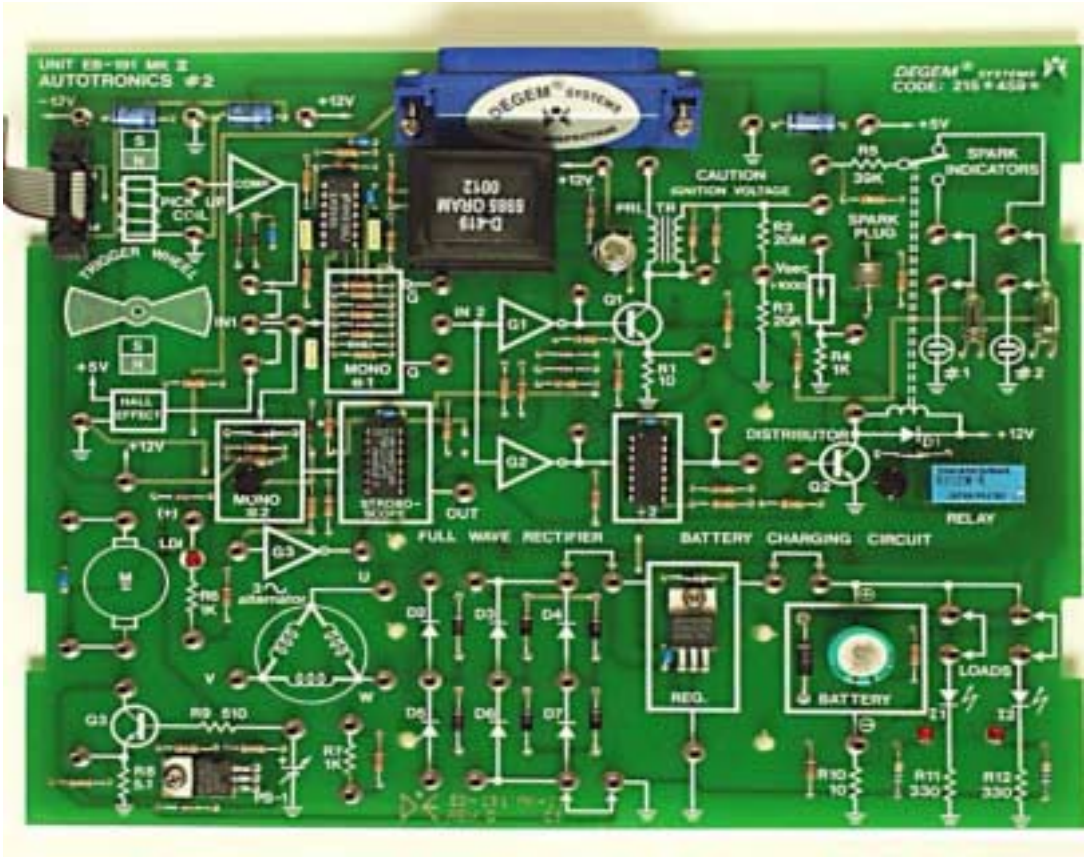
DEGEM ®
SYSTEMS

EB-2000

EB-191



The EB-191 Autotronics II board is a comprehensive instructional module designed to teach the fundamental concepts of automotive charging and electronic ignition systems to students in high schools, technical schools and colleges.

The module contains various practical circuits with which the student can perform a number of meaningful experiments, which help reinforce the student's comprehension of the related concepts. The individual circuits and the required test equipment can be quickly wired by connecting the 2-mm jacks associated with the necessary points. Students perform a minimal amount of wiring, thereby increasing the time available for training. Randomly inserted faults modify the circuits under test to provide valuable true-to-life troubleshooting exercises, which develop diagnostic skills.

A comprehensive student experiment manual clearly details the experiment procedure. An optional theory manual provides the necessary theory to help students achieve the experiment objectives. Optional Windows-based, graphics courseware enhances the learning procedure by providing the essential background theory, testing the student's level of competence, providing detailed experiment procedures, evaluating all measurements and answers to questions and testing the student's level of achievement at the end of the experiment. The student may learn in the standalone mode or under CML (Computer Managed Laboratory), which allows the instructor to monitor student and class progress and records pertinent records in a database for future retrieval.

SPECIFICATIONS

DESCRIPTION

The EB-191 printed circuit board is designed to minimize circuit wiring time when setting up experiments. The board dimensions are 234.5 x 200 mm and may be powered by either PU-2000 or PUZ-2000 base units. All components are mounted on the printed circuit board and the schematic diagrams of all circuits are silk-screened to help the student identify components and system operation. The board is provided with plastic standoff protectors to protect the bottom side of the board, which is solder-masked. All major signals can be accessed from the 2-mm jacks to simplify connections within the circuit and to test equipment. All integrated circuits and transistors are mounted on sockets. The printed circuit board can be stored in the supplied plastic binder for convenient storage.

EXPERIMENTS COVERED

1. Alternating current
- Know how AC is generated
- Become familiar with the characteristics of an AC sine wave
- Know the meaning of frequency, period, peak EMF and RMS EMF
- Know how multiphase AC is generated

2.Tacho-generator
- Know what factors determine the frequency of the sine wave generated by an alternator
- Know the relation between the generated voltage and the rotational speed
- Know how to use a DMM as a tachometer

3. Alternators and AC to DC conversion
- Know the components of an alternator
- Know how single phase AC is rectified
- Know the two configurations for connecting the stator windings
- Know how three-phase AC is generated
- Know how to measure rectified single-phase and three-phase voltage

4.Automotive charging system
- Know the purpose of the charging system
- Know the system's main components and their function
- Understand the role of the regulator
- Observe battery charging and discharging current

5.Hall effect switch
- Know how the Hall effect sensor operates
- Know how a rotating vane interrupter can trigger the Hall effect switch
- Know how the Hall sensor output voltage can be inverted
- Know how power transistors can be actuated by Hall switches
- Know how to determine the dwell angle

6. Strobe light
- Know the operating principle and some applications of the strobe light
- Understand how to trigger a strobe light
- Know how to use a strobe light to observe a rotating object
- Know how to use a strobe light as a tachometer

7. Hall-switch triggered ignition system
- Know the function of the ignition system
- Know the main components of a conventional battery-coil ignition system
- Understand how a vane-interrupter Hall-triggered ignition system operates
- Observe ignition waveforms on an oscilloscope

8.Inductive pick-up coil triggered ignition system
- Know the main components of an ignition system triggered by an inductive pick-up coil
- Recognize the waveforms of a pick-up coil on an oscilloscope
- Understand how inductive pick-up coil ignition systems work

ACCESSORIES

Required Accessories
- EB-2000 workstation
- EB-154 microprocessor board
- Digital multi-meter
- Function generator
- Dual trace oscilloscope
- DL-20 patch cord kit

COMPUTER MINIMUM CONFIGURATION

Pentium II 350MHz with:
64 MB RAM, 40 X CD
COM1 or COM2 port
SVGA card with 8 Mbytes
Operating System: Windows 95/98/NT/2000/XP
Microsoft Internet Explorer 5 or 6

INSTRUCTIONAL MATERIALS

Pedagogical experts who train technicians in electronics technology wrote the courseware and experiments.

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