



Data spring X type 1:  
 De=16.2 mm  
 dw=1.2 mm  
 Ls=180 mm  
 Lb=150 mm  
 turns=124  
 K=50 N/m  
 maximum extension= $150 \times 1.5 + 53 = 278$  mm  
 maximum tension=6.4 N  
 minimum extension= $150 \times 1.5 - 53 = 172$  mm  
 minimum tension=1.1 N  
 X-direction Lw=54.3 mm  
 Y-direction Lw=107.5 mm

Data spring X type 2:  
 De=16.4 mm  
 dw=1.4 mm  
 Ls=180 mm  
 Lb=150 mm  
 turns=106  
 K=104 N/m  
 maximum extension= $150 \times 1.5 + 53 = 278$  mm  
 maximum tension=13.3 N  
 minimum extension= $150 \times 1.5 - 53 = 172$  mm  
 minimum tension=2.29 N  
 X-direction Lw=54.3 mm  
 Y-direction Lw=107.5 mm

Data spring X type 3:  
 De=21 mm  
 dw=2 mm  
 Ls=190 mm  
 Lb=150 mm  
 turns=74  
 K=324 N/m  
 maximum extension= $150 \times 1.5 + 53 = 278$  mm  
 maximum tension=41.47 N  
 minimum extension= $150 \times 1.5 - 53 = 172$  mm  
 minimum tension=7.13 N  
 X-direction Lw=44.3 mm  
 Y-direction Lw=97.5 mm

Data spring X type 4:  
 De=37.5 mm  
 dw=3.5 mm  
 Ls=215 mm  
 Lb=145 mm  
 turns=41  
 K=960 N/m  
 maximum extension= $145 \times 1.5 + 53 = 270.5$  mm  
 maximum tension=120.5 N  
 minimum extension= $145 \times 1.5 - 53 = 164.5$  mm  
 minimum tension=18.7 N  
 X-direction Lw=21.8 mm  
 Y-direction Lw=75 mm

ref.	note	date	signature
modifications			
ref.	draw.	added legend	ref. draw. added legend

	<b>LIGO PROJECT</b>	designed for: <b>R.De Salvo</b>
		draw. by: <b>C.Gennaro-PROMEC</b>
		date: <b>23-11-06</b>
title: <b>HAM-OPTICAL BENCH</b>		LIGO-D051257-00-D
HORIZONTAL SPRING		scale: <b>A 1</b>