

# X-Bearing Friction Test

ufodoctor3, April 12<sup>th</sup>, 2019

## Introduction to the Problem

Many forum colleagues complain the x-bearing of the JGaurora5 3D printer. With perfect cleaning and lubrication of the x-rod the printing works fine, else the moving extruder will rattle and the upper printing layers provide an x-offset up to 5 mm.

After rigorous investigation it came out, that the non-perfect diameter of the x-rod is the real source of the problem!

## Solution of the Problem

With an auxiliary friction test device (Fig.1), connected between the base unit and the tower the x-friction can be investigated at reduced torque to find out, where the x-rod needs to be polished or cleaned!

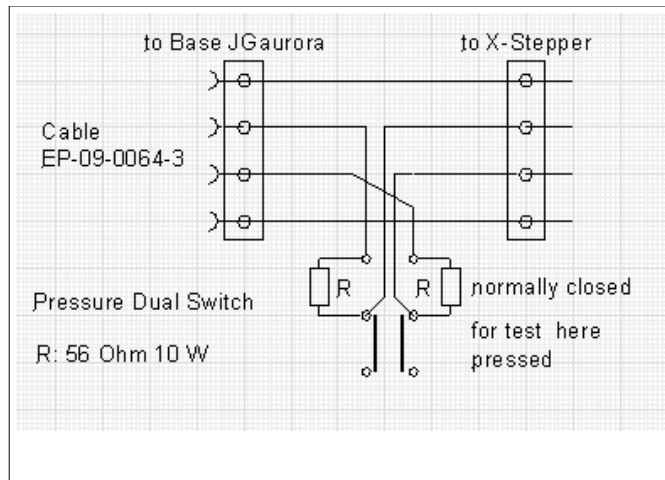


Fig. 1: Friction tester device

Serial Resistor	56 Ohm			
	Signal mV	Diff to Zero mV	Current A	Max Force N
Zero, no Supply	2433			
+ Pulse	2594	161	0.403	16
- Pulse	2247	-186	-0.465	
Test with Serial Resistor in both coils				
+ Pulse	2583	150	0.375	9
- Pulse	2251	-182	-0.455	
Power in Resistor	$I^2 \times R$			
P	11.5934 W			

Force Sensor: Mechanical spring scale  
 Current Sensor:  
 Sparkfun Digi-Key 1568-1882-ND  
 400mV/1A (DC up to 80 kHz)

Fig. 2: Test with Current Sensor Sparkfun

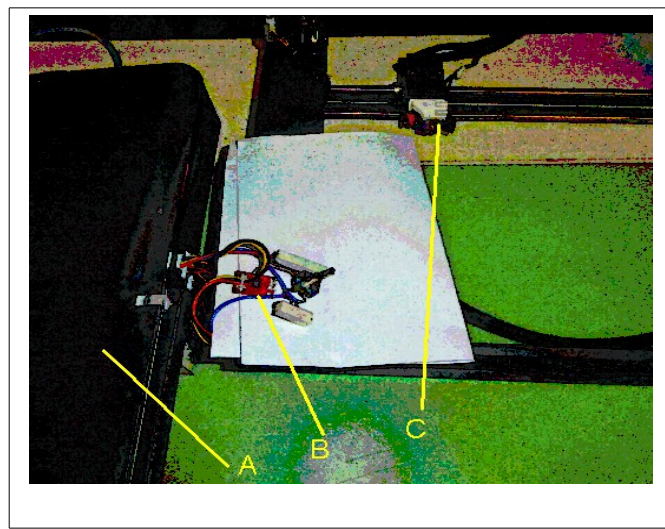


Fig. 3: Test Setup  
 Base Unit and Tower disassembled

- A: Base Unit JGaurora
- B: Friction Tester with Current Monitor by Sparkfun
- C: Moving Extruder on x-rod

With the reduced x-stepper torque (by the test device Fig.1) the non-perfect areas of the x-rod can be located by a rattle noise.

These x-areas need to be polished!

### Comment:

Starting this friction detector before every printing and not observing "rattle", the system is OK!