Leaf Spring Analysis

L1 vertical motion leaf spring: 2 sets of 2 parallel beams

thickness	1.450	mm	0.057	in				
width	12.700	mm	0.500	in				
length	45.720	mm	2.244	in				
Mom Iner.	3.226	mm^4	7.75E-06	in^4	K	4.60E-04	in^4	
modulus		E	7.75E+06	psi	G	2.33E+06	psi (BE CAREFUL HERE!)	
EI			60.1	psi-in^4	KG	1070.5	psi-in^4	
Stiffness			3.921	mils/lb	Stiffness	0.524	mrad/(in-lb)	

dY (mils)	Load (lbs)	Load (grams)	Stress (psi)				
1.0	0.26	116	527				
2.0	0.51	232	1054				
3.0	0.77	347	1581				
4.0	1.02	463	2108				
5.0	1.28	579	2635				
6.0	1.53	695	3162				
7.0	1.79	811	3689				
8.0	2.04	926	4216				
9.0	2.30	1042	4743				
10.0	2.55	1158	5270	**desired load for full L1 module >>>>>>>**	**1158**	**grams**	
11.0	2.81	1274	5797				
12.0	3.06	1390	6324				
13.0	3.32	1505	6851				
14.0	3.57	1621	7378				
15.0	3.83	1737	7905				
16.0	4.08	1853	8432				
17.0	4.34	1969	8959				
18.0	4.59	2084	9486				
19.0	4.85	2200	10013				
20.0	5.10	2316	10540				

Twisting of springs to allow .002" difference over 5"

angle	0.0004	rad
Torque	0.763	in-lb
Load @5"	0.15	lb
	69	grams

Note: fixture imparts ~0.5 in-lb torque with spring at one end.