



Air

Conditioning

Training unit instructions

CTDR-1

Do not attempt to run unit until you have read this document.

This document explains fault simulation controls. Items covered are as follows:

- 1. Fault Switch.**
- 2. Fan Switch**
- 3. Blocked thermostatic expansion valve simulation.**
- 4. Blocked filter drier simulation.**
- 5. Compressor valve plate fault simulation.**
- 6. Unit under condensing fault simulation**
- 7. Digital thermometer.**
- 8. General and disclaimer, PED Statement & Maintenance**

FAULT SWITCH

The fault switch is situated on the main control panel next to the condenser fan switch, evaporator fan switch and evaporator thermostat. It is a Three position rotary switch; each position activates a pre-set fault as follows:

Switch fully anticlockwise. No fault unit runs normally.

Position (1) Simulates a Blocked TEV.

Position (2). Simulates a blocked drier.

Position (3) Simulates compressor valve plate damaged.

Fig 1



BLOCKED TEV SIMULATION

Turn the fault switch two clicks clockwise from the rest position, the back pressure drops below 0 P.S.I cooling duty drops right off as indicated by the digital thermometer rising. The sight glass remains full as liquid backs up in the liquid line. The TEV frosts up.

BLOCKED DRIER SIMULATION

Turn the fault switch one click clockwise, almost immediately the back pressure will start to drop, the sight glass will show liquid trickling through, and the cooling duty will drop right off as indicated by the digital thermometer rising. Head pressure will drop slightly and the BI Switch may cut out depending on refrigerant charge. The drier will become cold, sweat, or may even frost up.

FAULTY VALVE PLATE SIMULATION

Turn the fault switch 3 clicks clockwise from the rest position, head pressure drops, back pressure rises, sight glass remains stable and the cooling duty drops off.

THE FAN SWITCH

The fan switch is located on the fault panel above the fault switch. **(See fig 1).** The switch has three positions:

1. (Down) fan runs permanently (use this position as the main setting)
2. (Centre) fan does not run (under condensing fault)
3. (Up) fan controlled by Tri Switch (tri switch demonstration)

UNIT UNDER CONDENSING FAULT SIMULATION

Liquid line gets hotter than normal; head pressure rises until H.P. switch cuts out. This simulates a fault on a vehicle that has a corroded condenser where the fins are no longer bonded to the tube, or a faulty condenser fan.

Note H.P. Switch may not cut out until pressure in excess of 350 PSI.

THE DIGITAL THERMOMETER

All units with fault simulation control incorporate a digital thermometer. The thermometer displays supply air temperature. Before starting the training rig note the ambient air temperature on the thermometer. As it is not likely that the air temperature in the classroom will vary much during the training session this reading can be used for coil drop calculations during the session. **Note that the thermometer samples every fifteen seconds** therefore it will take this amount of time for any change in temperature to be noted after a fault has been set. It is also recommended that the rig be run in normal cooling mode for at least 3 minutes before setting faults. This allows time for the thermometer to indicate the minimum temperature for the fan speed selected and also allows time for the refrigeration system to warm up which will reduce wear to the compressor during fault conditions.

GENERAL AND DISCLAIMER

It is imperative that this unit be run and supervised only by a professional refrigeration engineer or a person whom has been given adequate training to use the equipment. It is essential for safety and to prevent damage to the compressor that faults are only set for as much time as is necessary to provide training and then the unit must be set back to normal cooling mode. If the unit is left running in fault status permanent damage will result. Some faults involve high refrigerant gas pressures and whilst the rig has been pressure tested by ourselves in accordance with BS EN378/2K there may be some Danger involved due to high refrigerant gas pressures. We therefore insist that normal safety equipment associated with refrigerant handling is worn by all present during training. Refrigeration gauges must be fitted at all times whilst the unit is being run, if head pressure rises above 350P.S.I. then the unit must be shut down immediately. The manufacturer accepts no responsibility for injury or death however caused as a result of the use of this apparatus.

Pressure Equipment Directive

The **CTDR-1** Vehicle A/C Training Rig uses quality components made to the highest standards. These components are approved for use under the pressures that will be encountered by the equipment within this application. Furthermore the unit is pressure tested and certified to withstand 500 PSI of OFN without distortion of any component and has a rated AP of 350 PSI. The system is pressure tested in accordance with BS EN378/2K and is assured leak free when leaving our factory.

Maintenance

The unit requires no real maintenance except for the following:

Periodic checking of compressor oil level. This can be included as a practical task for students during training and is used as part of practical assessment during our Diagnostic A/C Training Courses. The compressor should be topped up where necessary with PAG 100 lubricant. The capacity from empty is 8 Fl/Oz. The drive belt should be checked and tensioned after 4Hrs running and then every 3 Months. The receiver drier should be changed and the evaporator should be sanitised at least annually. Visual checks should be made to the equipment prior to each training session.

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