

## **DATA RECOVERY / HARD DISK TECHNICAL NOTES**

**Title:** Vertical Vibration causes platter damage on Maxtor DiamondMax Plus 8 (N40P)

**Drive:** Maxtor DiamondMax Plus 8 (N40P family)

**Symptoms of Failure:** Drive is detected in Bios as “Maxtor N40P”

**Notes:** The Maxtor N40P hard disk family (also known as the DiamondMax Plus 8 series) of slimline hard disks suffers from a vertical vibration problem that damages the hard disk's firmware zone & renders the data inaccessible by normal means.

This arises because the fluid bearing located in the drive's motor assembly (any Maxtor with an L in the product number has a fluid bearing eg. 6E040L0... etc) suffers from axial play over time.

We have noticed that the form factor of the DiamondMax Plus 8 family (short bearing / wide platter) contributes significantly to this defect - which is further compounded by the mechanical assembly tolerances (platter / spindle concentricity tolerance) when the drive is assembled in the factory.

Increases in vertical vibration are more evident on the outermost disk area, where the head needs to reach the maximum vertical travel distance to comply with platter oscillations (and at higher speed).

The hard disk's service track is also located in this region. The service track is read when the disk starts up and usually (when the disk is idling), the heads will return to this position too. Working conditions such as these accelerate head suspension wear, causing sectors to seem unreadable.

As the G-list is updated, the firmware will gradually become corrupted, repaired, and finally lost.

The read / write heads may also begin to produce an audible steady ringing noise. In this case the parking cantilever sub-assembly will be subject to axial play too, and additionally -

- 1) When the heads are next parked the cantilever will be bent
- 2) When the drive next starts up the heads will move sending the bent cantilever to track 0 and onward, whilst continuously scraping the disk surface.

Once this has happened, the disk becomes a good candidate for microscopy.

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Research: DataClinic (UK) and DataClinic (Italy)