



Tools for data recovery experts

Guide for using HddSurgery™ head change tools:

- *HDDS Sea 3.5" 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 3.5" Ramp Set** is a set of head replacement tools which can be used to safely and easily replace heads on almost all new 3.5" Seagate hard drives which "park heads" on a ramp. Set contains 6 pairs of head replacement tools: **Sea 3.5" Ramp p1**, **Sea 3.5" Ramp p2**, **Sea 3.5" Ramp p3a**, **Sea 3.5" Ramp p3b**, **Sea 3.5" Ramp p4** and **Sea 3.5" Ramp p5**.

- **Sea 3.5" Ramp p1**



This head replacement tool can be used on 3.5" Seagate hard drive models Barracuda, SV35, Constellation ES, ES.2, CS and others which have 1 platter and with their heads parked on a ramp.

- **Sea 3.5" Ramp p2**



Sea 3.5" Ramp p2 head replacement tool can be used on 3.5" Seagate hard drive models Barracuda, SV35, Constellation ES, ES.2, CS and others which have 2 platters and their heads parked on a ramp.

- **Sea 3.5" Ramp p3a**



New series of 3.5" Seagate hard drives with 3 platters, which park their heads on a ramp, can have two types of mechanics. **Sea 3.5" Ramp p3a** head replacement tool can be used on first type of these drives which include models Barracuda, SV35, Constellation ES, ES.2, CS and others with 3 platters and their heads parked on a ramp. These hard drives usually have only one small hole near the center of the head arm through which the tool is mounted.

- Sea 3.5" Ramp p3b



Sea 3.5" Ramp p3b head replacement tool can be used on the second type of 3 platter drives which includes models Barracuda Green and Constellation ES with their heads parked on a ramp. The supported drives have one larger hole on the head arm near the "tip" where the heads are and the tool is mounted through this hole. These two types of mechanics can be easily recognized.

- Sea 3.5" Ramp p4



This head replacement tool can be used on 3.5" Seagate hard drive models Constellation ES, Barracuda XT and other models with 4 platters which park their heads on a ramp.

- Sea 3.5" Ramp p5



Sea 3.5" Ramp p5 head replacement tool can be used on 3.5" Seagate hard drive models Constellation ES, Barracuda XT and other models which have 5 platters and their heads parked on a ramp.

3. Supported models

HDDS Sea 3.5" Ramp Set			
<p>Most of these supported Seagate hard drives don't have a definitive way to determine the platter number only by their model name. Certain models come with both 2 and 3 platters, some with both 4 and 5 platters. Because of this, we will present a full list of Seagate hard drives supported by the whole set.</p>			
Barracuda	Barracuda Green	Barracuda XT	SV35
ST3000DM001 ST2000DM001 ST1500DM001 ST1000DM003 ST750DM003 ST500DM002 ST320DM000 ST250DM000	ST2000DL003 ST1500DL003	ST33000651AS ST32000641AS	ST3000VX000 ST2000VX000 ST1000VX000
Constellation ES		Constellation ES.2	Constellation CS
ST2000NM0001 ST2000NM0011 ST2000NM0031 ST1000NM0001 ST1000NM0011 ST500NM0001 ST500NM0011		ST32000444SS ST32000445SS ST32000644NS ST31000424SS ST31000524NS ST3500414SS ST3500514NS	ST33000650NS ST33000650SS ST32000645NS ST32000645SS
		ST3000NC002 ST3000NC000 ST2000NC001 ST1000NC001	

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.



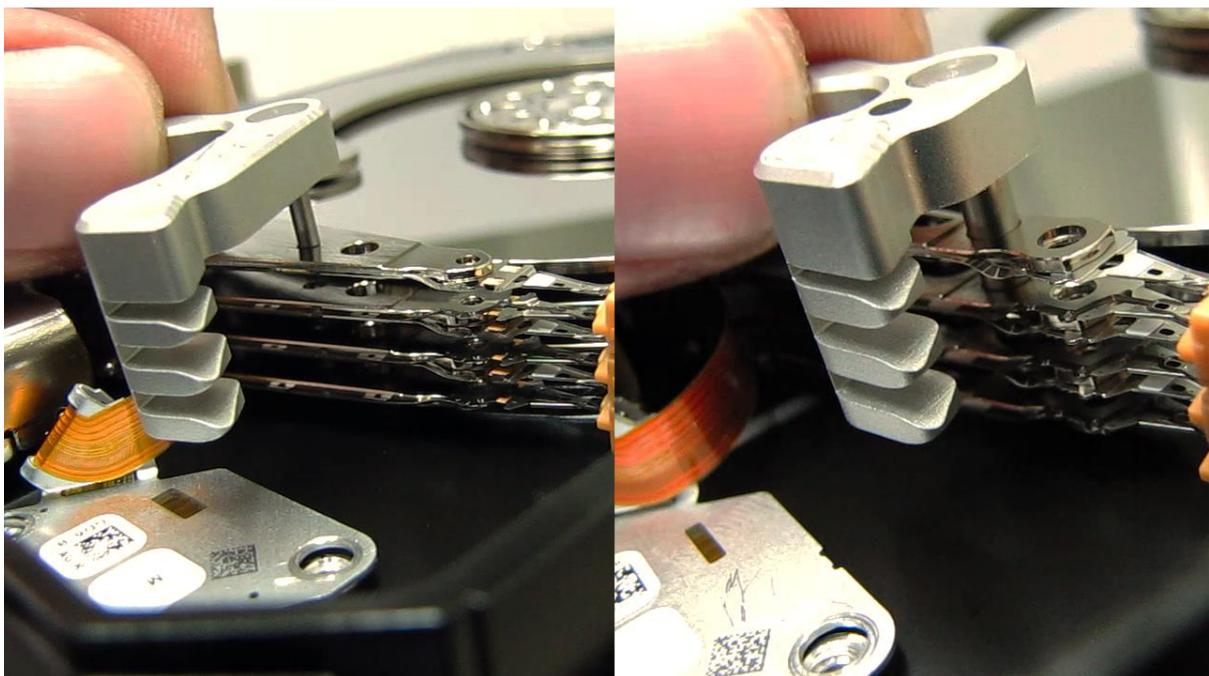
Picture 1. (handling the tools)

5. Head replacement process

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.

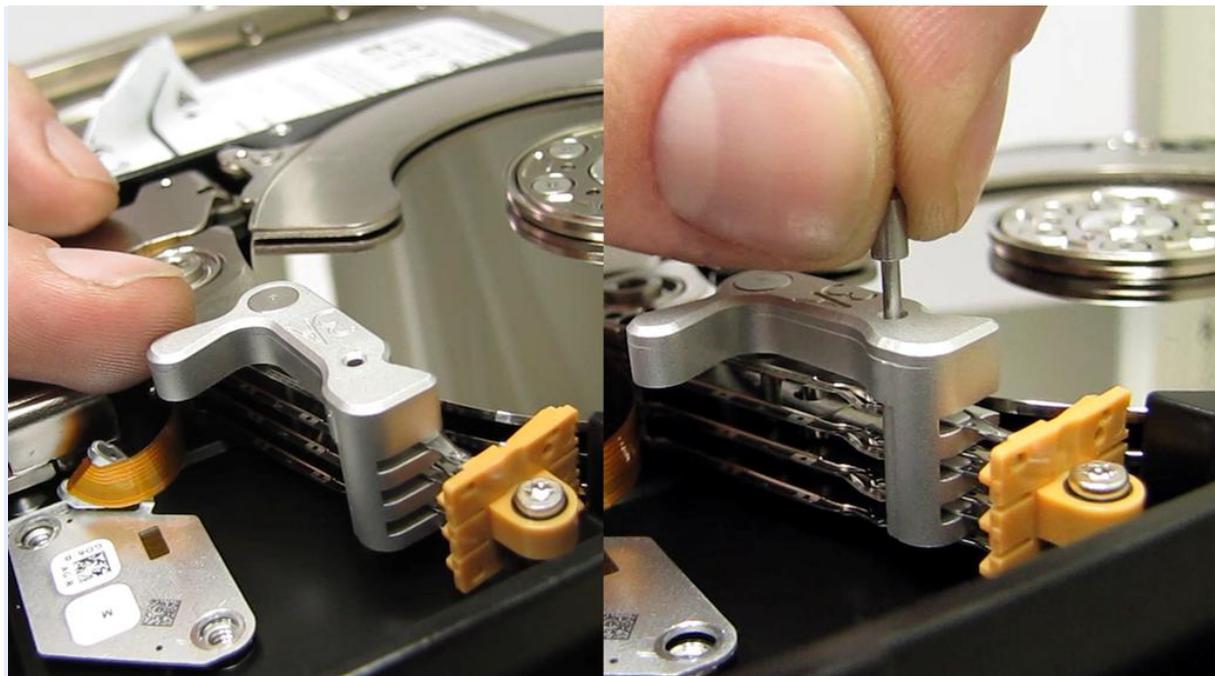
Carefully center the axis of the tool over the smaller hole on the head arm. Take care that the snouts stand away from the heads, and push the axis of the tool all the way down through the hole. Axis of the tool should go easily through this hole. When using **Sea 3.5" Ramp p3b** and **p4** tools, push the axis through the larger round hole on the head arm.



Picture 2. (mounting the Sea 3.5" Ramp p3a (left), and Sea 3.5" Ramp p3b (right))

Step 2 – Securing the heads with the tool

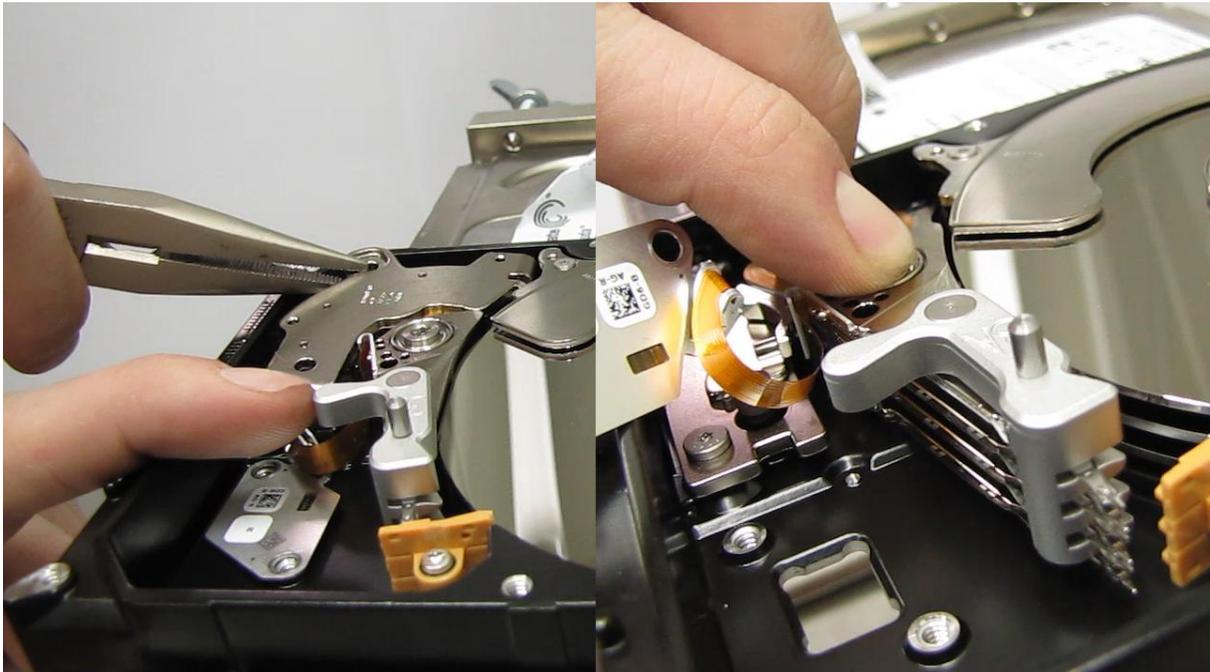
Push the tool so the snouts go between the heads. These snouts will keep the distance between the heads and assure that the heads don't touch each other. Secure the tool in this position with provided securing pin. Pin should go through the hole easily.



Picture 3. (securing the heads with the tool)

Step 3 – Moving the heads off the ramp

Remove the 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.

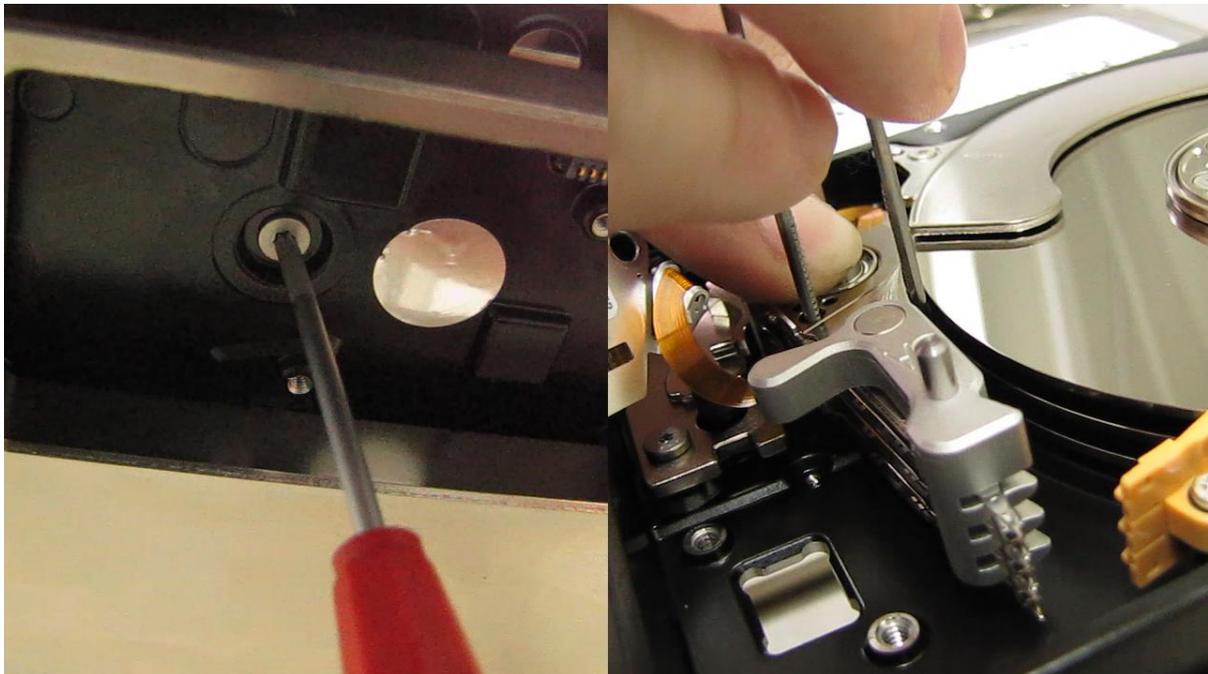


Picture 4. (moving the heads off the ramp)

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.

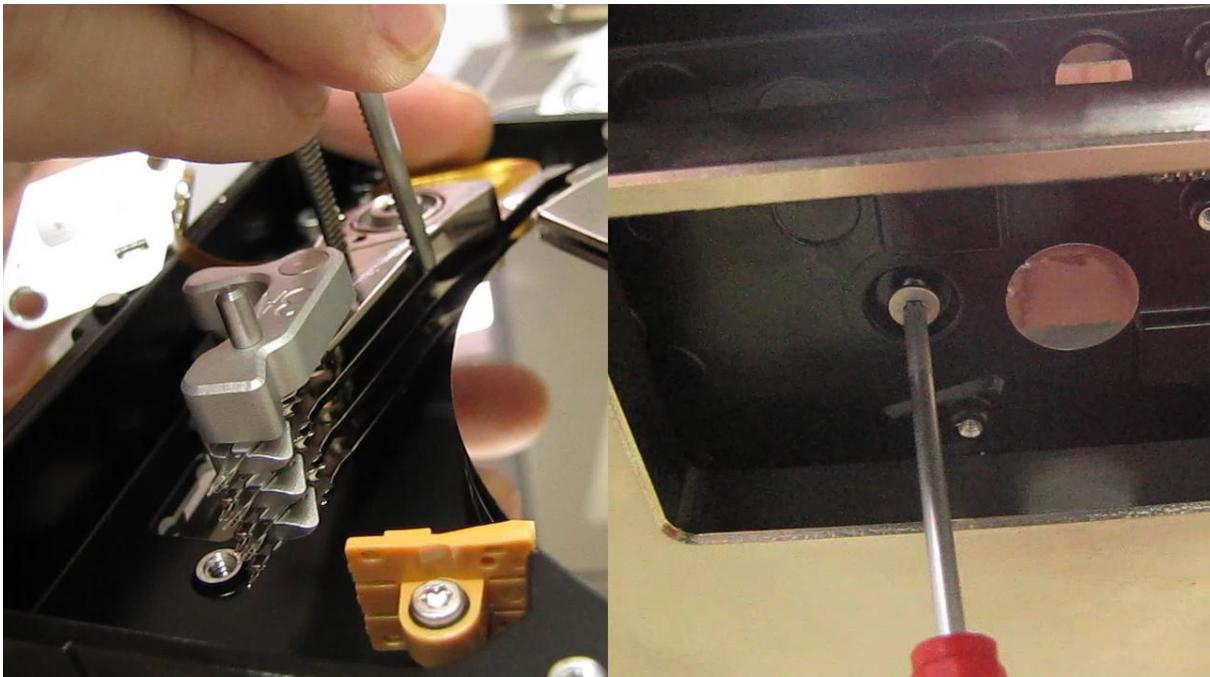


Picture 5. (dismounting the heads)

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.

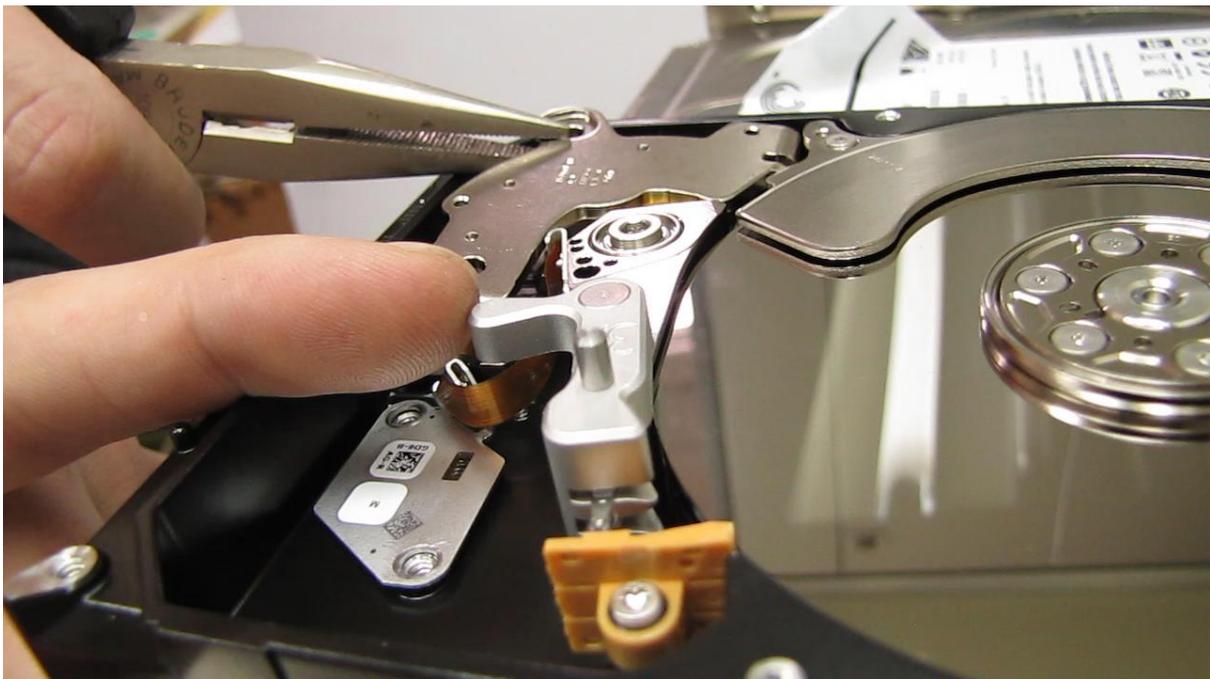
When the head arm is in its place, screw the head arm from the bottom. Be sure to tighten this screw to assure good connection between the head arm and the hard drive casing.



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

Step 6 – Moving the heads to the ramp

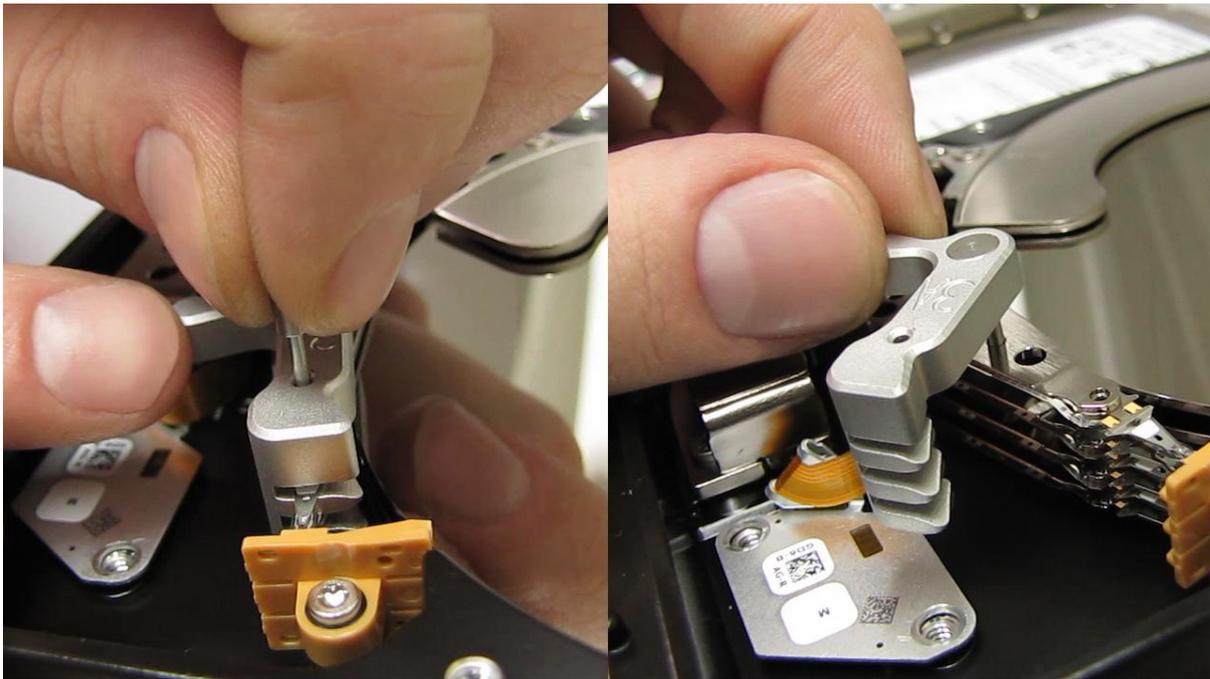
Push the heads over the ramp. While holding the heads on the ramp, return the magnet to its place. Be very careful in this step because the magnet might damage the heads if it lands on the magnetic coil of the head arm.



Picture 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.

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>