A/C-HEATER SYSTEM - MANUAL

1992 Infiniti G20

1991-92 Manual A/C-Heater System

G20

* PLEASE READ THIS FIRST *

CAUTION: When discharging air conditioning system, use only approved refrigerant recovery/recycling equipment. Make every attempt to avoid discharging refrigerant into the atmosphere.

A/C SYSTEM SPECIFICATIONS

SPECIFICATIONS TABLE

Application	Specification
Compressor Type	Atsugi Rotary Vane
System Oil Capacity	6.8 ozs.
Compressor Belt Defection (1)	9/32-5/16" (7-8 mm)
Refrigerant (R-12) Capacity	24-29 ozs.
System Operating Pressures (2)	
High Side	162-210 psi (11.4-14.8 kg/cm²)
Low Side	14-26 psi (1.0-1.8 kg/cm²)

(1) - With 22 lbs. (10 kg) applied midway on longest belt run.
(2) - With ambient temperature of 86°F (30°C). Engine speed 1500 RPM. Let system operate for at least 10 minutes before checking.

DESCRIPTION

A separate evaporator housing assembly is combined with a standard heater assembly to create an integrated A/C-heating unit. Evaporator is in the center with blower motor directing airflow through evaporator and then through the heater.

OPERATION

Push button control panel (auto amplifier) operates the intake and mode door motors to position the doors according to operators selection. See Figs. 1 and 2. Slide switch controls temperature. A dial (slide) switch controls fan speed. The A/C switch controls air conditioner operation.

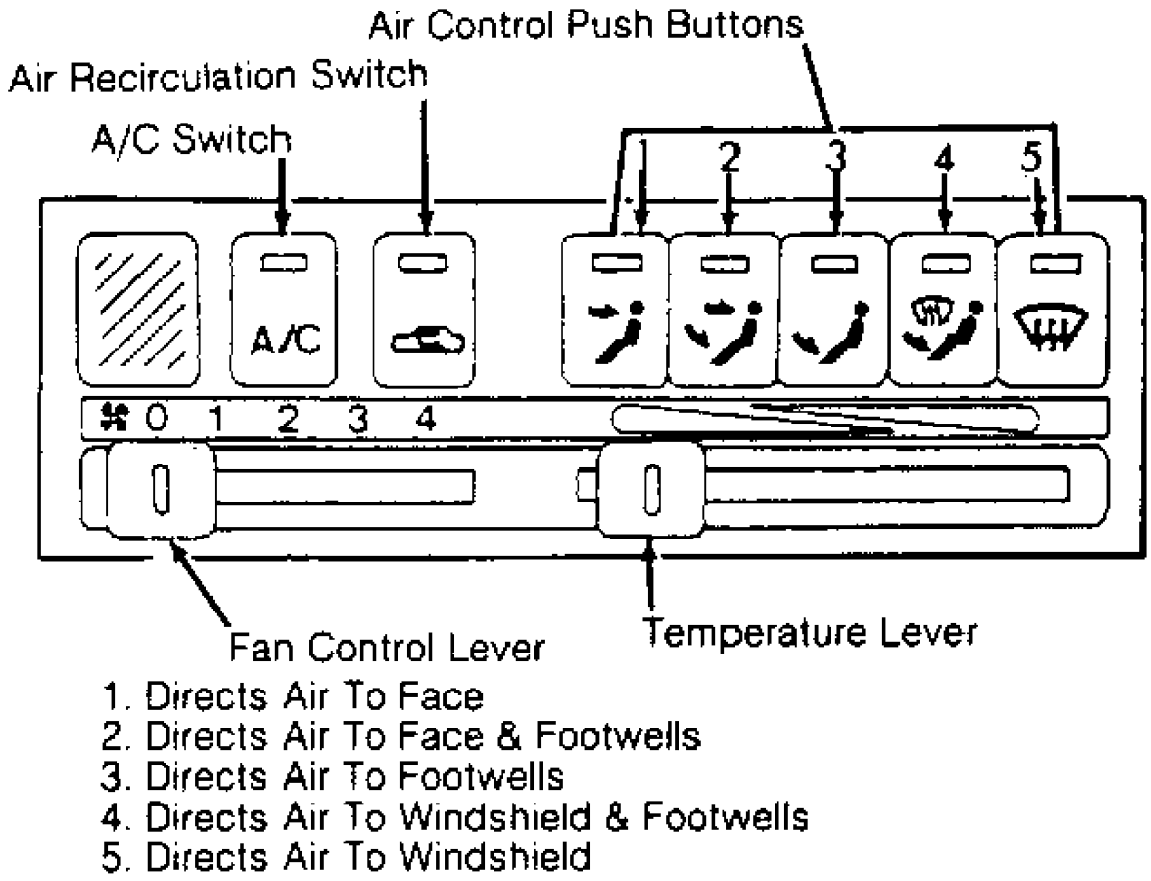


Fig. 1: A/C-Heater Control Panel ID (Typical)
Courtesy of Nissan Motor Co., U.S.A.

AUXILIARY AIR CONTROL (AAC) VALVE

When A/C system is operating, vacuum flows through AAC valve and engine idle speed is increased. Additional air results in higher engine idle. This higher idle speed allows engine to idle smoothly during compressor operation.

DUAL PRESSURE SWITCH

The dual pressure switch is mounted on the receiver-drier to protect A/C system from high pressure build-up (due to restriction, overcharge or compressor malfunction). See Fig. 3. If excessively low or high pressure is sensed within system, dual pressure switch electrically stops compressor clutch operation.

FUSIBLE PLUG

Fusible plug, mounted on receiver-drier, is a high temperature relief. When 221°F (105°C) is sensed, plug melts to vent

refrigerant to atmosphere, thereby protecting the system.

INTAKE DOOR MOTOR

The intake door motor, attached to heater unit, rotates so air is drawn from inlets set by push button control panel. Motor rotation is transferred to a lever which moves intake door.

MODE DOOR MOTOR

The mode door motor, attached to heater unit, rotates so air is discharged from outlet(s) set by push button control panel. Motor rotation is transferred to a link which moves mode door.

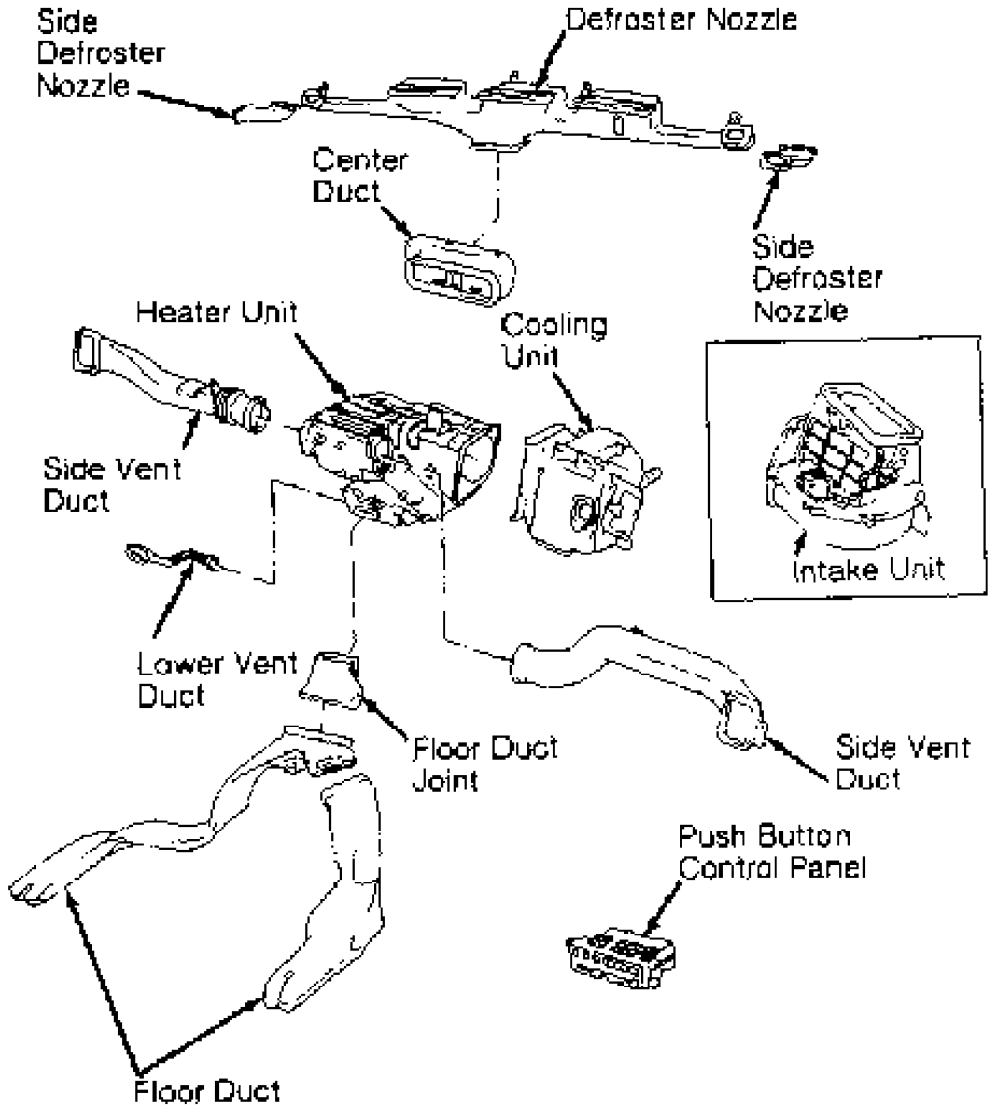


Fig. 2: Exploded View of A/C-Heater Components & Ducts (Typical)
Courtesy of Nissan Motor Co., U.S.A.

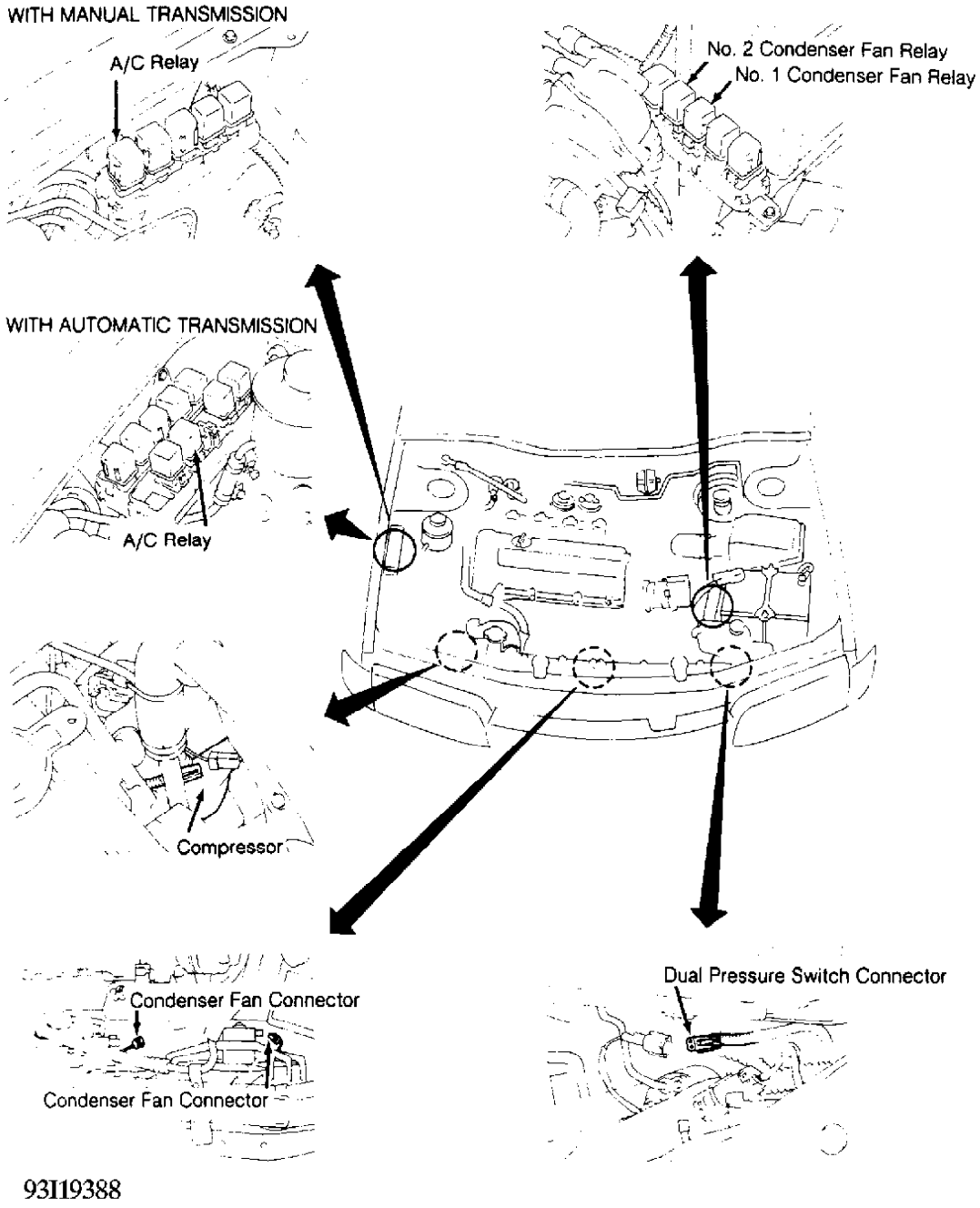


Fig. 3: Locating Manual A/C-Heater System Components
Courtesy of Nissan Motor Co., U.S.A.

ADJUSTMENTS

INTAKE DOOR

1)Turn ignition switch to ACC position. Turn REC

(recirculation) switch to OFF position. Install intake door motor on intake unit (connect harness before installing motor). Install intake door lever.

2) Set intake door rod in FRESH position, and secure door rod to holder on intake door lever. See Fig. 4. Ensure intake door operates properly when REC switch is cycled on and off.

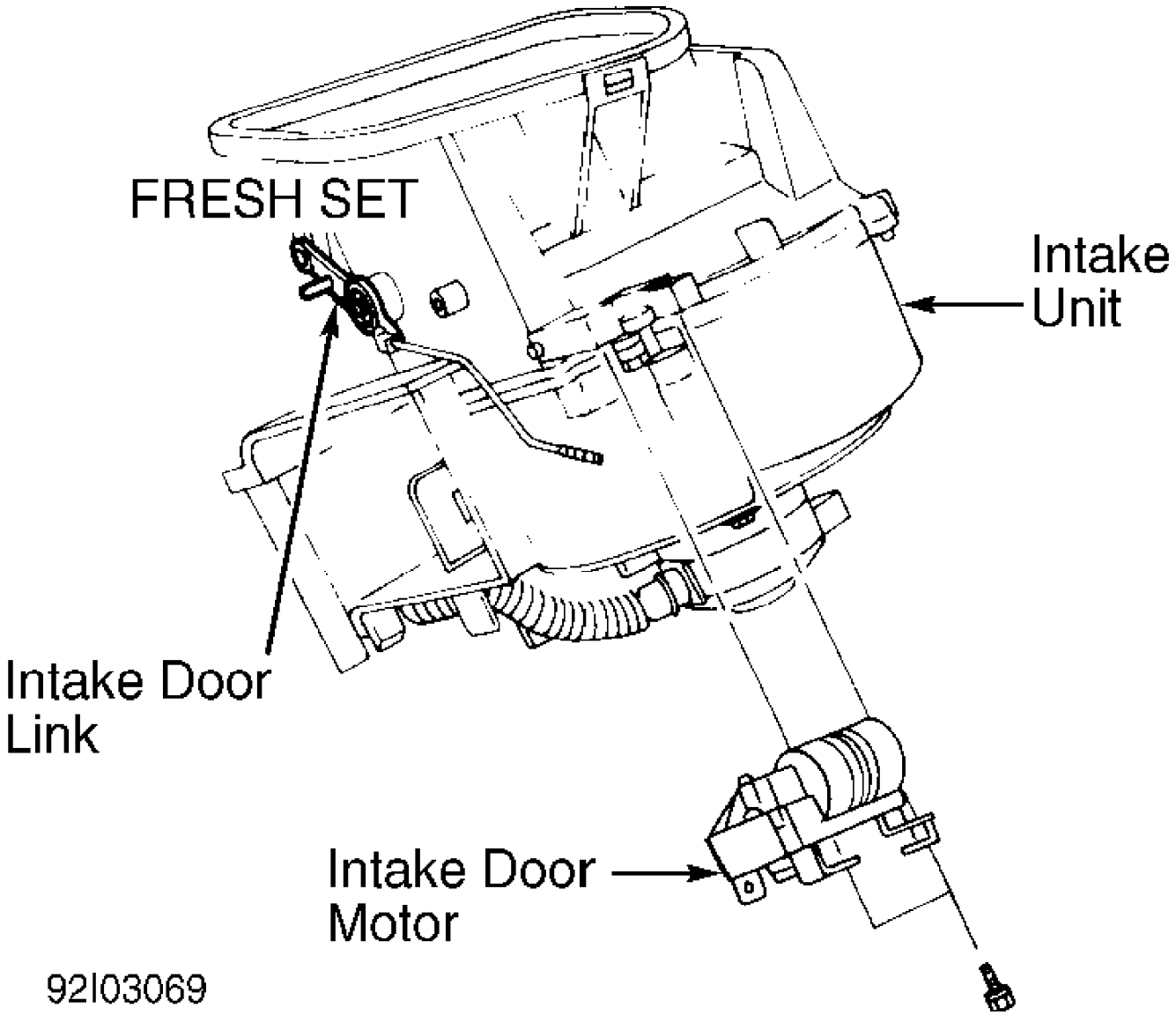


Fig. 4: Adjusting Intake Door
Courtesy of Nissan Motor Co., U.S.A.

MODE DOOR

1) Move side link by hand and hold mode door in VENT position. Install mode door motor on heater unit and connect to wiring harness. See Fig. 5. Turn ignition to ACC position. Turn VENT switch to ON position. Attach mode door motor rod to side link rod holder.

2) Turn DEF (defrost) switch to ON position. Ensure side link operates at fully open position. Turn VENT switch to ON position. Ensure side link operates at fully open position.

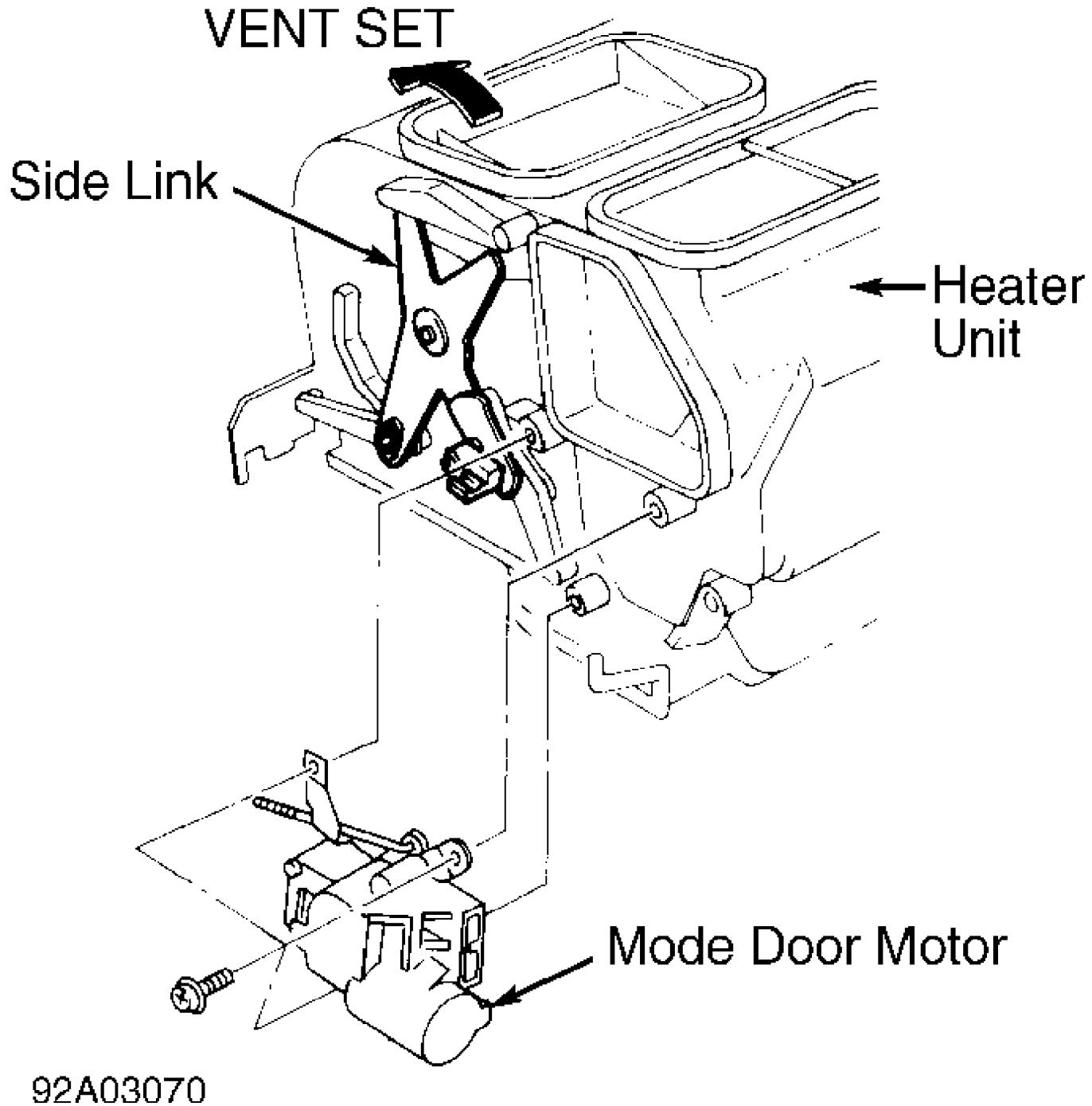


Fig. 5: Adjusting Mode Door
Courtesy of Nissan Motor Co., U.S.A.

TEMPERATURE CONTROL CABLE

Set temperature control lever and air mix door lever to full hot. Set air mix door lever to full hot. Pull on outer cable, and secure cable using retaining clip. See Fig. 6.

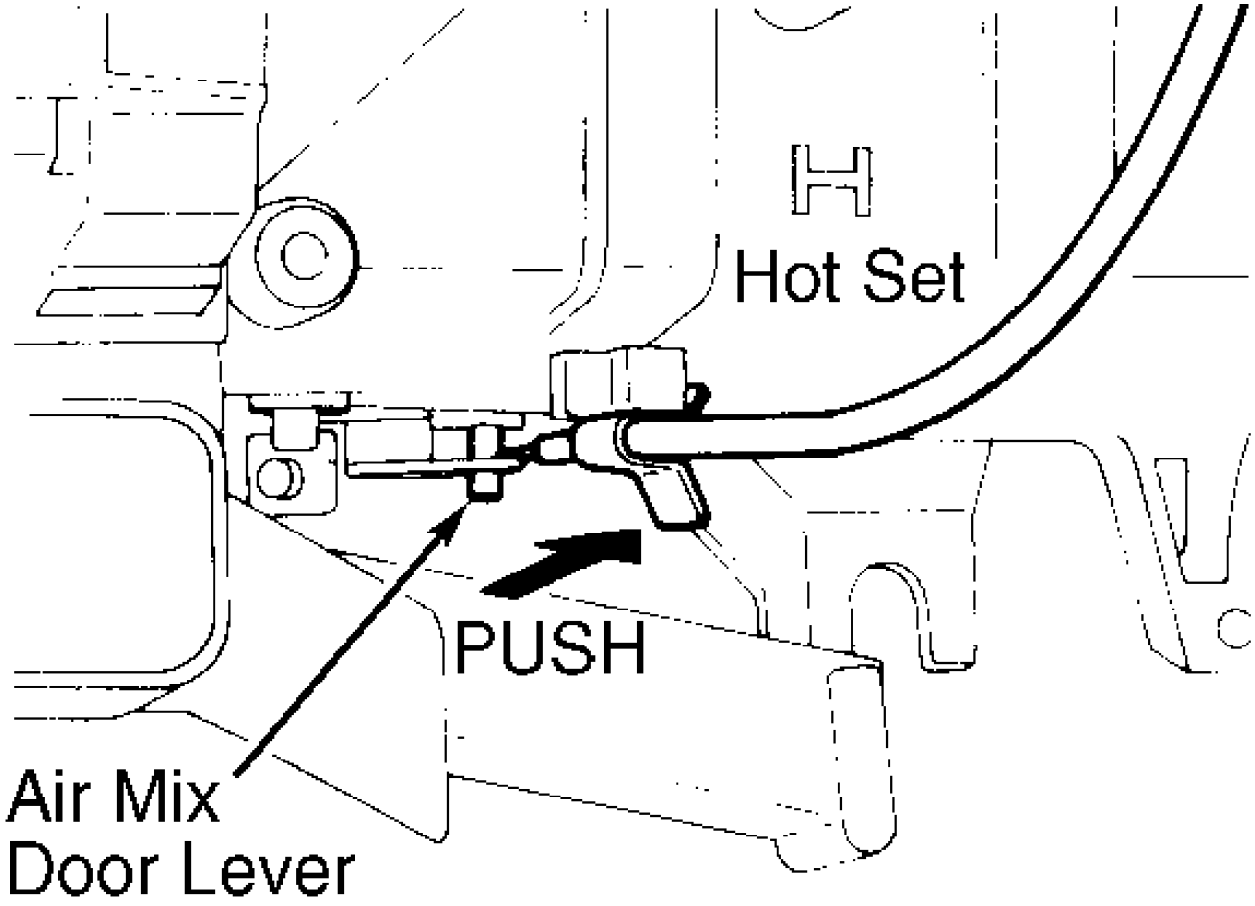


Fig. 6: Adjusting Temperature Control Cable
Courtesy of Nissan Motor Co., U.S.A.

WATER COCK CONTROL ROD

NOTE: When adjusting water cock control rod, first disconnect temperature control cable from air mix door lever. Reconnect and readjust temperature control cable.

FRESH VENT DOOR

Turn ignition switch to ACC position. Turn fresh vent switch to OFF position. Install fresh vent door motor on heater unit (connect harness before installing motor). Push fresh vent shaft in direction indicated. See Fig. 7. Pull on outer cable and secure cable using clamp.

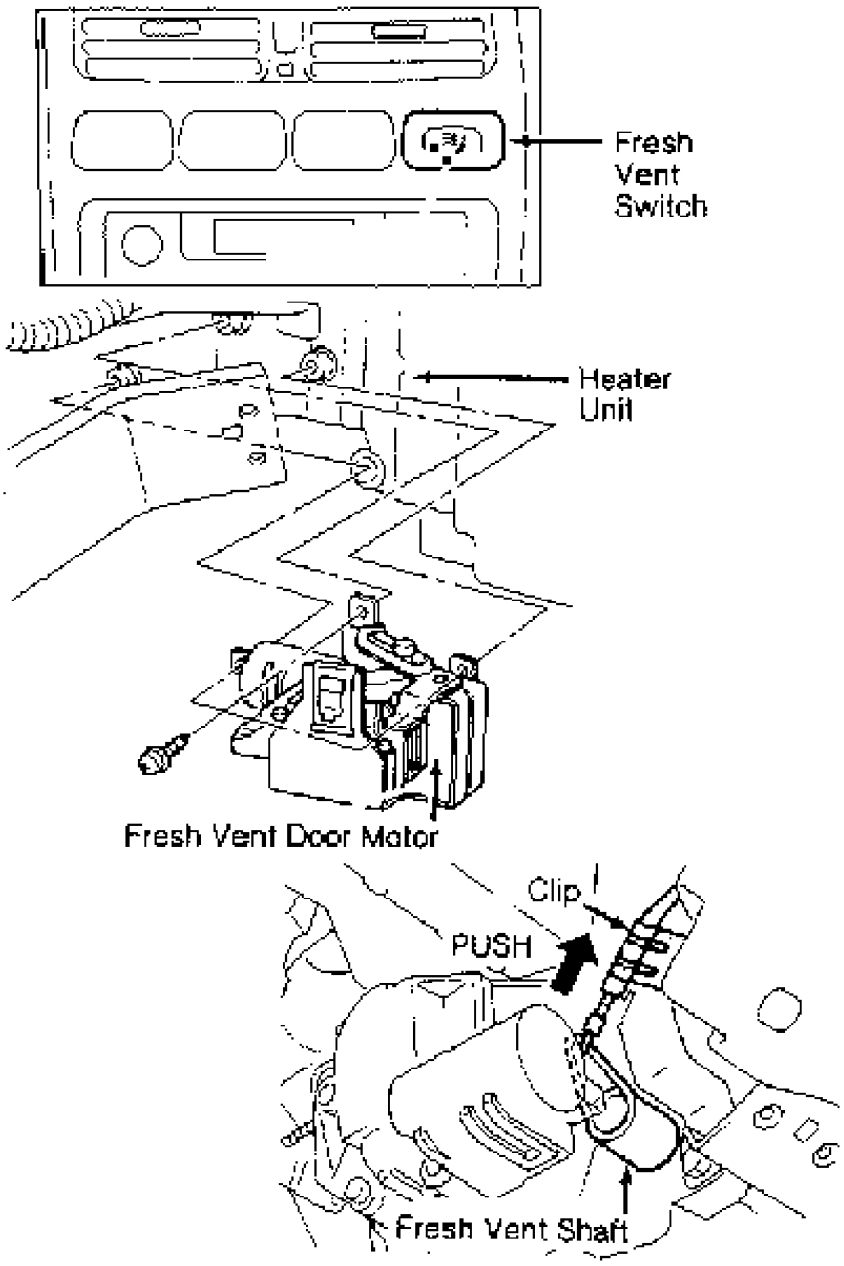


Fig. 7: Adjusting Fresh Vent Door
Courtesy of Nissan Motor Co., U.S.A.

TROUBLE SHOOTING

Use the following trouble shooting charts for diagnosing air conditioning system problems.

NOTE: The following diagnostic charts are courtesy of Nissan Motor Co., U.S.A.

PRELIMINARY CHECKS

See PRELIMINARY CHECKS table below and the applicable Figs.

PRELIMINARY CHECKS TABLE

Preliminary Check	Cause/Symptom	Figure
1	Intake Door Not Set at FRESH in DEFROST or FOOT/DEFROST Mode	See Fig. 8
2	A/C Does Not Blow Cold Air	See Fig. 9
3	Magnetic Clutch Does Not Engage in DEFROST Mode	See Fig. 10
4	Air Outlet Does Not Change	See Fig. 11

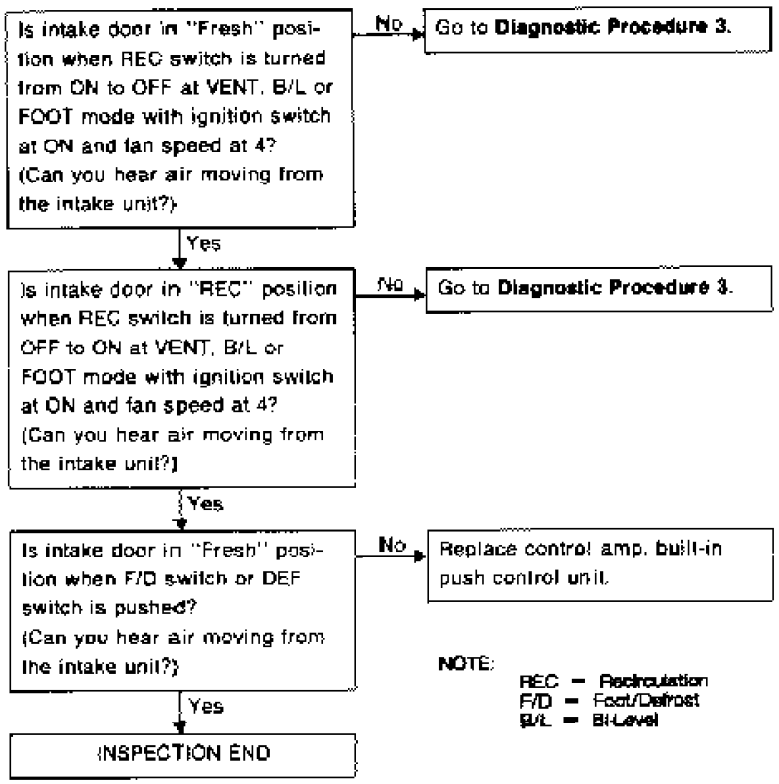


Fig. 8: Preliminary Check 1

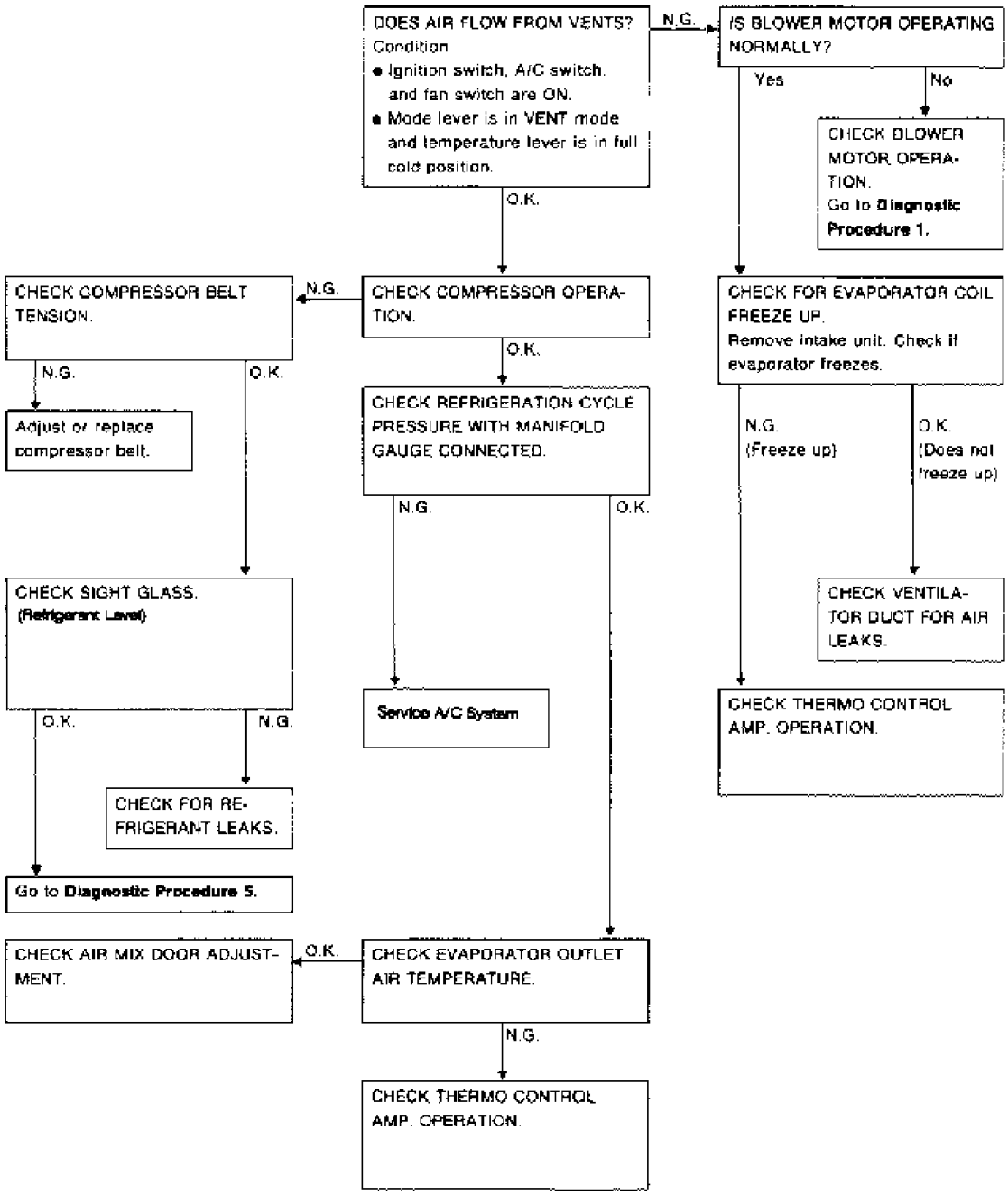


Fig. 9: Preliminary Check 2

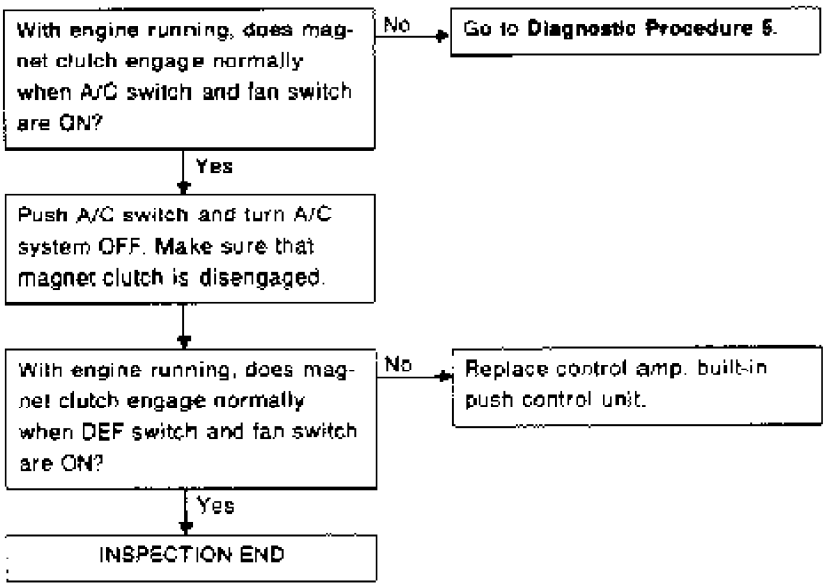


Fig. 10: Preliminary Check 3

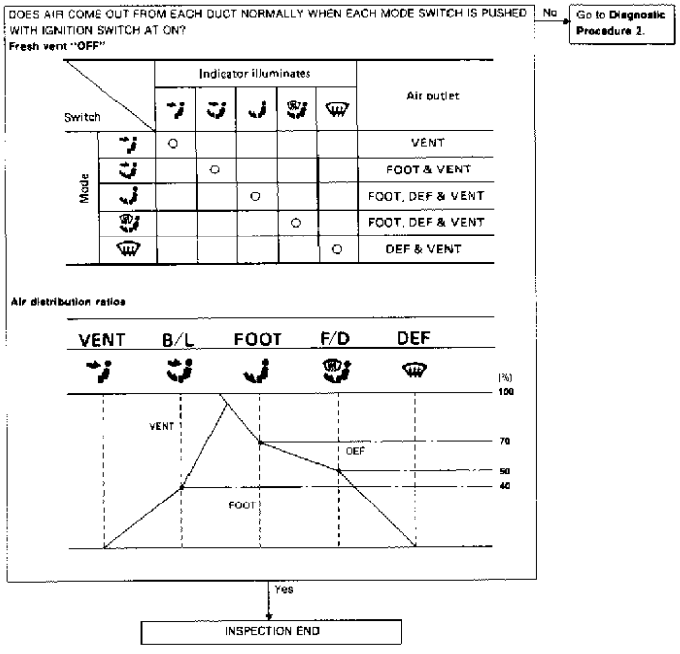
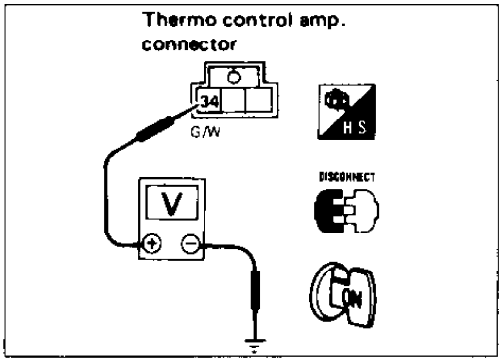
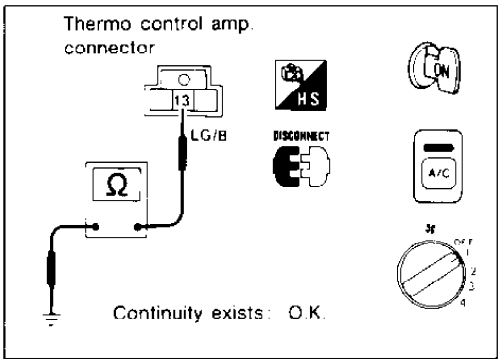
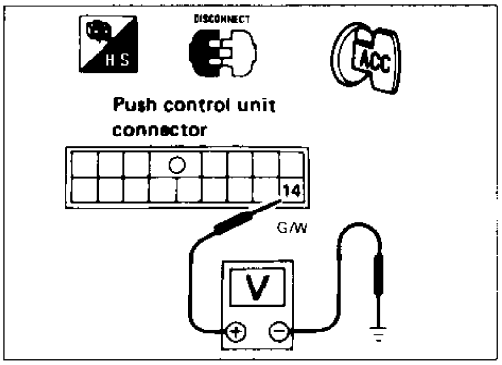


Fig. 11: Preliminary Check 4

MAIN POWER SUPPLY & GROUND CIRCUIT CHECK







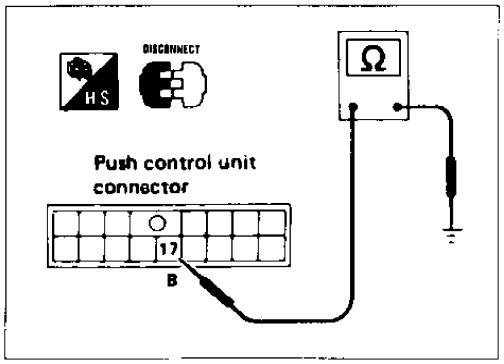


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Fig. 12: Main Power Supply & Ground Circuit Check

THERMO CONTROL AMP. CHECK

Check power supply circuit for thermo control amp. with ignition switch ON.

1. Disconnect thermo control amp. harness connector.
2. Connect voltmeter from harness side.
3. Measure voltage across terminal No. ㉞ and body ground.

Voltmeter terminal		Voltage
⊕	⊖	
㉞	Body ground	Approx. 12V

Check body ground circuit for thermo control amp. with ignition switch ON, A/C switch ON and fan switch ON.

1. Disconnect thermo control amp. harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. ⑬ and body ground.

Ohmmeter terminal		Continuity
⊕	⊖	
⑬	Body ground	Yes

PUSH CONTROL UNIT CHECK

Check power supply circuit for push control unit with ignition switch at ACC.

1. Disconnect push control unit harness connector.
2. Connect voltmeter from harness side.
3. Measure voltage across terminal No. ⑭ and body ground.

Voltmeter terminal		Voltage
⊕	⊖	
⑭	Body ground	Approx. 12V

Check body ground circuit for push control unit with ignition switch OFF.

1. Disconnect push control unit harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. ⑰ and body ground.

DIAGNOSTIC PROCEDURES

See DIAGNOSTIC PROCEDURES table and the applicable Figures.

DIAGNOSTIC PROCEDURES TABLE

Procedure	Cause/Symptom	Figure(s)
1	Blower Motor Does Not Rotate	See Fig. 13 to 15
2	Air Outlet Does Not Change	See Fig. 16 to 17
3	Intake Door Does Not Change in VENT, BI-LEVEL or FOOT Mode	See Fig. 18
4	Fresh Vent Door Does Not Change	See Fig. 19
5	Magnetic Clutch Doesn't Engage w/ A/C & Fan Switches in ON Position ...	See Fig. 20 to 24
6	Illumination or Indicators of Push Control Unit Do Not Come On	See Fig. 25
6-1	Illumination or Indicators of Push Control Unit Do Not Come On	See Fig. 26
6-2	Illumination or Indicators of Push Control Unit Do Not Come On	See Fig. 27
6-3	Illumination or Indicators of Push Control Unit Do Not Come On	See Fig. 28
6-4	Illumination or Indicators of Push Control Unit Do Not Come On	See Fig. 29
6-5	Illumination or Indicators of Push Control Unit Do Not Come On	See Fig. 30

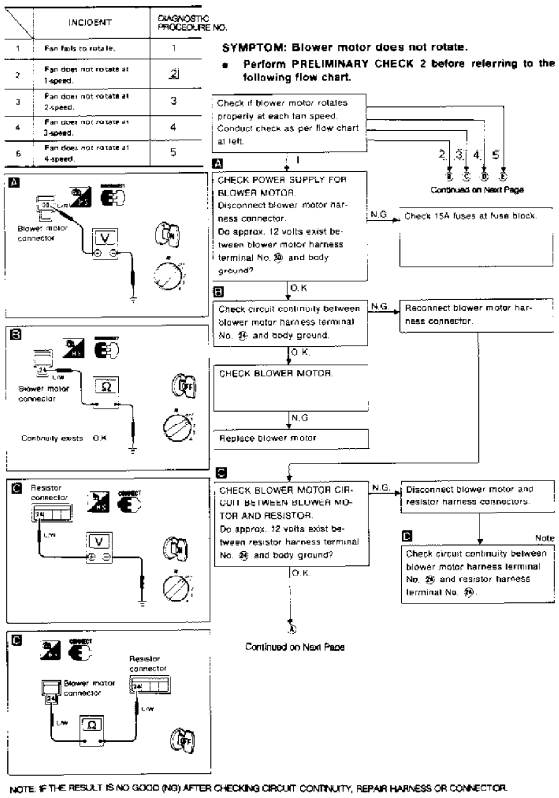
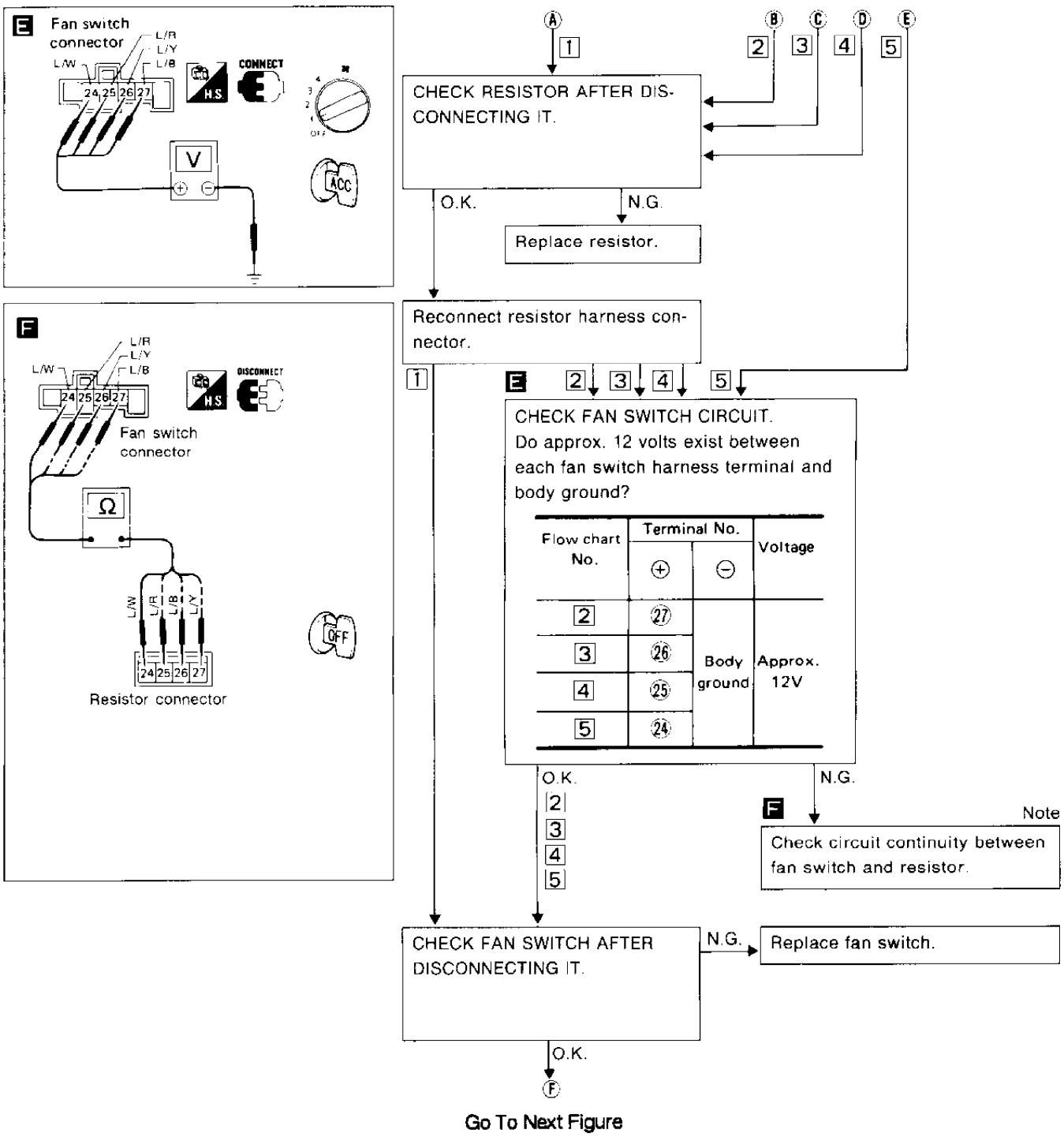


Fig. 13: Diagnostic Procedure 1 (1 of 3)



NOTE: IF THE RESULT IS NO GOOD (NG) AFTER CHECKING CIRCUIT CONTINUITY, REPAIR HARNESS OR CONNECTOR.

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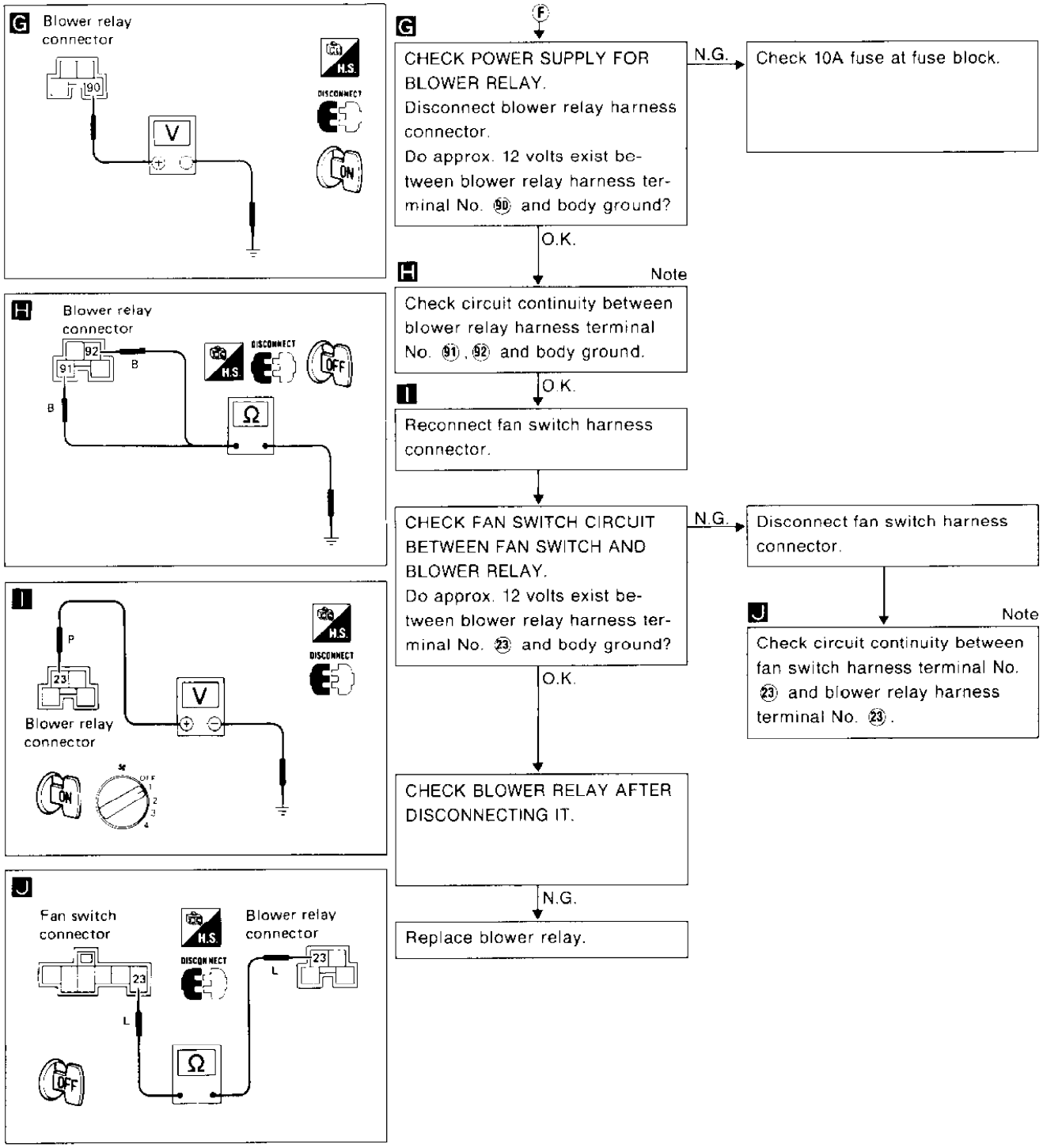
Fig. 14: Diagnostic Procedure 1 (2 of 3)



NOTE: IF THE RESULT IS NO GOOD (NG) AFTER CHECKING CIRCUIT CONTINUITY, REPAIR HARNESS OR CONNECTOR.

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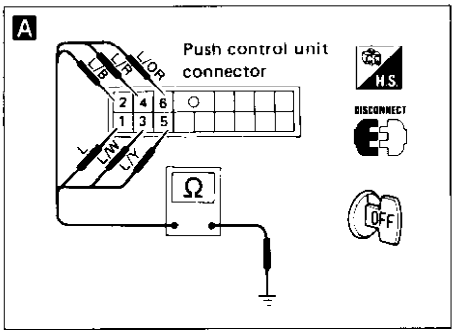
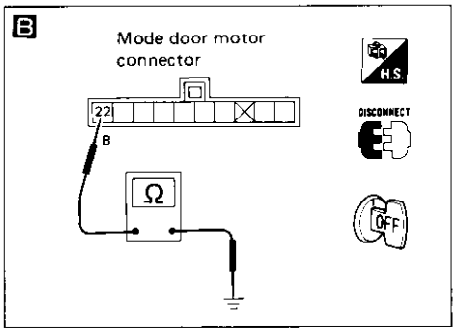
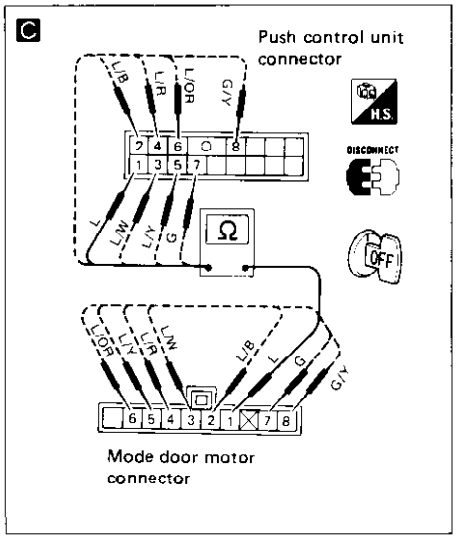
Fig. 15: Diagnostic Procedure 1 (3 of 3)







- **Perform PRELIMINARY CHECK 4 and Main Power Supply and Ground Circuit Check before referring to the following flow chart.**

A

CHECK MODE DOOR MOTOR POSITION SWITCH.

1. Turn VENT switch ON with ignition switch at ACC position.
2. Turn ignition switch OFF. Disconnect push control unit connector.
3. Check if continuity exists between terminal No. ① or ② of push control unit harness connector and body ground.
4. Using above procedures, check for continuity in any other mode, as indicated in chart.

Mode switch	Terminal No. ⊕	Terminal No. ⊖	Continuity
VENT	① or ②	Body ground	Yes
B/L	② or ③		
FOOT	③ or ④		
F/D	④ or ⑤		
DEF	⑤ or ⑥		

O.K. →

CHECK SIDE LINK.

N.G. →

Disconnect mode door motor harness connector.

B Note

CHECK BODY GROUND CIRCUIT FOR MODE DOOR MOTOR. Does continuity exist between mode door motor harness terminal No. ㉒ and body ground?

O.K.

C Note

Check circuit continuity between each terminal on push control unit and on mode door motor.

Terminal No. ⊕ Push control unit	Terminal No. ⊖ Mode door motor	Continuity
①	①	Yes
②	②	
③	③	
④	④	
⑤	⑤	
⑥	⑥	
⑦	⑦	
⑧	⑧	

Ⓐ

Go To Next Figure

NOTE: IF THE RESULT IS NO GOOD (NG) AFTER CHECKING CIRCUIT CONTINUITY, REPAIR HARNESS OR CONNECTOR.

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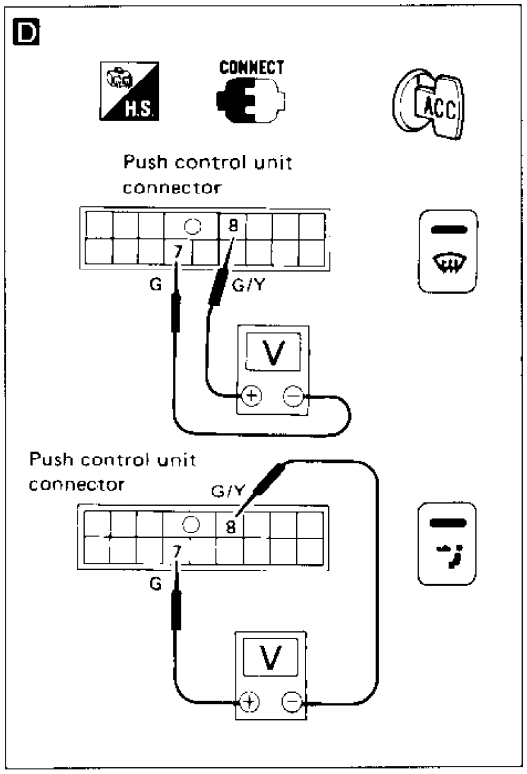
Fig. 16: Diagnostic Procedure 2 (1 of 2)



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Reconnect push control unit and mode door motor harness connectors.

D

CHECK FOR OUTPUT OF PUSH CONTROL UNIT.
Do approx. 12 volts exist between push control unit harness terminal No. ⑦ and ⑧ when mode is switched from "VENT" to "DEF" or when mode is switched from "DEF" to "VENT"?

N.G. → Replace control amp. built-in push control unit.

Terminal No.		Mode door motor	
⑦	⑧	Mode door operation	Direction of linkage rotation
⊖	⊖	Stop	Stop
⊖	⊕	VENT → DEF	Clockwise
⊕	⊖	DEF → VENT	Counterclockwise

O.K. → Replace mode door motor.

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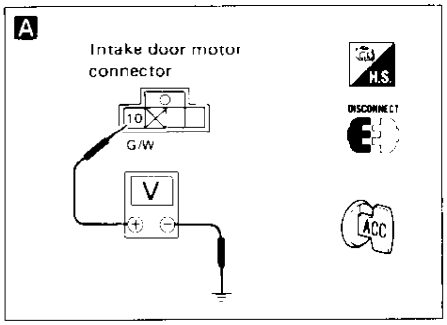
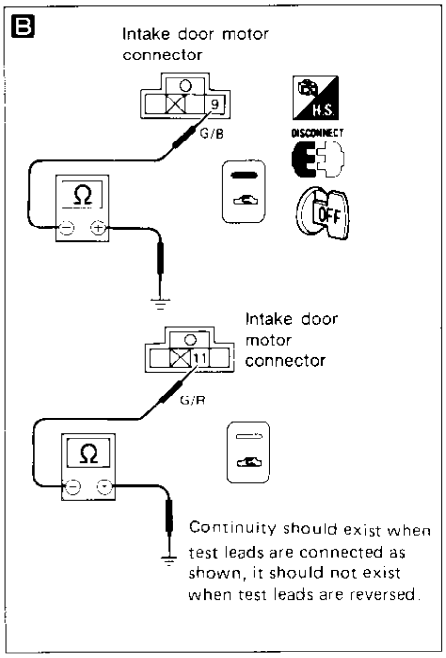
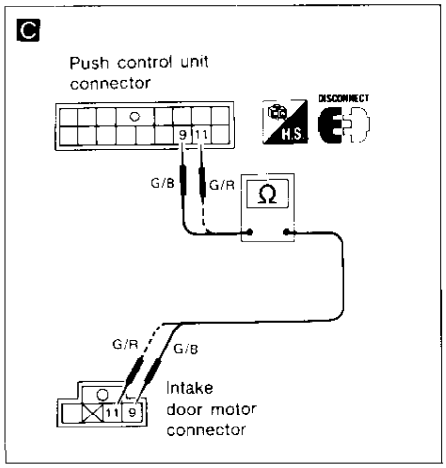
Fig. 17: Diagnostic Procedure 2 (2 of 2)







- **Perform PRELIMINARY CHECK 1 and Main Power Supply and Ground Circuit Check before referring to the following flow chart.**

A

CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR.
Disconnect intake door motor harness connector.
Do approx. 12 volts exist between intake door motor harness terminal No. ⑩ and body ground?

N.G. → Check 10A fuses at fuse block.

O.K. ↓

B

CHECK BODY GROUND CIRCUIT FOR INTAKE DOOR MOTOR.
Does continuity exist between intake door motor harness terminal No. ⑨ and body ground when REC switch is ON?
Does continuity exist between intake door motor harness terminal No. ⑪ and body ground when REC switch is OFF?

N.G. → Disconnect push control unit harness connector.

C

Note

Check circuit continuity between push control unit harness terminal No. ⑨ (⑪) and intake door motor harness terminal No. ⑨ (⑪)?

O.K. ↓

Replace control amp. built-in push control unit.

O.K. ↓

Replace intake door motor.

NOTE: IF THE RESULT IS NO GOOD (NG) AFTER CHECKING CIRCUIT CONTINUITY, REPAIR HARNESS OR CONNECTOR.

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Fig. 18: Diagnostic Procedure 3

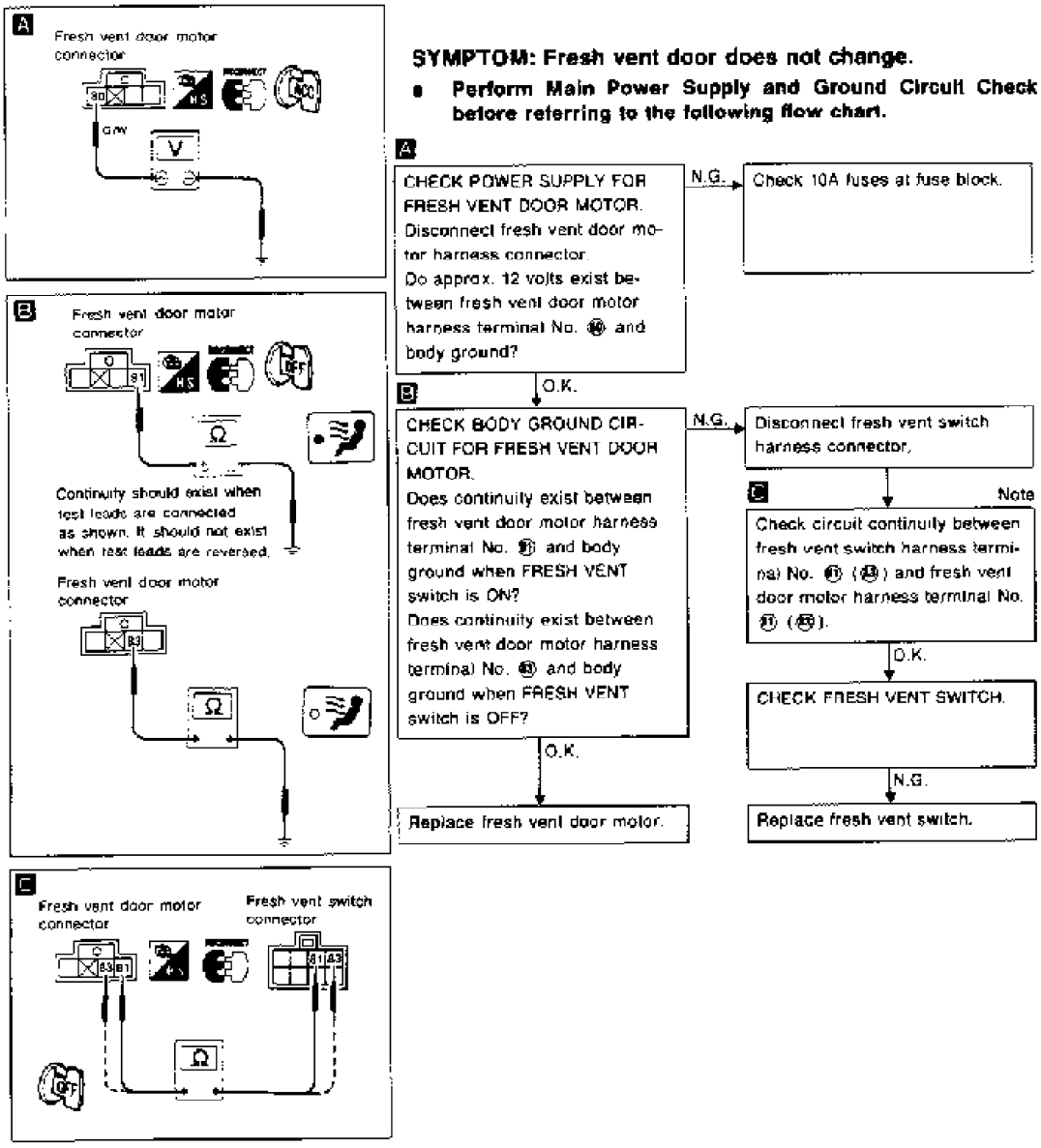


Fig. 19: Diagnostic Procedure 4

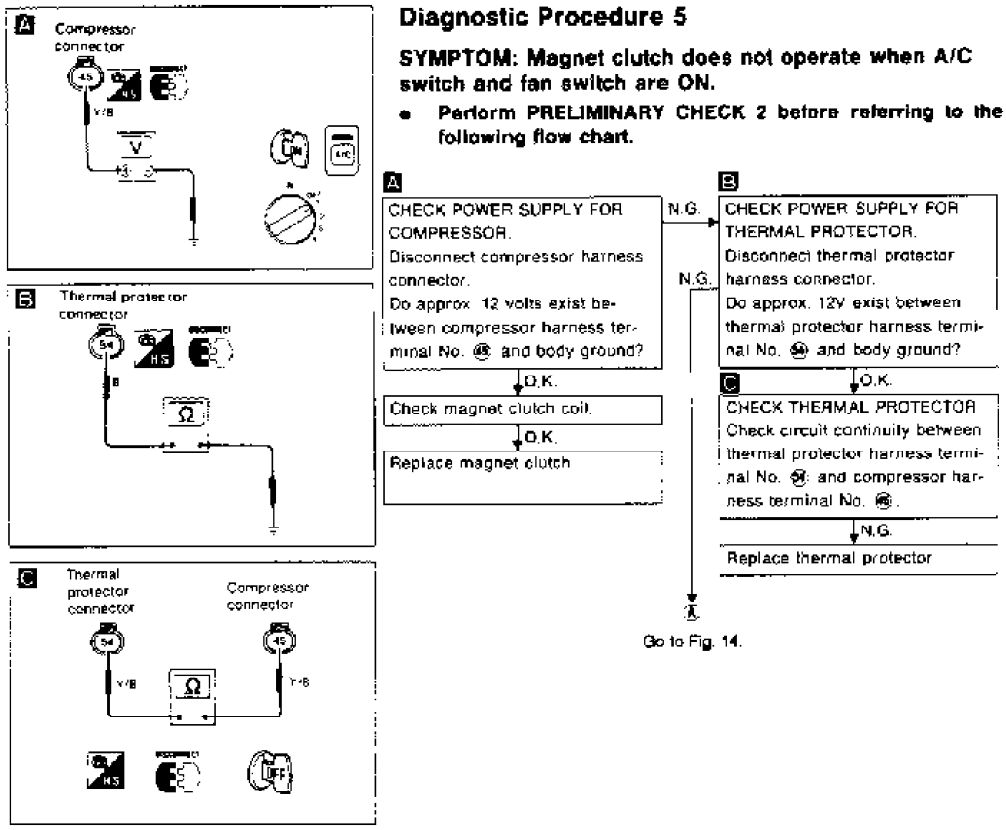


Fig. 20: Diagnostic Procedure 5 (1 of 5)

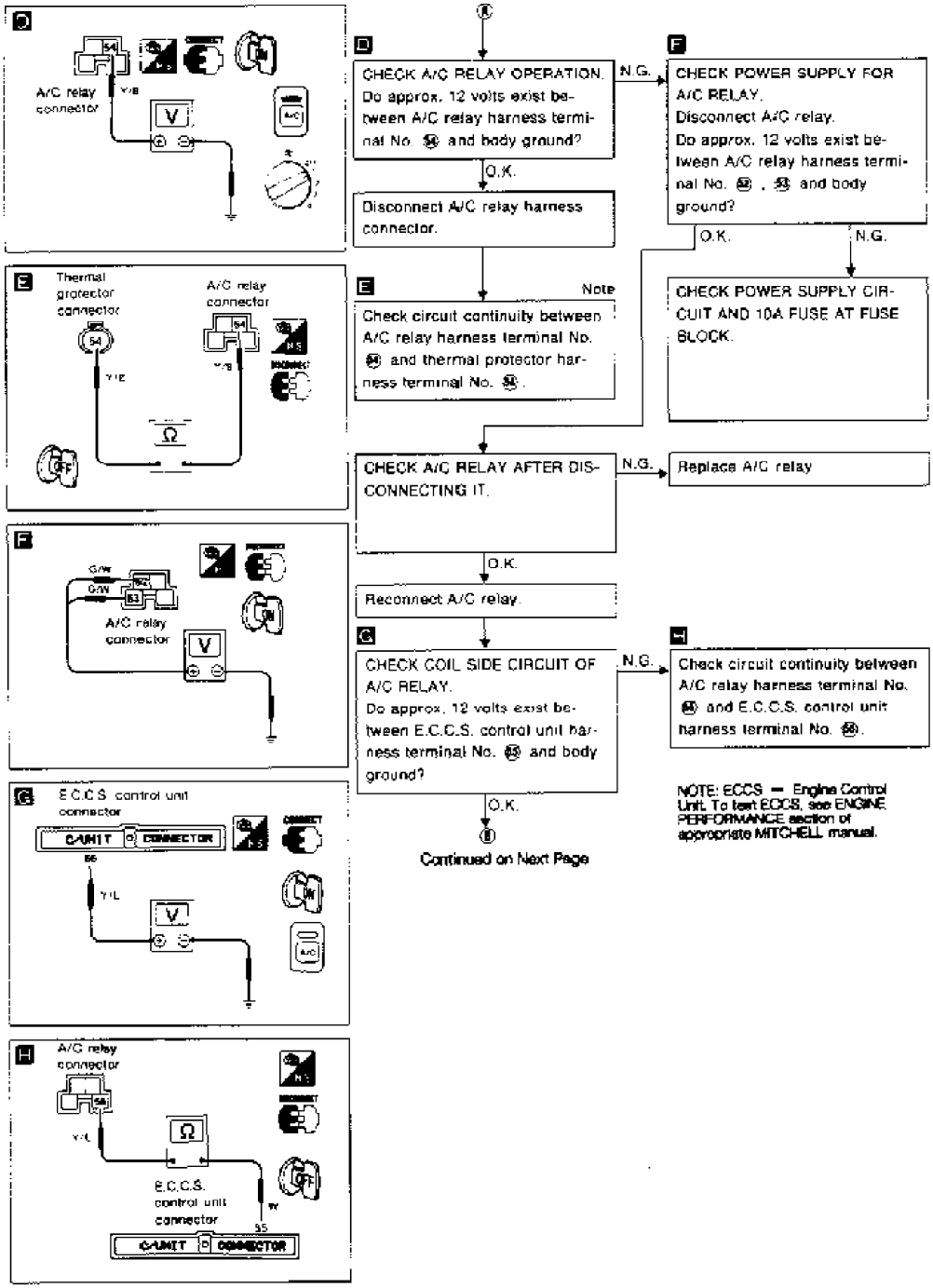


Fig. 21: Diagnostic Procedure 5 (2 of 5)

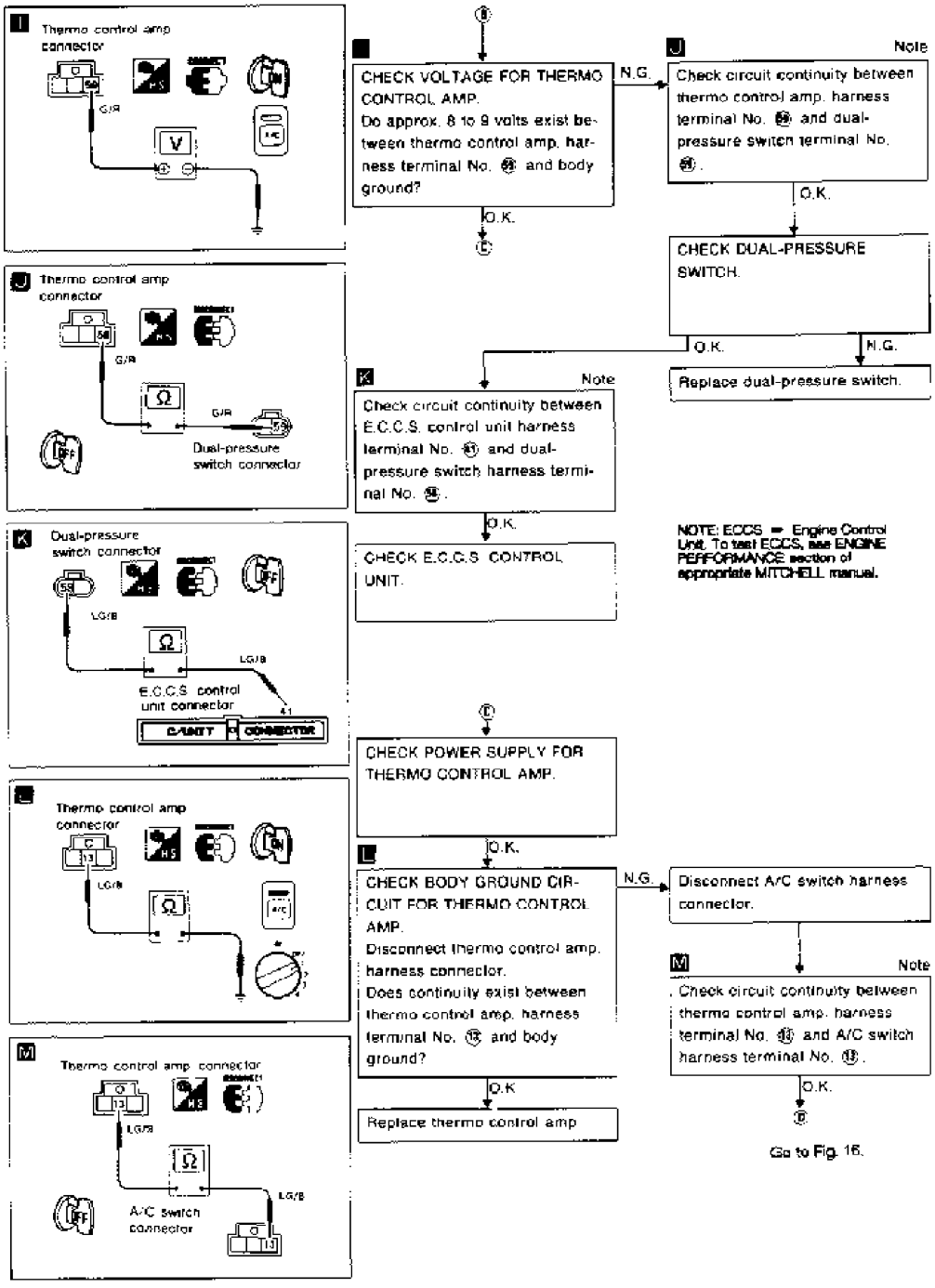


Fig. 22: Diagnostic Procedure 5 (3 of 5)

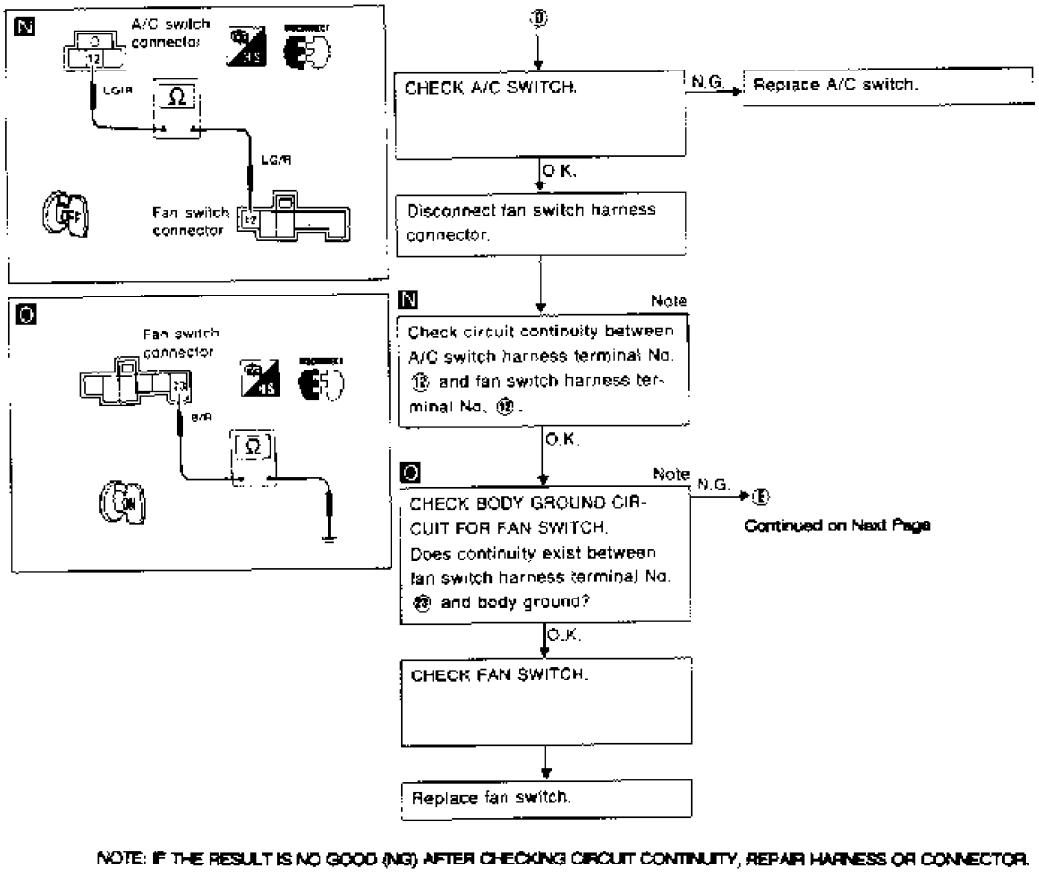


Fig. 23: Diagnostic Procedure 5 (4 of 5)

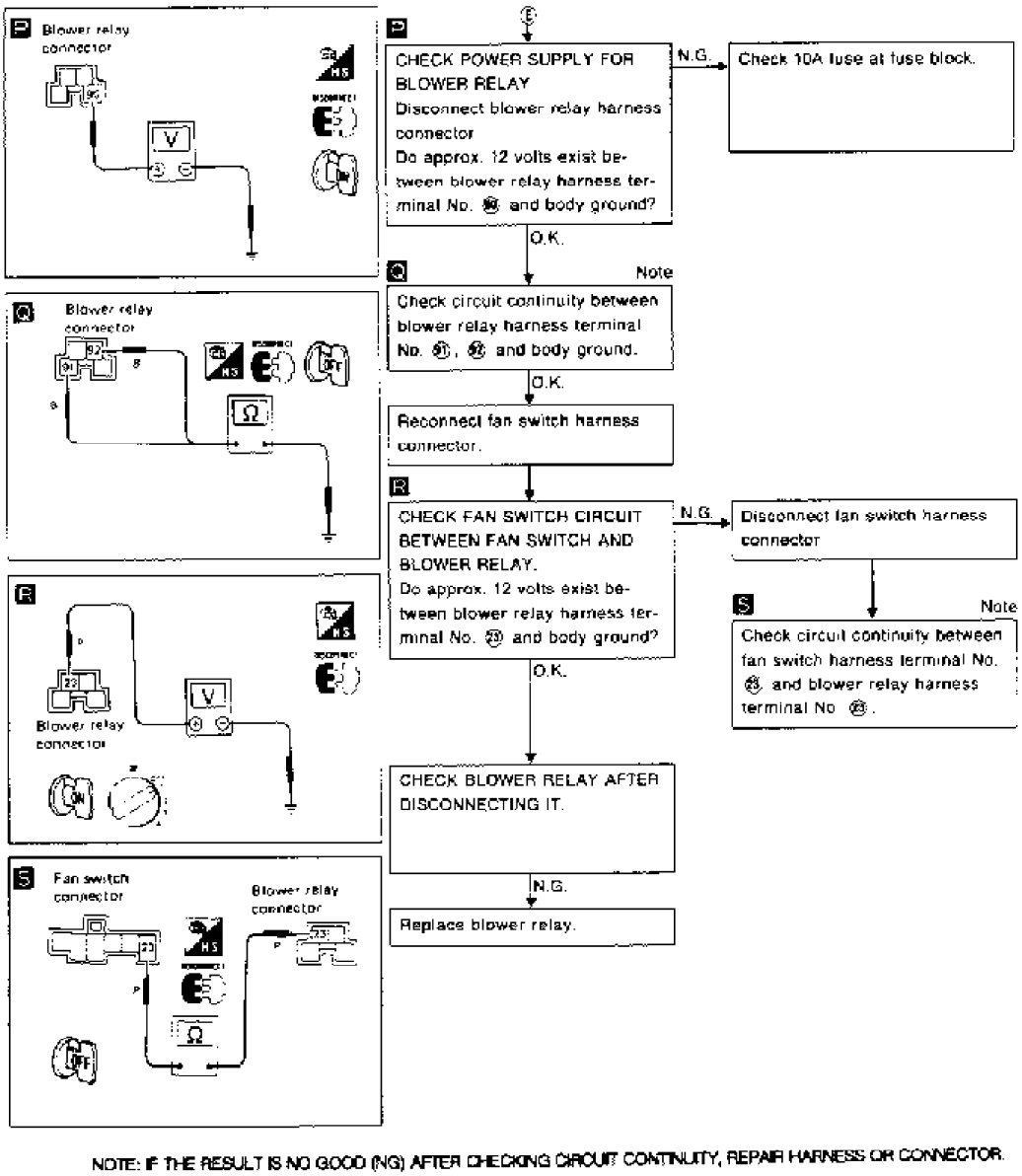


Fig. 24: Diagnostic Procedure 5 (5 of 5)

SYMPTOM: Illumination or indicators of push control unit do not come on.

- **Perform Main Power Supply and Ground Circuit Check before referring to the following flow chart.**

Turn ignition switch and lighting switch ON.

NOTE:
REC = Recirculation
F/D = Foot/Defrost
B/L = Bi-Level

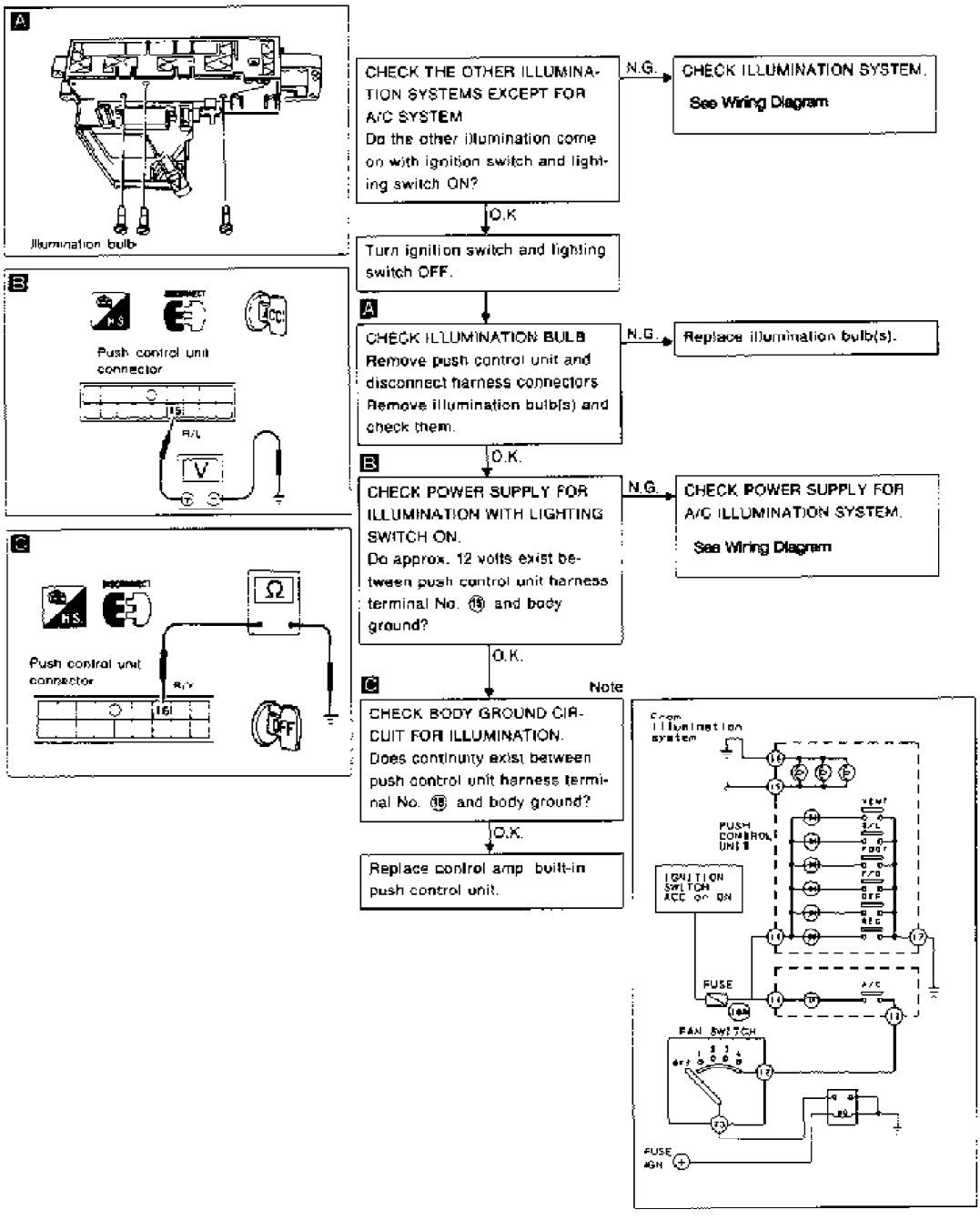
CHECK ILLUMINATION AND INDICATORS.

- Turn A/C, REC and fan switches ON.
- Push VENT, B/L, FOOT, F/D and DEF switches in order.
- Check for incidents and follow the repairing methods as shown:

INCIDENTS									"How to repair"
ILL.		VENT	B/L	FOOT	F/D	DEF	REC	A/C	
Push control unit	Fresh vent								
X	O	O	O	O	O	O	O		Go to DIAGNOSTIC PROCEDURE 6-1.
O	X	O	O	O	O	O	O		Go to DIAGNOSTIC PROCEDURE 6-2.
		O	O	O	O	O	O	X	Go to DIAGNOSTIC PROCEDURE 6-3.
O		X	X	X	X	X	X		Go to DIAGNOSTIC PROCEDURE 6-4.
		Δ							Replace control amp. built-in push control unit.
O		X	X	X	X	X	X	O	Replace control amp. built-in push control unit.
		X	X	X	X	X	X	O	Go to DIAGNOSTIC PROCEDURE 6-5.

O: Illumination or indicator comes on.
X: Illumination or indicator does not come on.
Δ: Some indicators for VENT, B/L, FOOT, F/D, DEF or REC come on.

Fig. 25: Diagnostic Procedure 6



NOTE: IF THE RESULT IS NO GOOD (NG) AFTER CHECKING CIRCUIT CONTINUITY, REPAIR HARNESS OR CONNECTOR.

Fig. 26: Diagnostic Procedure 6-1

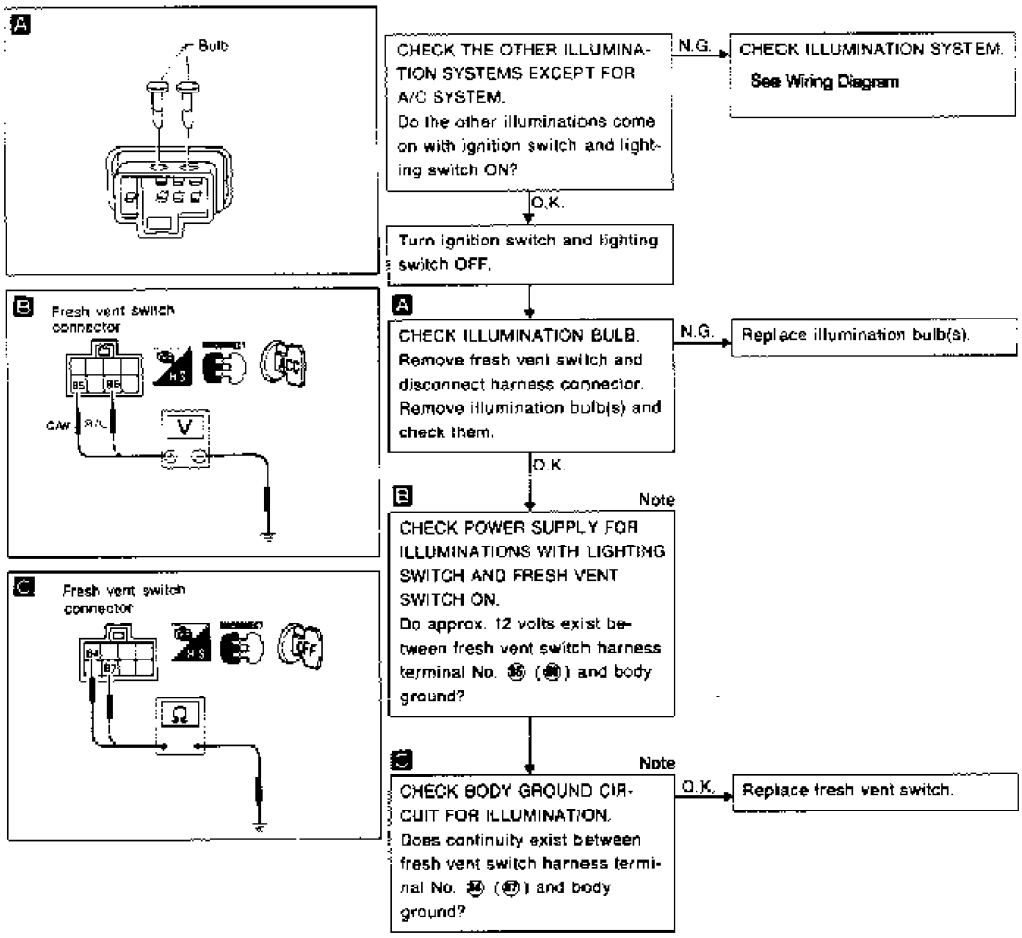
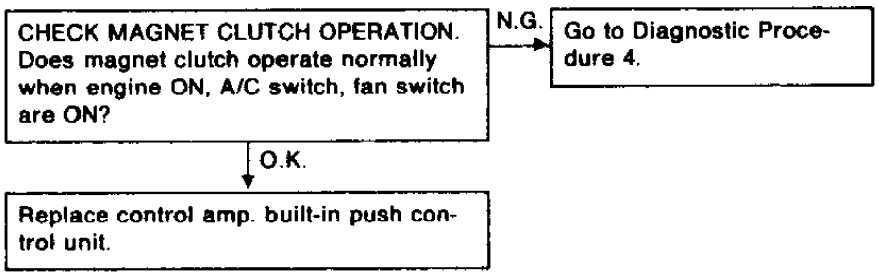


Fig. 27: Diagnostic Procedure 6-2



NOTE: IF THE RESULT IS NO GOOD (NG) AFTER CHECKING CIRCUIT CONTINUITY, REPAIR HARNESS OR CONNECTOR.

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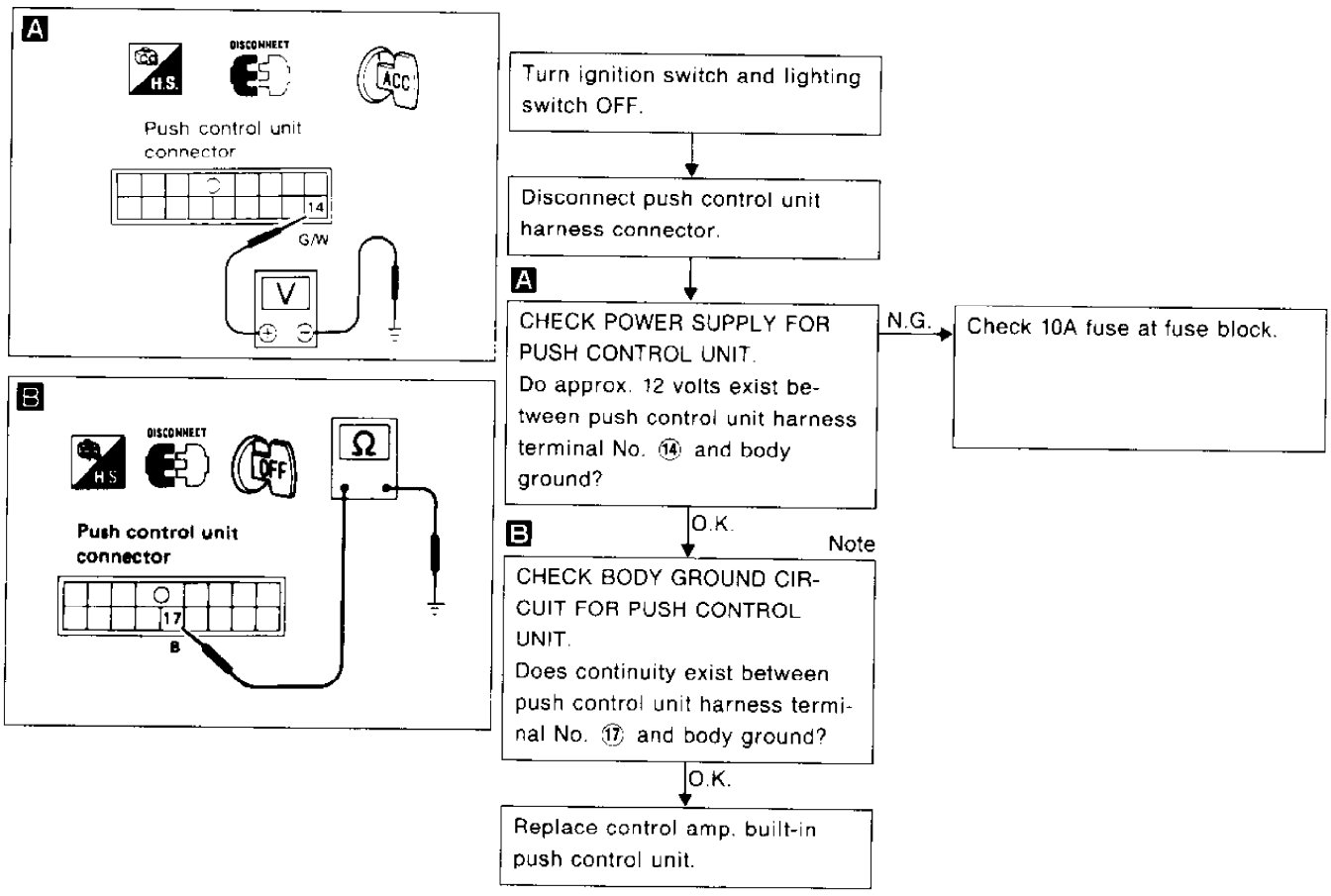
Fig. 28: Diagnostic Procedure 6-3



NOTE: IF THE RESULT IS NO GOOD (NG) AFTER CHECKING CIRCUIT CONTINUITY, REPAIR HARNESS OR CONNECTOR.

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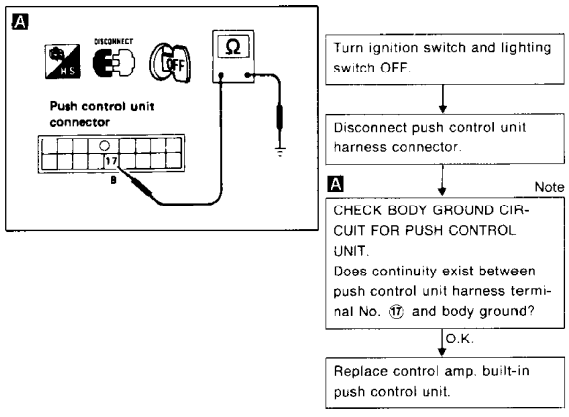
Fig. 29: Diagnostic Procedure 6-4



NOTE: IF THE RESULT IS NO GOOD (NG) AFTER CHECKING CIRCUIT CONTINUITY, REPAIR HARNESS OR CONNECTOR.

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Fig. 30: Diagnostic Procedure 6-5

TESTING

RELAYS

Remove appropriate relay from vehicle. See Fig. 3. Apply 12 volts to coil side of relay. See Fig. 31. Check for continuity between remaining terminals of relay. If no continuity exists, replace relay.

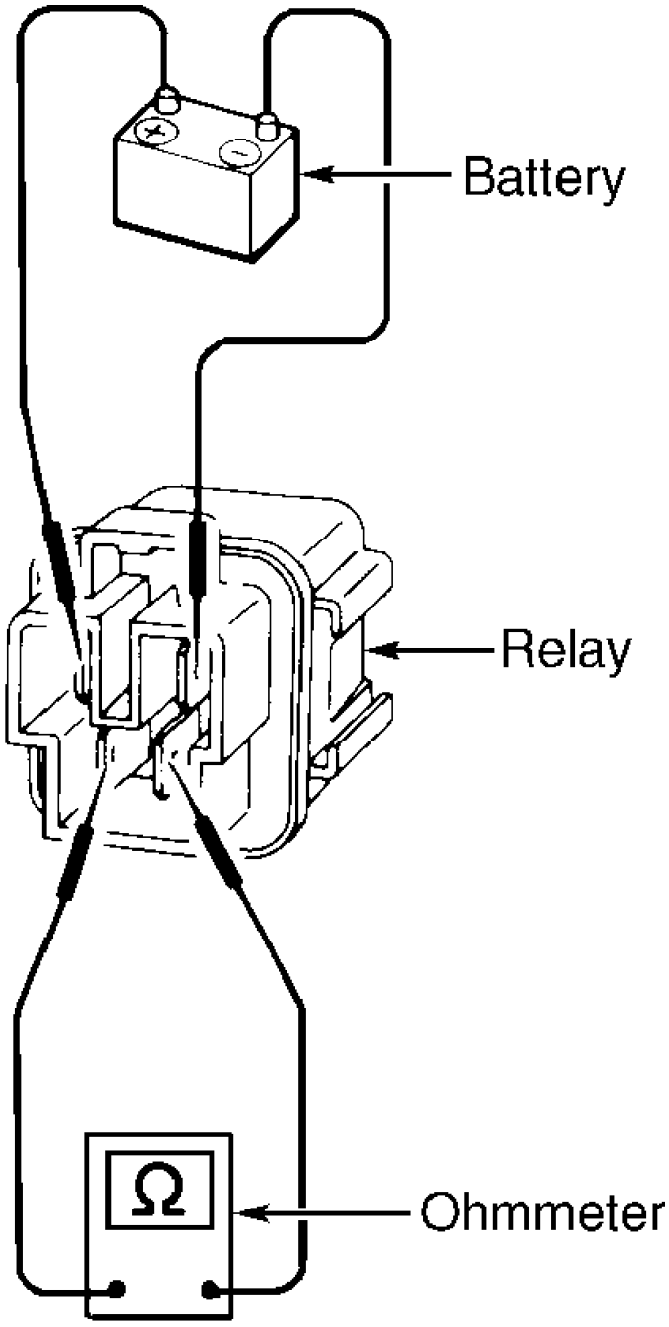
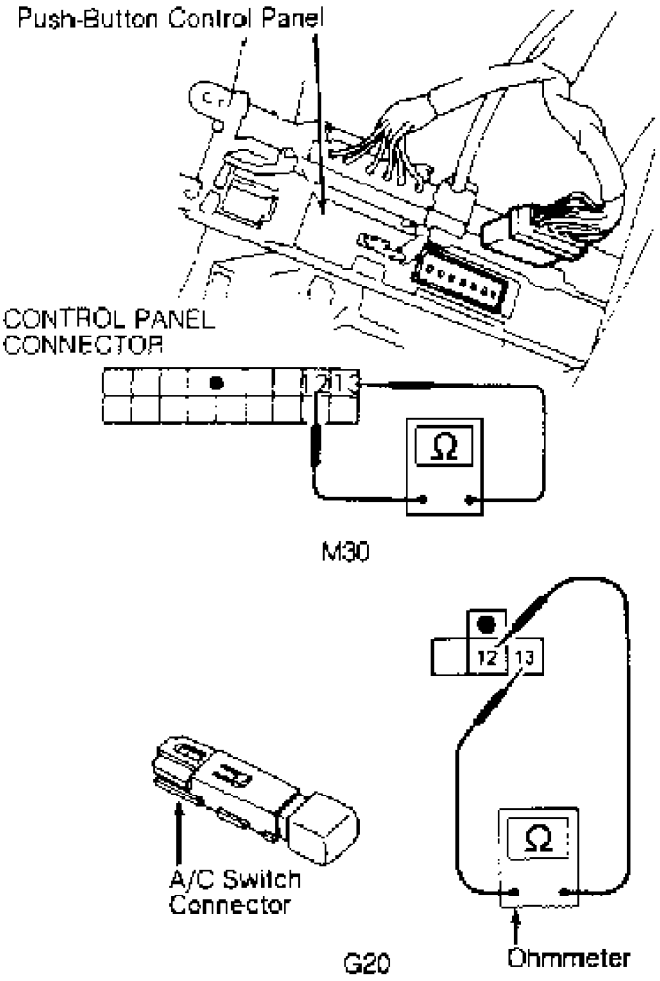


Fig. 31: Testing Typical 4-Terminal Relay
Courtesy of Nissan Motor Co., U.S.A.

A/C SWITCH

Disconnect A/C push button control panel. Using an ohmmeter, ensure continuity exists between terminals No. 12 and 13 with switch in position indicated. See Fig. 32.



Switch condition		Terminal No.		Continuity
A/C	DEF	⊕	⊖	
ON	ON	13	12	Yes
ON	OFF			
OFF	ON			

Fig. 32: Testing A/C Switch
Courtesy of Nissan Motor Co., U.S.A.

BLOWER MOTOR

Disconnect wiring harness at blower motor. Apply battery voltage to blower motor terminals. Ensure blower motor operation is smooth. If blower motor operation is rough or not up to speed, replace blower motor.

BLOWER MOTOR RESISTOR

Disconnect blower motor resistor connector. See Fig. 33. Using an ohmmeter, check for continuity between resistor terminals. If continuity does not exist, replace blower motor resistor.

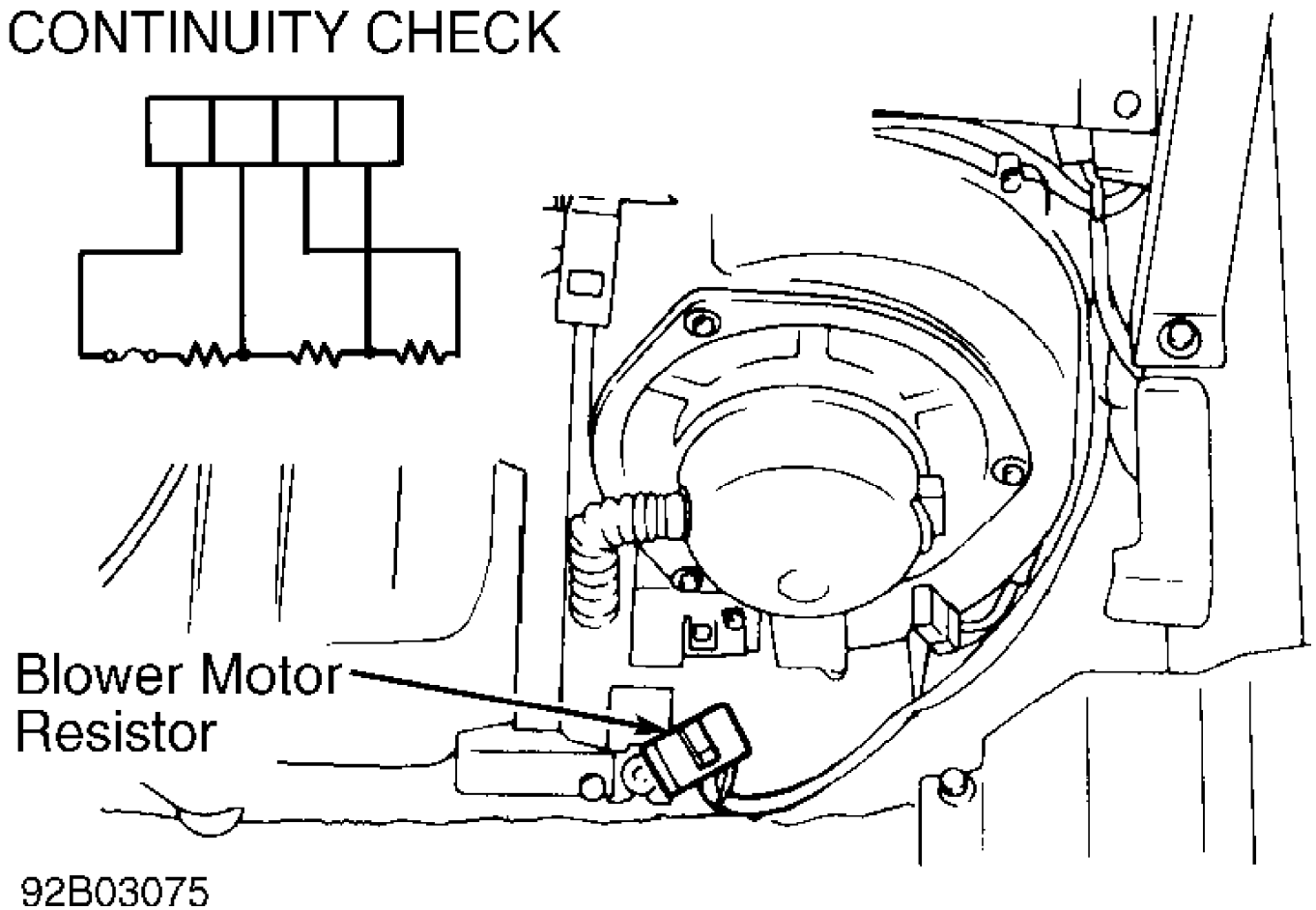


Fig. 33: Locating & Testing Blower Motor Resistor
Courtesy of Nissan Motor Co., U.S.A.

DUAL PRESSURE SWITCH

Remove dual pressure switch connector. See Fig. 3. Using an ohmmeter, check dual pressure switch operation as indicated in the DUAL PRESSURE SWITCH SPECIFICATIONS table. Replace switch if it does not perform as indicated.

DUAL PRESSURE SWITCH SPECIFICATIONS TABLE

High Side Pressure psi (kg/cm²)	System Operation	Continuity Exists
Decreasing To 26-31 (1.8-2.2)	Off	No
Increasing To 356-412 (25-29)	Off	No

Increasing To 26-34 (1.8-2.4)	.....	On	.....	Yes
Decreasing To 270-341 (19-24)	.....	On	.....	Yes

FAN SWITCH

Remove fan switch connector. See Fig. 34. To check fan switch operation, check for continuity between connector terminals. If continuity is not as indicated, replace fan switch.

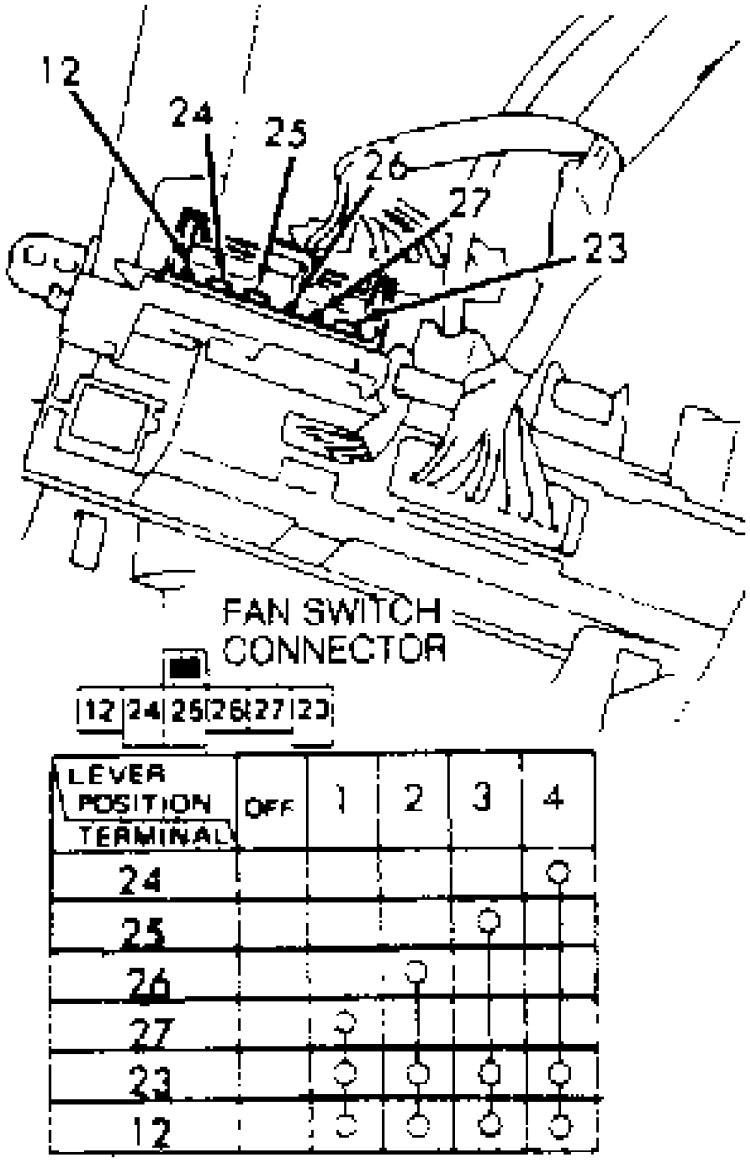


Fig. 34: Testing Fan Switch (Typical)
Courtesy of Nissan Motor Co., U.S.A.

THERMAL PROTECTOR

Remove thermal protector switch connector. See Fig. 35. Using an ohmmeter, check for switch continuity as indicated in THERMAL PROTECTOR SPECIFICATIONS table. Replace switch if it does not perform as indicated.

THERMAL PROTECTOR SPECIFICATIONS TABLE

Compressor Temperature	Continuity
Decreasing To 248-266°F (120-130°C)	Yes
Increasing To 275-293°F (135-145°C)	No

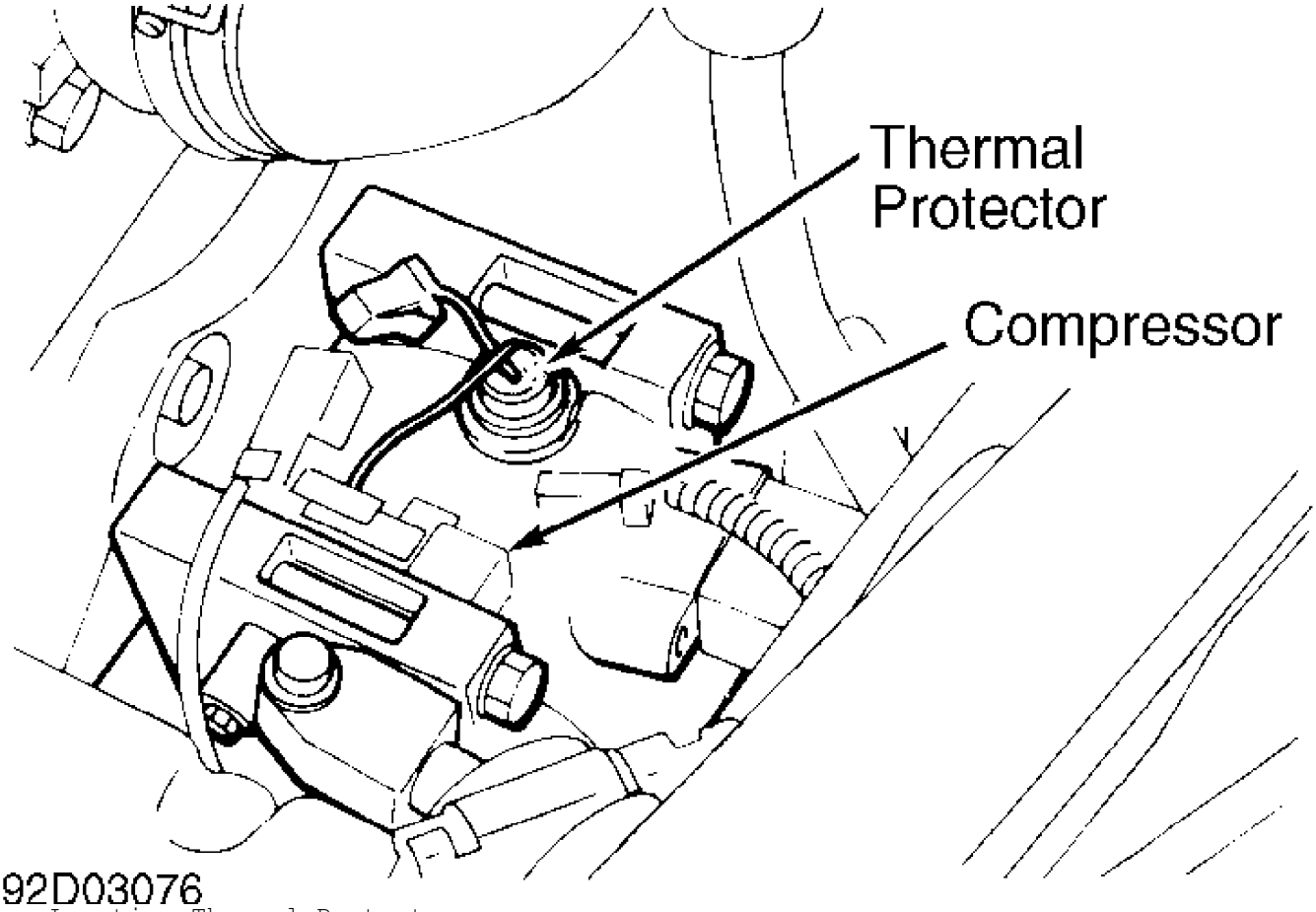


Fig. 35: Locating Thermal Protector
Courtesy of Nissan Motor Co., U.S.A.

THERMAL CONTROL AMPLIFIER

With engine running, operate A/C system. Using a DVOM, measure voltage between terminal No. 59 of thermo control amplifier connector and ground. See Fig. 36. Check thermal control amplifier operation as indicated in the THERMAL CONTROL AMPLIFIER SPECIFICATIONS table. Replace amplifier if it does not perform as indicated.

THERMO CONTROL AMPLIFIER SPECIFICATIONS TABLE

Evaporator Outlet Air Temperature	Thermo Amplifier Operation	Measured Voltage

Decreasing To 37-38°F (2.5-3.5°C)	.....	Off	 12
Increasing To 39-41°F (4-5°C)	.....	On	 0

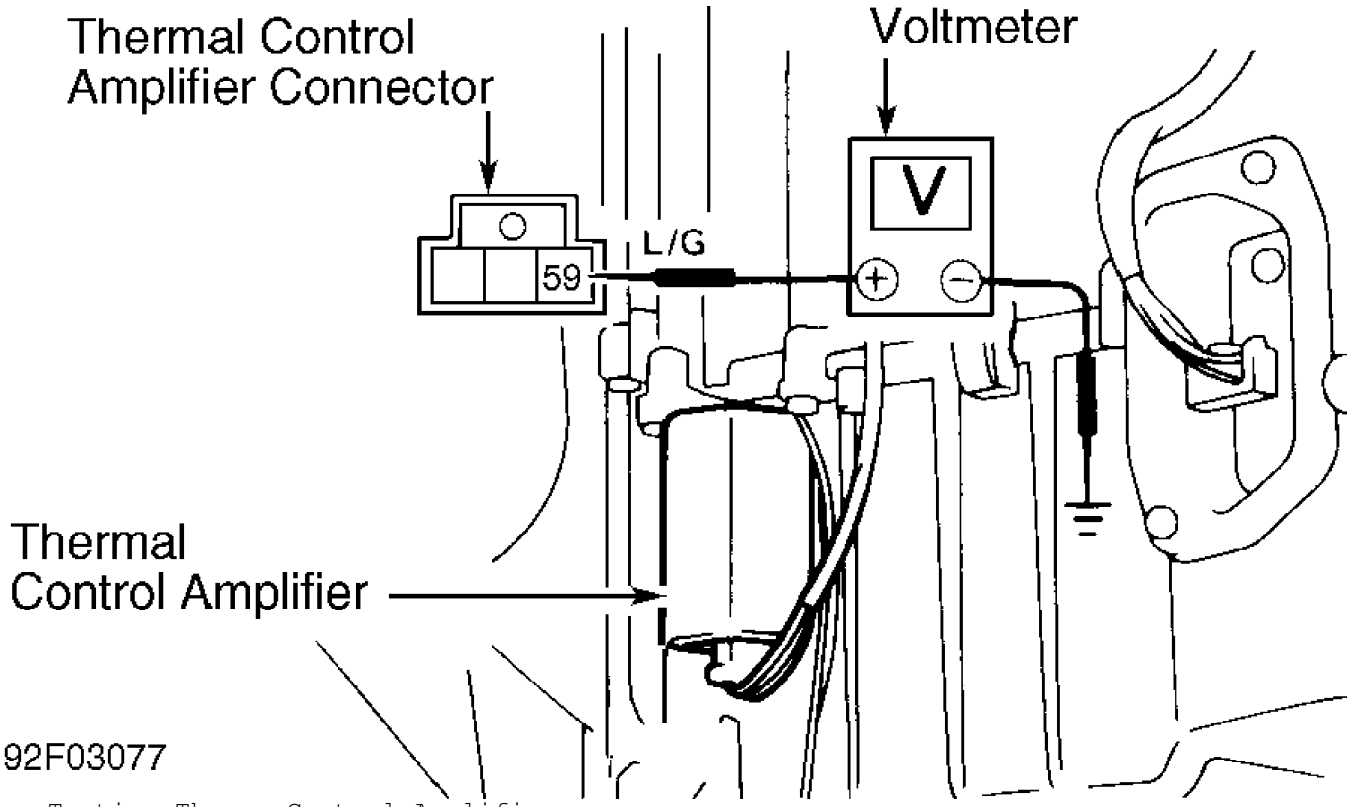


Fig. 36: Testing Thermo Control Amplifier
Courtesy of Nissan Motor Co., U.S.A.

REMOVAL & INSTALLATION

COMPRESSOR

Removal & Installation

1) If possible, operate compressor while engine idles for at least 10-15 minutes to stabilize system and allow oil to return to compressor. Shut off A/C system, and turn ignition off. Loosen idler pulley bolt, and remove compressor belt.

2) Discharge A/C system using approved refrigerant recovery/recycling equipment. Disconnect compressor clutch lead wire. Disconnect discharge and suction hoses from compressor and plug openings.

3) Remove compressor mounting bolts. Remove compressor with clutch facing up. To install, reverse removal procedure. Use new "O" rings when attaching hoses to compressor.

EVAPORATOR/HEATER ASSEMBLY

NOTE: Removal and installation information is not available from manufacturer. See Figs. 2 and 21.

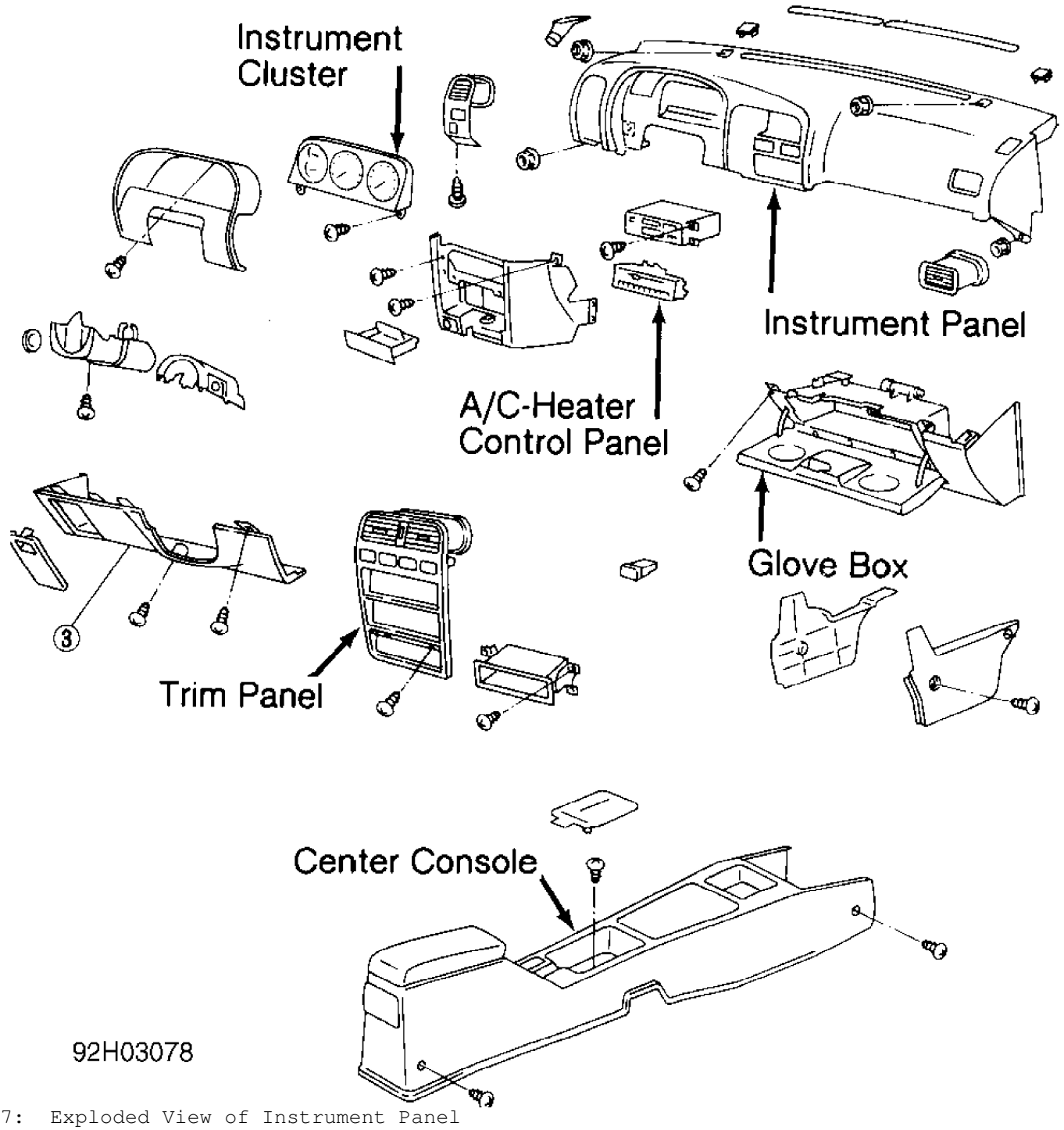


Fig. 37: Exploded View of Instrument Panel
Courtesy of Nissan Motor Co., U.S.A.

WIRING DIAGRAMS

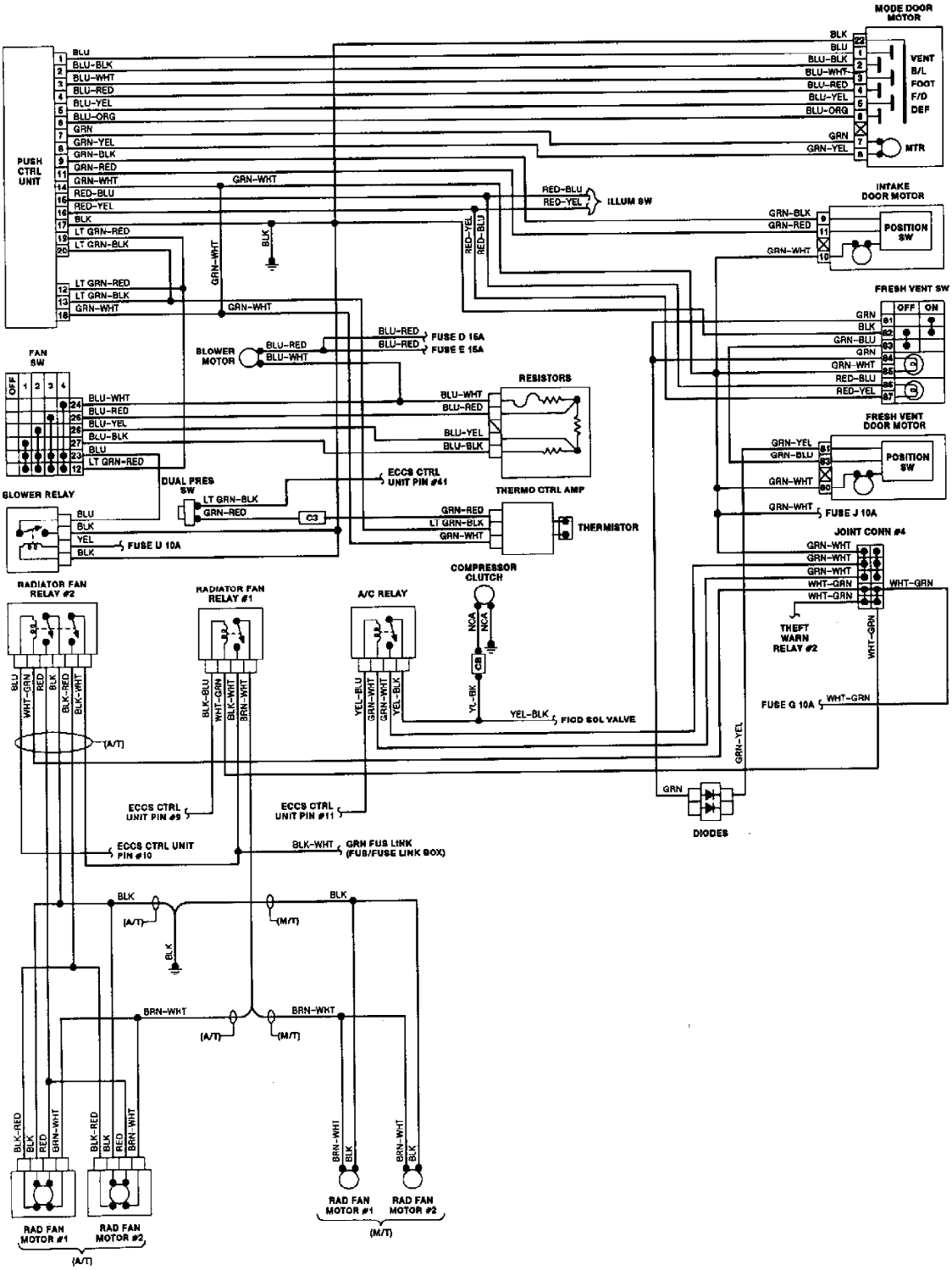


Fig. 38: Manual A/C-Heater System Wiring Diagram

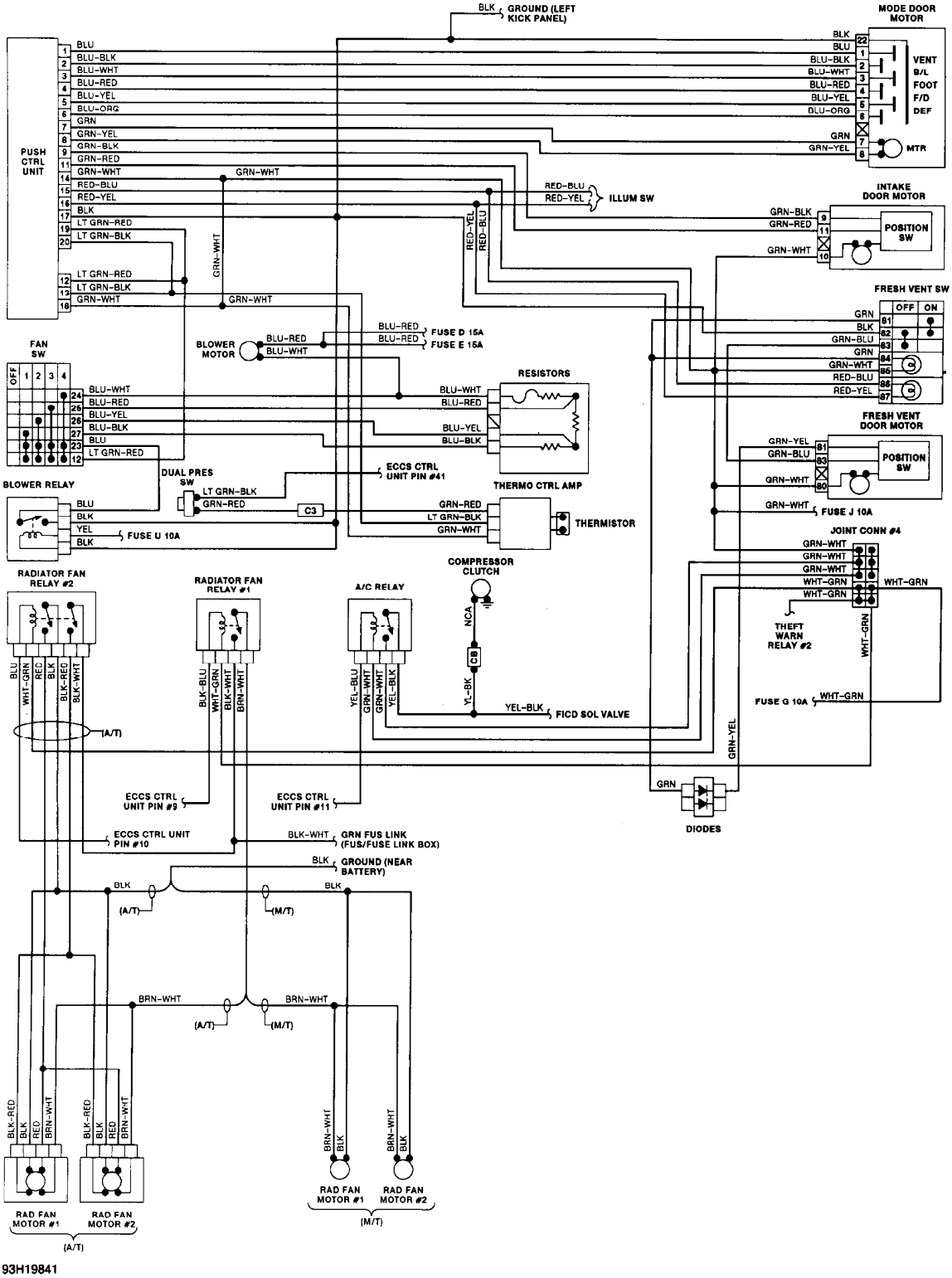


Fig. 39: Manual A/C-Heater System Wiring Diagram (1992)