FLEETWOOD RV

Technical Services Information

Keywords: Dash Air Conditioning, Air Conditioning, Automotive, Automotive Air Conditioner, Air Conditioner, AC, *.*

Topic: Denso Dash Air Conditioner, Component Testing **Issue Date:** 01/18/2001

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Note: Please refer to the appropriate GM, Ford, Freightliner, or Spartan (thru mid-1998) manuals when On-Vehicle Diagnosis indicates that the problem is caused by the following components:

1. Compressor and Magnetic Clutch
2. Receiver/Drier
3. Models with Electric Fan Motor for Condenser

1. Blower/Cooling Unit

A. On Vehicle Inspection of Expansion Valve

Inspect A/C system visually and audibly. Next, inspect the system with a ROBINAIR (manifold gauge) or equivalent equipment.

1) While turning A/C switch "ON" and BLOWER switch "HI", run engine at 1,500 RPM for at least five (5) minutes and check A/C performance in RECIRC mode.

2) If expansion valve is clogged, the low pressure reading will drop. If normal, the pressure will remain the same.

3) If the low pressure reading is normal and A/C is not cooling, check for malfunction of expansion valve.

B. Blower/Cooling Unit Removal

1) Disconnect negative cable from battery.

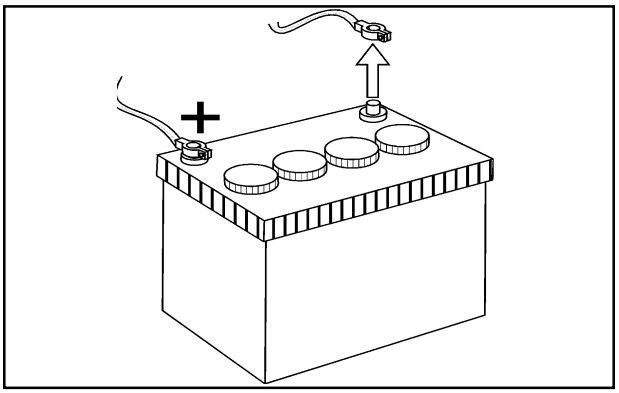


Figure 52: Battery Cable

2) Remove refrigerant from the system using ROBINAIR or equivalent equipment.

3) Remove HVAC cover on passenger side.

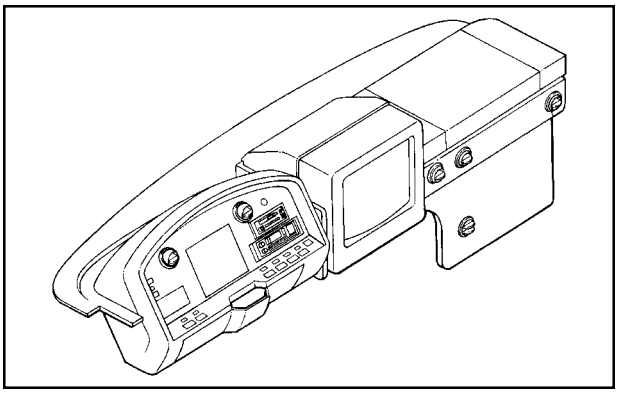


Figure 53: HVAC Cover

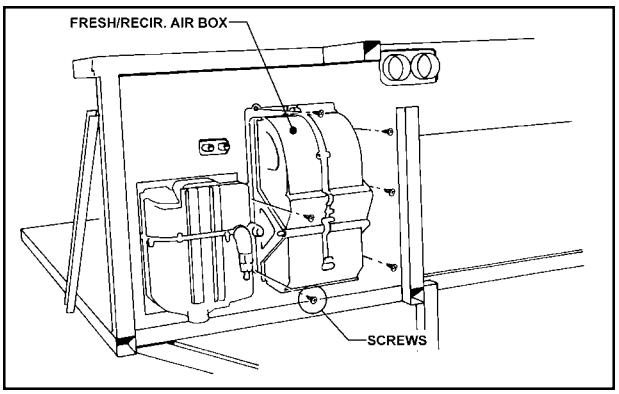


Figure 54: Fresh/Recirc Air Box

4) Remove fresh/recirculate air box. (Fig. 54)

5) Disconnect wire harness at: (Fig. 55)

- Three (3) relays
- Blower
- Servo motor
- Two (2) connectors from thermostat
- Blower resistor
- Fresh/recirculate connector
- Pressure switch
- Main harness connector

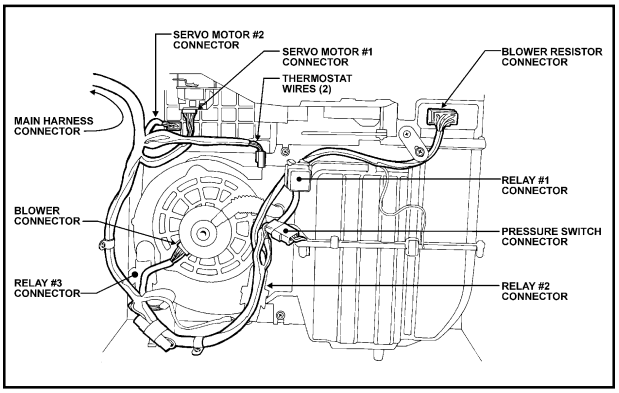


Figure 55: Blower/Cooling Unit

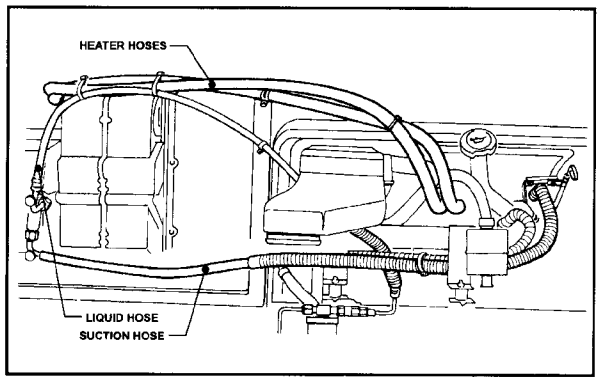


Figure 65: Ford Hose Routing (thru mid-1998)

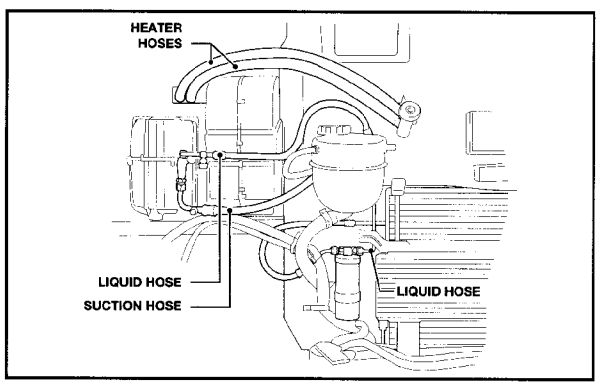


Figure 66: Ford Hose Routing (from mid-1998)

5. Heater

A. On Vehicle Inspection and Adjustment

1) Inspect HVAC control panel. Move the temperature control lever to see if cable moves freely without binding and has full range of travel.

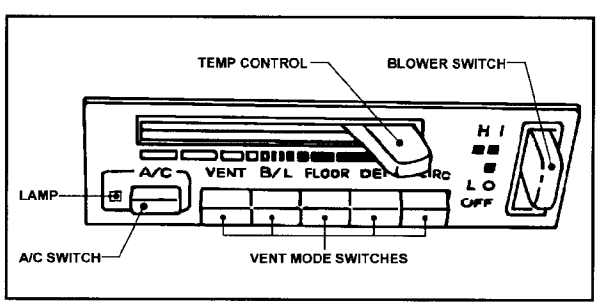


Figure 73: A/C Control 67

2) Check routing of the temperature control cable so it is free of any sharp bends or interference with linkages.

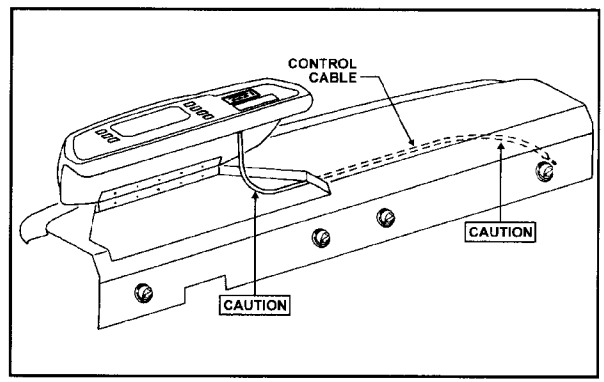


Figure 68: A/C Control Cable Routing

B. Control Cable Adjustment

NOTE: On the control panel, check that the control cable insulation extrudes no less than 1/16" past the metal clamp on the control panel mounting base. If less than 1/16", go to next step. (Fig. 69)

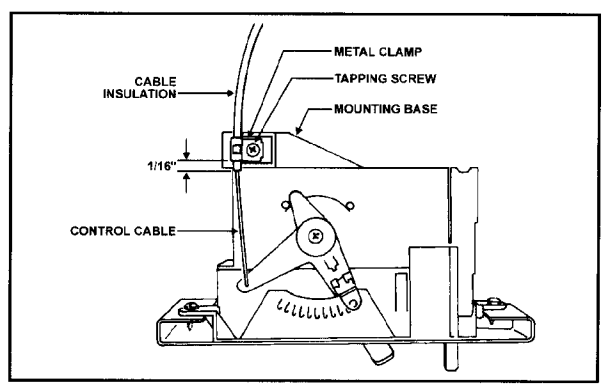


Figure 69: Cable Adjustment at Control Panel

1) Loosen the tapping screw and push the control cable insulation forward past the metal clamp approximately 1/16". Retighten the tapping screw.

⚠CAUTION: Do not overtighten the tapping screw. This could result in damage to the mounting base of the control panel.

2) On the bottom of the HVAC unit, locate the spring clip and carefully remove the control cable insulation. (Fig. 70)

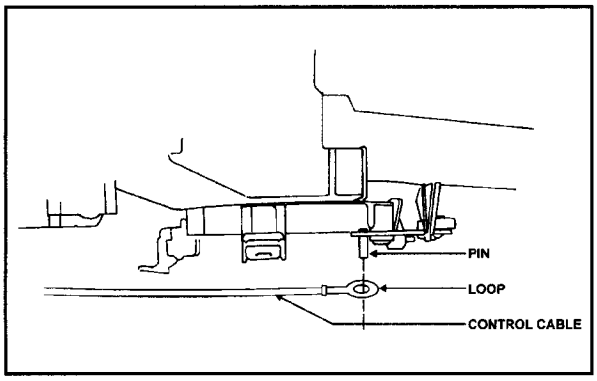


Figure 70: Cable Adjustment at Heater

3) Move the temperature control lever on the control panel to the maximum cool position (all the way to the left). (Fig. 71)

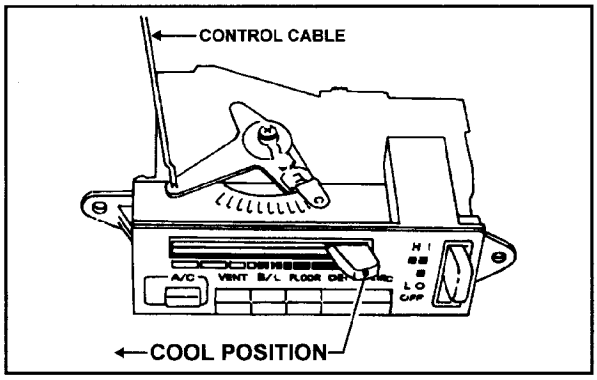


Figure 71: Max Cool Position of Control Panel

4) Looking at the bottom of the HVAC unit, push and hold the cam lever with the control cable attached to the pin to maximum cool (clockwise) position. (Fig. 72)

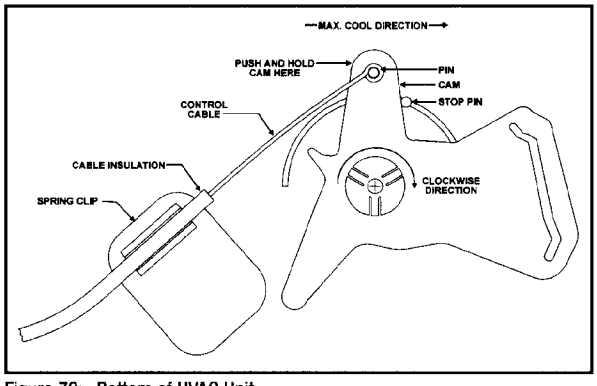


Figure 72: Bottom of HVAC Unit

5) While holding the cam lever in the proper position, recheck that the temperature control lever on the control panel is in the maximum cool position. (Fig. 71)

6) While holding the cam lever in the maximum cool position, snap the control cable insulation into the spring clip by pushing upward. (Fig. 73)

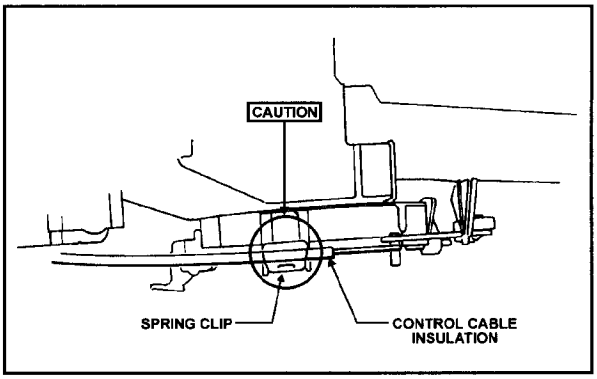


Figure 73: Spring Clip Connection of Cable

C. Heater Core Removal

1) Remove blower/cooling unit case (see page 40).

2) Remove control cable from heater unit. (Fig. 74)

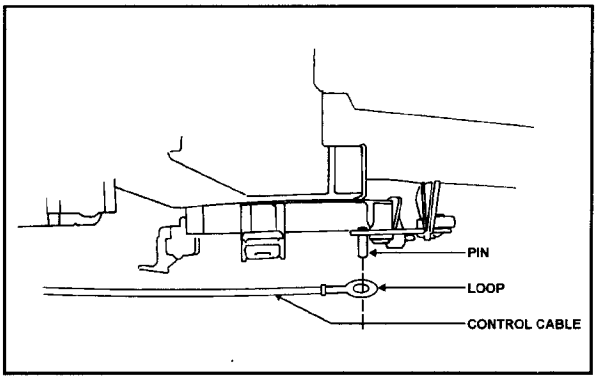


Figure 80: Removing Control 74

3) Remove heater hose from heater core.

NOTE: Hoses should be marked so they can be easily identified and reconnected to their proper connections.

F. Remove two (2) wire harness connectors from control panel.

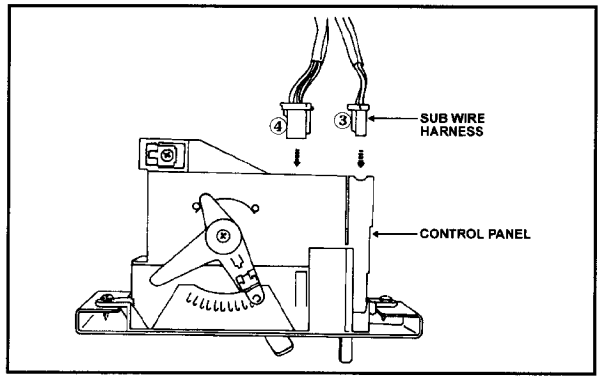


Figure 82: Removal of Subwire Harness

G. Remove and save metal support bracket from control panel (if equipped).

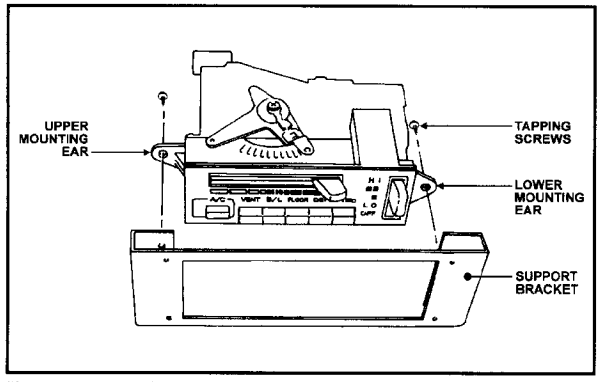


Figure 83: Metal Support Bracket

A. Inspection

Inspect control panel for continuity.

Terminal No. / Mode	1	2	3	4	6 (-) Ground	7	8	9	10	11
A/C (on)					○		○			
Vent (face)		○			○					
B/L			○		○					
Floor					○			○		
DEF				○	○		○			
Recirc (Button Depressed)					○				○	
Fresh (Recirc Button Out)					○					○

○—○ Indicates there is continuity between these terminals

Control Panel Connector

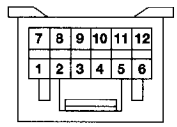


Figure 84: Control Panel Circuit

B. Installation

Follow reversal of steps for removal.

NOTE: See Control cable adjustment on page 43.

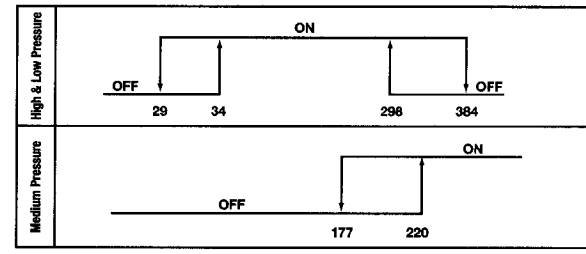
9. Pressure Switch

A. Pressure Switch Operation

The pressure switch is a triple pressure switch with a high and low pressure set of contacts and a medium pressure set of contacts. The high-low side is wired in series with the thermostat and controls the ground to the coil of the magnetic clutch relay. On vehicles equipped with a condenser fan, the medium side is wired in parallel with the water temperature switch and controls the ground to the coil of the condenser fan relay.

B. On Vehicle Inspection

1) Disconnect negative cable from battery.
2) Remove HVAC cover on passenger side.
3) Confirm refrigerant charge status with ROBINAIR or equivalent equipment.
4) Disconnect the pressure switch harness connector from the cooling unit harness.



Units: PSI

Switch / Item	Off → On kg/cm² (psi)	On → Off kg/cm² (psi)
Low Pressure Side	2.4 (34.1)	2.1 (29.9)
High Pressure Side	21 (298.6)	27 (383.9)
Medium Pressure Side	15.5 (220.4)	12.5 (177.8)

Figure 85: Pressure Switch Operation

5) Connect a jumper wire between terminals 13B and 14A of the cooling unit harness.

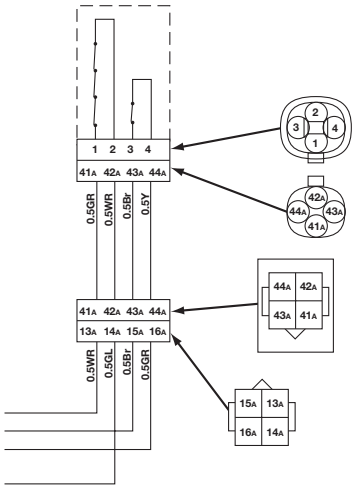


Figure 86: Pressure Switch Connector

6) With the A/C system at normal operating pressures, check for continuity between terminals 41A and 42A for the high-low side and terminals 43A and 44A for the medium side.

7) If there is no continuity, replace the switch.

C. Pressure Switch Removal

1) Remove and disassemble blower/ cooling unit. (Fig. 87)

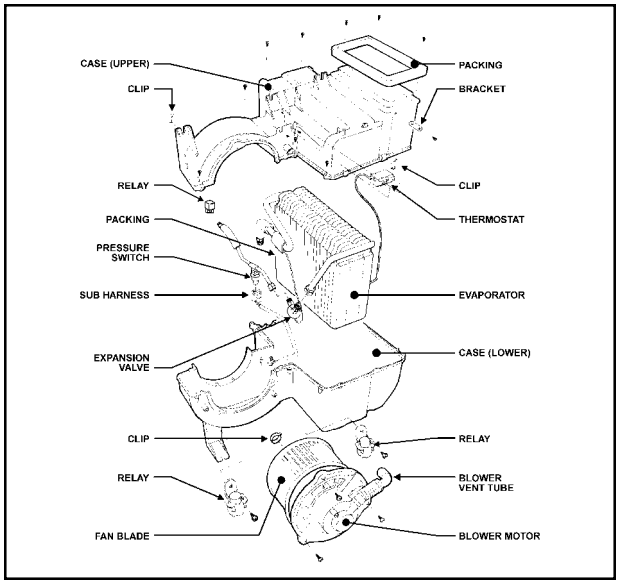


Figure 87: Blower/Cooling Unit (disassembled)

2) Remove wire harness from pressure switch.

3) Remove pressure switch from liquid line.

D. Installation

Follow reversal of steps for removal.

10. Blower

A. On Vehicle Inspection

1) Blower and Fan Operation

Connect positive (+) lead from battery to terminal #2 and negative (-) lead to terminal #1 to confirm smooth operation of motor.

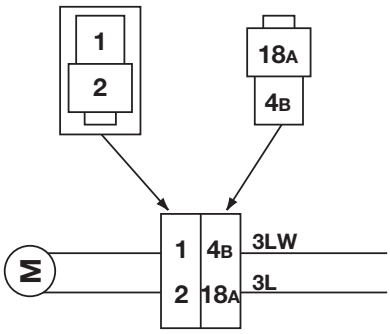


Figure 88: Blower and Fan Circuit

2) Blower Resistor Inspection.
Inspect the resistor for specification.

Checking for proper resistance of the blower motor resistor

Resistance Value \ Pins	1	2	4	5
.5Ω	○—○			
.8Ω		○—○		
1.68Ω			○—○	

○—○ Indicates there is continuity between these terminals

Blower Resistor connector

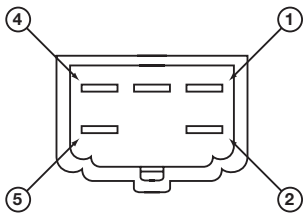


Figure 89: Blower Resistor

B. Blower and Fan Removal

1) Disconnect negative cable from battery.
2) Remove HVAC cover on passenger side.
3) Remove blower motor 2-pin connector.
4) Remove blower motor vent tube.
5) Remove three (3) screws mounting blower motor to the case.
6) Remove the blower motor and fan.

   NOTE: If the blower motor or fan replacement is required, follow the steps below.

   a) Remove clip from fan.
   b) Remove fan from blower motor.
   c) Replace fan or blower motor as required.

C. Blower Resistor Removal

1) Disconnect negative cable from battery.

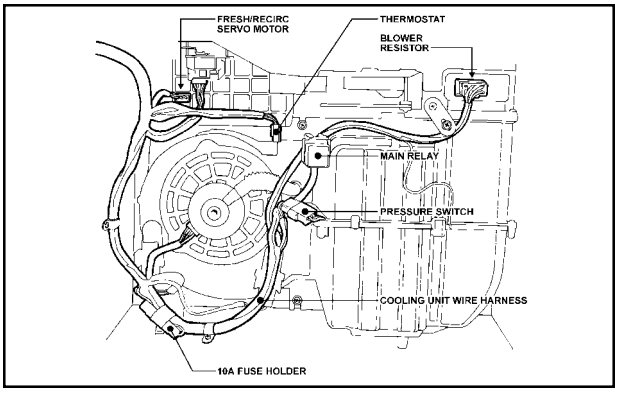


Figure 90: HVAC Component Location

2) Remove HVAC cover on passenger side.
3) Disconnect 4-pin connector from blower resistor.
4) Remove two (2) screws from blower resistor.
5) Remove blower resistor.

D. Installation

Follow reversal of steps for removal.

11. Relays

Remove HVAC cover on passenger side to access the following three (3) relays:

A. Main Relay

Inspect five 5-pin main relay for continuity and replace the relay as required.

Battery Voltage \ Terminal No.	30	85	86	87	87A
Not Supplied		○—○			
	○				○
Supplied		⊖	⊕		
	○			○	

○—○ Indicates there is continuity between these terminals
⊖--⊕ Indicates terminals to which battery voltage is supplied

Main Relay connector

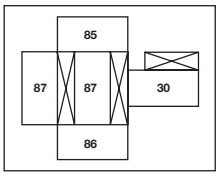


Figure 91: Main Relay

B. Blower HI Relay

Inspect 4-pin Blower HI Relay for continuity and replace the relay as required.

Battery Voltage \ Terminal No.	21A	2B	50	18B
Not Supplied	○—○			
Supplied	⊕ ⋯ ⊖		○—○	

○—○ Indicates there is continuity between these terminals
⊖--⊕ Indicates terminals to which battery voltage is supplied

Blower High Relay connector

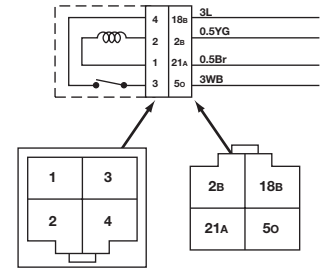


Figure 92: Blower Hi Relay

C. Mg/Cl (Magnetic Clutch Relay)

Inspect 4-pin Mg/Cl Relay for continuity and replace the relay as required.

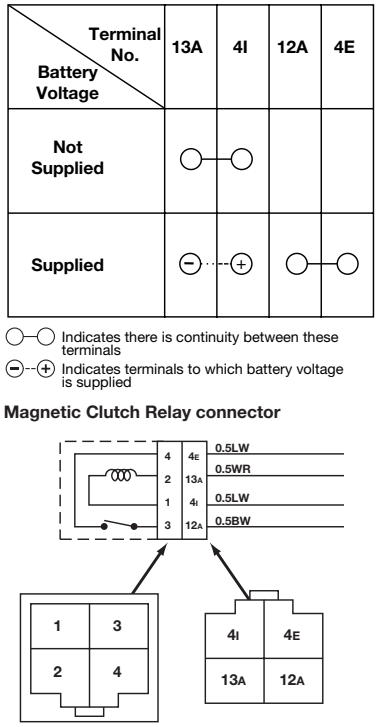


Fig. 93: Magnetic Clutch Relay

12. Air Intake Servo

A. Air Intake Servo Operation

The air intake servo changes the air intake door between the FRESH and RECIRC positions by rotating 180° in the clockwise direction every time the RECIRC switch on the control panel is depressed (RECIRC mode) or released (FRESH mode).

NOTE: To check for proper operation of the Air Intake Servo, the ignition switch must be in the “ON” position.

B. Air Intake (Air Box Fresh/Recirculate) Servo Removal

1) Remove HVAC cover on passenger side to access the servo.
2) Disconnect negative cable from battery.
3) Disconnect connector for air box fresh/recirculate servo motor.
4) Remove fresh/recirc air box.
5) Remove linkage rod from servo motor.
6) Remove wire harness from servo motor.
7) Remove two (2) screws from servo motor.
8) Remove servo motor from air box.

C. Air Intake Servo Inspection

Check continuity of the servo according to the chart as shown.

To check for voltage at the Air Intake Servo Sub Harness female connector, use chart below

Switch Position \ Main Harness Pin	1 .5YG	2 .5YG	4 .5YL
Recirc (in)	+		−
Fresh (recirc out)	+	−	

Indicates terminals to which battery voltage is supplied

Air Intake Servo connector

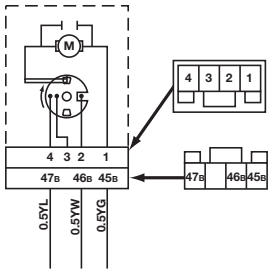


Fig. 94: Air Intake Servo Circuit

D. Air Intake Servo Installation

Follow reversal of steps for removal.