



Tools for data recovery experts

Guide for using HddSurgery™ head change tools:

- ***HDDS HGST 2.5" Ramp Set***

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™ HGST 2.5" Ramp Set head replacement tools

HddSurgery™ **HDDS HGST 2.5" 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" Hitachi Global Storage Technologies (HGST) hard drives which "park heads" on a ramp. Set contains 3 pairs of head replacement tools: **HGST 2.5" Ramp p1**, **HGST 2.5" Ramp p2**, **HGST 2.5" Ramp p3** and pair of **HGST 2.5" Support Tools**.



- **HGST 2.5" Ramp p1**

This head replacement tool can be used on 2.5" HGST hard drive models which have 1 platter, which park their head(s) on a ramp.



- **HGST 2.5" Ramp p2**

This tool is used on HGST 2.5" hard drives with 2 and 1 platters, which park their heads on a ramp.



- **HGST 2.5" Ramp p3**

HGST 2.5" Ramp p3 head replacement tool can be used on 2.5" HGST hard drive models which have 3 platters and their heads parked on a ramp.

■ HGST 2.5" Support tool

HGST 2.5" Support tool is used to support head and magnets replacement process on 2.5" HGST hard drives. The upper and lower magnet of these drives are connected and can't be disassembled by classical methods. This means that heads must be disassembled together with the magnets. Support tool secures position of heads in relation to both magnets during heads replacement process. Support tool, its function and parts, will be presented in detail in the chapter 4.



3. Supported models

HDDS HGST 2.5" Ramp Set

List of Hitachi Global Storage Technologies families and models on which process of head replacement could be performed by using the ramp tools from HDDS HGST 2.5" Ramp Set.

<p>Travelstar 4K40</p> <p>HTS424020M9AT00 HTS424030M9AT00 HTS424040M9AT00</p>	<p>Travelstar E5K100</p> <p>HTE541040G9AT00 HTE541040G9SA00</p>	<p>Travelstar 4K120</p> <p>HTS421212H9AT00 HTS421210H9AT00 HTS421280H9AT00 HTS421260H9AT00 HTS421240H9AT00</p>	<p>Travelstar E5K160</p> <p>HTE541616J9AT00 HTE541612J9AT00 HTE541680J9AT00 HTE541660J9AT00</p> <p>HTE541616J9SA00 HTE541612J9SA00 HTE541680J9SA00 HTE541660J9SA00</p>	<p>Travelstar 5K250</p> <p>HTS542525K9A300 HTS542520K9A300 HTS542516K9A300 HTS542512K9A300 HTS542580K9A300 HTS542525K9SA00 HTS542520K9SA00 HTS542516K9SA00 HTS542512K9SA00 HTS542580K9SA00</p>
<p>Travelstar 7K60</p> <p>HTE726040M9AT00 HTE726060M9AT00</p>	<p>Travelstar 7K100</p> <p>HTS721010G9AT00 HTS721080G9AT00 HTS721060G9AT00 HTS721010G9SA00 HTS721080G9SA00 HTS721060G9SA00</p>	<p>Travelstar 5K120</p> <p>HTS541212H9AT00 HTS541210H9AT00 HTS541280H9AT00 HTS541260H9AT00</p> <p>HTS541212H9SA00 HTS541210H9SA00 HTS541280H9SA00 HTS541260H9SA00</p>	<p>Travelstar 7K200</p> <p>HTS722020K9A300 HTS722016K9A300 HTS722012K9A300 HTS722010K9A300 HTS722080K9A300</p> <p>HTS722020K9SA00 HTS722016K9SA00 HTS722012K9SA00 HTS722080K9SA00</p>	<p>Travelstar E5K250</p> <p>HTE542525K9A300 HTE542516K9A300 HTE542512K9A300 HTE542580K9A300</p>
<p>Travelstar E7K60</p> <p>HTS726060M9AT00</p>				<p>Travelstar 5K320</p> <p>HTS543232L9A300 HTS543225L9A300 HTS543216L9A300 HTS543212L9A300 HTS543280L9A300</p>
<p>Travelstar 5K100</p> <p>HTS541010G9AT00 HTS541080G9AT00 HTS541060G9AT00 HTS541040G9AT00</p> <p>HTS541010G9SA00 HTS541080G9SA00 HTS541060G9SA00 HTS541040G9SA00</p>	<p>Travelstar E7K100</p> <p>HTE721010G9AT00 HTE721080G9AT00 HTE721060G9AT00 HTE721010G9SA00 HTE721080G9SA00 HTE721060G9SA00</p>	<p>Travelstar 5K160</p> <p>HTS541616J9AT00 HTS541612J9AT00 HTS541680J9AT00 HTS541660J9AT00 HTS541640J9AT00</p> <p>HTS541616J9SA00 HTS541612J9SA00 HTS541680J9SA00 HTS541660J9SA00 HTS541640J9SA00</p>	<p>Travelstar E7K200</p> <p>HTE722020K9A300 HTE722016K9A300 HTE722012K9A300</p>	<p>HTS543232L9SA01 HTS543225L9SA01 HTS543216L9SA01 HTS543212L9SA01 HTS543280L9SA01</p> <p>HTE543232L9A300 HTE543225L9A300 HTE543216L9A300 HTE543212L9A300</p>

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HDDS HGST 2.5" Ramp Set

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Travelstar Z5K320	Travelstar Z7K320	Travelstar 5K500.B	Travelstar 7K500
HTS543232A7A384 HTS543232A7A381 HTS543232A7A385 HTS543225A7A384 HTS543225A7A381 HTS543225A7A385 HTS543216A7A384 HTS543216A7A381 HTS543216A7A385 HTE543232A7A384 HTE543225A7A384	HTS723232A7A364 HTS723232A7A361 HTS723232A7A365 HTS723225A7A364 HTS723225A7A361 HTS723225A7A365 HTS723216A7A364 HTS723216A7A361 HTS723216A7A365 HTE723232A7A364 HTE723225A7A364	HTS545050B9A300 / HTS545050B9A301 HTS545040B9A300 / HTS545040B9A301 HTS545032B9A300 / HTS545032B9A301 HTS545025B9A300 / HTS545025B9A301 HTS545016B9A300 / HTS545016B9A301 HTS545012B9A300 / HTS545012B9A301 HTE545050B9A300 HTE545032B9A300 HTE545025B9A300 HTE545016B9A300	HTS725050A9A364 HTS725050A9A361 HTS725032A9A364 HTS725032A9A361 HTS725025A9A364 HTS725025A9A361 HTS725016A9A364 HTS725016A9A361 HTS725012A9A364 HTS725012A9A361 HTE725050A9A364 HTE725032A9A364 HTE725025A9A364 HTE725016A9A364
Travelstar 7K320	Travelstar 5K500	Travelstar Z5K500	Travelstar Z7K500
HTS723232L9A360 HTS723225L9A360 HTS723216L9A360 HTS723212L9A360 HTS723280L9A360 HTS723232L9SA61 HTS723225L9SA61 HTS723216L9SA61 HTS723212L9SA61 HTS723280L9SA61 HTE723232L9A300 HTE723225L9A300 HTE723216L9A300 HTE723212L9A300	HTS545050KTA300 HTS545040KTA300 HTS545050KTA01 HTS545040KTA01 Travelstar E5K500 HTE545050KTA300 HTE545040KTA300	HTS545050A7E680 / OJ38065 HTS545050A7E681 / OJ39415 HTS545050A7E685 / OJ43135 HTS545032A7E680 / OJ38063 HTS545032A7E681 / OJ39413 HTS545032A7E685 / OJ43133 HTS545025A7E680 / OJ38062 HTS545025A7E681 / OJ39412 HTS545025A7E685 / OJ43132 HTE545050A7E680 / OJ39685 HTE545032A7E680 / OJ39683	HTS725050A7E630 / OJ26005 HTS725050A7E631 / OJ26045 HTS725050A7E635 / OJ26065 HTS725032A7E630 / OJ26003 HTS725032A7E631 / OJ26043 HTS725032A7E635 / OJ26063 HTS725025A7E630 / OJ26002 HTS725025A7E631 / OJ26042 HTS725025A7E635 / OJ26062 HTE725050A7E630 / OJ26055 HTE725032A7E630 / OJ26053

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HDDS HGST 2.5" Ramp Set

List of the Hitachi Global Storage Technologies families and models on which process of head replacement could be performed by using ramp tools from HDDS HGST 2.5" Ramp Set.

Travelstar 5K750

HTS547575A9E384
HTS547575A9E381
HTS547564A9E384
HTS547564A9E381
HTS547550A9E384
HTS547550A9E381

HTE547575A9E384
HTE547564A9E384
HTE547550A9E384

Travelstar 7K750

HTS727575A9E364
HTS727575A9E361
HTS727564A9E364
HTS727564A9E361
HTS727550A9E364
HTS727550A9E361

HTE727575A9E364
HTE727564A9E364
HTE727550A9E364

Travelstar 5K1000

HTS541010A9E680
HTS541010A9E681
HTS541075A9E680
HTS541075A9E681
HTS541064A9E680
HTS541064A9E681

HTE541010A9E680
HTE541075A9E680
HTE541064A9E680

Travelstar 5K1500

HTS541515A9E630
HTS541515A9E631
HTS541515A9E635

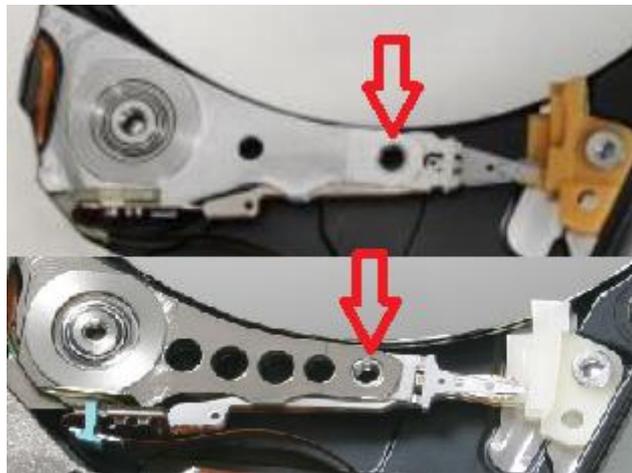
HTE541515A9E630

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4. Specificities of HGST 2.5" hard drives and features of HDDS HGST 2.5" ramp tools

4.1 Hole used for mounting HGST 2.5" ramp tools

There are many different models (and mechanics) of modern Hitachi 2.5" hard drives. Actuator arms of these various mechanics are mutually different in terms of shape, dimensions and number of holes on them. There is one thing, however, which is common for all of different Hitachi mechanics - position and dimension of the hole near the top of the head assembly. On some models this hole is the only one which exists on the actuator arm and on the others, which have 2 or more available holes on the actuator arm, this hole is the one which is nearest to the heads themselves. Since this hole is common for all different Hitachi 2.5" HDD mechanics, it is used for mounting of the HddSurgery HGST 2.5" ramp tools.



Picture 4.1 (Hole on the actuator arms of two different HGST 2.5" hard drives which is used for mounting of the HDDS HGST 2.5" ramp tools)

4.2 Security brake(s) on HGST drives



*Picture 4.2 (Left - Hitachi 2.5" hard drive with two security brakes on the upper magnet;
Right - HDD with one security brake in the upper magnet)*

Some Hitachi 2.5" hard drives have two (left and right) security brakes located in the holes of the upper magnet. The left one secures heads position on the ramp, while the right one limits heads movement above HDD platters. On the other side on the newer Hitachi 2.5" models there is only one security brake in the upper magnet - the left one.

In both cases brake(s) from the upper magnet must be removed in order to mount support tool and slide heads off the ramp. In the second case (Picture 4.2 Right), there is no right security brake on the upper magnet. Since no right hole is available, support tool must be mounted only by using left hole for basing.

4.3 Additional braking mechanisms on HGST drives

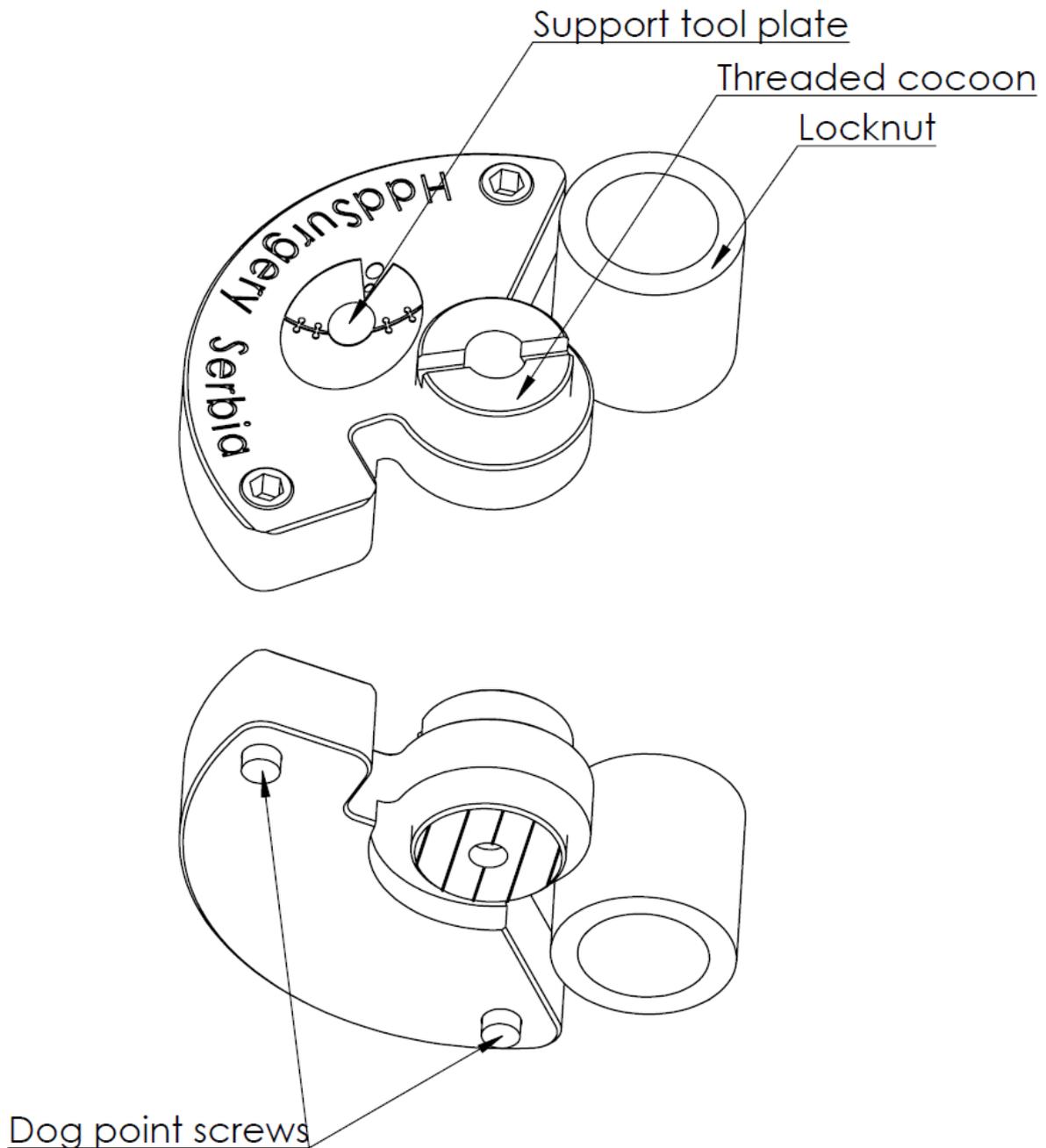


Picture 4.3 (Left - First type; Right - Second type)

There are two types of additional braking mechanisms on Hitachi 2.5" hard drives. Additional braking mechanism, shown on the left part of picture 4.3 must not be removed during head replacement process - however, additional precautions have to be taken during heads and magnets dismounting and mounting. On the other side, additional braking mechanism shown on the right side of the picture 4.3, must be removed as it is not allowing heads to slide off the ramp.

4.4 Features of the Support tool

Main parts of the HGST 2.5" Support tool are presented on picture 4.4.



Picture 4.4 (Support tool and its parts)

Support tool plate is made of steel with high magnetic properties. This ensures that magnetic force between plate and upper magnet connects them during head replacement process.

Right and left dog point screws secure precise mounting position of the support tool plate on the head assembly and magnet. Both dog points screws can be dismantled from the support tool by using hex key if there is only one (or none) available hole in the upper magnet. Also, unfastening of dog point screws will decrease dimension of the part of the screw which comes out of the hole in the tool - this can be useful when dealing with hard drives with tiny upper magnet.

Threaded cocoon is part of the support tool which connects it to the head assembly via screw. Beside this, since different models of HGST 2.5" hard drives have different relations of key dimensions - threaded cocoon is used to determine exact position of upper magnet in relation to the head assembly shaft. Bottom surface of threaded cocoon is covered with notches which carve themselves into the head assembly after screw is tightened. This secures head assembly position in relation to the magnets.

Locknut is used to prevent unfastening of threaded cocoon and consequently - losing secured heads position in relation to the magnets during the head replacement process.

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.

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 5.1. (HDDS HGST 2.5" Ramp Set)

6. Head replacement process

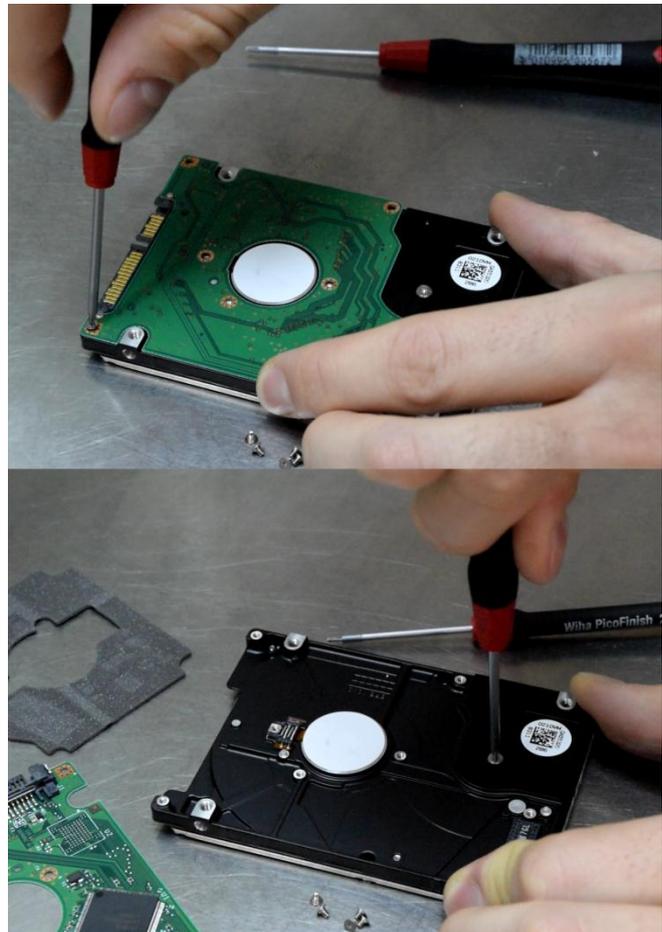
Step 1 – Preparing the hard drive for head replacement

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 mentioned screw later in the process.

Picture 6.1 (Dismounting the PCB (up) and loosening and tightening of the screw which is holding head assembly from the bottom (down))



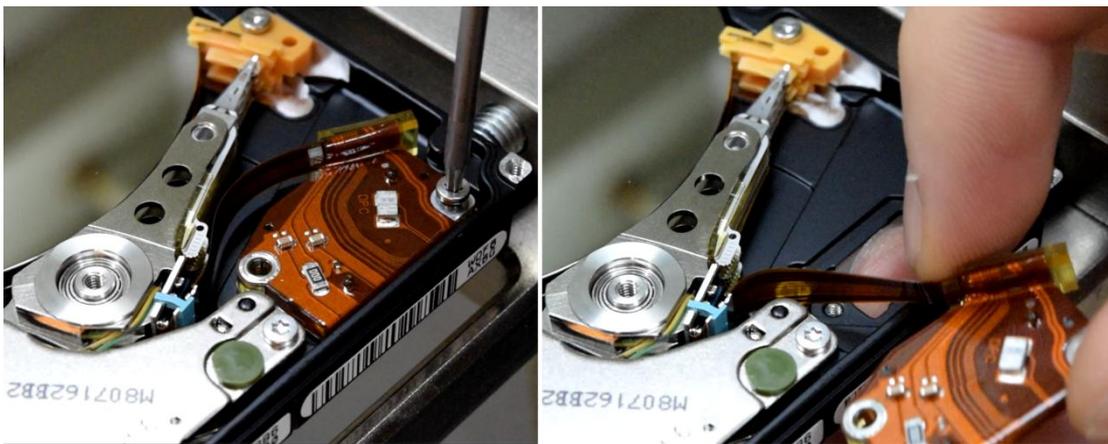
Unstick the hard drive sticker in order to uncover the screw which is holding the head assembly from above. Then loosen and remove all of the screws from the hard drive lid and open the hard drive casing.



Picture 6.2 (Unsticking of the hard drive sticker (up) and unscrewing the lid (down))

Step 2 – Releasing flat cable connector

Remove 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 platters. Because of this, hold the top of connector with another hand while pushing it from the bottom. Before applying pressure, remove screws from their holes.



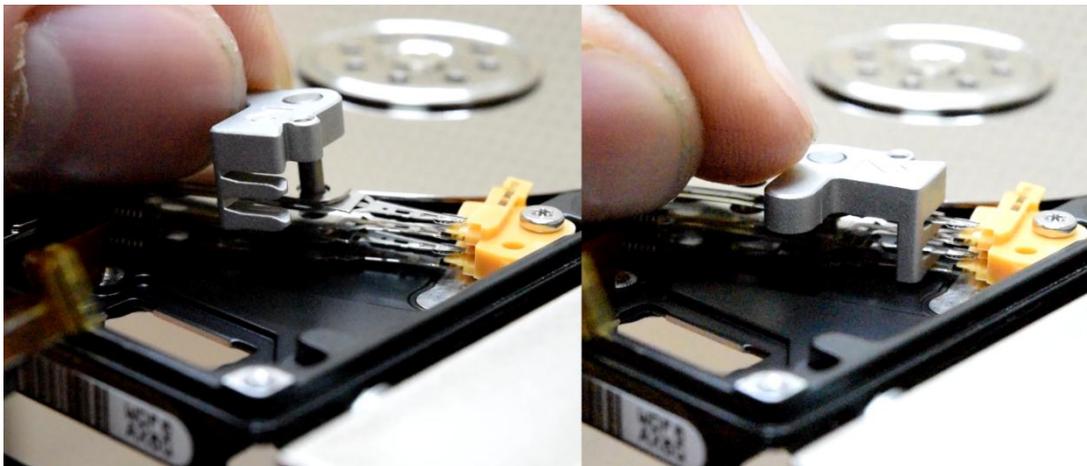
Picture 6.3 (Dismounting the flat cable connector)

Step 3 – Mounting the tool on the actuator arm

Carefully center the axle of the tool over the hole which is the closest to the top of the head arm (near the heads themselves). There are different mechanics of HGST 2.5" hard drives, among them there are hard drives which have few holes on the actuator arm and on the other side there are hard drives which actuator arm has only one hole on it. Hole which is the closest to the heads is common for all HGST 2.5" hard drives and because of that it is used for mounting of the ramp tool.

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.

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 that tool is lying straight and steady on the actuator arm and help it to achieve steady and straight position before pushing the snouts.



Picture 6.4 (Mounting the tool on the actuator arm)

!!! VERY IMPORTANT !!!

Don't secure the tool with the securing pin at this moment. On some models there is a danger that securing pin will fall on the top platter if it is placed at this moment.

Step 4 – Removing the security brake(s)

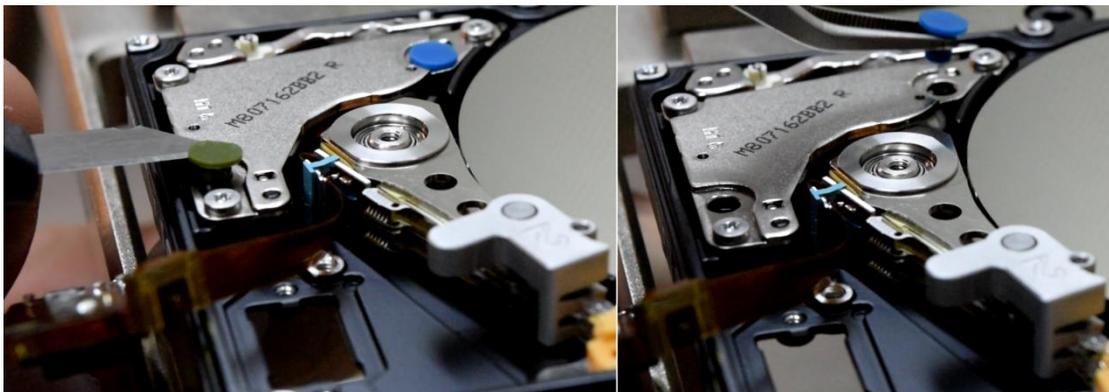
Carefully remove both security brakes, placed in the holes of the upper magnet. Firstly remove right security brake and then the left one, which is securing the heads position on the ramp. After left security brake is removed heads will slide to right a little bit but will remain in the ramp area.

Some HGST 2.5" hard drives have only one security brake - the left one. Anyhow, in this step it should be removed.

!!! VERY IMPORTANT !!!

Be VERY CAREFUL while removing security brakes and watch them not to fall on the platters.

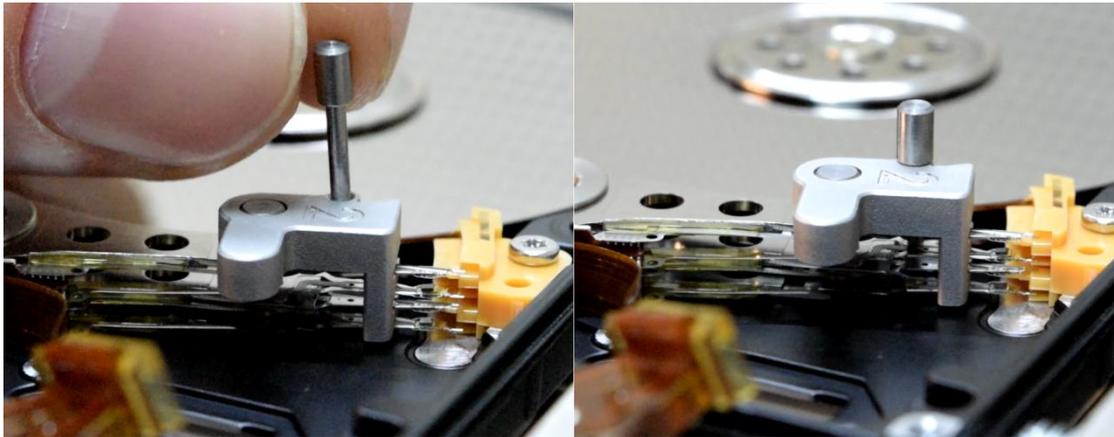
Despite brake(s) placed in the holes of upper magnet, HGST 2.5" hard drives have separate brake mechanism. There are two types of these mechanisms (see chapter 4). Brake mechanism which is not allowing heads to slide off the ramp (second type - chapter 4), although security brake(s) are previously removed from the upper magnet, must be removed in this step.



Picture 6.5 (Removing the security brake(s))

Step 5 – Securing the heads with the tool

After removal of the security brake(s) heads will slide a little bit to the right but should remain on the ramp. In this moment it is safe to secure the tool position on the heads by providing securing pin. HDDS HGST 2.5" Ramp tools have implemented side-locking system which means that securing pin locks the tool position on the heads by going to the side of the heads.



Picture 6.6 (Securing the heads with the tool)

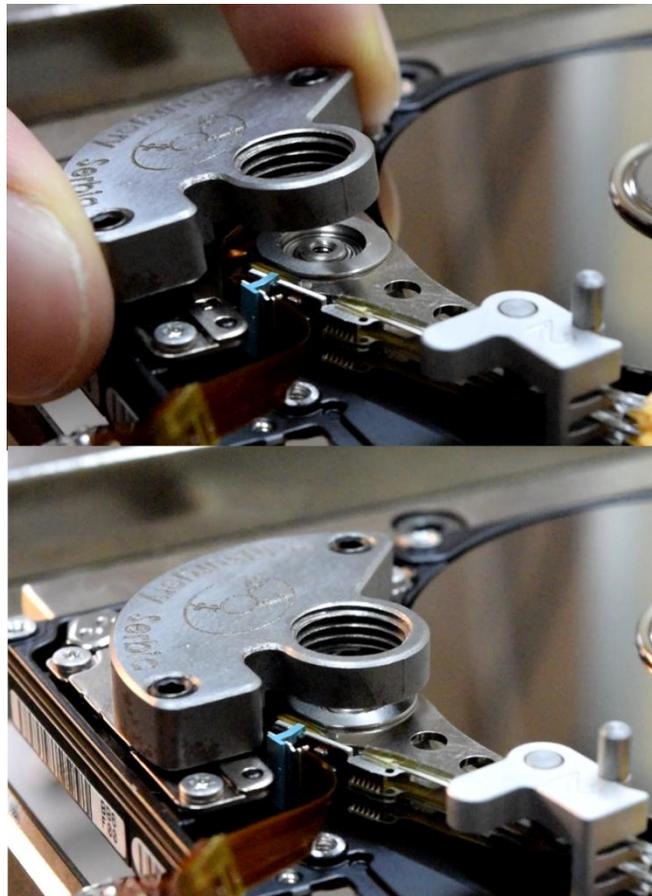
Step 6 – Mounting the support tool plate

Place the Support tool plate on the upper magnet. For its positioning use two dog point screws (DIN 915) which are tightened to the plate. Non-threaded section of the two dog point screws should be placed through the two holes of the upper magnet in which security brakes were placed.

!!! VERY IMPORTANT !!!

Support tool plate is made of steel with high magnetic properties - needed for the tool functioning. Be careful while mounting the plate on the magnet because of the mag.force.

If the upper magnet has only one (left) hole (and previously had one (left) security brake) on it, dismount right dog point screw by using hex key. In this case plate will be positioned by using only left dog point screw so exact positioning of the plate should be helped with evaluation of concentricity between head assembly shaft and threaded opening of the support tool plate.

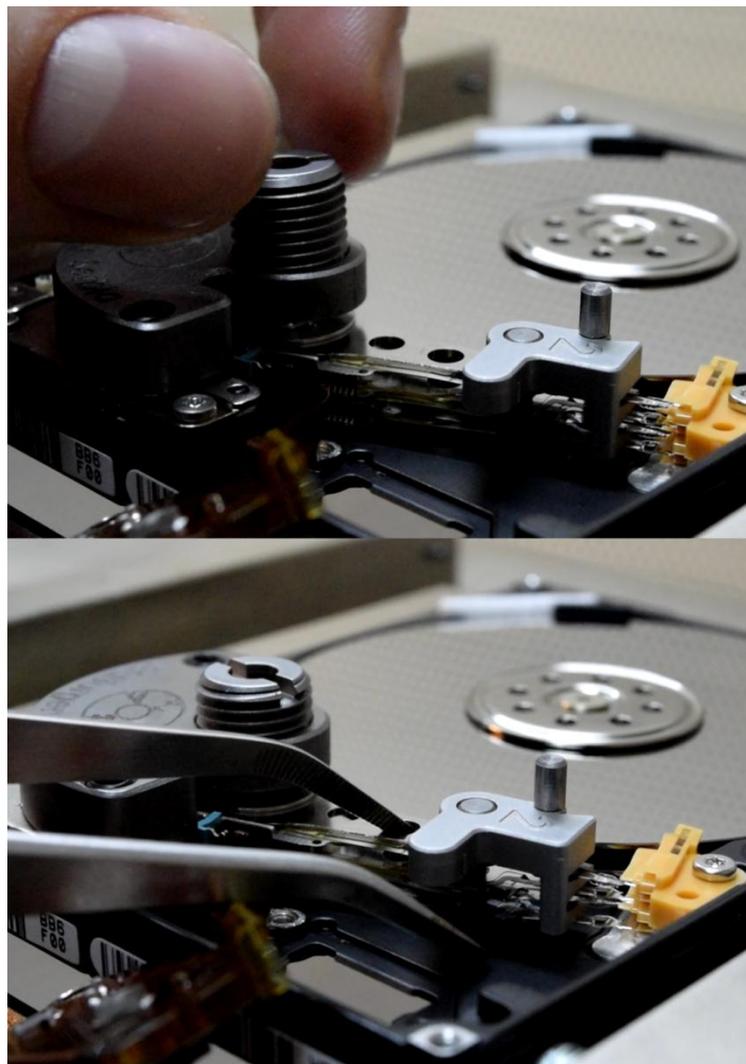


Picture 6.7 (Mounting of the support tool plate)

Step 7 – Mounting the support tool threaded cocoon and moving the heads off the ramp

Start fastening threaded cocoon into the threaded opening of the support tool plate. Turn one or two full circles so the cocoon is standing safely into the threaded opening.

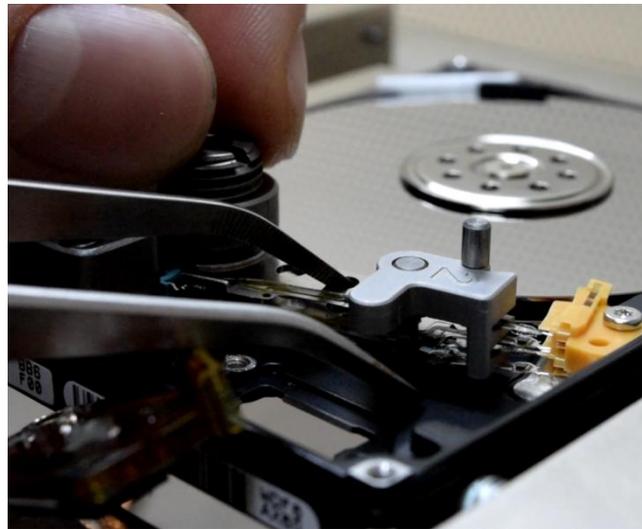
Slide the heads off the ramp, preferably by using tweezers. If there are no other holes available on the actuator arm, you can use handle of the ramp tool for sliding as well, however be extremely gentle. While of the ramp, heads will remain separated by the ramp tool snouts. Keep holding the heads outside ramp area.



Picture 6.8 (Mounting of the support tool threaded cocoon (up); sliding the heads of the ramp (down))

Step 8 – Fixing the support tool to the head assembly

While holding the heads and keeping them of the ramp, continue with gentle fastening of the threaded cocoon. **On the first sign of resistance to the fastening - stop!** This is sign that bottom of the threaded cocoon has reached the top of the head assembly.



Picture 6.9 (Fastening of the support tool threaded cocoon)

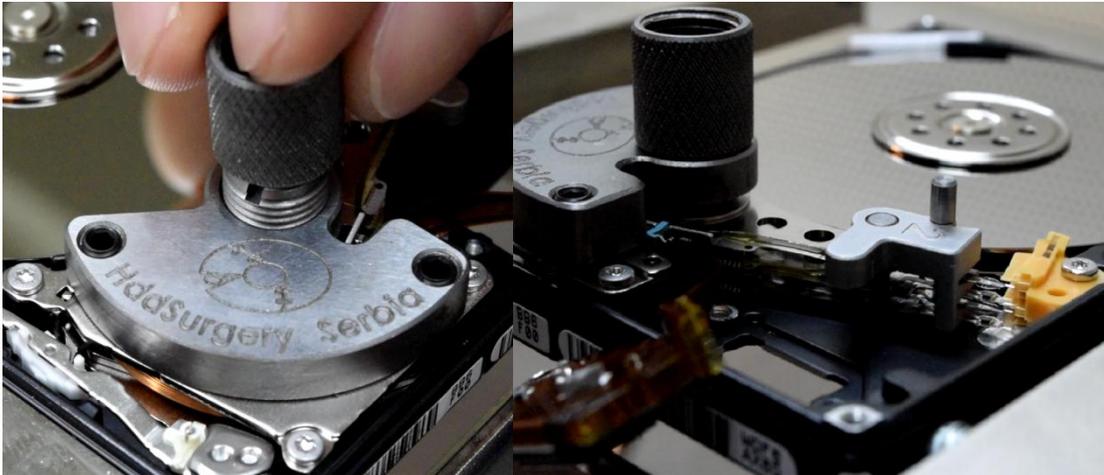
Insert the screw which previously connected head assembly to the hard drive lid into the cocoon. Check that screw has gone through the bottom hole of the cocoon and be sure to **tighten it firmly**. After this, heads will remain fixed to the support tool and outside of the ramp area - so there is no need to hold them anymore.



Picture 6.10 (Inserting the screw into the threaded cocoon (left); tightening the screw which is connecting support tool and head assembly (right))

Step 9 – Mounting the locknut

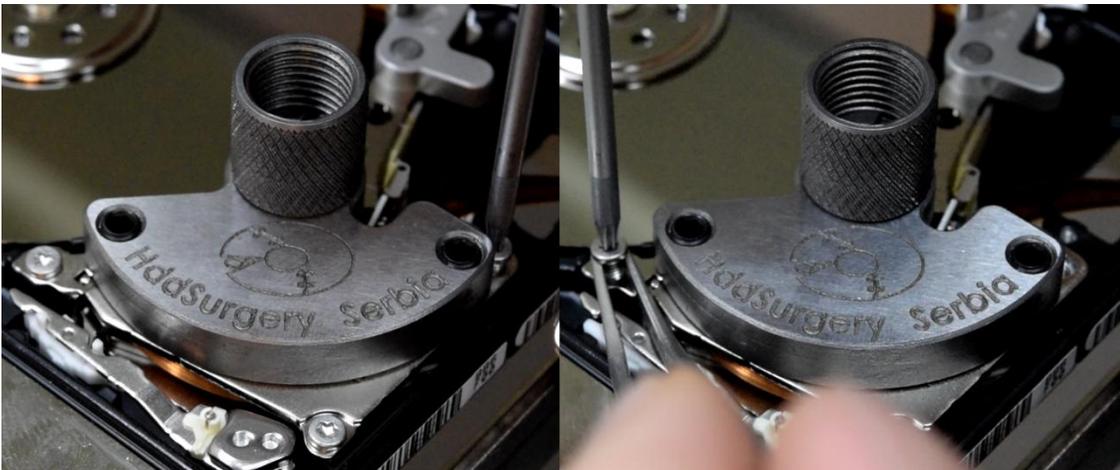
To prevent threaded cocoon from unfastening - knurled locknut must be applied. Fasten it to the threaded cocoon until it touch the support tool plate and **tighten it firmly**.



Picture 6.11 (Mounting the locknut)

Step 10 – Removing the magnet screws

Remove three screws which are fixing both magnets to the donor drive casing.

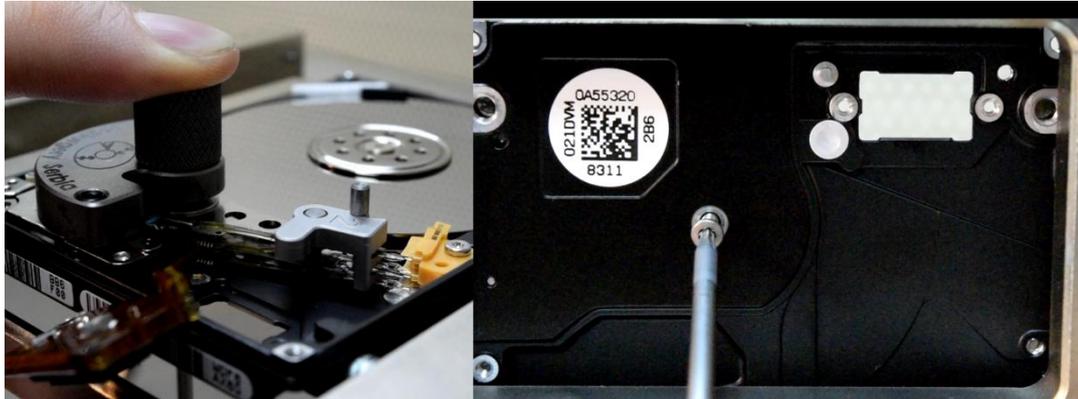


Picture 6.12 (Removing the magnet screws)

Step 11 – Removing the screw that is holding the head arm

Loosen and remove the bottom screw that's holding the head assembly connected to the donor drive casing. While loosening this screw, hold the locknut of the support tool (as shown on picture below).

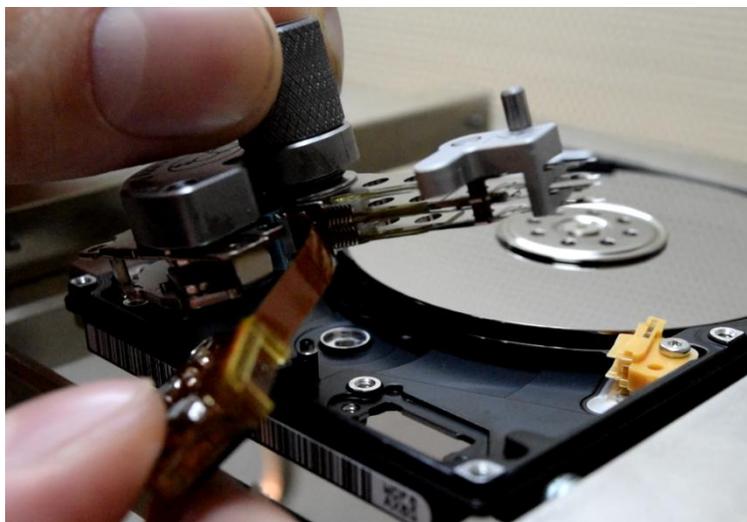
After removing this screw, heads and magnets are completely disconnected from donor hard drive.



Picture 6.13 (Holding the support tool locknut (left) while loosening the screw that is holding the head arm connected to the casing of donor drive (right))

Step 12 – Dismounting heads and magnets from donor drive

Use locknut as a handle and lift support tool up together with head assembly and both magnets. Hold the flat cable connector with the other hand in the process.



Picture 6.14 (Dismounting the heads and magnets from donor drive by using support tool)

Step 13 – Mounting the heads and magnets on a patient drive

Carefully place the head assembly and magnets to its place in patient drive by holding the locknut of the support tool. Assist the process with your other hand. Use four screw holes of the patient drive casing as a guides for exact positioning of the assembly. Three of these holes are for the screws which connect both magnets to the casing and one is for the screw which connects head assembly to the casing.

!!! VERY IMPORTANT !!!

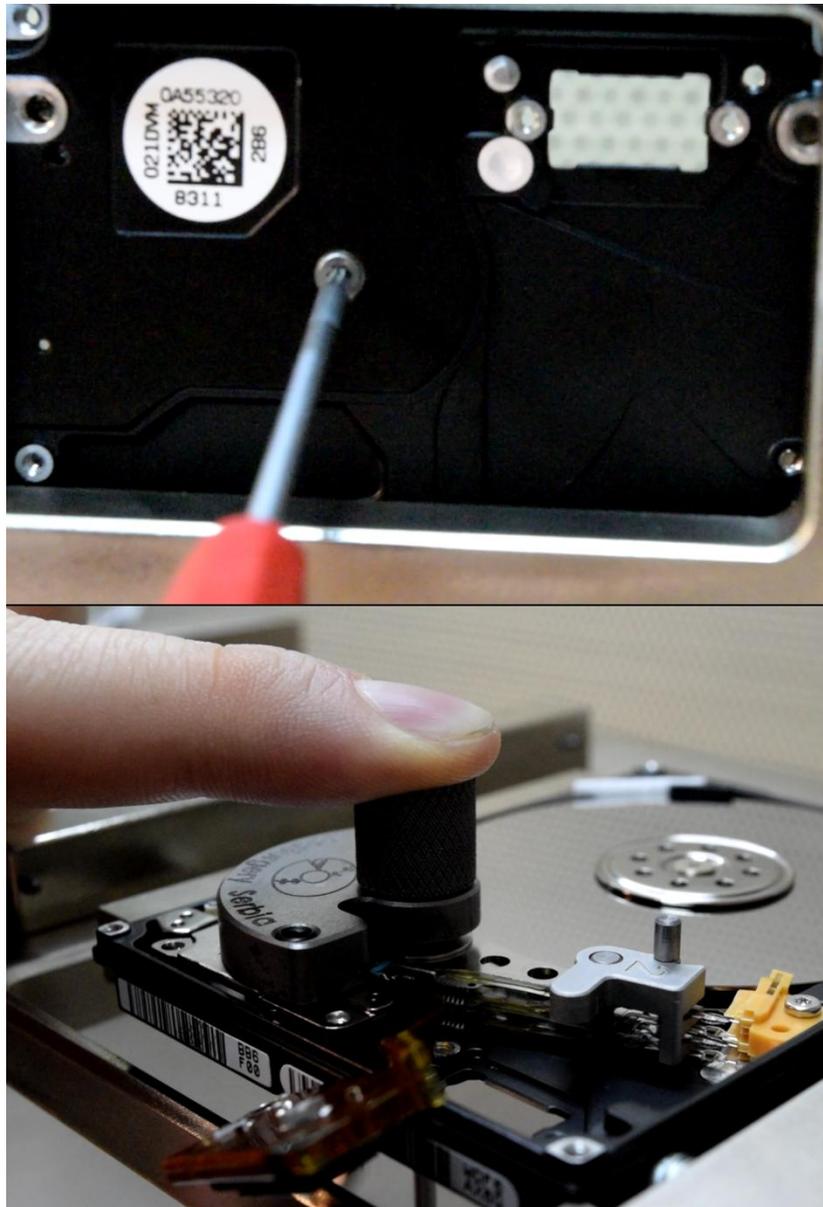
Watch not to damage heads in the process. ESPECIALLY be careful that heads don't come in contact with the ramp.



Picture 6.15 (Up - Patient drive; Down -Mounting heads and magnets in the patient drive)

Step 14 – Tightening the screw that is holding the head assembly from the bottom

When the head assembly and magnets are in their place, tighten the screw which is holding head arm from the bottom while holding the locknut of the support tool from above (as shown on picture below). Be sure to tighten this screw to assure good connection between the head arm and the patient hard drive casing.



Picture 6.16 (Tightening the screw which is holding head assembly from the bottom (up) while holding the support tool locknut (down))

Step 15 – Tightening three screws that connect magnets to the patient drive casing

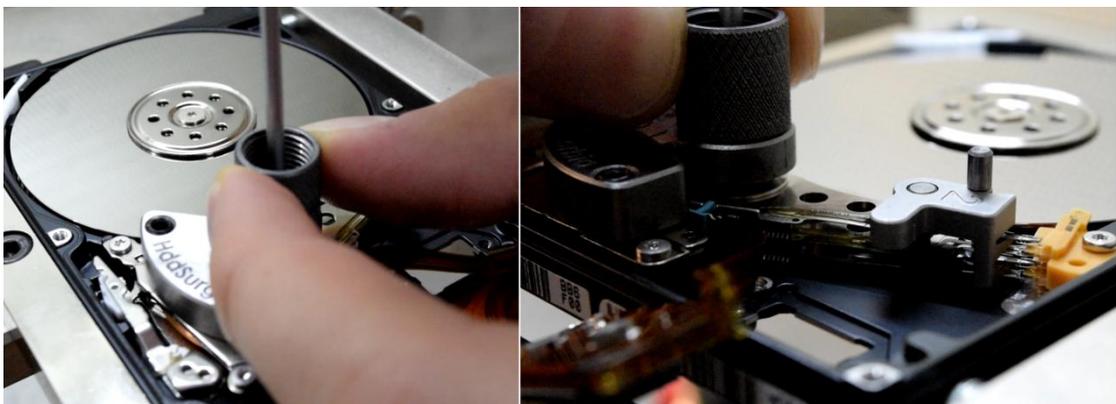
Tighten three screws that are fixing magnets to the patient drive casing.



Picture 6.17 (Tightening three screws (fixing magnets to the patient drive casing))

Step 16 – Loosening the screw that connects support tool to the head assembly

Hold firmly the locknut (to oppose loosening force) of the support tool and unscrew the screw inside the threaded cocoon, which connects support tool to the head assembly. Heads will slide back to the ramp area after screw is loosened. It's **very important** to hold locknut firmly during screw loosening to prevent moving heads to the ramp caused by excessive loosening force.



Picture 6.18 (Loosening the screw that connects support tool to the head assembly - sliding heads back to the ramp)

Step 17 – Dismounting the support tool

Dismount the support tool by holding its locknut and lifting it up. Support tool plate is holding for the hard drive magnets because of the effect of magnetic force. This force is not excessive however it must be overpowered by lifting.



Picture 6.19 (Dismounting the support tool)

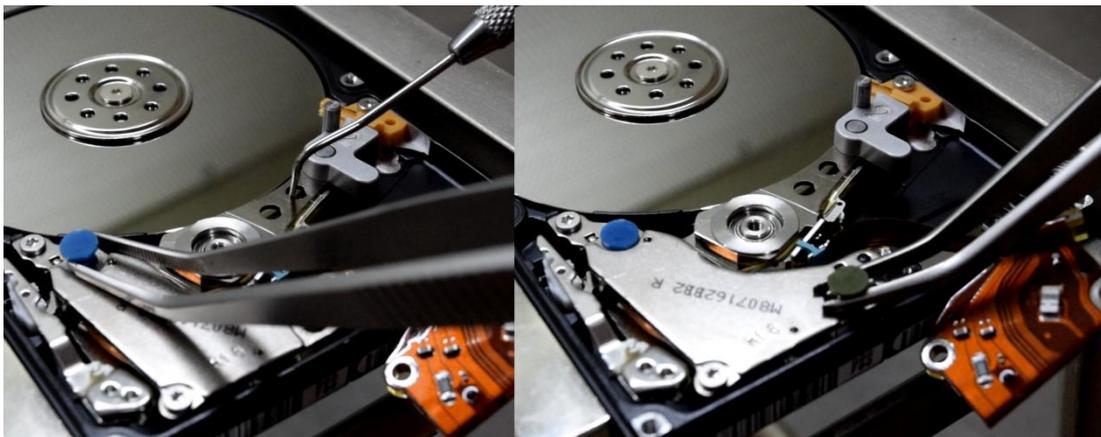
!!! VERY IMPORTANT !!!

It is recommended to remove securing pin from the tool at this moment in order to avoid problems during the tool dismounting in step 19. However it is not necessary to perform this action in this step on the most of the models (such as drive in this manual).

Step 18 – Returning the security brake(s)

Slide heads slightly to the right of the ramp in order to set free left opening in the upper magnet where left security brake should be placed. You can use handle of the ramp tool for this action, however be extremely gentle. While holding heads in that position place security brake in the left opening and then release the heads. Their position on the ramp is now secured. Put the right security brake in the right opening.

If hard drive had additional brake mechanism, which was removed in the process of dismounting heads and magnets from donor drive, mount it in a patient drive in this step.



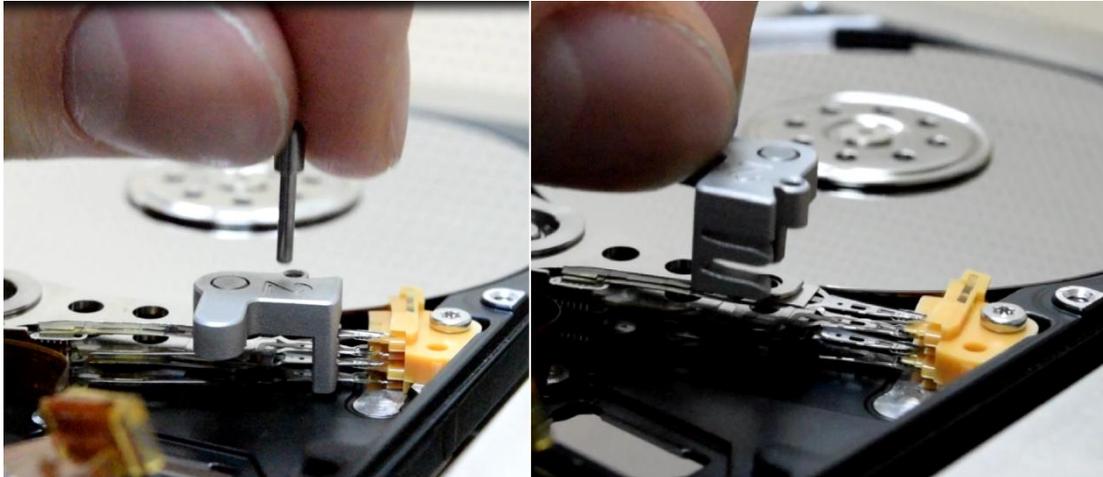
Picture 6.20 (Left - Returning the left security brake; Right - Returning the right security brake)

!!! VERY IMPORTANT !!!

Be VERY CAREFUL while returning security brakes and watch them not to fall on the platters.

Step 19 – Dismounting the tool

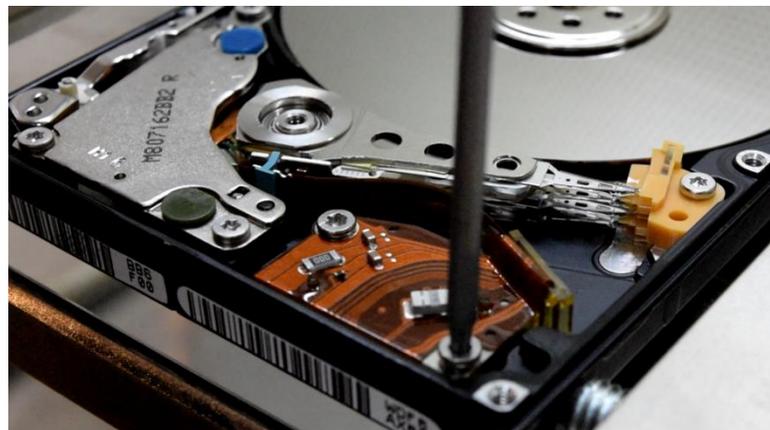
Remove the securing pin from the tool if you haven't removed it already in step 17. Scroll the tool away from the heads. While gently holding the actuator arm, pull the axle of the tool out of the hole by holding the tool for its handle.



Picture 6.21 (Dismounting the tool)

Step 20 – Fixing the flat cable connector and finishing the head replacement process

Place the flat cable connector on its place and tighten the two screws that are holding it. Put the lid and PCB back and clone the disk.



Picture 6.22 (Tightening two screws that are holding the flat cable connector)

7. Conclusion

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

HddSurgery™ is not responsible for any possible consequential damage, including 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