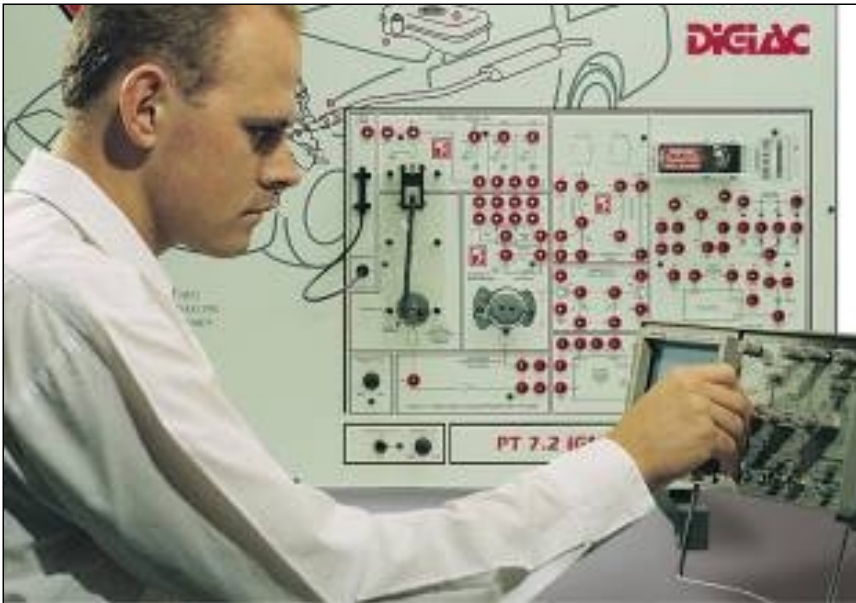


## EES2 Starting, Charging and Basic Ignition Systems



This is an integrated instructional module designed specifically to operate within an "Instructional Pod" environment. It provides a 15-assignment study program that has been designed for use within the AutoLAB program for core learning. The module package includes hardware, software, and curriculum materials sufficient to complete the learning activities.

The curriculum incorporates continuous assessment through questions. When used in conjunction with a ClassAct networked management system, this provides instant feedback of student performance.

Each assignment is split into at least two tasks and they start with a series of questions designed to track inventory, and ensure that any missing pieces can be located. The tasks are designed to teach starting, charging and basic ignition systems, with the research activities based upon on screen material.

Assessment questions are incorporated into each task and a series of job sheets that are printed out by the student are used to guide them through the related shop activities on real vehicle systems.

Based around a computer-linked panel that provides a complete simulation of a vehicle ignition system, this module enables students to learn the principles of automotive ignition systems. The EES2 panel trainer incorporates an engine rotation simulator with a crankshaft, connecting rod and piston.

Sensors are provided for crankshaft / camshaft position, profile ignition pickup and cylinder identification. LED's are used to simulate spark plugs and a special timing light is also provided on-board.

The electronic ignition system represented on the board is a two coil "wasted spark" type with a single micro-controller providing the operating facilities of the Ignition Control Module (ICM) and Engine Control Module (ECM) as found in many vehicle systems.

### **Typical topic areas include:**

- Ignition system components.
- Spark plugs.
- Engine starting systems.
- Contact breaker ignition systems.
- Electronic ignition circuits.
- Charging system tests.
- Alternators.
- Voltage regulation / battery charging.
- Starters.
- Starter relays and solenoids.
- Switches, connectors, and wiring.
- Faultfinding vehicle circuits.
- Wiring and harness repair.

The module guides the student through task-oriented instruction. The tasks include hands-on practical activities. Each task has a theoretical summary that explains the concepts and automotive applications involved.

The computer presented training material is compatible with the ClassAct classroom management system that can track student progress during these tasks and will report back immediately to instructional staff if a student falls below a predetermined standard or takes too long to perform a task.

Each assignment is designed around a list of performance objectives. These lists include academic, technical, and occupational objectives. The assignments are written in such a way as to enable a student to attain the performance objectives, with the assessment questions linked to these in order to provide a measure of true competency.

The performance objectives are used by the ClassAct management system to generate a comprehensive portfolio of student competency reports. The module includes a default competence report addressing the latest NATEF standards.

### **Typical activities include:**

- Identify ignition system components and types.
- Identify and investigate the operation of spark plugs.
- Identify and investigate contact breaker ignition systems.
- Diagnose faults in contact breaker ignition systems.
- Identify and investigate electronic ignition systems.
- Diagnose faults in electronic ignition systems.
- Identify starting and charging system components and types.
- Perform charging system output test.
- Remove, inspect, and install generator, inspecting and adjusting generator drive belts.
- Disassemble generator, clean, inspect, and test components.
- Perform charging circuit voltage drop test.
- Perform starter current draw and voltage drop test.
- Inspect and test starter relays and solenoids.
- Remove and install starter.
- Inspect and test switches, connectors and wires of starter control circuits.
- Perform solder repair of electrical wiring.
- Repair wiring harness and connectors.

# EES2 Starting, Charging and Basic Ignition Systems

**The items supplied with this instructional module include:**

- EES2 Instructor’s Guide
- EES2 On-Screen Multimedia Manual CD-ROM
- EES2 Video Materials CD-ROM
- EES2 Voice-Overs CD-ROM
- NATEF Instructor’s Resources CD-ROM
- Test & Measuring Equipment Interactive Instructor CD-ROM
- Book – ‘Automotive Technology-A Systems Approach’ by Jack Erjavec
- Health and Safety Sheet
- PT 7.2 Panel Trainer
- PT 7.2 Accessory Kit
- Digital Multimeter

**NATEF task list areas addressed:**

- VI-A1 P-1
- VI-A2 P-1
- VI-A6 P-1
- VI-A8 P-1
- VI-A9 P-1
- VI-A10 P-1
- VI-A12 P-1
- VI-A15 P-1
- VI-A16 P-1
- VI-A17 P-1
- VI-C1 P-1
- VI-C2 P-1
- VI-C3 P-2
- VI-C4 P-1
- VI-C5 P-2
- VI-C6 P-1
- VI-D1 P-1
- VI-D3 P-2
- VI-D4 P-1
- VI-D5 P-1

**Additional items required:**

- Computer
- Access to Printer
- Bench Press 10 Ton
- Carbon Pile Regulator
- Electrical Terminal Set (Consumable Item)
- Heat Gun
- Heat Shrink (Consumable Item)
- Insulation Tape (Consumable Item)
- Oscilloscope
- Personal protective equipment (PPE)
- Pry Bar
- Pulley Extractor
- Remote Starter Switch
- Scribe
- Solder (Consumable Item)
- Soldering Gun
- Torque Wrench
- Vernier Caliper
- Wire Crimping Tool
- Wire Strippers
- Grease (Consumable Item)
- Various Hand Tools

**Module Facts**

EES2  
Starting, Charging, and Basic Ignition Systems

	No.	Average time
Assignments	15	90 minutes
Extension Activities	21	60 minutes
<b>Total</b>		<b>43 hours</b>



**LJ Technical Systems**  
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