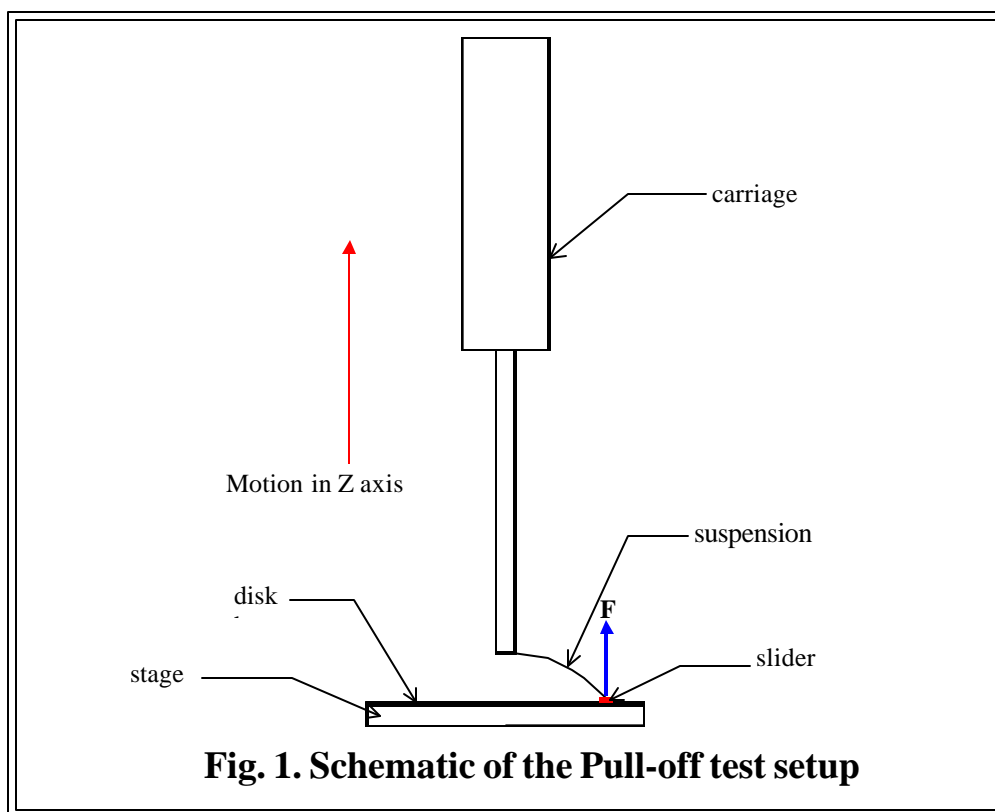


UNIVERSAL MICRO-TRIBOMETER UMT**Measurement of the Vertical Stiction (Pull-off) forces
in the head-disk interface.**

One of the applications of the Universal Micro-tribometer is the precision measurements of pull-off forces. This paper describes a test procedure for the measurement of Pull-off forces between magnetic head slider and a disk. Figure 1 shows the schematic of the Pull-off setup.

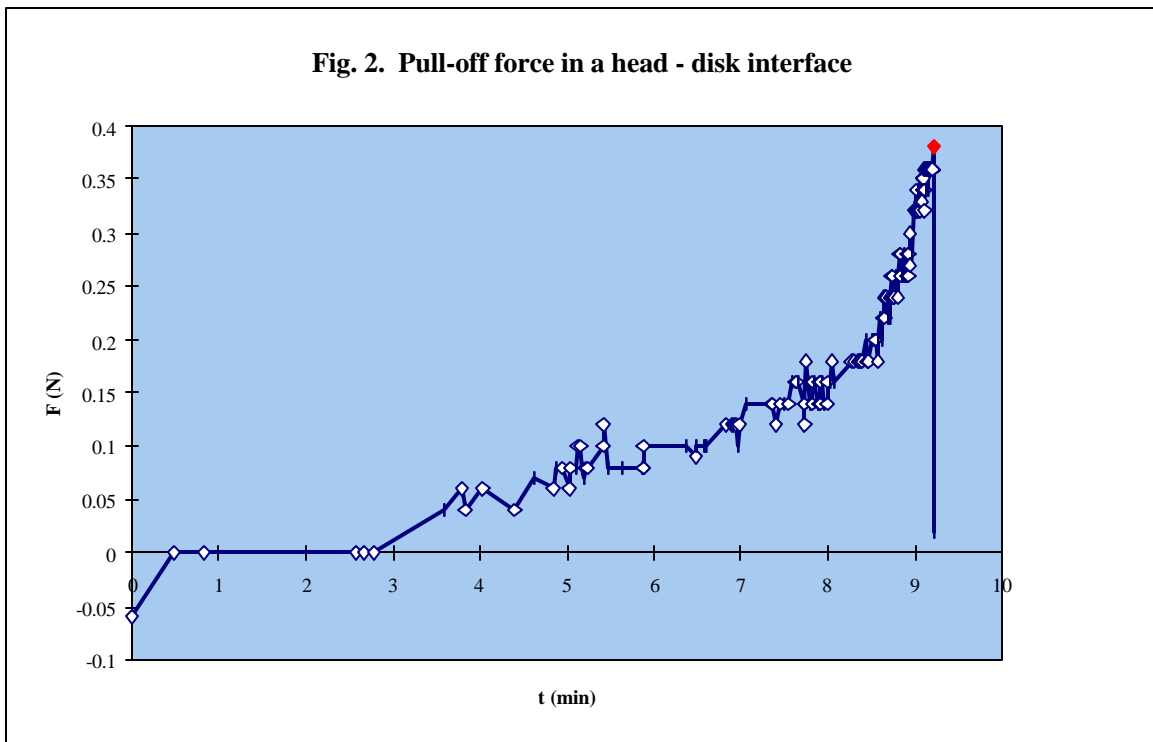


Experimental procedure: Magnetic disk is positioned on the horizontal stage. The suspension with magnetic head is assembled on the carriage and is brought onto the disk surface by linear vertical motion system. The head is resting on the disk surface for 10 minutes under constant vertical load 0.07 N. The load sensor provides feedback to the closed-loop vertical motion control, which ensures constant load during resting. The load sensor accurately measures both compressive and tensile loads.

Patent Pending



After rest, the carriage starts lifting up with the vertical speed 0.005 mm/min. Pull-off force F is determined as the maximum force before the slider is pulled off the disk surface. Figure 2 presents the data for a Pull-off test of a 30% head slider from a laser-textured carbon overcoated disk; the Pull-off force was found to be 0.38 N.



The Micro-Tribometer allows to investigate effects of vertical speed, time of stationary contact (rest), head and suspension design, head and disk materials, disk lubricant, etc. on the vertical stiction (pull-off) force.