

## INTRODUCTION

The Ackermann Steering Principle defines the geometric arrangement of linkages in the steering of a car or other vehicle. It is designed to solve the problem of wheels when turning, since they need to trace out circles of different radii.

The Ackermann Steering Mechanism, "MDA", allows to explain the special features of the Ackermann steering geometry and to study the influence of the steering angle with varying steering geometry.

## GENERAL DESCRIPTION

The Ackermann Steering Mechanism, "MDA", is a bench-mounted unit designed to determine the lead angle of a steering trapezoid in an Ackermann steering mechanism, the disadvantages of incorrectly adjusted track rods and the influence of the track rod length.

This unit consists of a complete Ackermann linkage model mounted on a flat board. The symmetrical linkage system consists of two track rods and an intermediate steering rod. Each track rod is coupled to a lever and a pivot. These pivots simulate the point where each wheel of a car is connected to. The whole system can turn from left to right by hand. There are two rotating indicators, attached to the levers, which indicate the steering angle on graduated discs.

The linkage system is fully adjustable so that Ackermann angles can be varied. The length of the track rods may be modified by turning an adjustment nut to demonstrate the effect of misalignment or damage of the steering.



ISO 9001: Quality Management (for Design, Manufacturing, Commercialization and After-sales service)



European Union Certificate (total safety)



Certificates ISO 14001 and ECO-Management and Audit Scheme (environmental management)



"Worlddidac Quality Charter" and Platinum Member of Worlddidac

## SPECIFICATIONS

Anodized aluminum frame and panels made of painted steel.

Diagram in the front panel with distribution of the elements similar to the real one.

The unit includes:

Space between pivots: 460 mm approx.

Two levers made of aluminum.

An intermediate steering rod made of aluminum.

Two track rods, with individual length adjustable by an adjustment nut.

Two pivots.

Two indicators to measure the steering angle.

Two graduated discs for angle displacement. Measuring range of the steering angle:  $\pm 50^\circ$ . Scale graduation:  $1^\circ$ .

Manuals: This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

## EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Determination of the lead angle of a steering trapezoid.
- 2.- Demonstrating how Ackermann angles are determined in a steering system.
- 3.- Study of the influence of the track rod length.
- 4.- Determining the steering error as a function of the steering angle with varying steering geometry.
- 5.- Determining the variation on turns caused by track maladjustment.
- 6.- Determining the variation on turns caused by damage.

## DIMENSIONS AND WEIGHTS

MDA:

-Dimensions: 620 x 300 x 100 mm approx. (24.41 x 11.81 x 3.94 inches approx.)

-Weight: 10 Kg approx. (22 pounds approx.)

**MDA/ICAI. Interactive Computer Aided Instruction Software System:**



With no physical connection between unit and computer, this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF). Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.

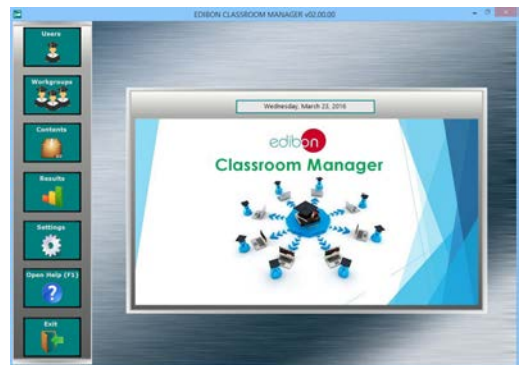
Instructor Software

- ECM-SOF. EDIBON Classroom Manager (Instructor Software).

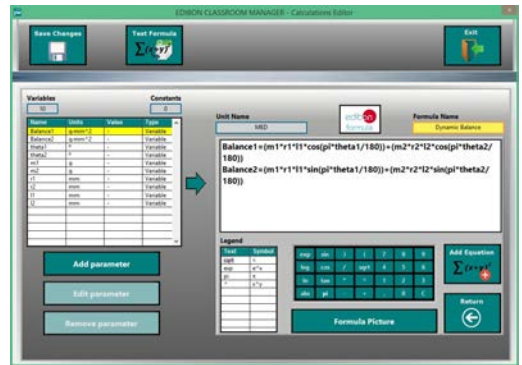
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual students, workgroups, units, etc... so the teacher can know in real time the level of understanding of any student in the classroom.

Innovative features:

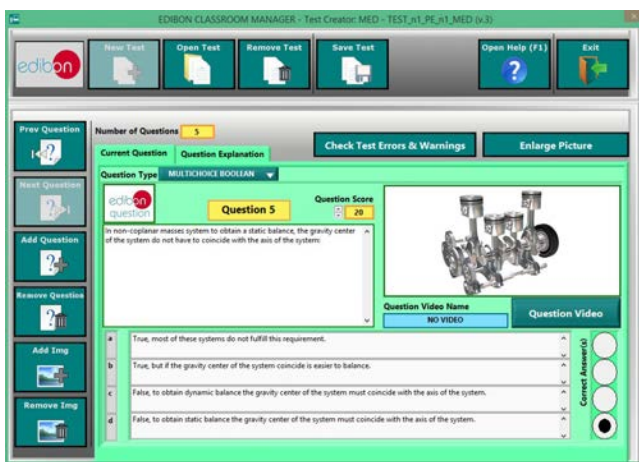
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.
- Updatable Contents.
- Report generation, User Progression Monitoring and Statistics.



ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen



ECAL. EDIBON Calculations Program Package - Formula Editor Screen



ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question



ERS. EDIBON Results & Statistics Program Package - Student Scores Histogram

Optional  
Student Software

- ESL-SOF. EDIBON Student Labsoft (Student Software).

ESL-SOF is the application addressed to the Students that helps them to understand theoretical concepts by means of practical exercises and to prove their knowledge and progression by performing tests and calculations in addition to Multimedia Resources. Default planned tasks and an Open workgroup are provided by EDIBON to allow the students start working from the first session. Reports and statistics are available to know their progression at any time, as well as explanations for every exercise to reinforce the theoretically acquired technical knowledge.

Innovative features:

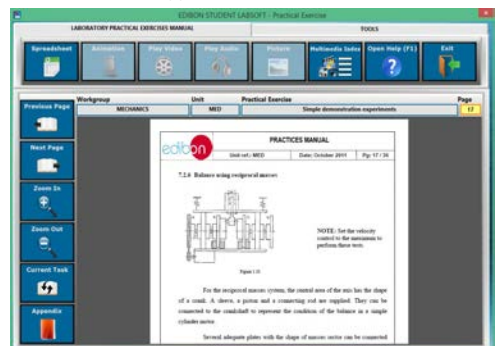
- Student Log-In & Self-Registration.
- Existing Tasks checking & Monitoring.
- Default contents & scheduled tasks available to be used from the first session.
- Practical Exercises accomplishment by following the Manual provided by EDIBON.
- Evaluation Methods to prove your knowledge and progression.
- Test self-correction.
- Calculations computing and plotting.
- Equation System Solver Engine.
- User Monitoring Learning & Printable Reports.
- Multimedia-Supported auxiliary resources.

For more information see ICAI catalogue. Click on the following link:

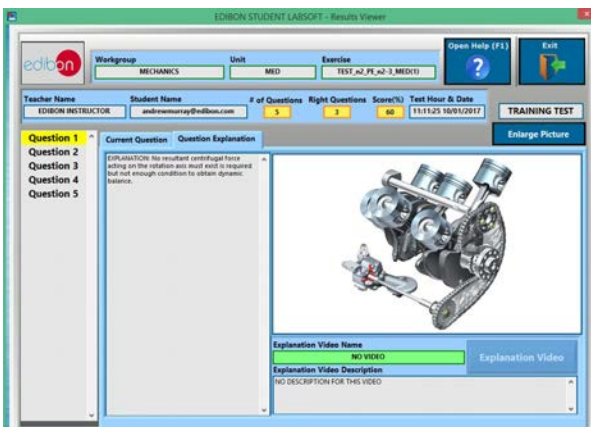
[www.edibon.com/en/files/expansion/ICAI/catalog](http://www.edibon.com/en/files/expansion/ICAI/catalog)



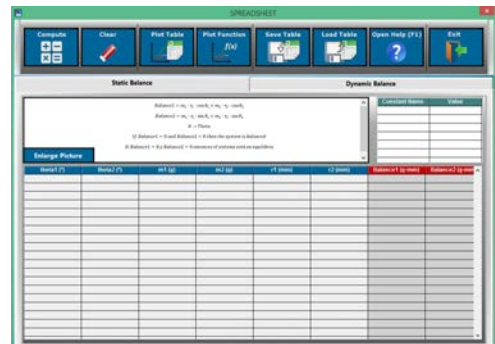
ESL-SOF. EDIBON Student LabSoft (Student Software)  
Application Main Screen



EPE. EDIBON Practical Exercise Program Package Main Screen



ERS. EDIBON Results & Statistics Program Package - Question Explanation



ECAL. EDIBON Calculations Program Package Main Screen

\* Specifications subject to change without previous notice, due to the convenience of improvement of the product.



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REPRESENTATIVE:

