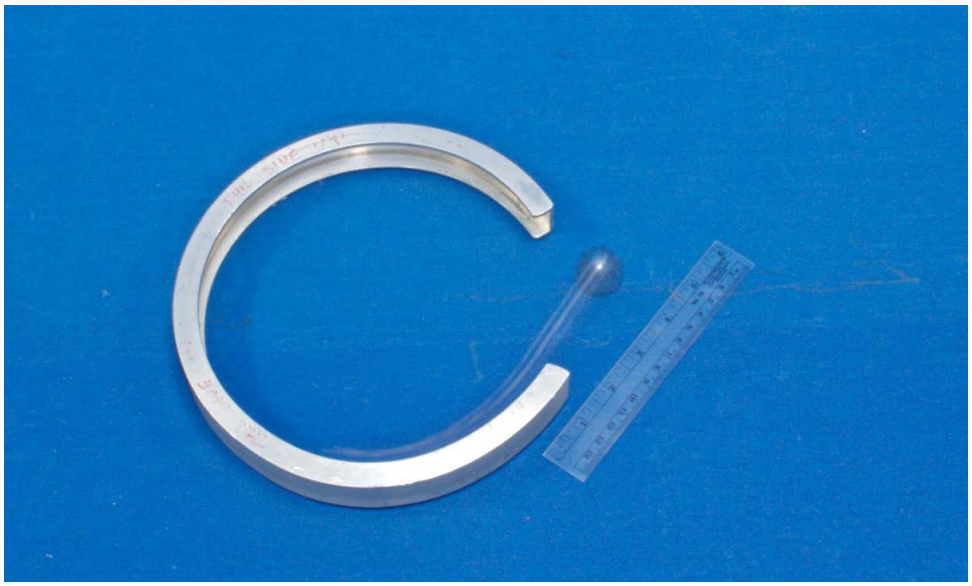
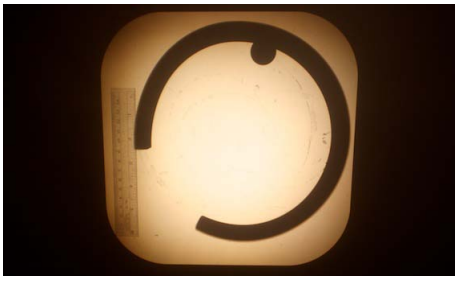
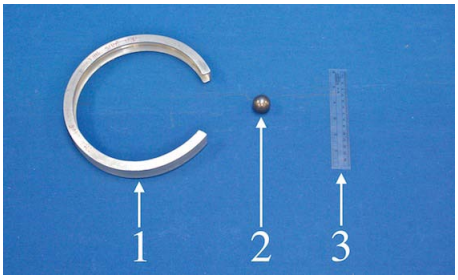
BROKEN RING 1D55.10

Mechanics | Motion in Two Dimensions | Centrifugal Escape







Concept:

Here we see that a body must have an external and centripetally directed force in order to move circularly. While in contact with the ring, the ball experiences a centripetal force provided by the normal force of the ring, and thus moves along a circular path. Once the ball exits the ring, there is no longer any force exerted by the ring, and so the ball must move along a straight-line path that is tangent to the ring at the exit point.

Equipment:

1. Broken Ring
2. Small Ball
3. 6 inch Transparent Ruler
4. Overhead Projector (not pictured)

Procedure:

1. Place the broken ring on the overhead projector with the foam side down.
2. Roll the ball around the inside of the ring towards the broken section.
3. Notice that the ball moves in a straight line upon exiting the ring.
4. Repeat the demonstration using the transparent ruler to show that the ball's path is indeed straight and parallel to the ring opening at the broken section.