Engineering and Technical Teaching Equipment

INTRODUCTION

Automatic transmissions perform speed change operations automatically without the human factor intervention. Automatic gear boxes have two different parts: the torque converter and the transmission.

Generally speaking, overdrive is the highest gear in the transmission and allows the engine to operate at lower RPM for a given road speed.

The Overdrive consists of an electrically or hydraulically operated epicyclic gears train bolted behind the transmission unit.

GENERAL DESCRIPTION

The Overdrive Unit, "MEC", includes a set of epicyclical gears that represent an application of a simple epicyclic arrangement of the type used in a motor vehicle overdrive.

A simple epicyclic 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.

In the "MEC" unit the power reaches the epicyclic gear through the central sun gear, that is to say, the input shaft is joined to the central sun pinion and the output power is obtained at the output shaft because it is joined to the ring.

This unit allows the student to study the reduction ratios of overdrive, as well as torque conversion.

SPECIFICATIONS

The "MEC" unit is assembled in an anodized aluminum structure with a painted steel panel.

"MEC" is a bench-top unit supported by four legs. Besides, it is provided with four brackets to be suspended in the wall, which allows the experiments with weights to be carried out more easily.

This unit is mainly composed 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.

In order to carry out some practices with "MEC" unit, two "B type" set of weights is required. (See "Required Accessories" section)

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

EXERCISES AND PRACTICAL POSSIBILITIES

1.- To study the overdrive speed.

2.- To demonstrate the operation of an epicyclic gears system to obtain the overdrive speed.

3.- To determine the angular displacement at the input and output and to compare it with the overdrive reduction ratio calculated.

4.- To determine the minimum effort required at the input to raise a load at the output in an overdrive reduction ratio.

5.- Power transmission: checking the ratio between input torque and output torque for an overdrive reduction ratio.

REQUIRED ACCESSORIES (Not included)

- 2 "B type" set of weights. 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)

DIMENSIONS AND WEIGHTS

MEC:

-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.)

MEC/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.
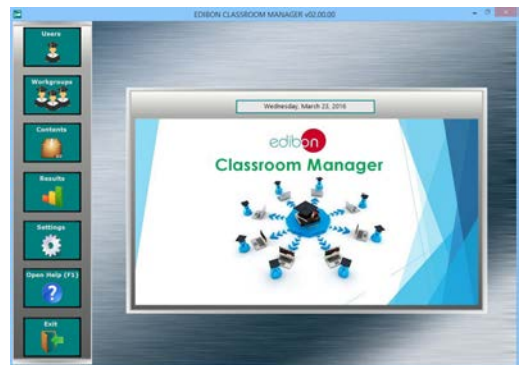
Instructor Software

**- 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
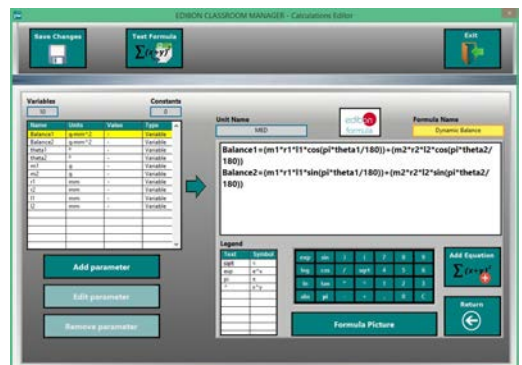
ECAL. EDIBON Calculations Program Package - Formula Editor
Screen
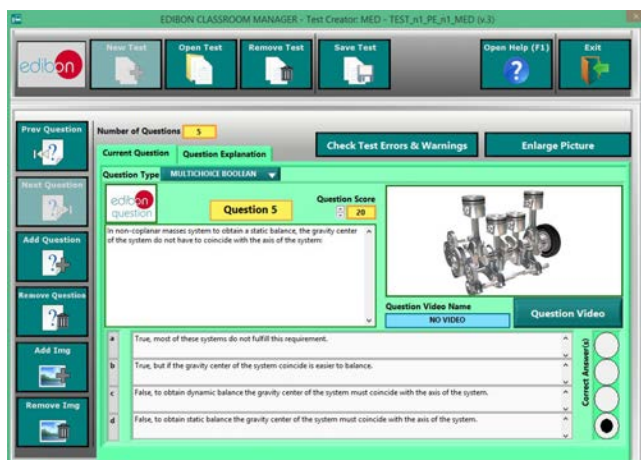
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with
Numeric Result Question

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

- 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:
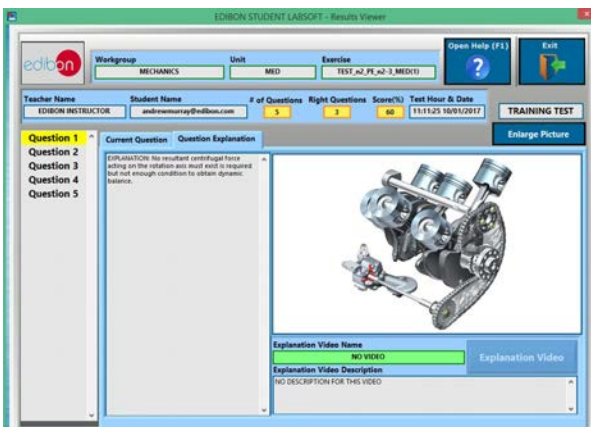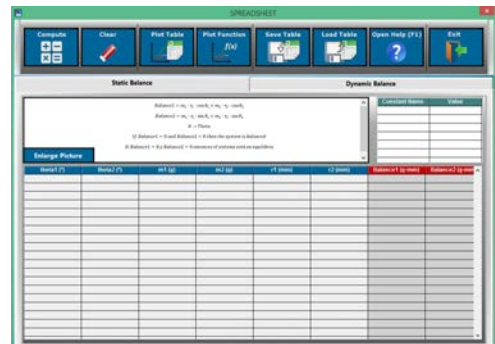www.edibon.com/en/files/expansion/ICAI/catalog

ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen
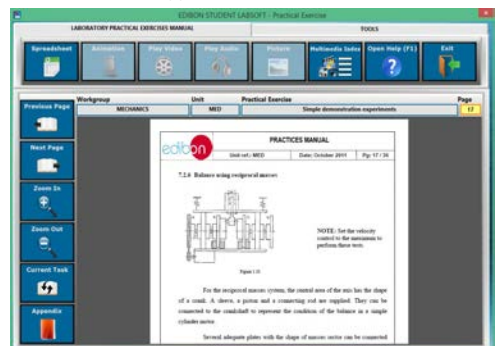
EPE. EDIBON Practical Exercise Program Package Main Screen

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.

edibon
INTERNATIONAL

C/ Del Agua, 14. Polígono Industrial San José de Valderas.
28918 LEGANÉS. (Madrid). ESPAÑA - SPAIN.
Tel.: 34-91-6199363   Fax: 34-91-6198647
E-mail: edibon@edibon.com   Web: **www.edibon.com**

Edition: ED01/18
Date: January/2018

REPRESENTATIVE: