STARCOOL III SERVICE MANUAL

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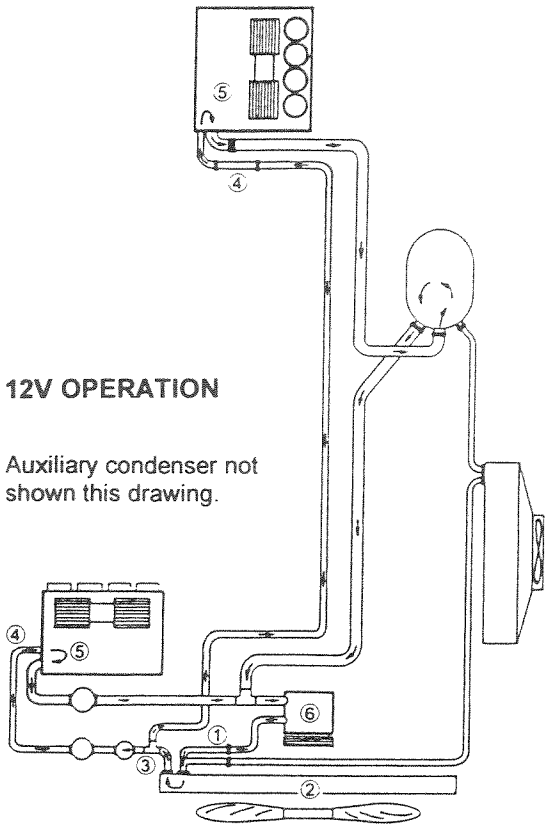
MODEL SERIES III
IN PRODUCTION 9/96



12V OPERATION

Auxiliary condenser not shown this drawing.

HOW DOES THE STARCOOL WORK WHEN DRIVING? (12V)

① The vehicle compressor pushes refrigerant vapor through a check-valve to the factory condenser. An additional check-valve prevents refrigerant vapor from traveling to the 110V compressor.

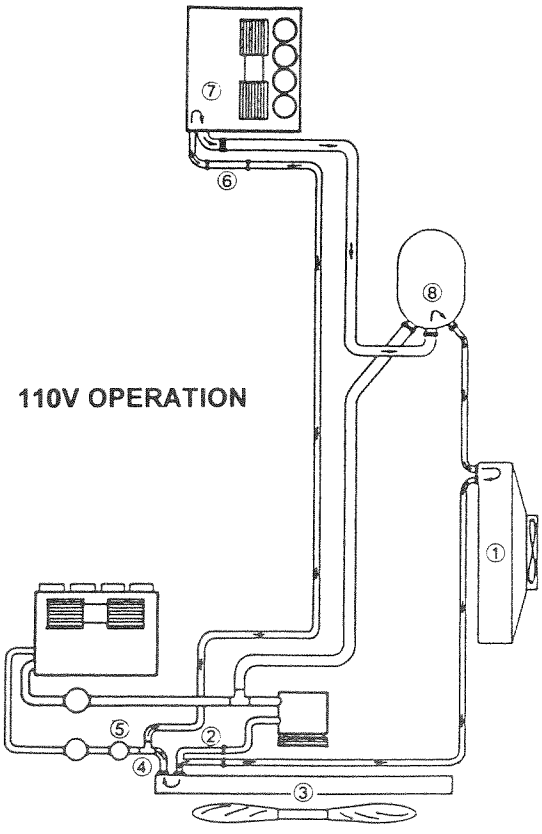
② The factory condenser lowers the temperature of the compressed refrigerant vapor and condenses it into liquid refrigerant by means of air traveling across the condenser. An auxiliary 12V condenser fan operates whenever the Starcool fan switch is on low, medium or high.

③ A "tee" fitting allows liquid refrigerant to flow to the Starcool orifice tube and through a normally open solenoid valve to the factory expansion valve or orifice tube. A factory receiver drier may be in the system.

④ The expansion valve , or orifice tube will regulate the flow of liquid refrigerant into the Starcool and factory evaporator.

⑤ In the evaporators, liquid refrigerant is vaporized and absorbs the interior heat when the blower fans are operating.

⑥ The refrigerant vapor carries the absorbed heat to the factory compressor to complete the cycle. An accumulator may be in the system before the compressor to remove moisture.



110V OPERATION

HOW DOES THE STARCOOL WORK WHEN PARKED? (110V)

① The auxiliary condenser lowers the temperature of the compressed refrigerant vapor and condenses it into liquid refrigerant by means of air traveling across the condenser. The auxiliary 12V condenser fan operates whenever the Stacool 110V compressor is "on".

② The 110V compressor pushes refrigerant vapor through a check-valve to the factory condenser. An additional check-valve prevents refrigerant vapor traveling to the factory compressor.

③ The factory condenser lowers the temperature of the compressed refrigerant vapor and condenses it into liquid refrigerant by means of air traveling across the condenser. The 12V condenser fan operates whenever the Starcool fan switch is on low, medium or high.

④ A "tee" fitting allows liquid refrigerant to flow to the Starcool orifice tube. The normally open solenoid valve will close whenever the Starcool thermostat is set to cool and the temperature selector is set below the interior temperature of the vehicle.

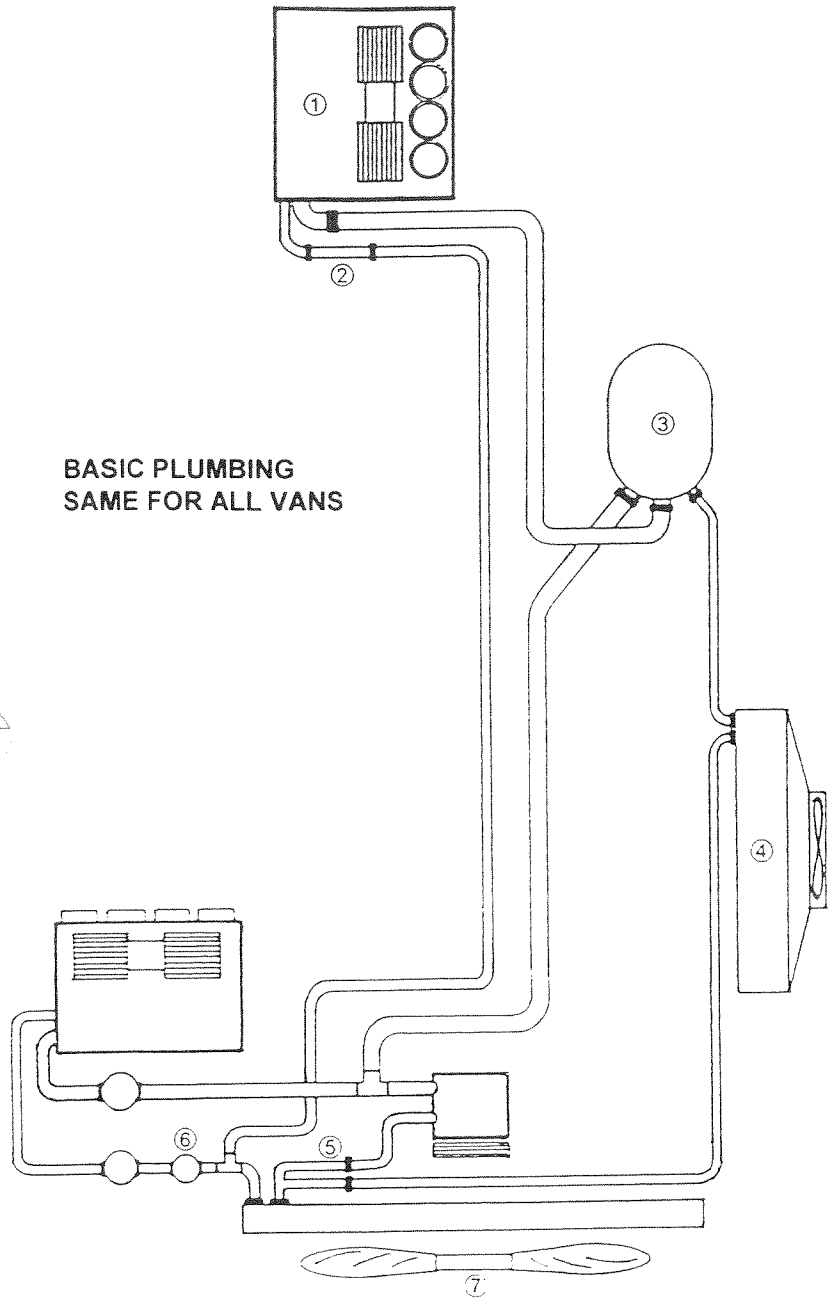
⑤ The closing of the solenoid valve prevents liquid refrigerant from traveling to the factory evaporator.

⑥ The orifice tube will regulate the flow of liquid refrigerant into the Starcool evaporator.

⑦ In the Starcool evaporator, liquid refrigerant is vaporized and absorbs the interior heat of the vehicle when the blower fan is operating.

⑧ The refrigerant vapor carries the absorbed heat to the Starcool 110V compressor to complete the cycle.

COMPONENTS / PLUMBING



BASIC PLUMBING
SAME FOR ALL VANS

① **EVAPORATOR / BLOWER (S)**

Pulls warm interior air across coil, where refrigerant vapor absorbs heat in air and discharges cold air at vents.

② **ORIFICE TUBE (S)**

Regulates the flow of refrigerant into the evaporator coil.

③ **COMPRESSOR (S)**
Compresses refrigerant vapor from evaporator and pushes refrigerant vapor to condenser.

④ **AUXILIARY CONDENSER (S)**

Blows ambient temperature air across coils so that compressed refrigerant vapor will change to a liquid state.

⑤ **CHECK VALVE (S)**

Prevents flow of hot refrigerant vapor to the compressor which is not operating.

⑥ **SOLENOID VALVE (S)**

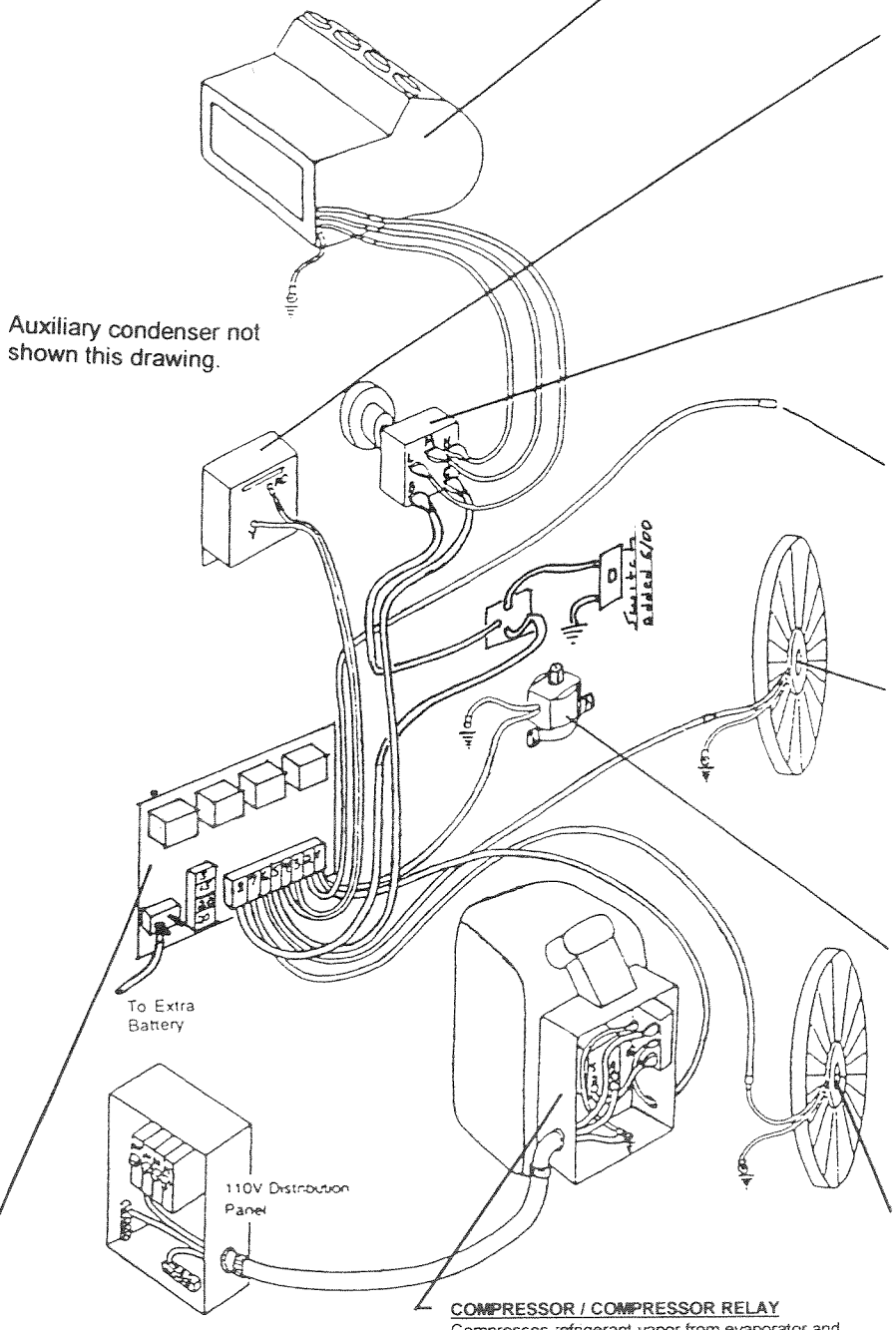
Controls flow of refrigerant to vehicle dash evaporator. Closes when Starcool is operated on 110V power. Open whenever vehicle A/C is operated.

⑦ **CONDENSER FAN**
Different fan for each van. Blows ambient temperature air across vehicle condenser so that compressed refrigerant vapor will change to a liquid state before entering expansion valve.

(S) This component same for all vans.

ELECTRICAL SYSTEM

BASIC ELECTRICAL SYSTEM SAME FOR ALL VANS



EVAPORATOR / BLOWER
Pulls warm interior air across coil, where refrigerant vapor absorbs heat in air and discharges cold air at vents.

WILL ONLY OPERATE WHEN:
- Starcool blower switch set to low, medium or high.

PROTECTION INCLUDES:
- 20 amp 110V fuse on relay plate.

THERMOSTAT
Controls operation of 110V compressor.

WILL ONLY OPERATE WHEN:
- Starcool blower switch set to low, medium or high. Vehicle ignition is "off".

PROTECTION INCLUDES:
- 5 amp 12V fuse on relay plate.

BLOWER / SWITCH
Locates by thermostat.

WILL ONLY OPERATE WHEN:
- Set to low, medium or high.

PROTECTION INCLUDES:
- 20 amp 12V fuse on relay plate.

IGNITION "ON" SOURCE
Connects to radio switch wire.

WILL ONLY OPERATE WHEN:
- Ignition switch is turned "on" or to accessory.

PROTECTION INCLUDES:
- Wire should connect to fused 10 or 15 amp, 12V ignition "on" source from radio fuse.

CONDENSER FAN
Locates behind van grill. Blows ambient temperature air across vehicle condenser so that compressed refrigerant vapor will change to a liquid state before entering orifice tube.

WILL ONLY OPERATE WHEN:
- Starcool blower switch set to low, medium or high.

PROTECTION INCLUDES:
- 20 amp 12V fuse on relay plate.

SOLENOID VALVE
Controls flow of refrigerant to vehicle dash evaporator. Closes when Starcool is operated on 110V power. Open whenever vehicle A/C is operated.

WILL ONLY OPERATE WHEN:
- Starcool Blower switch set to low, medium or high.
- Thermostat set to "cool" and temperature selector set below interior temperature.
- Vehicle ignition is "off".

PROTECTION INCLUDES:
- 5 amp 12V fuse on relay plate.

AUXILIARY CONDENSER FAN
Locates under van. Blows ambient temperature air across auxiliary condenser so that compressed refrigerant vapor will change to a liquid state before entering vehicle condenser.

WILL ONLY OPERATE WHEN:
- Starcool blower switch set to low, medium or high.
- Thermostat set to "cool" and temperature selector set below interior temperature.
- Vehicle ignition is "off".

PROTECTION INCLUDES:
- 15 amp 12V fuse on relay plate.

RELAY PLATE
Locates under sofa/dinette. Controls operation of Starcool A/C. Also contains 12V fuses for blower fan, condenser fans and solenoid valve.

WILL ONLY OPERATE WHEN:
- Starcool blower switch is set to low, medium or high.
- Thermostat is set to "cool" and temperature selector is set below interior temperature.
- Vehicle ignition is "off".
- Ground wire is connected to chassis ground.

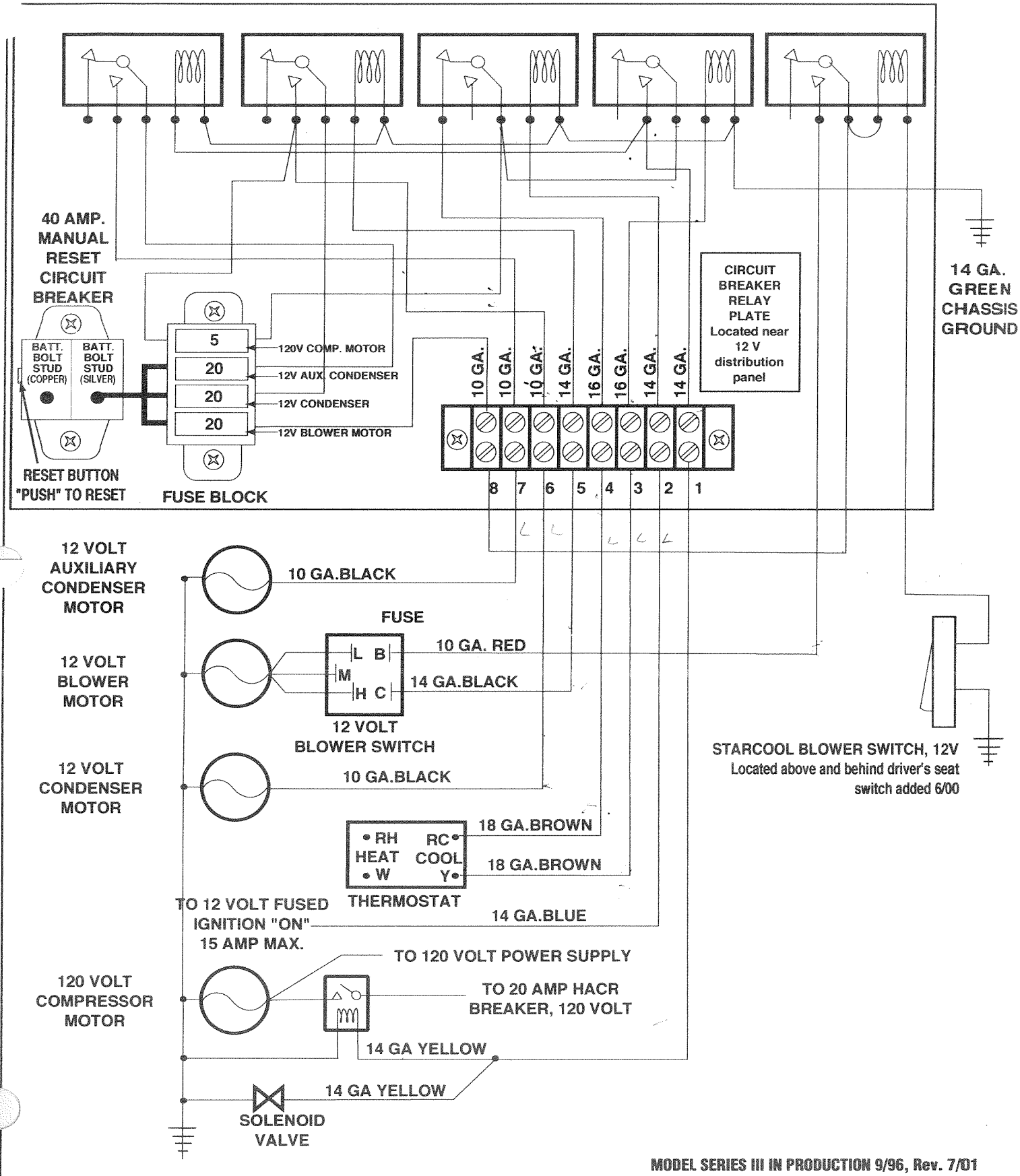
PROTECTION INCLUDES:
- 40 amp 12V manual reset circuit breaker.
- 12V fuses on relay plate.

COMPRESSOR / COMPRESSOR RELAY
Compresses refrigerant vapor from evaporator and pushes refrigerant vapor to condenser.

WILL ONLY OPERATE WHEN:
- 110V power is available (110V hookup or generator)
- Starcool blower switch set to low, medium or high.
- Thermostat set to "cool" and temperature selector set below interior temperature.
- Vehicle ignition is "off".

PROTECTION INCLUDES:
- 20 amp 110V circuit breaker on 30 amp center
- High temperature cut-out switch.
- Ignition "on" cut-out relay
- Check valve.
- 5 amp 12V fuse on relay plate.

STARCOOL III ELECTRICAL SCHEMATIC



MODEL SERIES III IN PRODUCTION 9/96, Rev. 7/01

TROUBLE SHOOTING

STARCOOL NOT COOLING DURING 110 VOLT OPERATION

- ☐ Check air volume and temperature at StarCool vents.
  - ☐ Air flow not adequate.
    - ☐ Check blower operation
    - ☐ Check Air Filter
      - ☐ If StarCool blower does not operate:
        - ☐ Check 12V fuses on relay plate near 12V Distribution Center
        - ☐ 40 amp fuse on Relay plate
        - ☐ Check blower switch if fuses okay.
      - ☐ If fuses and switch okay:
        - ☐ Check ground wire at blower (evaporator)
      - ☐ If power present at blower (evaporator) and ground wire okay;
        - ☐ Then blower motor needs to be replaced. Contact StarCool.
  - ☐ Air flow adequate
    - ☐ Air temperature cold
      - ☐ Check for warm air entering vehicle;
        - ☐ Use sun shades, etc. to keep heat out
      - ☐ Air temperature out of vents should be 15° to 20° colder than air entering return air grill
    - ☐ Air temperature warm
      - ☐ StarCool condenser fans should operate any time StarCool blower switch is on;
        - ☐ Check fuses on relay plate
        - ☐ If not operating - also check ground wire at fan
      - If air temperature is cool and then becomes warm, verify operation of 110 volt compressor.
      - ☐ Check for leaks and check pressures;
        - ☐ Add refrigerant as needed
        - ☐ Check Air Filter.
      - ☐ Check Pressures
        - ☐ Low pressure gauge reads low
          - ☐ Check for blockage, frosting occurs at point of blockage
        - ☐ Low pressure gauge reads high
          - ☐ Low and high pressure gauges equal, Compressor is not operating properly.
          - ☐ Verify check valve for vehicle compressor is operating properly. Outlet side of check valve should be hot when StarCool compressor is operating. Inlet line of check valve should not be hot.
        - ☐ High pressure gauge reads low
          - ☐ Check compressor case, if hot system may be low on oil or refrigerant.
        - ☐ High pressure gauge reads high
          - ☐ Check for blockage, frosting occurs at point of blockage
          - ☐ Check for air in system or overcharge of refrigerant.
            - ☐ Remove excess refrigerant or evacuate system and recharge
          - ☐ Verify that StarCool condenser fans are operating

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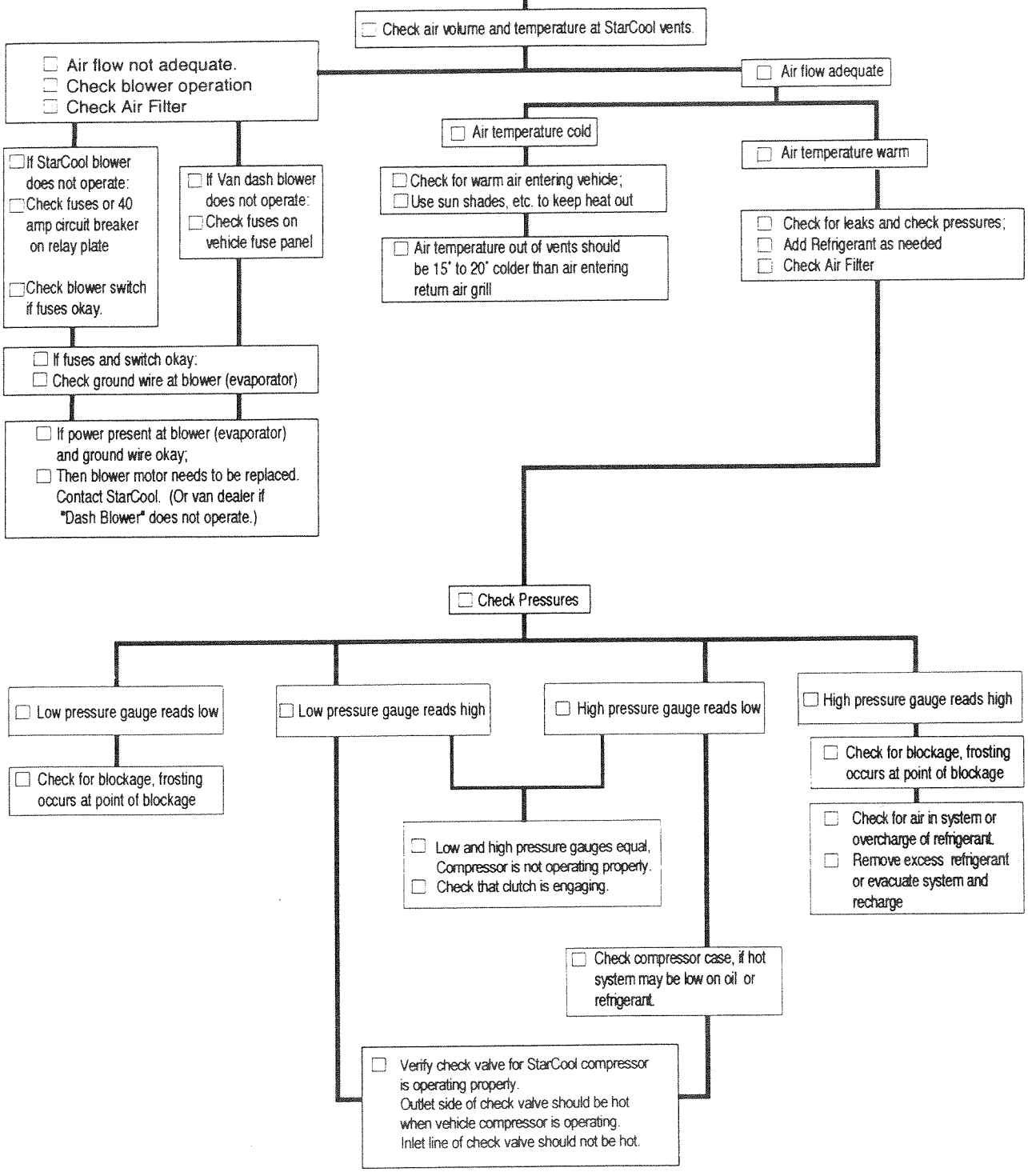
TROUBLE SHOOTING

STARCOOL NOT COOLING WHILE VAN ENGINE IS RUNNING



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