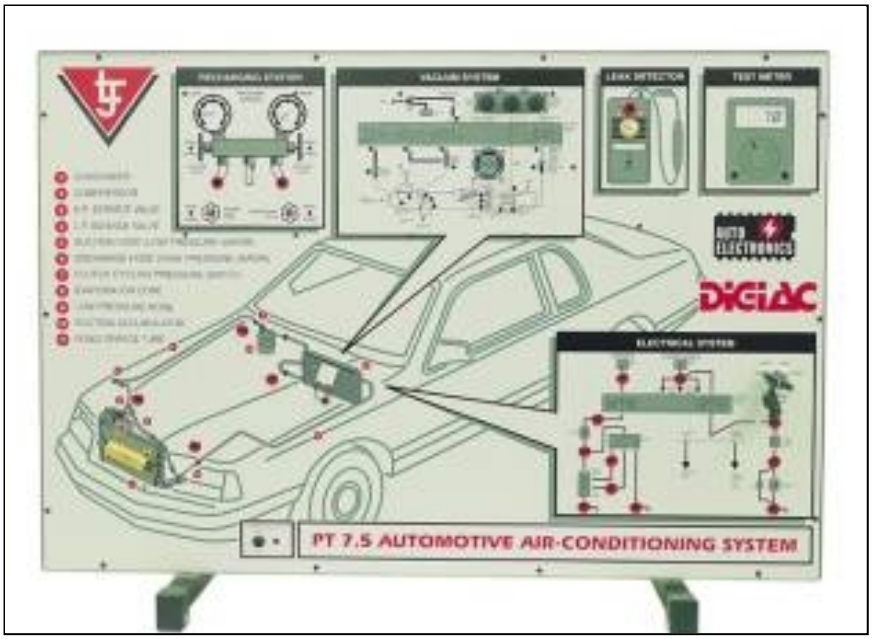
ACS1 Heating and Air Conditioning Systems



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 the practical aspects of automotive-air conditioning 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 computer-linked simulator panel trainer that allows students to learn the principles of automotive air conditioning systems. The unit provides a complete simulation of the following elements of a fixed orifice tube cycling clutch climate control system:

- Condenser
- Fixed orifice tube
- Compressor
- Suction Accumulator
- Evaporator Core
- HP-Service Valve
- LP-Service Valve
- Clutch cycling pressure switch
- AC pressure cut-off switch
- Air distribution system controls - dashboard
- Blower motor control
- Manifold gauge simulation
- Leak detector simulator

Typical topic areas include:

- Principles of heating and air conditioning.
- Refrigeration cycle and fixed orifice tube cycling clutch system.
- Climate control systems service.
- Air distribution control.
- Cooling system airflow components.
- Electrical controls.
- Failures in electrical controls.
- Vehicle ventilation, ducting and filtration.
- Coolant recovery systems.
- Coolant leakage checks.

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 the principles of air conditioning.
- Investigate the operation of an FOTCC system.
- Service climate control systems.
- Troubleshoot an air distribution system.
- Test air flow components.
- Investigate air conditioning electrical systems.
- Fault find problems with electrical controls in heater systems.
- Service cabin air filtration components.
- Test cooling system pressure caps.
- Pressure test cooling systems.
- Inspect cooling system hoses and belts.
- Inspect, test, and replace thermostat and housing.
- Inspect and test A/C – heater control panel assembly, cables and linkages.
- Determine coolant condition, drain and recover coolant, flush system, and refill with recommended coolant.
- Inspect and test A/C-heater control panel assembly.

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The items supplied with this instructional module include:

- ACS1 Instructor's Guide
- ACS1 On-Screen Multimedia Manual CD-ROM
- ACS1 Video Materials CD-ROM
- ACS1 Voice-Overs CD-ROM
- NATEF Instructor's Resources CD-ROM
- Book – Automotive Heating and Air Conditioning by Tom Birch
- Book – Automotive Technology-A Systems Approach by Jack Erjavec
- Health and Safety Sheet
- D3000 PT7.5 Panel Trainer
- D3000 Accessory Kit
- Digital Multimeter

Additional items required:

- Computer
- Access to Printer
- Antifreeze (Consumable item)
- Antifreeze Tester / Hydrometer
- Combustion Gas Leak Detector (Consumable parts)
- Diagnostic Scan Tool, Adapters and Leads
- Drip Tray
- Drive Belt Tension Gauge
- Exhaust Extraction System
- Feeler Gauges
- Heat Plate / Hot Plate
- Hose Clip Driver
- Inspection Lamp
- Length of Wool or Strip of Cloth
- Manifold Gauge Set or equivalent (134a)
- Personal protective equipment (PPE)
- Steel Rule
- Tachometer
- Thermometer
- Timing Light / Strobe
- Vacuum Gauge & Pump
- Vehicle Cooling System Pressure Tester
- Vehicle Service Manual
- Vehicle Technical Information

NATEF task list areas addressed:

- I-D3 P-1
- I-D4 P-1
- I-D5 P-1
- I-D6 P-2
- I-D7 P-1
- I-D10 P-2
- VII-A1 P-1
- VII-A2 P-1
- VII-C1 P-2
- VII-C2 P-1
- VII-C3 P-1
- VII-C4 P-1
- VII-C5 P-1
- VII-C6 P-1
- VII-C7 P-1
- VII-C8 P-1
- VII-D1 P-2
- VII-D2 P-1
- VII-D3 P-1
- VII-D4 P-2
- VII-D5 P-3
- VII-D6 P-3
- VII-D7 P-3
- VII-E4 P-1
- VIII-A14 P-1
- VIII-F3 P-2
- VIII-F4 P-1

Module Facts

ACS1 Heating and Air Conditioning Systems

	No.	Average time
Assignments	15	90 minutes
Extension Activities	13	60 minutes
	Total	36 hours

LJ Technical Systems
Web site: www.ljgroup.com

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