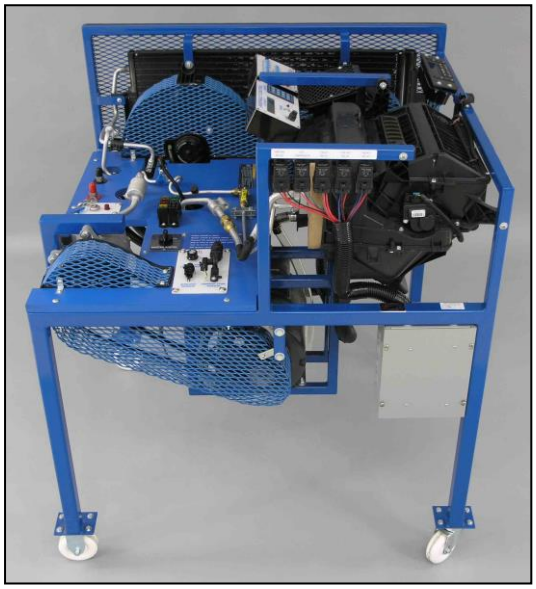
SPECIFICATION

1.0 AIR CONDITIONING W/AUTOMATIC CLIMATE CONTROL TRAINER (R-134a) MODEL 1351



This trainer to be part of a climate control program to present the live operation of an R-134a Air Conditioning System with Automatic Electronic Dual Zone Climate Controls (L26). The program to provide courseware for use by students and instructors.

1.1 CONSTRUCTION

The trainer frame to be constructed of square tubing. The trainer to be portable with rolling casters. To include safety shields over electric motor pulley, belt, electric cooling fans, and blower inlet. Other components are presented as typically found on an actual vehicle.

1.2 COMPONENTS

The trainer to use actual new model vehicle components and other necessary hardware.

To Include:

- A/C Lines & Fittings
- Compressor
- Condenser w/ Internal Filter/Dryer
- Evaporator
- Liquid Line Valve
- Blower Motor
- Blower Motor Processor
- OBD II Standard DLC
- Electric Cooling Fans
- Fuse Block
- HVAC Control Module
- HVAC Plenum Assembly
- Ignition Switch/Indicator
- In-car Temp Sensor Select Switch
- Power on Indicator
- System Switches & Relays
- System Wiring Harness
- Test Points
- Ambient Temp Sensor
- In-car Temp Sensor
- Lower Left Air Temp Sensor
- Lower Right Air Temp Sensor
- Outside Air Temp Sensor
- Sunload Sensor Assembly
- Upper Left Air Temp Sensor
- Upper Right Air Temp Sensor
- Left Air Temp Actuator
- Mode Actuator
- Recirculation Actuator
- Right Air Temp Actuator

1.3 TRAINER OPERATION

The trainer capable of fully automatic dual zone climate control system operation. The automatic climate control system determines the appropriate air intake, discharge, locations, fan speed, and discharge air temperature according to the driver or passenger-selected temperature and information provided by system sensors.

The in-car air temp sensor capable of being overridden via a temperature select switch, allowing change in sensor input.

The trainer to be capable of:

Refrigeration:

- System Recovery, Recycling & Recharging
- Refrigeration System Diagnosis & Testing
- Realistic Component Service

Air Management:

- Actuator Tests
- Mode and Temp Door Operation
- Sensor Tests
- Electronic HVAC Control Tests
- Blower Motor Tests

Engine Cooling:

- Cooling Fan Diagnosis

Diagnostics:

- A Tech 2 scan tool, when connected, will read HVAC-related DTCs and Data and give Bi-Directional HVAC output control.

2.0 SYSTEM DIAGNOSTICS

The trainer to provide an advanced level of instruction by duplicating actual on-vehicle faults and troubleshooting procedures. The trainer to use actual vehicle wire colors to be compatible with wiring diagrams. The trainer to be capable of actual service manual test procedures.

3.0 FAULT INSERTION

To Include:

Refrigeration Faults:

- To use a liquid line refrigerant control valve. To provide normal operation, and to demonstrate the effects of refrigerant flow restriction or blockage.

Electrical Faults:

- To be inserted via keypad, local computer, or ATech Network System (ANS). Software interface allows hard and intermittent faults to be entered by selecting faults from a pictorial schematic. Software interface faults to be entered randomly or as specified by instructor.

Electrical Faults:

Fault #	Description	Fault	CKT# or Circuit#	Wire Color
01	R. Upper Air Temp Sensor	Open	517	TN
02	L. Cooling Fan Power	High Resistance	504	WH
03	Blower Motor Power	Open	65	PU
04	Inside Air Temp Sensor	Short to Ground	734	D-GN
05	R. Cooling Fan Power	Open	409	L-BU
06	L. Cooling Fan Power	Short to Voltage	504	WH

3.1 FAULT INSERTION VIA KEYPAD

Realistic faults can be inserted via the keypad to provide troubleshooting practice.

3.2 FAULT INSERTION VIA LOCAL COMPUTER

Faults to be entered via the serial communications port of a single computer. Faults to be entered using a software interface (installed on the computer hard drive). Includes proprietary serial cable to connect to computer.

3.3 FAULT INSERTION VIA ATECH NETWORK SYSTEM (ANS)

Connection to the LAN is achieved with an optional ANS (ATech Network System). The ANS is a 16-port Serial Hub with standard CAT5 cable. Requires an Ethernet connection from the serial hub to the LAN. Software interface to be installed on any LAN computer.

4.0 POWER REQUIREMENTS

To include 220VAC/20Amp, single phase, 60HZ electric 5HP motor to drive compressor. To have a power cord for a North America (Nema 5-15) 220VAC/20Amp electrical outlet. Requires 12VDC automotive battery (not included). Current Draw = 19.6 Amps.

Optional 220VAC/50Hz configuration available.

5.0 OPERATIONS MANUAL

To provide instructor with Trainer Orientation, Start-up Procedures, Equipment Operation, Maintenance and Service Information.

6.0 AIR CONDITIONING/ELECTRONIC CLIMATE CONTROL COURSEWARE (MODEL 1351)

All items to be a complete courseware package and to include a photocopy site license to allow distribution of student manual. Courseware presented in Adobe PDF file format on CD-Rom.

6.1 STUDENT MANUAL

The courseware to include a Student Manual containing worksheets written specifically for use with the ATech Air Conditioning with Automatic Climate Control System Trainer, Reference Book, and Service Manual Information.

The units of instruction to be based on NATEF tasks. The Air Conditioning Program Activities to include:

1. Program Overview
2. System Overview
3. Principles of Refrigeration
4. Basic Refrigerant Cycle
5. Compressor & Control Components
6. Condenser and Evaporator
7. Receiver Dryer/Accumulator Metering Components
8. Safety Precautions & Environmental Concerns
9. Refrigerant System Tests
10. Leak Detection
11. Refrigerant System Recovery, Recycling & Recharging
12. Cooling Fan Operation
13. Cooling Fan Diagnosis
14. Air Distribution Overview
15. Air Distribution Controls
16. Blower Controls
17. Automatic Climate Control Operation
18. Automatic Climate Control Diagnosis
19. Strategy Based Diagnosis

6.2 NATEF TASK RECORD KEEPING SHEET

The courseware to include a NATEF Task Record Keeping Sheet to facilitate the instructor in recording the progress of each student as NATEF tasks are completed.

6.3 INSTRUCTOR GUIDE

The courseware to include an Instructor Guide to assist in management of the program material. The Instructor Guide to provide product information and answers.

6.4 SERVICE MANUAL INFORMATION

The courseware to include the appropriate manufacturer's Service Manual Information. The Service Manual Information to be used during student activities and system diagnosis.

7.0 SHIPPING

The trainer to have an approximate shipping weight of 250 lbs (113 Kg). Size to be approximately 48"W x 42"D x 54"H (121cm W x 106cm D x 137cm H). Cartons are made from 100% recycled paper.

Shipping Requirements:

Dock capabilities or liftgate will be used.

Note: The unit will be shipped with no refrigerant (outside the US). R-134a refrigerant must be acquired locally.