



*Tools for data recovery experts*

## *Guide for using HddSurgery™ head change tools:*

- ***HDDS WD Black 2.5"-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](mailto: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™ WD Black 2.5"-3.5" Ramp Set head replacement tools

HddSurgery™ **HDSS WD Black 2.5"-3.5" Ramp Set** is a set of head replacement tools which can be used to safely and easily replace heads on the most of the modern 2.5" Samsung and Toshiba hard drives which "park heads" on a ramp. Set contains 8 pairs of head replacement tools: **WD Black 2.5" p1, WD Black 2.5" p2, WD Black 3.5" p1, WD Black 3.5" p2-3, WD Black 3.5" p4, WD Black 3.5" p5.**



- **WD Black 2.5" Ramp p1**

This head replacement tool can be used on 2.5" Western Digital hard drive models from Black series, which have 1 platter and park their head(s) on a ramp.



- **WD Black 2.5" Ramp p2**

This tool is used on Western Digital 2.5" hard drives from Black series with 2 platters, which park their heads on a ramp.



- **WD Black 3.5" Ramp p1**

WD Black 3.5" Ramp p1 head replacement tool can be used on 3.5" Western Digital hard drive models from Black series, which have 1 platter and park their head on a ramp.



- **WD Black 3.5" Ramp p2-3**

WD Black 3.5" Ramp p2-3 head replacement tool can be used on 3.5" Western digital hard drive models from Black series, which have 2 or 3 platters and park their heads on a ramp.



- **WD Black 3.5" Ramp p4**

WD Black 3.5" Ramp p4 head replacement tool can be used on 3.5" Western Digital hard drive models from Black series, which have 4 platters and park their heads on a ramp.

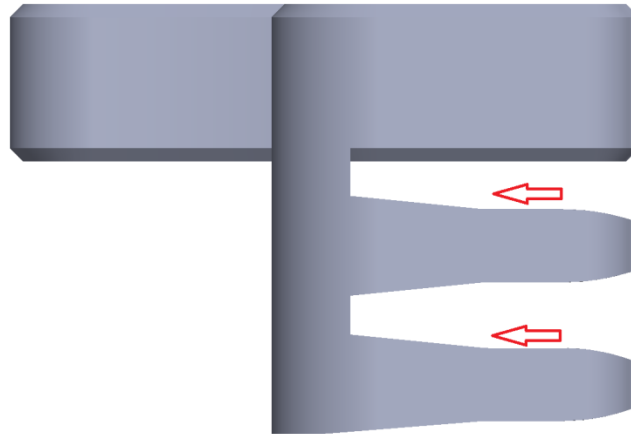


- **WD Black 3.5" Ramp p5**

WD Black 3.5" Ramp p5 head replacement tool can be used on 3.5" Western Digital hard drive models from Black series, which have 5 platter and park their heads on a ramp.

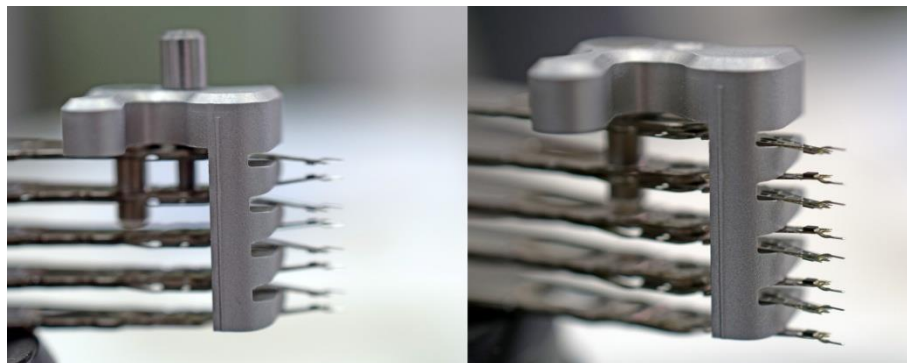
## What's new?

HddSurgery pays a lot of attention to the feedback of our customers, and the result of that is an innovation which allows better inspection of the heads and creates more room for safer manipulation.



*Picture 2.1 Front view of a tool with the "Peter slope"*

Our esteemed customer, colleague and friend Peter Magyar from [Adatmentes](#) pointed out that adding a slope to the combs could increase the efficiency of the tool in the ways we mentioned above, and HddSurgery™ acknowledged the benefit of this improvement and named it "Peter Slope" to honor his contribution. Sometimes, that extra space which this slope provides makes the whole difference while inspecting the heads, in other cases, the tool should be used normally.



*Picture 2.2 "Peter Slope"*

## 3. Supported models

### HDDS WD Black 2.5"-3.5" Ramp Set Western Digital supported models

List of **Western Digital** models on which process of head replacement could be performed by using the ramp tools from HDDS WD Black 2.5"-3.5" Ramp Set.

#### 2.5" Drives with 1 platter (p1)

##### Scorpio black

WD800BEKT-00F3T0/66F3T2  
 WD1200BEKT-60F3T0  
 WD1600BEKT-00F3T0/22F3T0/60F3T1/66F3T2/60V5T1  
 WD3200BEKT-00F3T0/22F3T0/60F3T0/75F3T0/60F3T1/60V5T1  
 WD800BJKT-75F4T0  
 WD1200BJKT  
 WD1600BJKT-00F4T0/22F4T0/75F4T0  
 WD1600BEKT-00A25T0/60A25T/75A25T0  
 WD2500BEKT-00A25T0/60A25T/75A25T0/00A25T1  
 WD1600BEKT-60PVMTO/66PVMTO/75PVMTO  
 WD1600BJKT-00PVMTO  
 WD2500BEKT-00PVMTO/22PVMTO/60PVMTO/66PVMTO/75PVMTO  
 WD3200BEKT-00PVMTO/22PVMTO/60PVMTO/66PVMTO/75PVMTO/08PVMTO1  
 WD1600BEKX-00B7WT0  
 WD2500BEKX-00B7WT0  
 WD3200BEKX-00B7WT0/22B7WT0/75B7WT0  
 WD2500LPLX  
 WD5000LPLX

#### 2.5" Drives with 2 platters (p2)

##### Scorpio black

WD2500BEKT-00F3T0/22F3T0/60F3T0/66F3T2/75F3T0/60F3T1/60V5T1  
 WD3200BEKT-00F3T0/22F3T0/60F3T0/75F3T0/60F3T1/60V5T1  
 WD2500BJKT-00F4T0/22F4T0/75F4T0  
 WD3200BJKT-00F4T0/22F4T0/75F4T0  
 WD3200BEKT-00KA9T0/22KA9T0/60KA9T0/22A25T1  
 WD5000BEKT-00KA9T0/22KA9T0/24KA9T0/60KA9T0/75KA9T0/80KA9T0  
 WD5000BPKT-00PK4T0/75PK4T0/80PK4T0  
 WD7500BPKT-00PK4T0/22PK4T0/75PK4T0  
 WD5000BPXK-00HPJT0/22HPJT0/60HPJT0/75HPJT0/80HPJT0  
 WD7500BPXK-00HPJT0/22HPJT0/60HPJT0/75HPJT0/80HPJT0

## HDDS WD Black 2.5"-3.5" Ramp Set Western Digital supported models

List of **Western Digital** models on which process of head replacement could be performed by using the ramp tools from HDDS WD Black 2.5"-3.5" Ramp Set.

### 3.5" Drives with 1 platter (p1)

#### Caviar Black

WD5001AALS-00E3A0  
 WD5002AALX-00J37A0  
 WD5002AAEX-00Y9A0/32Y9A0  
 WD5003AZEX-00K1GA0/00RKKAO  
 WD1003FZEX-00MK2A0

### 3.5" Drives with 2 and 3 platters (p2-3)

#### Caviar Black

WD5001AALS-00L3B  
 WD5001AALS-00L3B2\*/00LWTA0  
 WD6401AALS-00L3B2/003B20/00E8B0  
 WD7501AALS-00E3A0/22E3A0  
 WD7502AALS-22E3A0  
 WD1001FALS-00E3A0/00Y6A0  
 WD6402AAEX-00Z3A0/00Y9A0  
 WD7502AAEX-00Z3A0/00Y9A0  
 WD1002FAEX-007BA0/00Z3A0/00Y9A0  
 WD1001FAES-00W7A0/22W7A0/60W7A0/75W7A0/00Z2A0/60Z2A0  
 WD7501AALS-00J7B0/00J7B1/00E8B0  
 WD1001FALS-00J7B0/00J7B1/00K1B0/00E8B0/00U9B0  
 WD1501FASS-00U0B0/00W2B0  
 WD1502FAEX-007BA0  
 WD2003FZEX-00Z4SA0

### 3.5" Drives with 4 platters (p4)

#### Caviar Black

WD2001FASS-00U0B0/00W2B0  
 WD2002FAEX-007BA0  
 WD3001FAEX-00MJRA0



### 3.5" Drives with 5 platters (p5)

#### Caviar Black

WD4001FAEX-00MJRA0  
WD4003FZEX-00Z4SA0

### Western Digital 6TB drives

#### 3.5" Drives with 5 platters (p5)

#### Green

WD60EZR-00MVLB1  
WD50EZR-xxMVLBx

#### Red

WD60EFRX-68L0BN1  
WD50EFRX-68MYMN1

#### Blue

WD60EZRZ-xxRWYBx  
WD50EZRZ-xxRWYBx

#### Purple

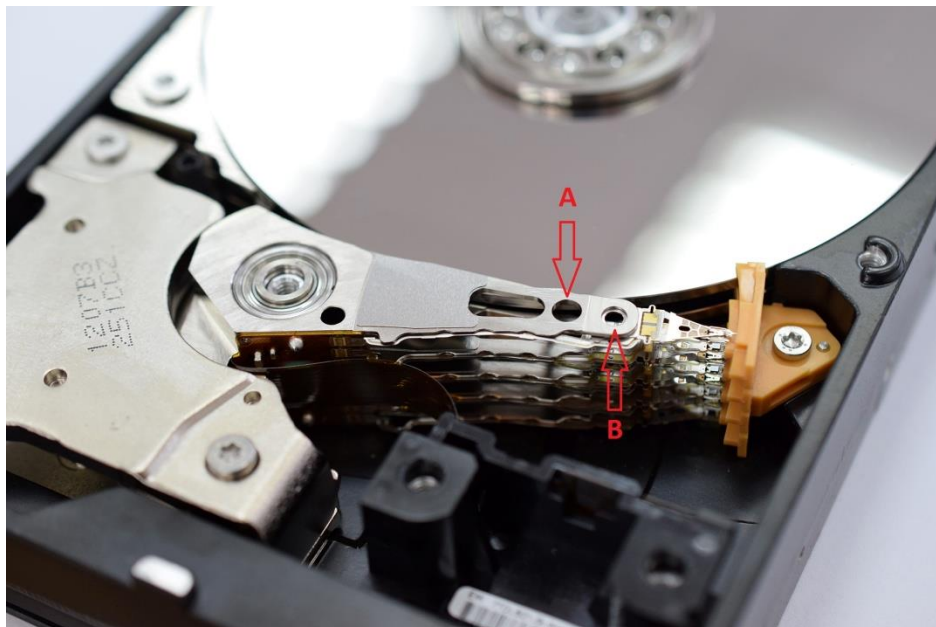
WD60PURX-64LZMY0

## 4. Specificities of WD Black 2.5"-3.5" hard drives and features of WD Black 2.5"-3.5" ramp tools

### 4.1 Hole used for mounting WD Black ramp tools

There are many different models (and mechanics) of modern WD Black 2.5" hard drives. Actuator arms of these various mechanics are mutually different in terms of shape, dimensions and number of holes on them.

On most of the models there is a hole (second closes to the heads, marked with "A") on the actuator arm which is used for mounting of the HddSurgery WD Black ramp tools and another hole (marked with "B") used for mounting of the safety pin.



*Picture 4.1 Hole on the actuator arms of WD Black hard drives*

## 5. 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.

While 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 5.1. (HDDS WD Black 2.5"-3.5" Ramp Set)

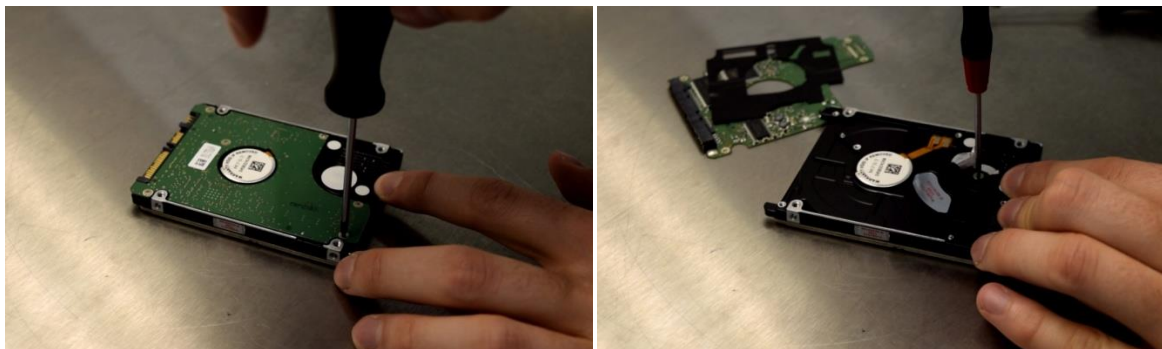
## 6. Head replacement process on Western Digital hard drives from Black series

Head replacement process on WD Black hard drives is exactly the same as shown on our HDDS WDC 2.5"-3.5" Ramp set manual.

### Step 1 – Preparing the hard drive for head replacement

To prepare the hard drive for head replacement process it is needed to dismount the PCB (circuit board on the bottom side) and to take off the lid from the top of the hard drive.

Loosen and remove all the screws on the PCB and dismount the circuit board. Loosen the screw, which is holding the head assembly from the bottom, just a little bit and then tighten it again. This is needed in order to avoid problems of loosening the mentioned screw later in the process.

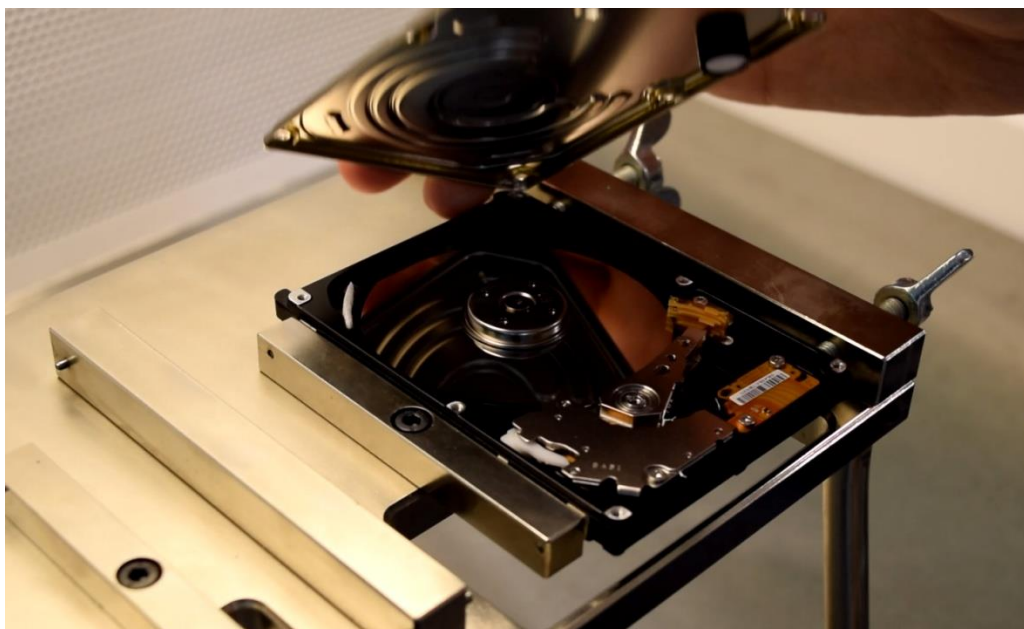


*Picture 6.1 Dismounting the PCB and loosening and tightening of the screw which is holding the head assembly from the bottom*

Loosen and remove all the screws from the hard drive lid and open the hard drive casing.



*Picture 6.2 Unscrewing the lid*



*Picture 6.3 Opening the casing*

## Step 2 – Releasing the flat cable connector

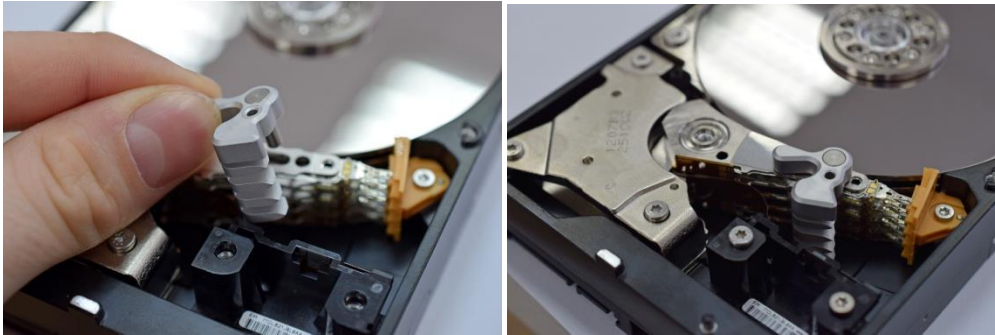
Remove the two screws that are holding the flat cable connector and push the connector from the bottom upwards to release it. Pressure from below may cause the connector to pop out and possibly damage the platters. Because of this, hold the top of connector with another hand while pushing it from the bottom. Before applying pressure, remove the screws from their holes.



*Picture 6.4 Dismounting the flat cable connector*

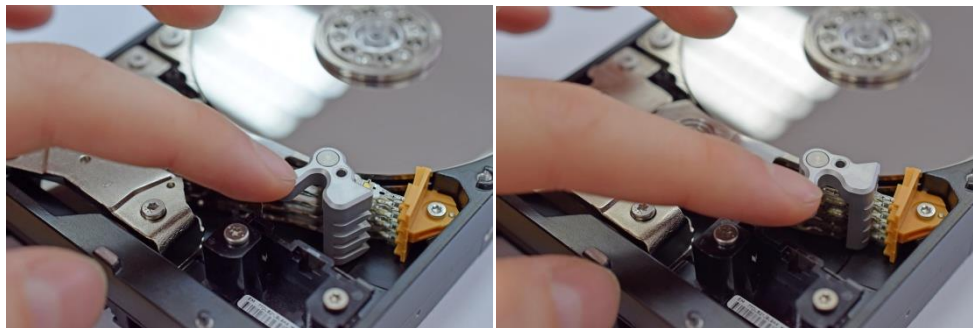
## Step 3 – Mounting the tool on the donor drive actuator arm

Carefully center the axle of the tool over the hole which is the **second closest** to the top of the head arm (near the heads themselves). Take care that the snouts stand away from the heads, and put the axle of the tool through hole in the actuator arm. Axle of the tool should go easily through this hole.



*Picture 6.5 Mounting the tool on the actuator arm*

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 after sliding them off the ramp. Before pushing the snouts check if the tool is lying straight and steady on the actuator arm and make sure it achieves a steady and straight position before pushing the snouts.



*Picture 6.6 Rotating the tool - snouts are positioned between the heads*

Secure the head's position on the tool by inserting the safety pin. The pin should go through the hole easily.



*Picture 6.7 Securing the heads with the tool*

## Step 4 – Dismounting the upper magnet



*Picture 6.8 Removing the screws connecting upper magnet to the HDD casing (left);  
Removing the upper magnet with the needle-nose pliers (right);*

Remove the magnet carefully using the needle-nose pliers (use the HDD casing as a lever).

## Step 5 – Removing the security brake

Carefully remove the security brake, placed in the area behind the magnets. Use the tweezers in the process.



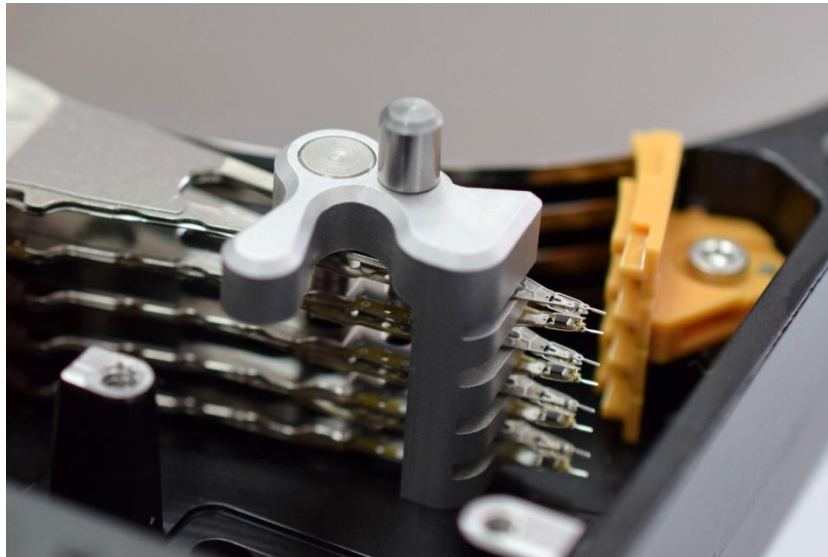
*Picture 6.9 Removing the security brake*

Firstly, loosen and remove the screw which connects the upper magnet to the HDD casing. Then, remove the upper magnet by using needle-nose pliers.



## Step 6 – Sliding the heads off the donor drive ramp

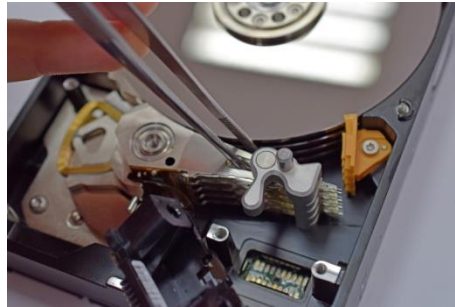
Slide the heads off the donor drive ramp by pushing the voice coil of the actuator arm.



*Picture 6.10 Sliding the heads off the donor drive ramp*

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

## Step 7 – Dismounting the Head Stack Assembly



*Picture 6.11 Removing the screw that holds the head arm assembly and head dismounting*

Gently position the tweezers in the slot of the Head Stack Assembly as shown in the picture, and apply vertical force to dismount the heads. Some WD Black drives still have a screw holding the head stack assembly from the bottom, in which case you need to loosen it up and unwind it first, before you can dismount the heads.

## Step 8 – Mounting the heads in the patient drive and moving the heads to the ramp

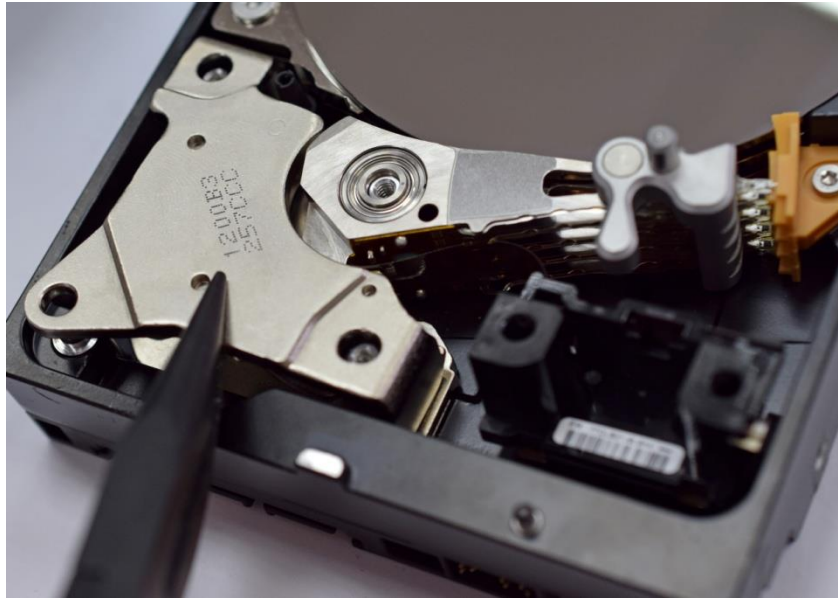


*Picture 6.12 Mounting the heads on the patient drive and moving them to the ramp*

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

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

## Step 9 – Mounting the upper magnet back on



*Picture 6.13 Putting the magnet back to its position*

After the heads are safely parked on the ramp and the security brake is properly positioned, it is time to put the upper magnet back to its place. Using the needle-nose pliers, carefully place the magnet to its original position.

## Step 10 – 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 6.14 Pin removal and tool dismounting*

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

## 8. Conclusion

This guide was written by HDDSurgery™ team and it is based on our experience acquired during the process of development, design and testing.

HddSurgery™ is not responsible for any possible consequential damage, including the loss or recovery of data or any other damage made by using or working with HddSurgery™ tools.

You can find more information about these tools and many other tools used for data recovery on our website:

<http://www.hddsurgery.com/>

Also you can watch the videos that show how these tool work on our YouTube channel:

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

If you have any doubts or questions regarding use of HDDS HGST 3.5" Ramp Set, you can contact our support team any time:

[support@hddsurgery.com](mailto:support@hddsurgery.com)