EP3 Ignition System Components and Operation

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 the principles, operation and servicing of distributorless ignition systems, with the research activities based upon on screen material and published textbooks.

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.

This module includes a hardware trainer that is based on the real automotive components found in a distributorless ignition system. The unit is powered by a 12V DC motor and is supplied with a 12V vehicle battery. The unit is fully guarded and is intrinsically safe for student usage.

It features an inductive pickup system, four spark plugs, HT ignition coil, and DIS (Distributorless Ignition System) module.

A series of high resistance and open circuit faults can be inserted using a bank of switches.

Typical topic areas include:

- Ignition system fundamentals.
- The ignition primary circuit.
- The ignition secondary circuit.
- Ignition coils.
- Distributors.
- Breakerless ignition systems.
- Spark plugs.
- Ignition system voltage wavepatterns.
- Ignition system timing.
- Electronic ignition systems.
- Electronic ignition systems service & diagnosis.

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:

- Investigate the fundamentals of ignition systems.
- Inspect and test ignition primary circuit wiring and components.
- Inspect and test ignition system secondary circuit wiring and components.
- Perform primary and secondary voltage and resistance measurements.
- Inspect and test ignition coils.
- Inspect and test distributor.
- Inspect and test ignition system pick-up sensor or triggering devices.
- Diagnose no-starting, driveability, and emissions concerns on vehicles with distributor ignition (DI) systems.
- Diagnose no-starting, driveability, and emissions concerns on vehicles with electronic ignition (EI/DIS) systems; determine necessary action.
- Inspect and test power and ground circuits and connections.
- Perform engine temperature sensor resistance and voltage tests.

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The items supplied with this instructional module include:

- EP3 Instructor's Guide
- EP3 On-Screen Multimedia Manual CD-ROM
- EP3 Video Materials CD-ROM
- EP3 Voice-Overs CD-ROM
- NATEF Instructor's Resources CD-ROM
- Test & Measuring Equipment Interactive Instructor CD-ROM
- Health and Safety Sheet
- DIS Trainer
- DIS Accessory Kit (Ignition Leads, T-pins, Thermometer)
- 12V Battery or PSU

Additional items required:

- Computer
- Access to Printer
- 1.5V Battery (Consumable Item)
- Clear Oil Container / Beaker
- Digital Multimeter
- Distributor Tester or Synchrograph, with Operating Instructions
- Electrical Wiring Probes
- Engine Analyzer (with Ignition Display Capability)
- Feeler Gauges
- Heat Gun
- Heat Plate / Hot Plate
- Inspection Lamp
- Off Vehicle Distributor, Complete with Cap, Rotor Arm and Contact Breakers
- Oscilloscope
- Oxygen Sensor Socket
- Pinch-off Pliers
- Personal protective equipment (PPE)
- Service/Workshop Manuals
- Torque Wrench
- Tachometer
- Timing Light / Strobe
- Water Jug
- Wire Gap Gauge
- Grease (Consumable Item)
- Various Hand Tools

NATEF task list areas addressed:

- VIII-A1 P-1
- VIII-A2 P-1
- VIII-A11 P-1
- VIII-B4 P-1
- VIII-C1 P-1
- VIII-C2 P-1
- VIII-C3 P-2
- VIII-C4 P-3
- VIII-C5 P-2
- VIII-C6 P-1
- VIII-C7 P-3
- VIII-C8 P-1

Module Facts

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	No.	Average time
Assignments	15	90 minutes
Extension Activities	23	90 minutes
	Total	57 hours

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