

## Mechanical Spacing to Investigation of Slider Dynamics in the Slider-Lubricant Contact Management

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**Abstract:** The force between the disk and slider under the unsteady proximity condition, the impact valve of the lubricant contact will be investigated in this study. In the research, the particle test is also conducted on the disk and the slider of the commercial vehicle. The test is conducted on the both speed of the take off and touchdown of the commercial vehicle. During the take off condition of the vehicle, the flimsiness of the slider dynamics is improved.

**Key words:** Mechanical spacing, slider dynamics, Touch-Down (TD), Takeoff (TO), flimsiness, commercial vehicle

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### INTRODUCTION

Numerous techniques have been produced to accomplish more noteworthy areal densities in Hard Disk Drives (HDDs) including thermally helped attractive recording, helium-filled drives and designed media (Wang *et al.*, 2015). Be that as it may, the utilization of numerous inventive advancements is unthinkable by and by because of value intensity and generation trouble (Knigge *et al.*, 2006). An option arrangement is to diminish the space between the slider and circle to under 2 nm which infers a physical dispersing of 0.25 nm at the read-compose transducer area. With such a little hole, irregular contact between the slider and lubricant layer used to ensure the recording zone is inescapable (Tani *et al.*, 2013). A consistent oil contact Head-Disk Interface (HDI) might be important to meet future attractive dividing needs (Ambekar *et al.*, 2005). The lubricant surface assumes a vital part in deciding the physical freedom and slider Flying-Height (FH) and slider elements are subject to the slider-lubricant contact (Yu *et al.*, 2007). New recording advancements force an altogether tight spending plan on slider progression; moreover, the HDI must be solid with no lubricant corruption of plate jacket, even after delayed operation. To accomplish higher areal thickness, it is important to consider the connection between the slider and lubricant (Liu *et al.*, 2009).

Slider vibration diminishes the recording dependability and adjusts the slider progression and intermolecular strengths, consequently impacting the connection between the slider and lubricant layer. Also,

contact-instigated surface wear and position vibration in both the vertical FH and in-plane bearings turn into an issue (Zheng and Bogy, 2010). This circumstance is identified with the hysteresis between Touch-Down (TD) and Take-Off (TO). Intermolecular strengths can influence TD while meniscus powers impact TO. The hysteresis is identified with the lubricant qualities, for example, thickness and rate of portable lubricant (Marchon *et al.*, 2013; Balakrishnan *et al.*, 2012). Hence, to explore the slider progression in the temperamental nearness condition and to build the recording dependability, it is important to break down this from the point of view of the TD/TO marvel (Selvakumar and Manoharan, 2014). In any case, no review has analyzed the slider progression amongst TD and TO conditions and the impact of the approach/withdrawal speeds between the slider and lubricant.

### MATERIALS AND METHODS

**Proposed system:** In this study, we dissected the slider elements in the precarious closeness condition and TD and TO condition as far as the slider approach and withdrawal speeds. To set the TD and TO conditions, we utilized warm Flying-Tallness Control (TFC) warm energy to affirm the change in mechanical dividing of the slider. These outcomes were utilized to characterize the connection between the slider and lubricant.

To examine the slider progression in temperamental closeness condition, we distinguished the vibration incited by slider-lubricant contact. The slider-lubricant contacts are distinguished by both Acoustic Discharge

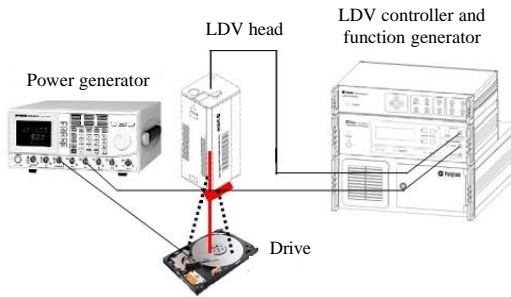


Fig. 1: Schematic of experiment setup

(AD) and Laser Doppler Vibrometer (LDV) techniques which are institutionalized contact locators broadly utilized as a part of research center based examinations. Be that as it may, AD is not a high affectability technique for the identification of the slider-lubricant contact as a result of the moderately frail flexible anxiety wave produced by the slider's surfing on the lubricant surface. The LDV strategy is usually used to screen the slider-lubricant and the slider-plate contact by measuring the vertical speed of the slider at its trailing edge.

Consequently, in this study, the vertical vibration of the slider was measured utilizing a LDV as appeared in Fig. 1. The HDI change in contact can be dictated by the slider vertical speed. A critical change in this speed shows distinction in the HDI for example, contact. With the TFC design, a driving voltage is connected to the TFC slider; the current created goes through the TFC radiator component which has variable resistance amid the warming procedure. The radiator starts resistive warming, bringing about the warm distension of the warmer component. This makes it conceivable to decrease the FH. In this study, the viable voltage was characterized as the voltage connected to the TFC radiator component amid examinations.

The impacts of TD and TO in the temperamental vicinity condition were explored as takes after. The slider was stacked and permitted to stream inactively for 10 min on the circle. As the slider slowly moved toward the lubricant with expanding TFC warm power, the vertical vibration of the slider was measured by the LDV. The TFC warm power at which the slider vertical speed changed altogether was characterized as the TD control. After contact, the slider was progressively pulled back from the lubricant by diminishing the TFC warm power. The TFC warm power at which an impressive change in the slider vertical vibration happened was characterized as the TO control. The TD and TO forces were 86 and 74 mW, separately.

## RESULTS AND DISCUSSION

### Section 1; probability of disappointment occasion

**event:** Developing issue tree once the disappointment information has been accumulated, it is gathered and sorted by its hardware/sub-framework. It is best to develop independently a flaw tree for every subsystem inside of a framework as it empowers information taking care of and examination to be led. The individual issue trees can later be grouped to break down the framework disappointment. Flaw tree development can be accomplished with the utilization of PC programming bundles for example, fault tree zV6.0 and AvSimz.18, 19.

### Section 2: Consequence seriousness

**Rundown of results:** Master judgment ought to be utilized to incorporate a rundown of outcomes and supplement the authentic information. This can be accomplished as a FMEA.22 once this has been done, the expert can then dole out every one of the outcomes into their separate gatherings. In the proposed methodology, four gatherings have been recognized, these are personnel, environment, equipment and catch. For every occasion or disappointment, a rating from 1-4 is given for each of the gatherings. The appraisals depict the results of an occasion happening in semantic terms for example, negligible, marginal, critical and catastrophic.

## CONCLUSION

This study, explored the impacts of the slider approach and withdrawal speed in TD and TO circumstance on slider elements in the precarious vicinity condition. To investigate the slider elements, we characterized three flying state: the relentless flying condition, precarious closeness condition and contact condition. These can be clarified by the connection between the slider and lubricant. Utilizing the characterized flying states, analyses were performed under TD and TO conditions. The TD circumstance uncovered no adjustment in slider flow with changes in the slider approach speed. In the TO circumstance, slider progression with the slider withdrawal speed. In particular, the slider elements did not change in the moderate withdrawal circumstance; be that as it may, quick withdrawal brought about the shakiness of the slider flow, gotten from the detachment association between the slider and lubricant.

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