



# Diagnosing and Erasing Hard Drives

If you need to test a hard drive that you want to reuse, this guide will show you what areas of the drive to check for problems.

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## INTRODUCTION

If you are evaluating a hard drive, this guide will show you how to do basic tests to detect common problems. ***While these tests are not perfect, most issues get detected.***

Common drive problems include:

- High hours (Wear and tear)
- Reallocated sectors
- Pending reallocated sectors
- Hidden problems

## Why should used hard drives be checked?

***Most failures are sudden and without warning.*** If these problems are caught early, the drive can be replaced before it fails. SMART plays a major role in this since the data can be used to do this.

***Note: Some hard drives have known problems (Ex: Seagate 7.01/7200.11), while others fail due to lower quality standards (Ex: WD Blue/Green).***

## Guide notes

- ***While Parted Magic can be redistributed legally per the GPL, I will not point to these downloads.***
- ***These tests are not 100% accurate. Some problems can (and do) slip past these tests.***

## A word on drive remapping

- ***While [WD](#), [HGST](#) and [Seagate](#) offer diagnostic tools, they do not work on drives with serious problems or excessive bad sectors.***
- ***Before attempting a sector remap, backup your data.***
- ***DO NOT REPAIR drives with SMART errors.***



## TOOLS:

- [Parted Magic](#) (1)

*If your drive failed, this can be used for erasure.*

- [Ubuntu ISO image](#) (1)

*ATA Secure Erase unsupported out of the box.*

- [Universal Drive Adapter](#) (1)

*USB 3.0 version linked in Step 1.*

- [USB Flash Drive](#) (1)

*Used to boot Parted Magic or Ubuntu.*



## PARTS:

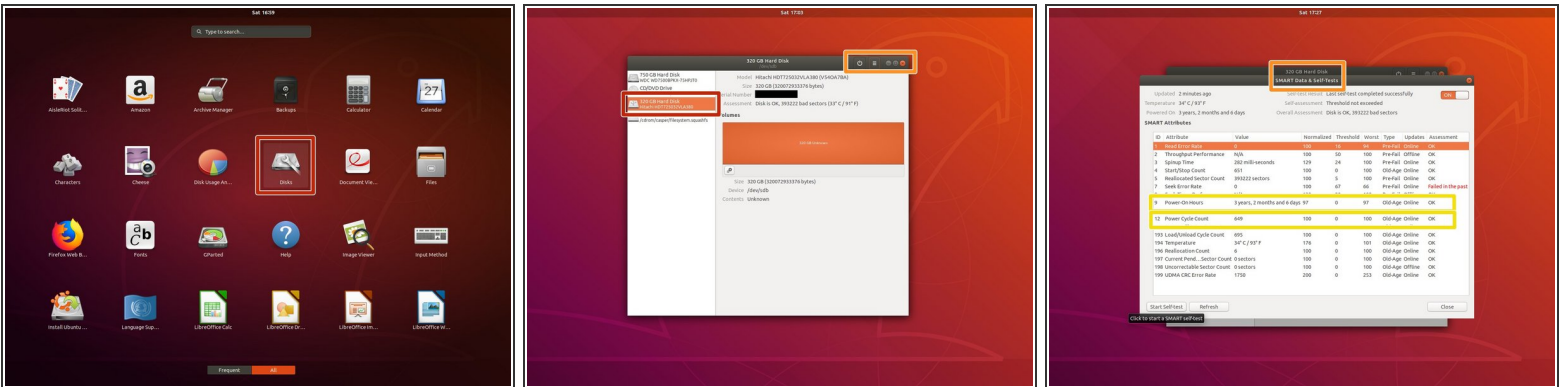
- [Hard Drive](#) (1)

## Step 1 — Mounting the hard drive for testing



- If the hard drive is not installed in a PC, a [USB drive adapter](#) can be used.
- If the hard drive is not installed and you do not have a USB adapter, it can be plugged into a motherboard.

## Step 2 — (Ubuntu) Check the POH/POC

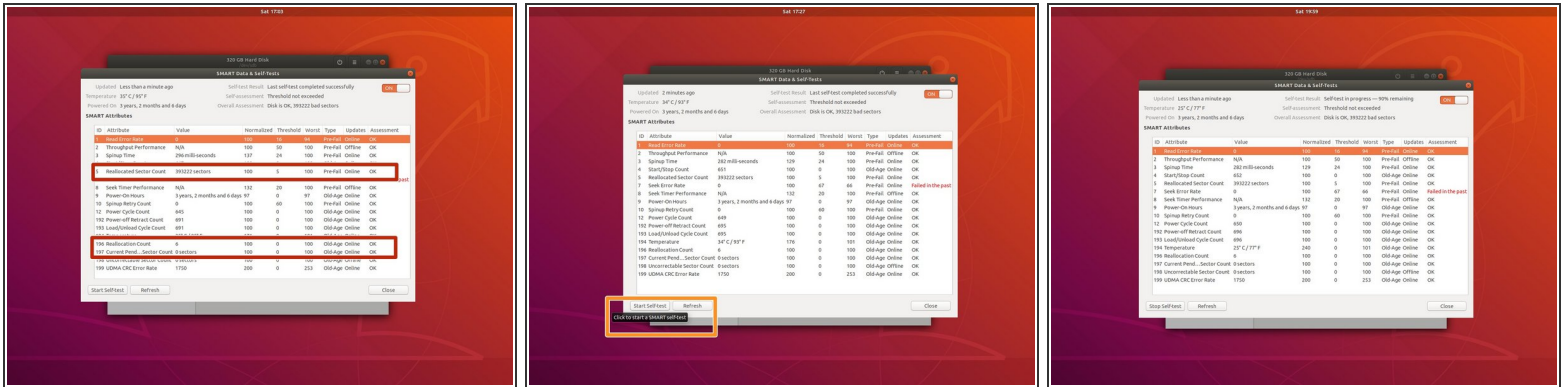


**⚠ While high hours are not an indication of failure, these drives are more likely to fail.**

**📌 GSmartControl can be used in Ubuntu if you cannot read the output from Disks.**

- Boot your system into a live Ubuntu session. Locate the **Disks** application and select the hard disk you want to test.
- From the drop-down menu, select **SMART Data and Self Tests**. This will pull up the SMART data.
- Locate the following SMART attributes: **Power On Hours** and **Power Cycle Count**.

## Step 3 — (Ubuntu) Check the reallocated sectors and test the drive



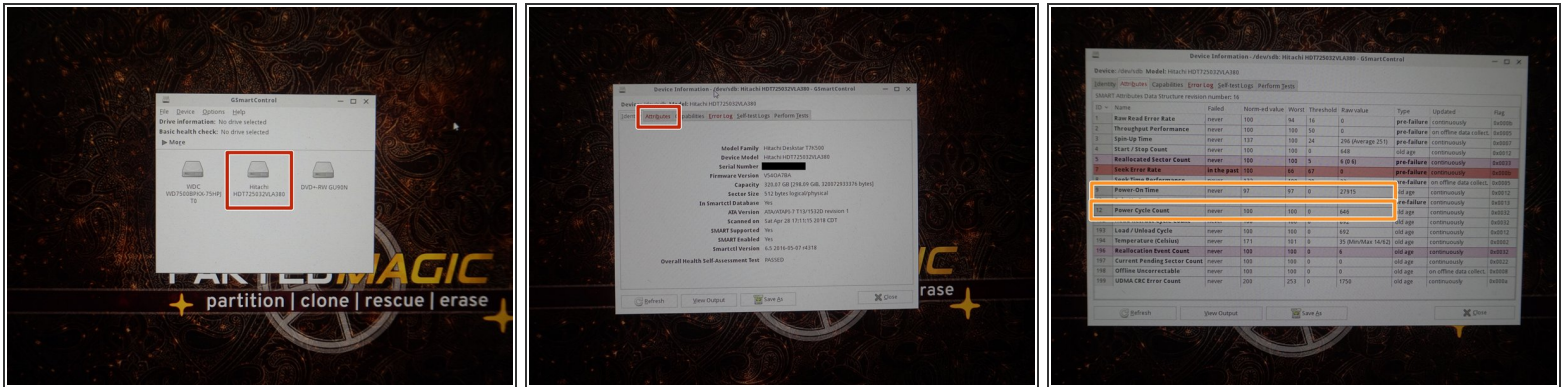
**⚠ If this attribute is highlighted, consider a replacement drive. Use SMART Extended for accuracy.**

**i** If your drive has run out of spare sectors, the drive capacity will drop.

- Locate the following SMART attributes: **Reallocated sector count**; **Current pending sector count**.
- To run a SMART Extended Self-Test, left click **Start Self-Test**. Select **Extended** from the drop-down menu.



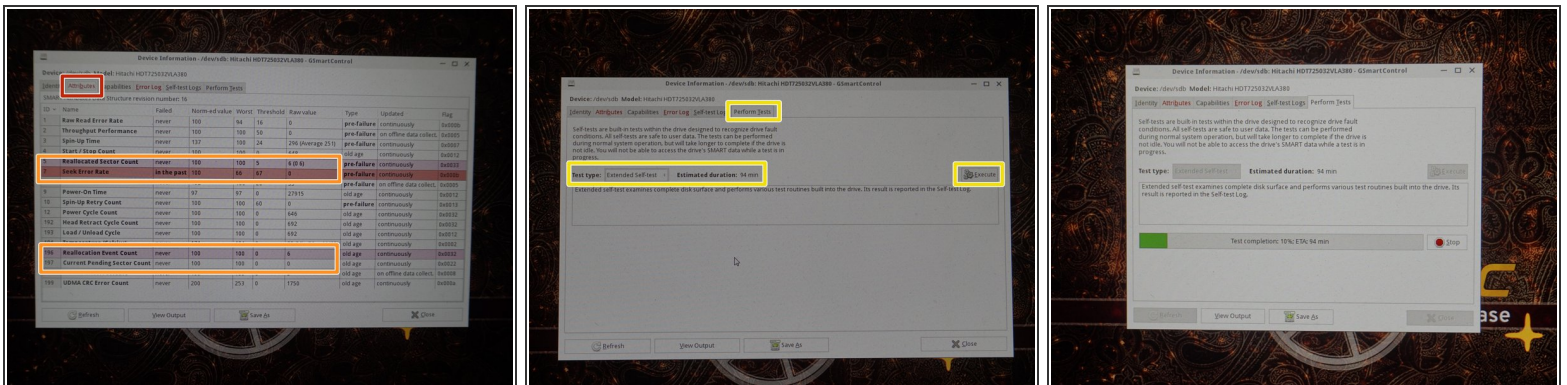
## Step 4 — (Parted Magic) Check the POH/POC



**⚠ While high hours are not an indication of failure, these drives are more likely to fail.**

- Select **Disks** from the desktop to open GSmartControl.
- Select the hard disk you want to test. Click **Attributes** to read the SMART data.
- Locate the following attributes: **Power On Time** and **Power Cycle Count**.

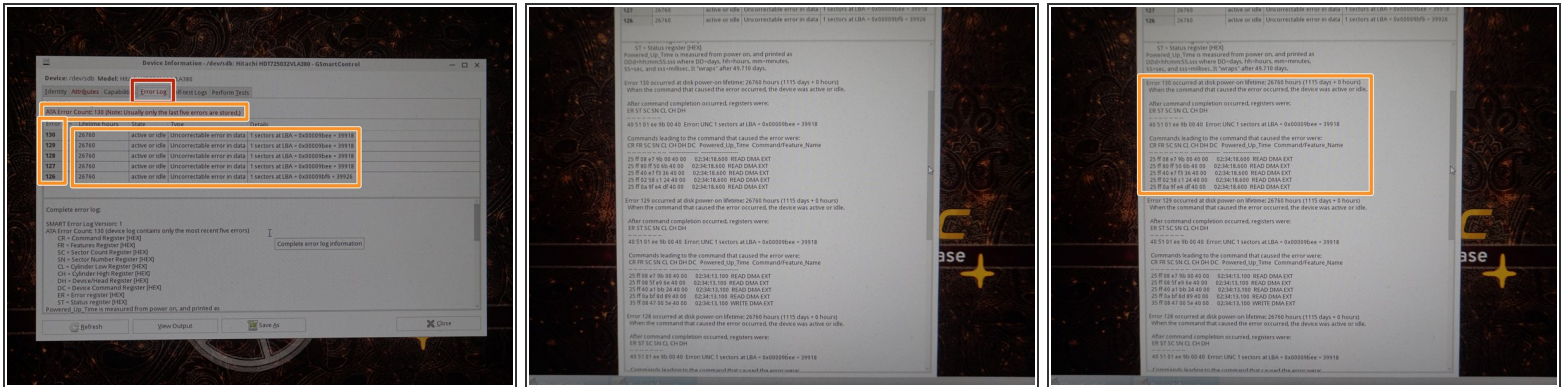
## Step 5 — (Parted Magic) Check the reallocated sectors and test the drive



**⚠ If this attribute is highlighted, consider a replacement drive. Use SMART Extended for accuracy.**

- In the **Attributes** tab, locate the following SMART attributes: **Reallocated Sector Count**; **Reallocation Event Count**; **Current Pending Sector Count**.
- To test the drive, select **Perform Tests**. Click **Test type:** and select **Extended Self-Test**.

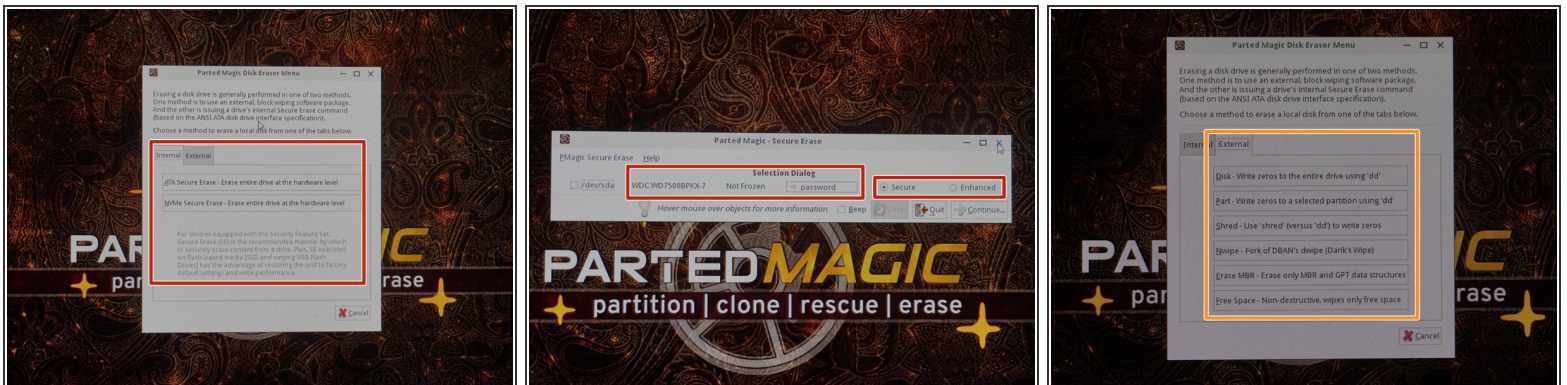
## Step 6 — (Parted Magic) Check the error log



**⚠ Use the error log and SMART data in conjunction to diagnose drive problems.**

- Check the error log for drive errors. To do this, click the **Error log** tab.
- In the Error log, review the available errors. Read these logs if any are found.

## Step 7 — (Parted Magic) Erasing hard drives



**⚠ Your erasure options are limited to the ATA Security Set supported by your drive.**

- **If your drive has ATA Secure Erase implementation problems, choose External.** Use **ATA Secure Erase** on newer drives if possible. **Only use Secure Erase on SSD's.**
- Drives without ATA Secure Erase will need to be erased externally. Select a tool in **External**. **For security, select Nwipe with DoD Short. This will erase the drive 3 times and blank it.**