

OPERATING INSTRUCTIONS

Economy Ballistic Car No. 32448-01

1. Introduction

The Economy Ballistic Car (32448-01) demonstrates that the horizontal component of velocity of a ball shot vertically from a car moving horizontally at constant velocity is the same as that of the car.

2. Description

The car consists of a metal frame mounted on four wheels. Mounted vertically on the frame is an ejection device consisting of a steel tube that contains a piston attached to a steel spring. A metal pin, inserted through one of two holes in the side of the tube and into a groove on the piston, holds the piston down when the spring is compressed. A steel ball is supplied with the car.

The car is also equipped with a release device — a hard braided cotton line used to pull the safety pin out of the ejection system when the car is set in motion.

3. Operation

Attach the cotton line to the hook of the pin. Set the steel ball on the piston and compress the spring until the groove on the piston lines up with one of the holes. Insert the pin into the hole. With the pin in the lower hole, the spring is under greater compression than when the pin is in the upper hole.

Place the car on a smooth, horizontal surface and shove it gently to impart a uniform horizontal motion to it. To minimize the effects of friction between the pin and plunger after the car is set in motion, pull the cotton line with a quick snap of the wrist and arm to release the pin from the ejection system; the spring loaded plunger will eject the ball upward.

As the car continues along its horizontal path, the steel ball will describe a parabolic path through space and return to land in the ejection system. The path of the ball is determined by the uniform horizontal motion imparted as the ball moved with the car, the vertical motion imparted when the spring-loaded plunger was released, and the downward acceleration of gravity — all acting simultaneously on the ball.

4. Maintenance

The Economy Ballistic Car needs no special maintenance. If you should experience any difficulty with this device, please contact Central Scientific Company. To ensure better service, please do not return any apparatus to Central Scientific Company until we have sent you authorization.

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