

SD
SERIES

Wheel and Differential Axle Apparatus – SD-1.51

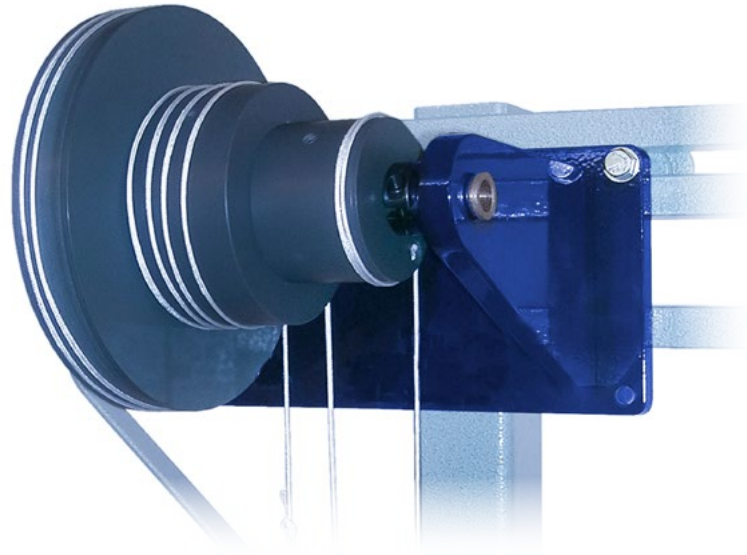
A wheel is attached to a differential axle assembly of Ø114mm (major axle) and Ø38mm (minor axle). The wheel and differential axle are secured to a shaft that runs in bearings within a sturdy wall mounting bracket.

All necessary cords, load hangers and weights are provided.

Three pulleys are fixed together to form a compound pulley. A single cord is attached to the wheel and wrapped around a number of times before hanging vertically and ending in a loop for the 'LOAD' hanger. A second cord is attached between the major and minor axles.

The cord is wrapped in differing directions onto each axle, this direction can be changed for different parts of the experiments. A special hanger (EFFORT) is mounted to the cord of the axles that allows vertical suspension whilst the axles rotate.

PROVIDES STUDENTS WITH AN INTRODUCTION TO MECHANICS OF WHEEL AND DIFFERENTIAL AXLE



Experimental content

- ▶ Comparison with calculated values for simple wheel and differential axle machine
- ▶ Determination of variation with load of limiting efficiency of the machine
- ▶ Experimental determination of velocity ratio
- ▶ Determination of variation with load of effort
- ▶ Determination of variation with load of efficiency

Related laws

- ▶ Relationship between Load and Effort
- ▶ Differential
- ▶ Simple Machines
- ▶ Velocity Ratio
- ▶ Mechanical Advantage
- ▶ Effort of Friction
- ▶ Efficiency

Requirements

Scale

SV
100



Recommended suspension height not to exceed 1.5metres

Features / benefits

- ▶ Wall mounted apparatus
- ▶ Can be mounted to SV100 Bench Mounted Frame
- ▶ One compound pulley; three diameters
- ▶ One diameter is wheel; two are the differential axle
- ▶ Axle has special hanger remaining vertical
- ▶ Full set of weights and hangers supplied
- ▶ Locking mechanism

Overall dimensions

Length	0.41m
Width	0.33m
Height	0.24m

Packed and crated shipping specifications

Volume	0.03m ³
Gross weight	12.5kg

Essential accessories/equipment

- ▶ SV100: Bench Mounted Frame

Technical specification

- ▶ Diameter of wheel: 170mm
- ▶ Diameter of major axle: 100mm
- ▶ Diameter of minor axle: 67mm
- ▶ Velocity Ratio: 10.5 : 1
- ▶ Maximum recommended Load: 50N
- ▶ Weights set: 4 x 0.1N, 3 x 0.2N, 1 x 1N, 2 x 2N, 2 x 5N, 1 x 10N, 2 x 20N

Ordering specification

- ▶ 1 x SD-1.51 assembled
- ▶ 1 x Sheaved hanger
- ▶ 1 x Load hanger
- ▶ 4 x 0.1N, 3 x 0.2N, 1 x 1N weights
- ▶ 2 x 2N, 2 x 5N, 1 x 10N, 2 x 20N weights
- ▶ 1 x Tape measure
- ▶ Spare cord
- ▶ Instruction manual
- ▶ Packing list
- ▶ Test sheet

Ordering codes

- ▶ **SD-1.51** Wheel and Differential Axle Apparatus
- ▶ **SV100** Bench Mounted Frame