

4-Stroke Petrol Engine Working Model (Cutaway)

User Manual

Educational Model

Intended use

Hand-cranked cutaway teaching model of a single-cylinder, air-cooled 4-stroke petrol engine that shows the intake, compression, power and exhaust strokes. It is a demonstration model and does not run on fuel.

Intended users

Instructors and students in engineering, automotive and physics education, and museum or exhibit staff.

Read this manual completely before first use and keep it with the product. This document provides general operating, care and safety guidance. Where the product is supplied with manufacturer labeling or instructions, those take precedence. For questions, a replacement copy, or a digital copy of this manual, email sales@scimedstore.com.

1. Safety

Safety warnings and cautions

- Supervise students at all times when the model is in use.
- Keep fingers clear of moving parts and cutaway openings while turning the crank.
- Turn the crank slowly and smoothly; do not force it if it binds.
- This model does not run on fuel. Never add fuel, oil or any ignition source.
- Place the model on a stable, level surface; lift it by the base, not by the engine parts.
- Small parts and sharp cut edges may be present; not suitable for unsupervised young children.

2. Package contents

- 4-stroke engine cutaway model mounted on polished wooden base with printed schematic diagram

Check contents on receipt. Report missing or damaged items to sales@scimedstore.com within 48 hours of delivery.

3. Specifications

Type	4-stroke petrol engine, air-cooled, cutaway working model
Configuration	Single cylinder, vertical piston, overhead valves
Visible parts	Piston, cylinder, connecting rod, crankshaft, camshaft, valves
Operation	Hand crank
Base	Polished wooden base with printed schematic and labels
Overall height	Approx. 450 mm
Base dimensions	~350 x 250 mm
Weight	~5-8 kg
Power	Manual; no electricity required

4. Unpacking and setup

- 1 Unpack the model carefully and lift it by the wooden base.
- 2 Inspect for parts loosened in transit.
- 3 Place on a stable table where students can see the cutaway side.
- 4 Turn the crank slowly through two full revolutions to check smooth movement.

5. Operation

Demonstrating the 4-stroke cycle

- 1 Turn the crank slowly until the piston is at the top of the cylinder.
- 2 Intake: turn the crank so the piston moves down; point out the intake valve opening.
- 3 Compression: continue turning so the piston moves up with both valves closed.
- 4 Power: continue so the piston moves down with both valves closed; explain where ignition would occur.

- 5 Exhaust: continue so the piston moves up; point out the exhaust valve opening.
- 6 Explain that one full cycle takes two crankshaft revolutions.
- 7 Repeat slowly, using the printed schematic to name each part.

Student activity

- 1 Let students take turns turning the crank under supervision.
- 2 Ask students to identify each stroke as it happens.
- 3 Have students observe how the camshaft controls valve timing.
- 4 Ask students to sketch the piston and valve positions for each stroke.

6. Cleaning and disinfection

- Dust the model with a soft brush or dry cloth.
- Wipe the wooden base with a slightly damp cloth and dry immediately.
- Do not use water or solvents on the engine parts or printed diagram.

7. Maintenance and storage

- Apply a drop of light oil to moving joints if movement becomes stiff, and wipe off excess.
- Check screws and fixings periodically and tighten gently.
- Store covered in a dry place away from direct sunlight and humidity.

8. Troubleshooting

Problem	Likely cause	What to do
Crank is stiff or binds	Dust, dryness or a loose part	Clean, lightly oil joints and check for loose parts; do not force.
Valves do not move with the piston	Loose camshaft or linkage	Stop use and check fixings; contact the supplier if needed.
Model wobbles on the table	Uneven surface	Place on a flat, stable surface.

9. Disposal

- Separate metal parts for recycling where possible and dispose of the wooden base in accordance with local regulations.

10. Warranty and support

Products are covered by SciMed's standard warranty (12 months from purchase unless a different period is stated on your invoice). Warranty terms: scimedstore.com/pages/warranty.

Support, spare parts and additional copies of this manual: sales@scimedstore.com. Please include your order number and a photo of the product or issue.

SciMed Scientific Equipment LLC · San Jose, California, USA · scimedstore.com