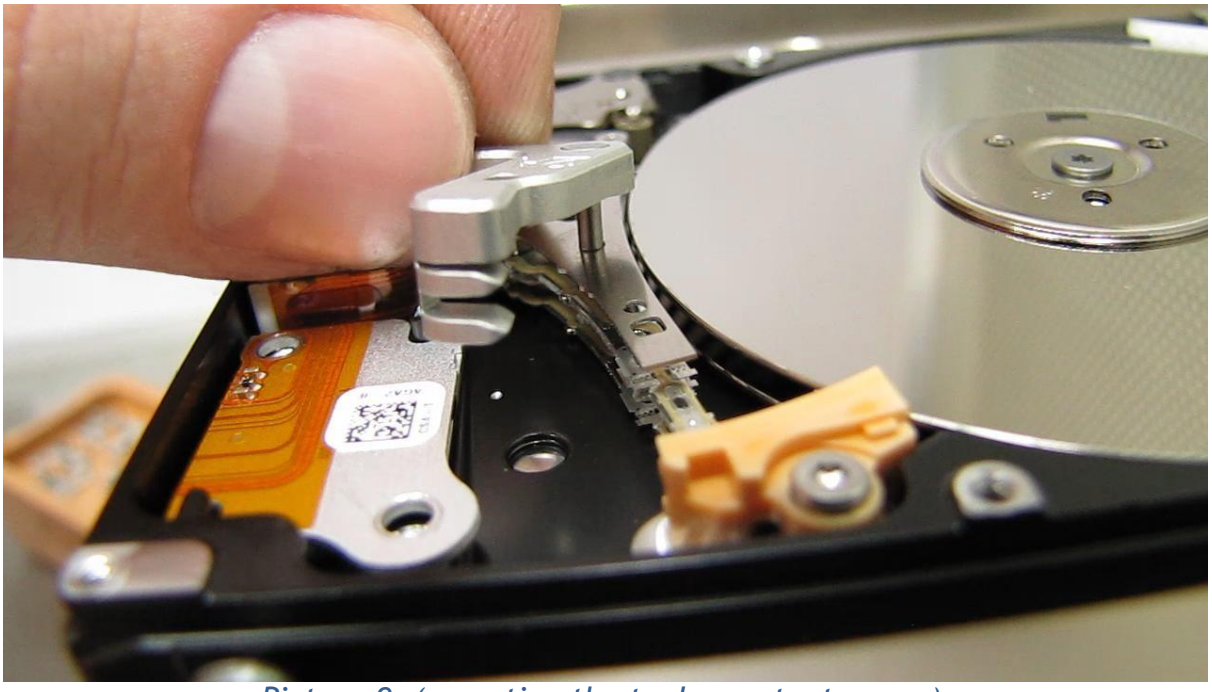
Put the lid back to close the disk. Put PCB back and clone the drive.

6. Head replacement process with Sea 2.5” Ramp p2a tool

Step 1 – Mounting the tool on actuator arm

Remove screws that are holding the flat cable connector and the magnet. Push the connector from the bottom upwards to release it. Pressure from below may cause the connector to pop out and possibly damage platters. Because of this, hold the top of connector with another hand while pushing it from the bottom. Do not remove the magnet yet because it is the only thing holding the heads on a ramp.

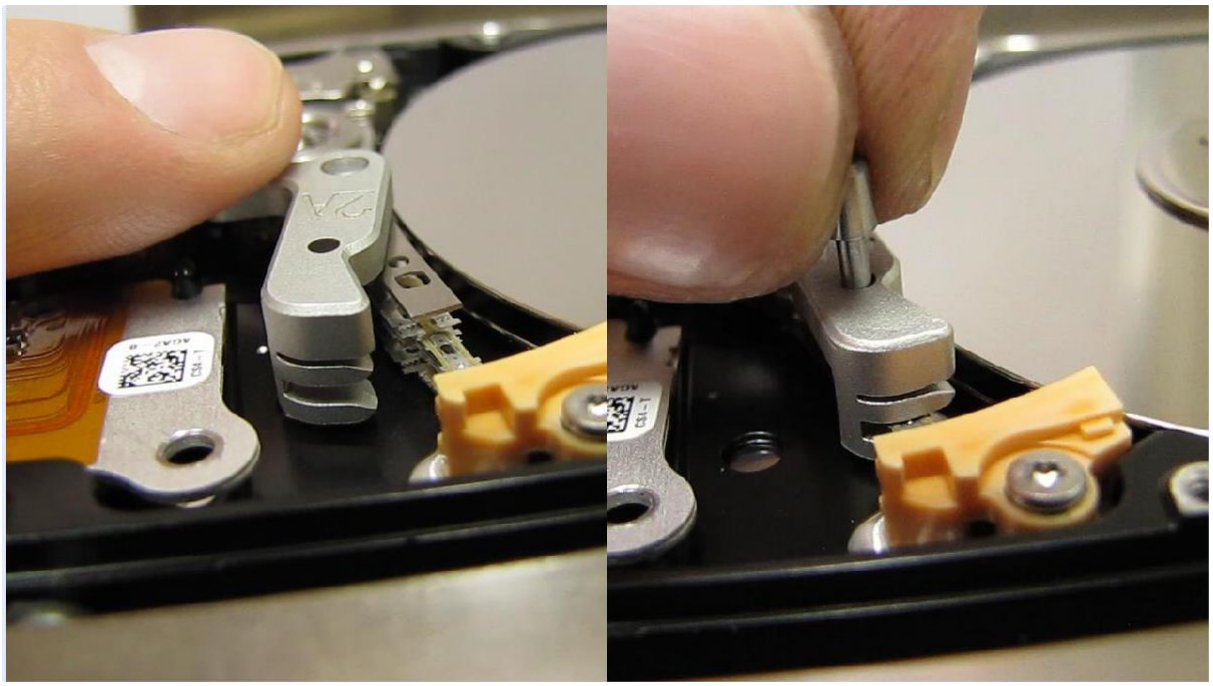
Carefully center the axis of the tool over the smaller hole near the center of the head arm. Take care that the snouts stand away from the heads, and push the axis of the tool all the way down through the hole. Axis of the tool should go easily through this hole.



Picture 9. (mounting the tool on actuator arm)

Step 2 – Securing the heads with the tool

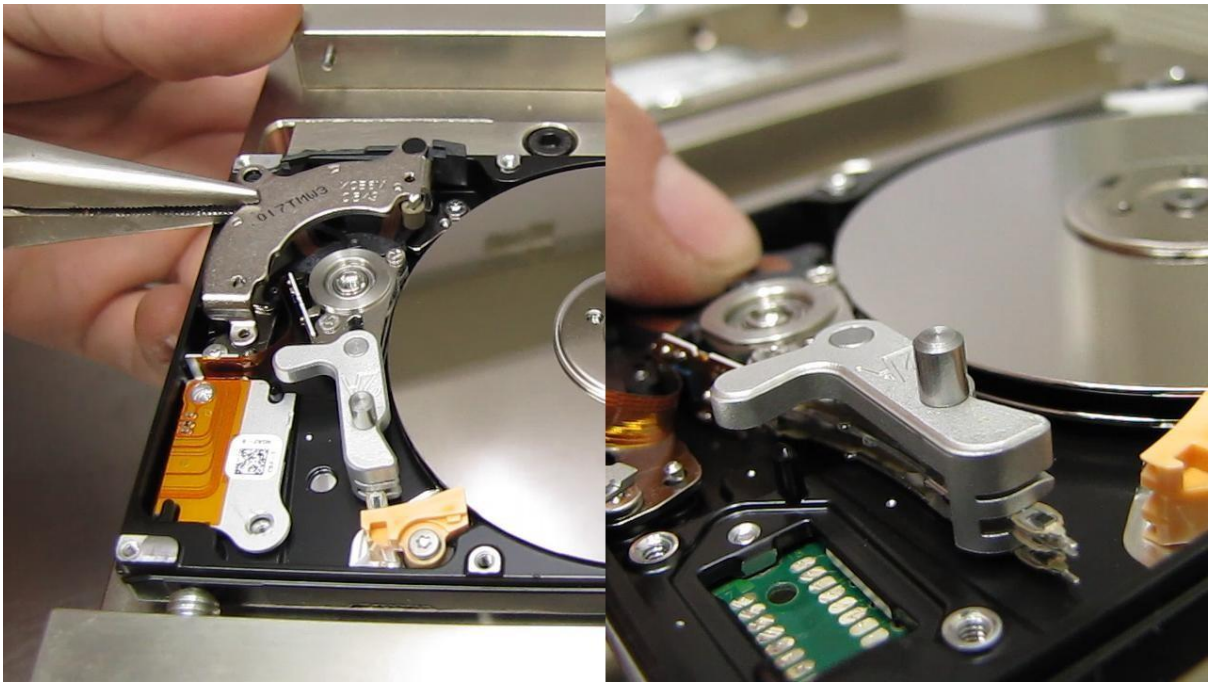
Apply light pressure on the tool's handle and push the tool so the snouts go between the heads. These snouts will keep the distance between the heads and assure that the heads don't touch each other. Secure the tool in this position with provided securing pin. Pin should go through the hole easily.



Picture 10. (securing the heads with the tool)

Step 3 – Moving the heads off the ramp

Remove the magnet and scroll the heads off the ramp. When heads are off the ramp, tool will prevent the heads from touching each other and head assembly can be safely and easily transferred to another drive.

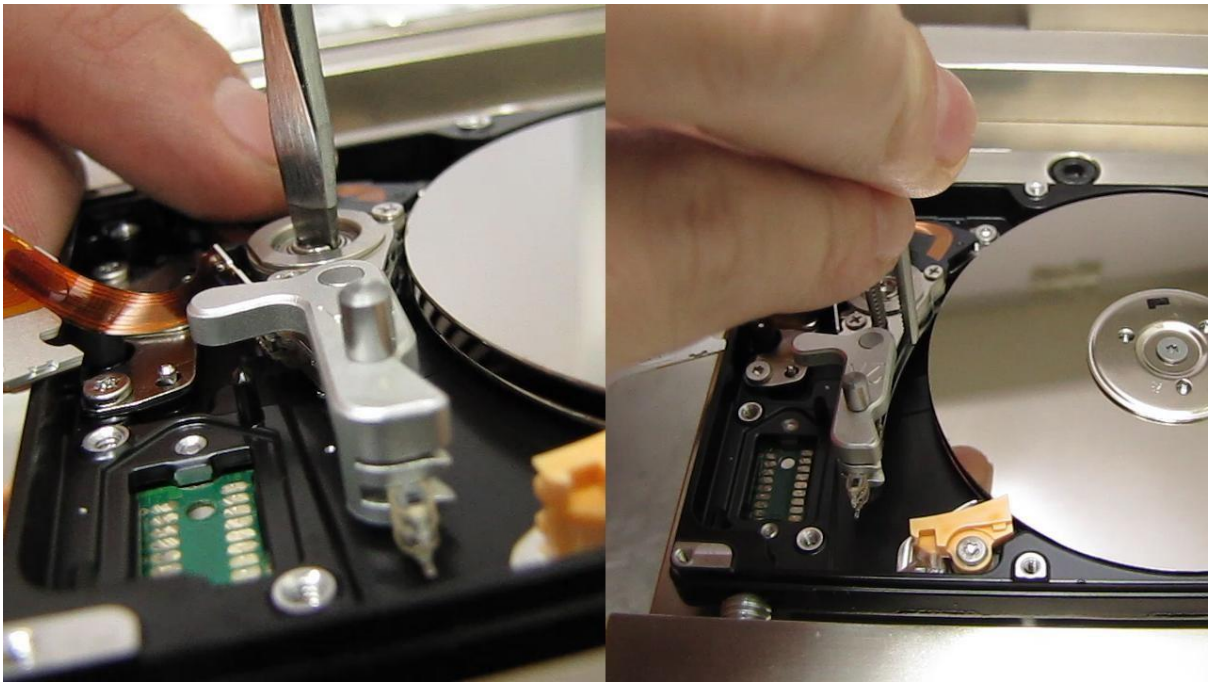


Picture 11. (moving the heads off the ramp)

Step 4 – Dismounting the heads

Head arms on these hard drives have a thread on the bottom which is holding them connected to the hard drive casing. Using a standard flat head screwdriver, unscrew the spindle of the head arm therefore unscrewing the head arm from the casing. While unscrewing, hold the head arm with your other hand to prevent the heads from going back to the ramp area.

To lift the head assembly, tweezers are needed. Using the tweezers, grab the head assembly through some of the holes on the head arm and then pull the head arm up. To make sure that the head assembly goes straight up, use one finger to pull the back side of the head arm (side where the magnetic coil is) simultaneously. Don't try to dismount the heads by pulling the tool.

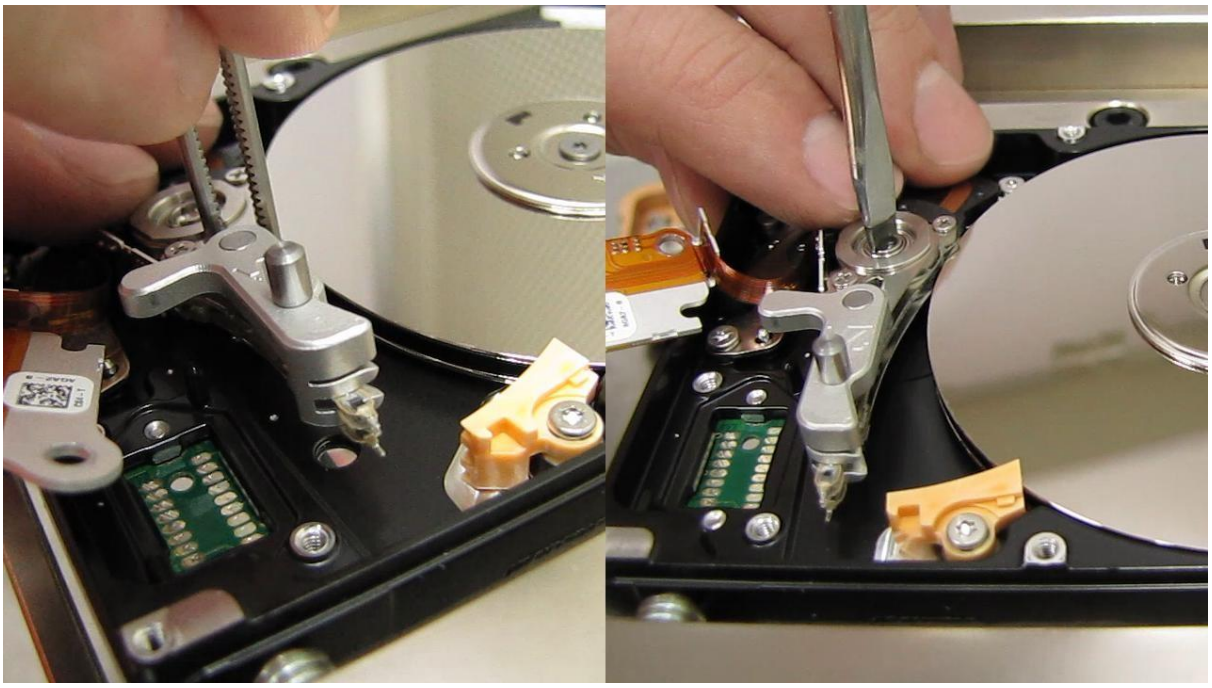


Picture 12. (dismounting the heads)

Step 5 – Mounting the heads in a patient drive

Place the head assembly to its place in a patient hard drive using the tweezers. Assist the process with your other hand.

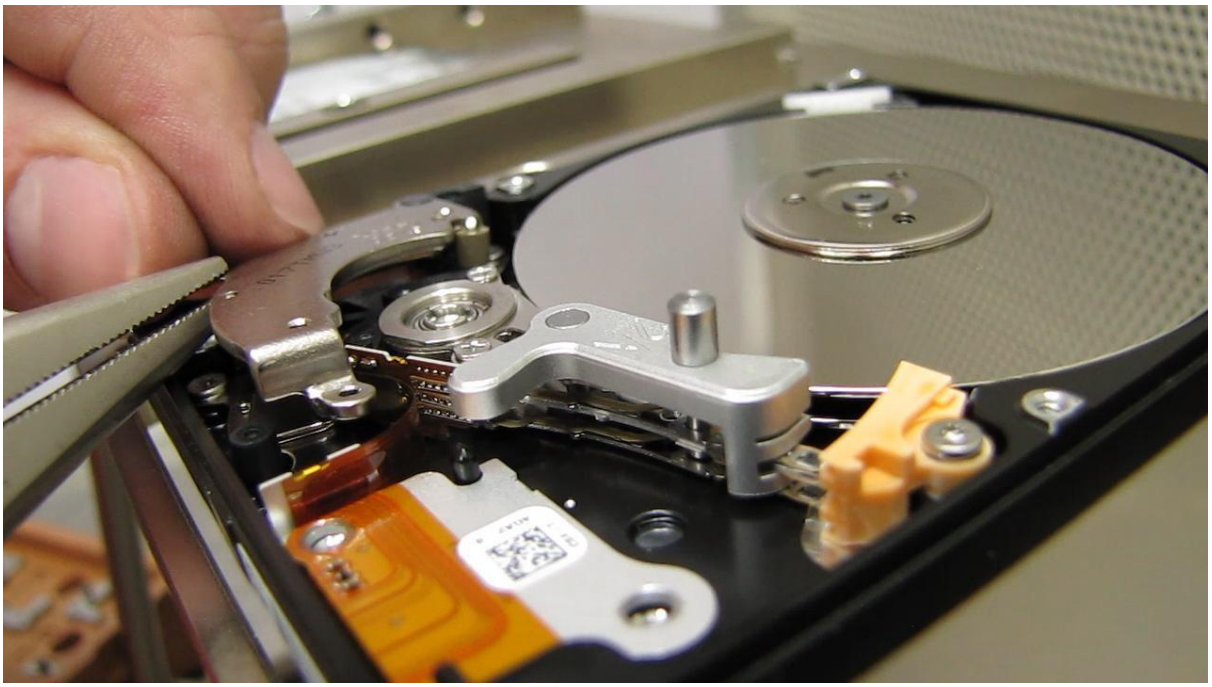
When the head arm is in its place, screw the spindle of the head arm to mount it to the casing. Be sure to tighten this “screw” to assure good connection between the head arm and the hard drive casing.



Picture 13. (mounting the heads in a patient drive)

Step 6 – Moving the heads to the ramp

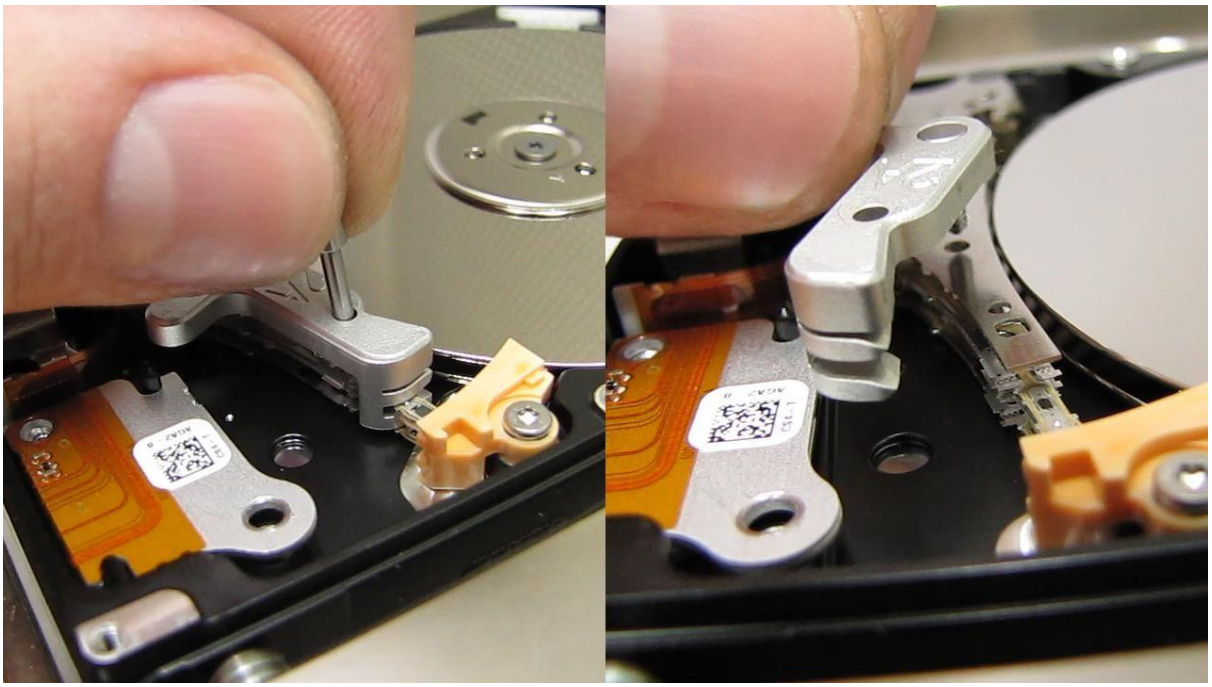
Push the heads over the ramp. While holding the heads on the ramp, return the magnet to its place. Be very careful in this step because the magnet might damage the heads if it lands on the magnetic coil of the head arm.



Picture 14. (moving the heads to the ramp)

Step 7 – Dismounting the tool

Remove the security pin from the tool. Scroll the tool away from the heads. While holding the head arm in its place with one hand, pull the axis of the tool out of the hole to dismount the tool.



Picture 15. (dismounting the tool)

Put the lid back to close the disk. Put PCB back and clone the drive.

You can find more information about this tool and many other tools used for data recovery on our website.

http://www.hddsurgery.com/

Also you can watch the videos that show how this tool works on our YouTube channel.

http://www.youtube.com/user/HddSurgery