

DATA RECOVERY / HARD DISK TECHNICAL NOTES

Title: Problems with Fluid Dynamic Bearing (FBD) technology in hard drive spindle motors

Notes: The motor assembly on many modern hard disk drives contains a fluid bearing. Fluid bearings are commonly used by many hard drive manufacturers and have advantages over their ball bearing counterpart drives is so much as (1) They provide superior shock resistance and, (2) They run much quieter.

However, Data Clinic investigation has shown that when a hard disk drive with a motor assembly of this type is powered up from cold, the fluid contained in the bearing takes time to reach it's optimum performance viscosity. During this time (when the fluid in the bearing is not operating at its optimum viscosity) the hard drive platters are subject to vertical vibration, causing multiple read & write errors, ultimately leading towards the failure of the hard drive.

We believe that this vertical vibration is a contributing factor to why many modern hard disks develop firmware and other service area related faults.



Above: Disassembly of the spindle motor from a seized Maxtor N40P series hard drive. The parts are (left to right): starter motor, fluid bearing, rotor

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Research: DataClinic (UK) and DataClinic (Italy)