

Torsion Pendulum

ME-6694

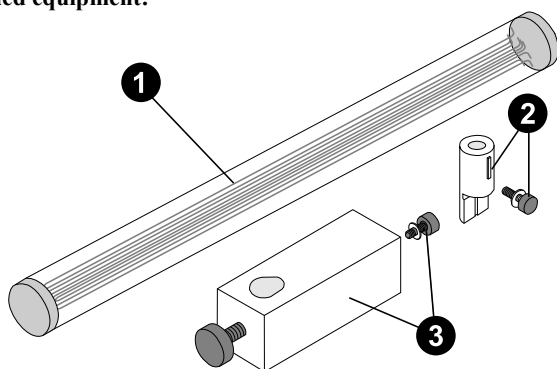
Introduction

The Torsion Pendulum, an accessory for the Rotary Motion Sensor (CI-6538) or PASPORT Rotary Motion Sensor (PS-2120A), is used to study torque and the motion of inertia in a rotating body. Using the apparatus, students can collect experimental data on rotational acceleration, rotational position, and rotational velocity for a variety of experiments. The apparatus includes wires with three different diameters, providing three different repeatable torque magnitudes.

NOTE: Due to its construction, the Wireless Rotary Motion Sensor (PS-3220) is NOT compatible with the apparatus.

Equipment

Included equipment:



- 1 9× 18-inch wires, including 3× with 0.032 inch diameters, 3× with 0.047 inch diameters, and 3× with 0.063 inch diameters
- 2 Upper wire clamp, with thumbscrew and washer
- 3 Lower wire clamp, with thumbscrew and washer

Required equipment:

- Either of the following rotary motion sensor setups:
 - PASPORT Rotary Motion Sensor (PS-2120A) with PASPORT interface
 - Rotary Motion Sensor (CI-6538) with PASCO digital interface
- PASCO Capstone or SPARKvue data collection software
- Universal Table Clamp (ME-9376B) or Large Rod Base (ME-8735)
- Stainless Steel Rod, 90 cm (ME-8738) or equivalent

Recommended equipment:

- Any of the following force sensor setups:
 - Wireless Force Acceleration Sensor (PS-3202)
 - PASPORT Force Sensor (PS-2104) with PASPORT interface
 - Force Sensor (CI-6537) with PASCO analog interface
- Rotational Inertia Accessory (ME-3420)

Assembly

1. Using a pair of pliers, bend the ends of the wires at 90° angles to the main body of the wire. The direction of the bend is not critical.
2. Use the Universal Table Clamp or Large Rod Base to secure a support rod near your computing device, as shown in Figure 1.

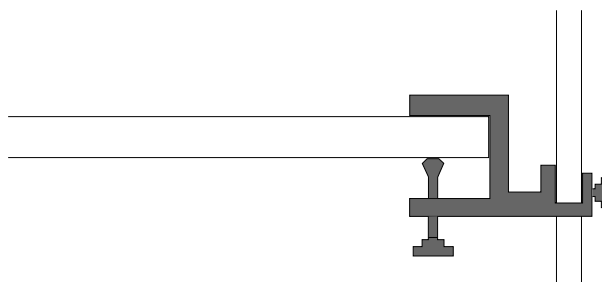


Figure 1

3. Slip the lower wire clamp onto the support rod.
4. Clamp the rotary motion sensor in place at the top of the support rod, as shown in Figure 2.

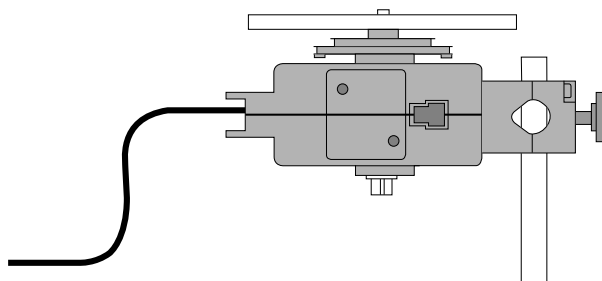


Figure 2

5. Clamp one end of the wire under the washer of the upper clamp. To do so, insert the bent part of the wire into the groove on the clamp, as shown in Figure 3, then firmly tighten the thumbscrew.

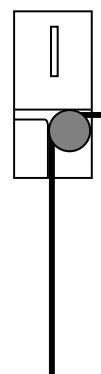


Figure 3

6. Clamp the other end of the wire under the washer of the lower wire clamp, as shown on the left in Figure 4. Make sure that the elbow of the bend in the wire fits snugly against the axle of the thumbscrew, as shown on the right in Figure 4.

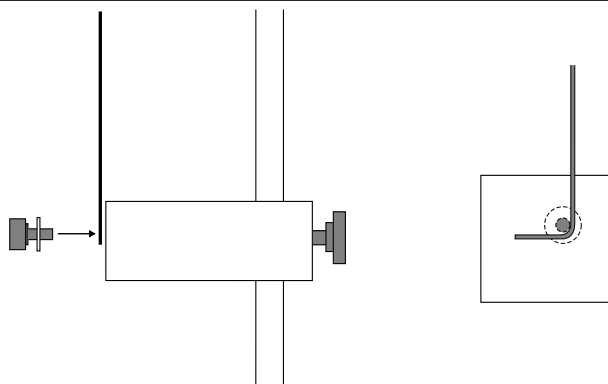


Figure 4

7. Adjust the height of the lower wire clamp to about 18 inches below the shaft of the rotary motion sensor.
8. Align the guide of the upper wire clamp with the slot in the rotary motion sensor's shaft, as shown in Figure 5.
9. Adjust the height of the lower wire clamp as necessary to position the top of the upper wire clamp approximately halfway up the shaft, as shown in Figure 5.

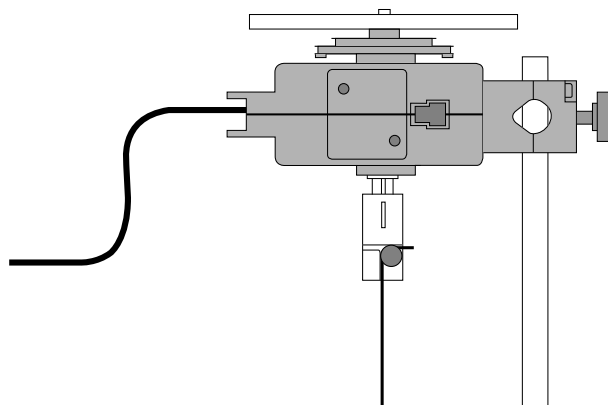


Figure 5

10. If necessary, adjust the lower wire clamp so the body of the wire is perpendicular to the table.
11. Recheck all screws on the clamps to make sure each part is firmly secured.

Once you have finished, the full setup of the apparatus should resemble what is shown in Figure 6. In this setup, turning the shaft on the rotary motion sensor will twist the wire, causing it to exert a torque on the sensor to counter the rotation. The magnitude of this torque can be calculated using PASCO Capstone and SPARKvue software.

⚠ CAUTION: Always wear safety glasses when experimenting with the Torsion Pendulum!

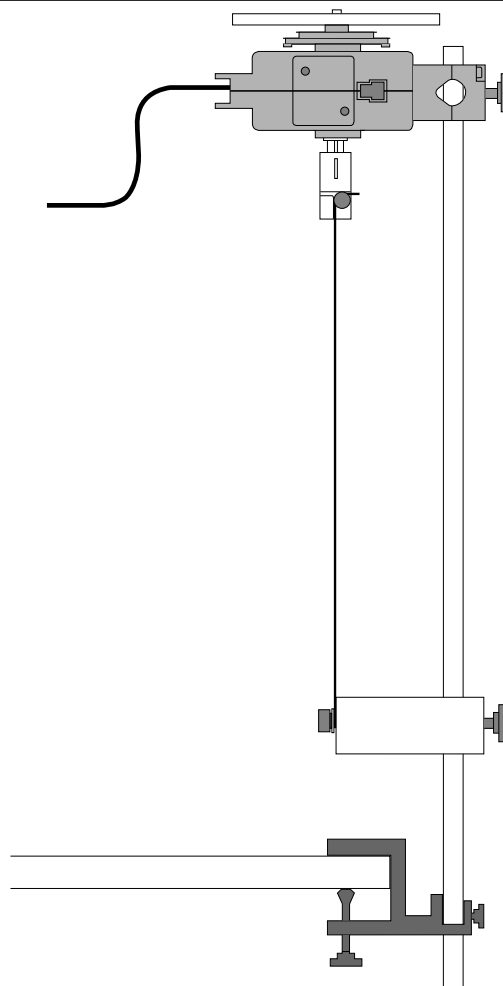


Figure 6

Software help

The SPARKvue and PASCO Capstone Help provide information on how to use this product with the software. You can access the help from within the software or online.

SPARKvue

Software: Main Menu  > Help

Online: help.pasco.com/sparkvue

PASCO Capstone

Software: Help > PASCO Capstone Help

Online: help.pasco.com/capstone

Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include student handouts and teacher notes. Visit pasco.com/freelabs/ME-6694.

Technical support

Need more help? Our knowledgeable and friendly Technical Support staff is ready to answer your questions or walk you through any issues.

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Limited warranty

For a description of the product warranty, see the Warranty and Returns page at www.pasco.com/legal.

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