

## INTRODUCTION

The most important elements of an automatic transmission are one or several planetary gears (or epicyclic gears), clutch packs, band brakes and pilot valves.

Epicyclic gears perform several functions:

- Coupling between input and output shafts.
- At low velocities, it generates high torque at the output shaft.
- At high velocities, it reduces the torque at the output shaft.
- Rotation direction inversion between the input and output shafts.

## GENERAL DESCRIPTION

The Epicyclic Gear Unit (1 element), "MTE1", designed by EDIBON, includes a set of epicyclic gears that allows the student to study different reduction ratios (direct drive and overdrive), as well as torque conversion.

A simple epicyclic gears set consists of:

- Sun gear that rotates together with the input shaft.
- Planet gears whose carrier can rotate.
- Ring gear that rotates together with the output shaft.

One of the three elements will provide motion to the system, it will be called driving element. Other element will be kept static, by braking it, and the third element will act as driven element.

## SPECIFICATIONS

Bench-top unit with adjustable legs.

Anodized aluminum frame and panels made of painted steel.

The "MTE1" unit mainly consists of:

The epicyclic gears set, formed by:

Sun gear ( $Z = 21$ ).

Planet gears set ( $Z = 21$ ).

Ring ( $Z = 63$ ).

Two graduated discs located at the input and output shafts.

The shafts of the unit are made in stainless steel. The discs and gears are made in aluminum to facilitate the experiments.

The pinions are made of aluminum and are mounted on ball bearings to reduce of losses due to friction, making the practical exercises execution easy.

Manuals: This unit is supplied with the following manuals: Required services, Assembly and Installation, Starting-up, Security, Maintenance and Practices manual.



MTE1 detail

Required elements (Not included):

- SET B. Brass Hook and Mass Set 2 kg (2 units).

Each "B type" set included:

6 weights of 200 g. (0.44 pounds)

6 weights of 100 g. (0.22 pounds)

2 weights of 50 g. (0.11 pounds)

2 weights of 20 g. (0.044 pounds)

2 weights of 10 g. (0.022 pounds)

1 support hook of 100 g. (0.22 pounds)

## EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- To demonstrate the operation of an epicyclic gears system.
- 2.- To determine and verify the speed and torque ratio between the input and output shafts.
- 3.- To study the mechanical advantage and efficiency of an epicyclic system.
- 4.- To determine the angular displacement at the input and output and to compare with the ratio calculated.
- 5.- To determine the minimum effort required at the input to raise a load at the output.
- 6.- Selection of gears:
  - Overdrive.
  - Direct drive.
- 7.- Power transmission: checking the relation between input torque and output torque.

### REQUIRED ELEMENTS (Not included)

- SET B. Brass Hook and Mass Set 2 kg (2 units).

### DIMENSIONS AND WEIGHTS

MTE1:

- Dimensions: 300 x 300 x 300 mm approx.  
(11.81 x 11.81 x 11.81 inches approx).
- Weight: 10 Kg approx.  
(22 pounds approx).

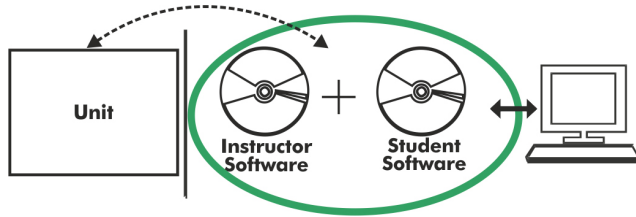
## SIMILAR UNITS AVAILABLE

Offered in this catalog:

- MTE1. Epicyclic Gear Unit (1 element).

Offered in other catalog:

- MTE2. Epicyclic Gear Unit (2 elements).
- MTE3. Epicyclic Gear Unit (3 elements).
- MBW. Borg-Warner Automatic Transmission.

**MTE1/ICAI. Interactive Computer Aided Instruction Software:**

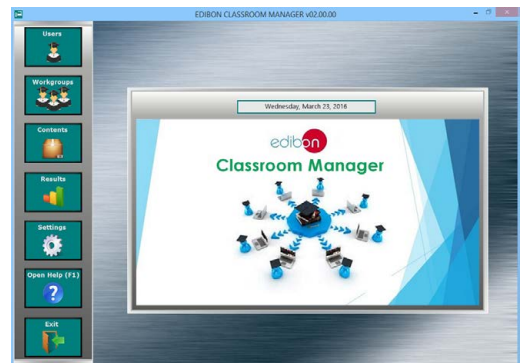
With no physical connection between unit and computer, this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF). Both are interconnected so that the teacher knows at any moment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

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

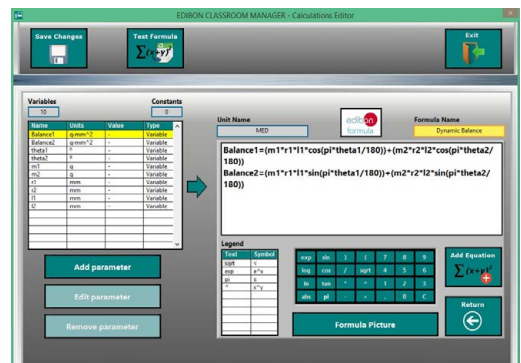
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

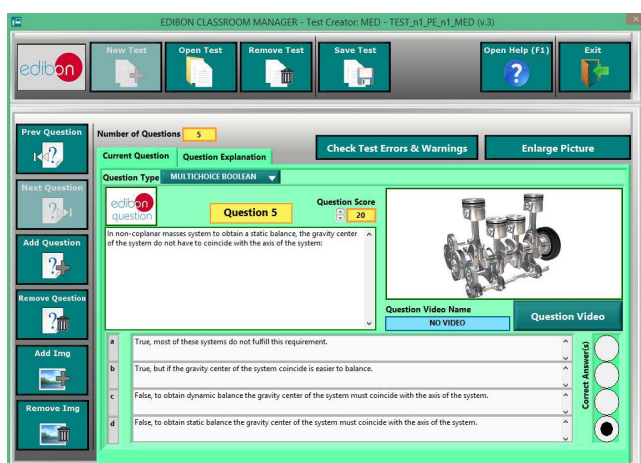
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.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

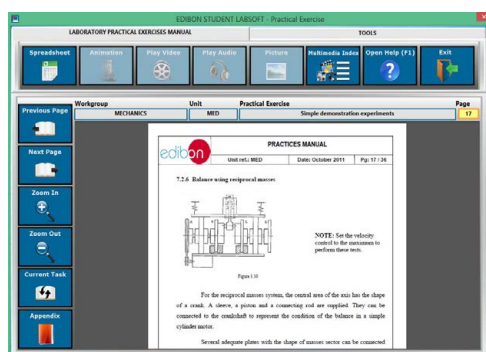
- **Student Log-In & Self-Registration.**
- **Existing Tasks checking & Monitoring.**
- **Default contents & scheduled tasks available to be used from the first session.**
- **Practical Exercises accomplishment by following the Manual provided by EDIBON.**
- **Evaluation Methods to prove your knowledge 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:

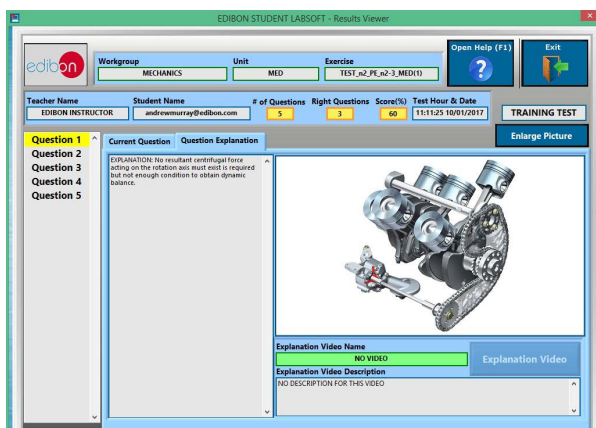
[www.edibon.com/en/interactive-computer-aided-instruction-software](http://www.edibon.com/en/interactive-computer-aided-instruction-software)



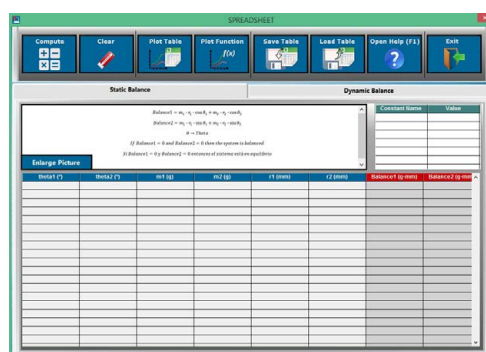
ESL-SOF. EDIBON Student LabSoft (Student Software)  
Application Main Screen



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:

