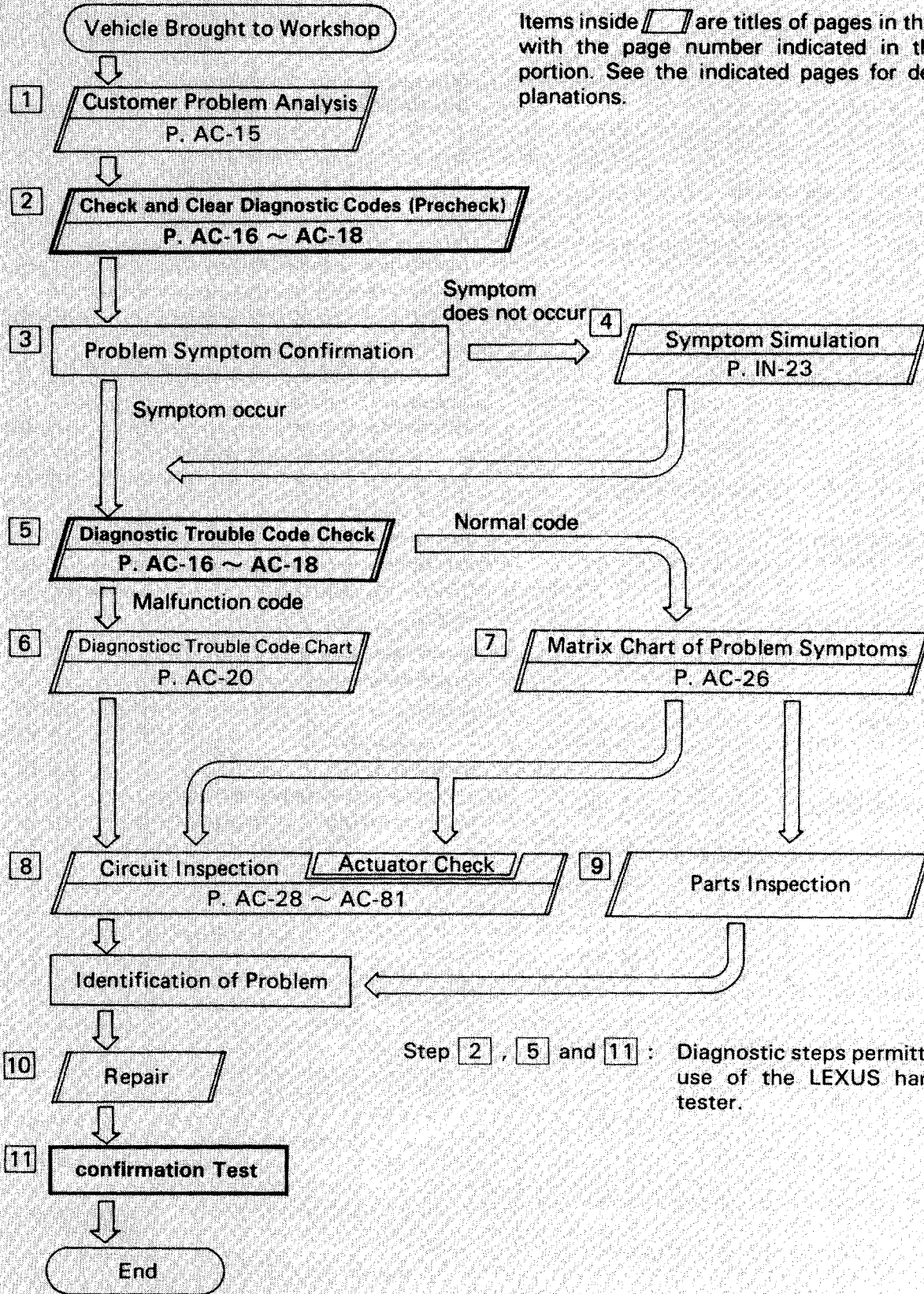


# TRUBLESHOOTING

# HOW TO PROCEED WITH TROUBLESHOOTING

Perform troubleshooting in accordance with the procedure on the following page.

Items inside **[ ]** are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.



Step **[ 2 ]** , **[ 5 ]** and **[ 11 ]** : Diagnostic steps permitting the use of the LEXUS hand-held tester.

# CUSTOMER PROBLEM ANALYSIS CHECK SHEET

## AIR CONDITIONING SYSTEM Check Sheet

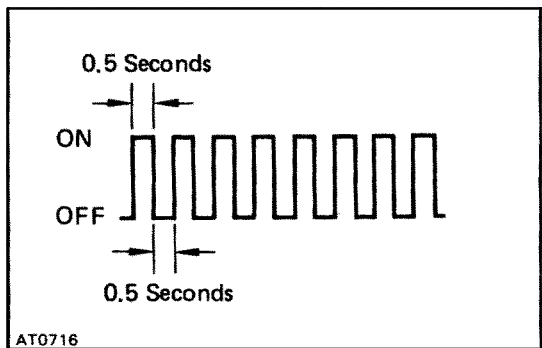
Inspector's Name:

Customer's Name		Registration No.	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	Odometer Reading	km Miles

Date of Problem Occurrence	/ /
How Often does Problem Occur?	<input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent (    times a day)
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Snowy <input type="checkbox"/> Various/Other
Outdoor Temperature	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold (Approx.    °F °C)

Symptoms	Air Flow Control is Faulty	<input type="checkbox"/> Blower motor does not operate <input type="checkbox"/> Blower motor speed does not change (Always Hi, Always Med, Always Lo)
	Temperature Control is Faulty	<input type="checkbox"/> Cabin temperature does not go down <input type="checkbox"/> Cabin temperature does not rise <input type="checkbox"/> Response is slow
	Air Inlet Control is Faulty	<input type="checkbox"/> Cannot change between FRS and REC (Always Fresh or always Recirculating)
	Vent Control is Faulty	<input type="checkbox"/> Mode will not change <input type="checkbox"/> Will not enter the desired mode

Diagnostic Trouble Code Check	1st Time	<input type="checkbox"/> Normal Code <input type="checkbox"/> Malfunction Code (Code    )
	2nd Time	<input type="checkbox"/> Normal Code <input type="checkbox"/> Malfunction Code (Code    )



## DIAGNOSIS SYSTEM

### Warning for A/C compressor lock

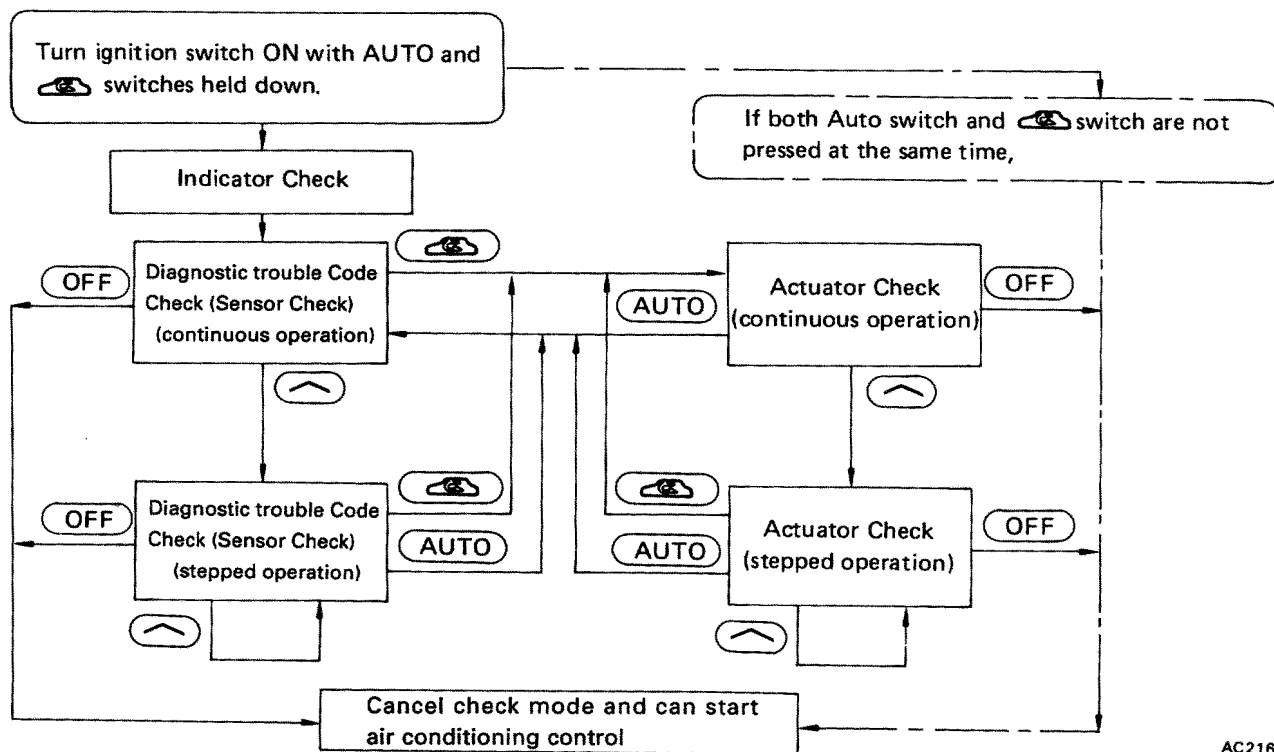
If compressor lock occurs during air conditioning operation, the A/C switch indicator on the air conditioning control assembly starts blinking.

When this occurs, check for compressor lock (trouble code 22) using diagnostic trouble code check then proceed to inspect the circuit or the component.

Compressor lock sensor circuit → page [AC-42](#)

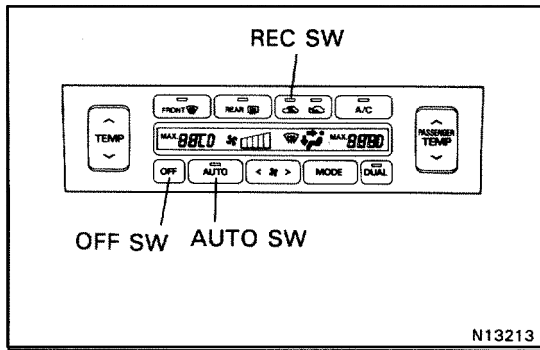
## LIST OF OPERATION METHODS

By operating each of the air conditioning control switches, as shown in the diagram below, it is possible to enter the diagnosis check mode.




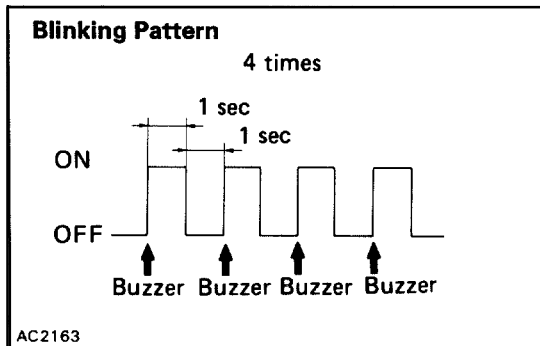
AC2162

○ : Indicates a switch operation.



## INDICATOR CHECK

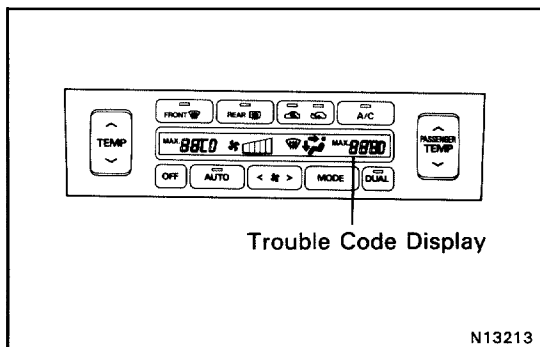
1. Turn the ignition switch on while pressing the air conditioning control AUTO switch and REC switch  simultaneously.



2. Check that all the indicators light up and go off at 1 second intervals 4 times in succession.
3. Check that the buzzer sounds when the indicators light up in 2.

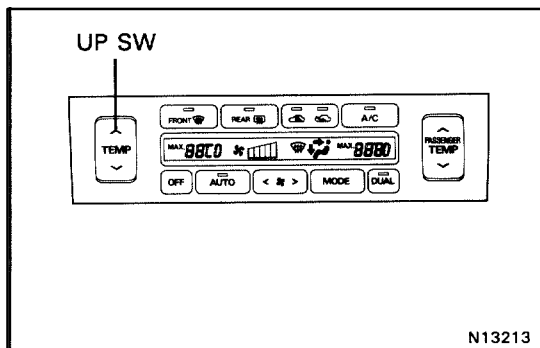
**HINT:**



- After the indicator check is ended, the diagnostic trouble code check begins automatically.
- Press the OFF switch when cancelling the check mode.



## DIAGNOSTIC TROUBLE CODE CHECK (SENSOR CHECK)

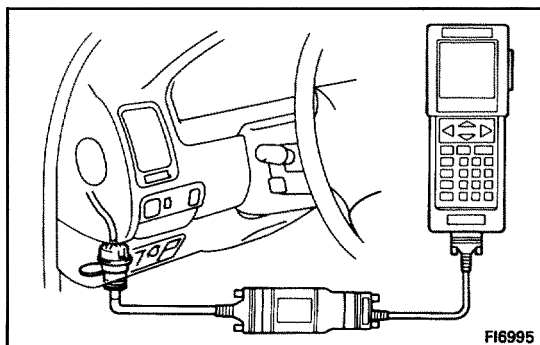
1. Perform an indicator check. After the indicator check is completed, the system enters the diagnostic trouble code check mode automatically.
2. Read the code displayed on the panel. Refer to the list of codes on page AC-20 when reading the trouble codes. (Trouble codes are output at the temperature display.)



If the slower display is desired, press the UP  switch and change it to step operation. Each time the UP  switch is pressed, the display changes by 1 step.

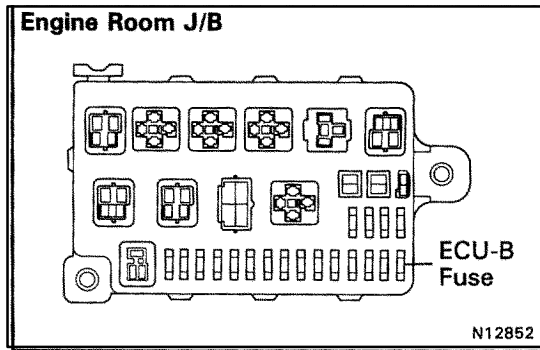
**HINT:**

- If the buzzer sounds when a trouble code is being read, it means the trouble indicated by that trouble code continues to occur.
- If the buzzer does not sound when a trouble code is being read, it means the trouble indicated by that trouble code occurred earlier (such as poor connector contacts, etc.).



## DIAGNOSTIC TROUBLE CODE CHECK USING LEXUS HAND-HOLD TESTER

1. Hook up the LEXUS hand-held tester to the DLC2.
2. Read the diagnostic trouble codes by following the prompts on the tester screen. Please refer to the LEXUS hand-held tester operator's manual for further details.



## CLEARING DIAGNOSTIC TROUBLE CODES

1. Pull out the ECU-B fuse in Engine Room J/B for 10 sec. or longer to clear the diagnostic trouble codes memory.
2. After reinserting the fuse, check that the normal code is output.

– MEMO –

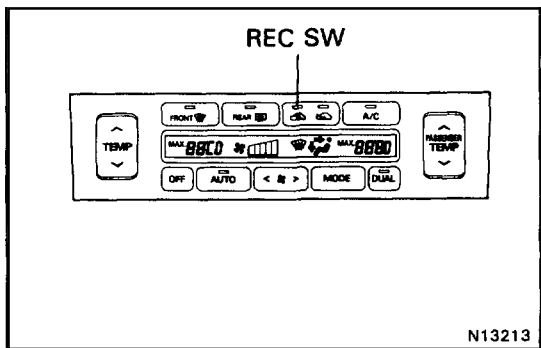
## DIAGNOSTIC TROUBLE CODE CHART

If malfunction code is displayed during the diagnostic trouble code check (sensor check), check the circuit listed for that code in the table below (Proceed to the page given for that circuit.)


DTC No.	Diagnostic Trouble Code Detecting Condition						
00	<ul style="list-style-type: none"> <li>Normal</li> </ul>						
11	<ul style="list-style-type: none"> <li>Open or short in room temperature sensor circuit.</li> </ul>						
12	<ul style="list-style-type: none"> <li>Open or short in ambient temperature sensor circuit.</li> </ul>						
13	<ul style="list-style-type: none"> <li>Open or short in evaporator temperature sensor circuit.</li> </ul>						
14	<ul style="list-style-type: none"> <li>Open or short in engine coolant temperature sensor circuit.</li> </ul>						
15	<ul style="list-style-type: none"> <li>Open or short in duct sensor circuit. (Driver Side)</li> </ul>						
16	<ul style="list-style-type: none"> <li>Open or short in duct sensor circuit. (Passenger Side)</li> </ul>						
21	<ul style="list-style-type: none"> <li>Open in solar sensor circuit. (Passenger Side)</li> </ul>						
	<ul style="list-style-type: none"> <li>Short in solar sensor circuit. (Passenger Side)</li> </ul>						
22	<ul style="list-style-type: none"> <li>All conditions below are detected for 3 secs. or more.               <ul style="list-style-type: none"> <li>(a) Engine speed: 450 rpm or more.</li> <li>(b) Ratio between engine and compressor speed deviates 20% or more in comparison to normal operation.</li> </ul> </li> </ul>						
23	<ul style="list-style-type: none"> <li>Open in pressure sensor circuit.</li> <li>Abnormal refrigerant pressure               <table style="display: inline-table; vertical-align: middle;"> <tr> <td style="font-size: 2em; vertical-align: middle;">{</td> <td style="padding: 0 5px;">below 196 kPa (2.0 kgf/cm<sup>2</sup>, 28 psi)</td> <td style="font-size: 2em; vertical-align: middle;">}</td> </tr> <tr> <td></td> <td style="padding: 0 5px;">over 3,140 kPa (32.0 kgf/cm<sup>2</sup>, 455 psi)</td> <td></td> </tr> </table> </li> </ul>	{	below 196 kPa (2.0 kgf/cm <sup>2</sup> , 28 psi)	}		over 3,140 kPa (32.0 kgf/cm <sup>2</sup> , 455 psi)	
{	below 196 kPa (2.0 kgf/cm <sup>2</sup> , 28 psi)	}					
	over 3,140 kPa (32.0 kgf/cm <sup>2</sup> , 455 psi)						
24	<ul style="list-style-type: none"> <li>Open in solar sensor circuit. (Driver Side)</li> </ul>						
	<ul style="list-style-type: none"> <li>Short in solar sensor circuit. (Driver Side)</li> </ul>						
32	<ul style="list-style-type: none"> <li>Short to ground or power source circuit in Air Inlet Damper position sensor circuit.</li> </ul>						
34	<ul style="list-style-type: none"> <li>Short to ground or power source circuit in Max cool Damper position sensor circuit. (Driver Side)</li> </ul>						
35	<ul style="list-style-type: none"> <li>Short to ground or power source circuit in Max cool Damper position sensor circuit. (Passenger Side)</li> </ul>						
42	<ul style="list-style-type: none"> <li>Air inlet damper position sensor value does not change even if A/C control assembly operates air inlet damper control servomotor.</li> </ul>						

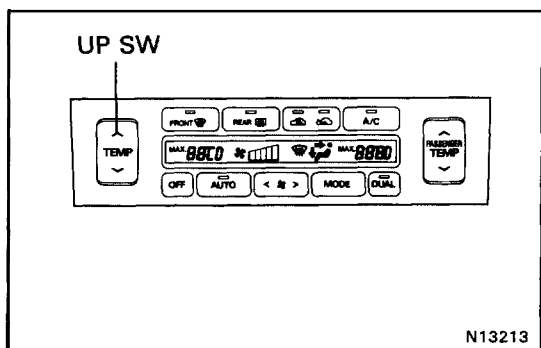




Trouble Area	Memory	See page
—	—	
<ul style="list-style-type: none"> <li>• Room temp. Sensor</li> <li>• Harness or connector between room temp. sensor and A/C control assembly</li> <li>• A/C control assembly</li> </ul>	<p style="text-align: center;">○ (8.5 min. or more)</p>	<a href="#">AC-28</a>
<ul style="list-style-type: none"> <li>• Ambient temp. sensor</li> <li>• Harness or connector between ambient temp. sensor and A/C control assembly</li> <li>• A/C control assembly</li> </ul>	<p style="text-align: center;">○ (8.5 min. or more)</p>	<a href="#">AC-30</a>
<ul style="list-style-type: none"> <li>• Evaporator temp. sensor</li> <li>• Harness or connector between evaporator temp. sensor and A/C control assembly</li> <li>• A/C control assembly</li> </ul>	<p style="text-align: center;">○ (8.5 min. or more)</p>	<a href="#">AC-32</a>
<ul style="list-style-type: none"> <li>• ECM</li> <li>• Harness or connector between engine ECU and A/C control assembly</li> <li>• A/C control assembly</li> </ul>	<p style="text-align: center;">○ (27 sec.)</p>	<a href="#">AC-34</a>
<ul style="list-style-type: none"> <li>• Duct sensor (Driver Side)</li> <li>• Harness or connector between duct sensor and A/C control assembly</li> <li>• A/C control assembly</li> </ul>	<p style="text-align: center;">○ (8.5 min. or more)</p>	<a href="#">AC-36</a>
<ul style="list-style-type: none"> <li>• Duct sensor (Passenger Side)</li> <li>• Harness or connector between duct sensor and A/C control assembly</li> <li>• A/C control assembly</li> </ul>	<p style="text-align: center;">○ (8.5 min. or more)</p>	<a href="#">AC-38</a>
<ul style="list-style-type: none"> <li>• Solar sensor (Passenger Side)</li> <li>• Harness or connector between sensor and A/C control assembly</li> <li>• A/C control assembly</li> </ul>	<p style="text-align: center;">○ (8.5 min. or more)</p>	<a href="#">AC-40</a>
<ul style="list-style-type: none"> <li>• Compressor drive belt</li> <li>• Compressor lock sensor</li> <li>• Compressor</li> <li>• Harness and connector between A/C control assembly and compressor, compressor lock sensor</li> <li>• A/C control assembly</li> </ul>	—	<a href="#">AC-42</a>
<ul style="list-style-type: none"> <li>• Pressure switch</li> <li>• Harness or connector between pressure switch and A/C control assembly</li> <li>• Refrigerant pipe line</li> <li>• A/C control assembly</li> </ul>	—	<a href="#">AC-44</a>
<ul style="list-style-type: none"> <li>• Solar sensor (Driver Side)</li> <li>• Harness or connector between sensor and A/C control assembly</li> <li>• A/C control assembly</li> </ul>	<p style="text-align: center;">○ (8.5 min. or more)</p>	<a href="#">AC-46</a>
<ul style="list-style-type: none"> <li>• Air inlet damper position sensor</li> <li>• A/C control assembly</li> <li>• Harness or connector between air inlet damper position sensor and A/C control assembly</li> </ul>	<p style="text-align: center;">○ (1 min. or more)</p>	<a href="#">AC-48</a>
<ul style="list-style-type: none"> <li>• Max cool damper position sensor (Driver Side)</li> <li>• A/C control assembly</li> <li>• Harness or connector between max cool damper position sensor and A/C control assembly</li> </ul>	<p style="text-align: center;">○ (1 min. or more)</p>	<a href="#">AC-50</a>
<ul style="list-style-type: none"> <li>• Max. cool damper position sensor (Passenger Side)</li> <li>• A/C control assembly</li> <li>• Harness or connector between max cool damper position sensor and A/C control assembly</li> </ul>	—	<a href="#">AC-52</a>
<ul style="list-style-type: none"> <li>• Air inlet damper control servomotor</li> <li>• Air inlet damper position sensor</li> <li>• Harness and connector between A/C control assembly and air inlet position sensor</li> <li>• Harness and connector between A/C control assembly and air inlet damper control servomotor</li> </ul>	<p style="text-align: center;">○ (15 secs. or more)</p>	<a href="#">AC-54</a>



## ACTUATOR CHECK










1. After entering the sensor check mode, press the REC  switch
2. Since each damper, motor and relay automatically operates at 1 second intervals beginning in order from 20 in the temperature display, check the temperature and air flow visually and by hand.



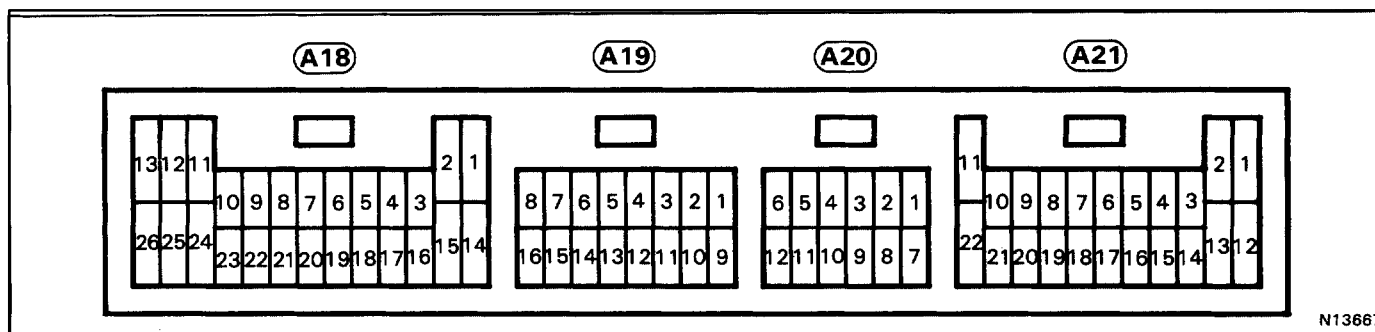
If the slower display is desired, press the UP  switch and change it to step operation. Each time the UP switch  is pressed, the display changes by 1 step.

### HINT:

- The buzzer sounds when the display trouble code changes.
- Code are displayed in order from the smaller to the larger numbers.
- To cancel the check mode, press the Off switch.

Step no.	Display code	Conditions							
		Blower motor	Air flow vent	Max cool damper	Air inlet damper	Magnetic clutch	Air mix damper	Water valve	Rear A/C
1	20	OFF	 (FACE)	0% open	 (FRESH)	OFF	Cool side (0% open)	SHUT	OFF
2	21	1	↑	↑	↑	↑	↑	↑	LO A/P
3	22	14	↑	↑	 (F/R)	ON	↑	↑	HI A/P
4	23	↑	↑	100% open	 (RECIRC)	↑	↑	OPEN	HI A/C
5	24	↑	 (BI-LEVEL)	↑	 (FRESH)	↑	Cool/Hot (50% open)	↑	↑
6	25	↑	↑	↑	↑	↑	↑	↑	LO A/C
7	26	↑	 (FOOT)	↑	↑	↑	↑	↑	OFF
8	27	↑	↑	↑	↑	↑	Hot side (100% open)	↑	↑
9	28	↑	 (FOOT/DEF)	↑	↑	↑	↑	↑	↑
10	29	31	 (DEF)	↑	↑	↑	↑	↑	↑

## A/C CONTROL ASSEMBLY TERMINAL STANDARD VALUE



Terminal	Symbols	Wiring Color	Condition	Standard Value
A18-1 ↔ A21-11	PSW ↔ GND	L-B ↔ W-B	IG ON	Below 1 V
A18-2 ↔ A21-11	RDFGR ↔ GND	R-B ↔ W-B	IG ON	Below 1 V
			Rear defogger switch OFF	10 ~ 14 V
A18-10 ↔ A21-11	WVO ↔ GND	R-G ↔ W-B	Change display code 22 to display code 23 While moving the W/V servomotor	Below 1 V
A18-11 ↔ A21-11	AIF ↔ GND	BR-R ↔ W-B	Display code 20	10 ~ 14 V
A18-12 ↔ A21-11	ABODr ↔ GND	B-W ↔ W-B	Change display code 29 to display code 20 While moving the A/B servomotor	10 ~ 14 V
A18-13 ↔ A21-11	ABOPa ↔ GND	LG ↔ W-B	Change display code 29 to display code 20 While moving the A/B servomotor	10 ~ 14 V
A18-14 ↔ A21-11	MGC ↔ GND	B-R ↔ W-B	Display code 22	Below 1 V
A18-15 ↔ A21-11	DOUT ↔ GND	GR-G ↔ W-B	DIN ≤ 1 V	PULSE
A18-16 ↔ A21-11	DIN ↔ GND	P-G ↔ W-B	IG ON	Below 1 V
			Connect Tc and E1 of DLC1, DLC2 Other than above condition	10 ~ 14 V
A18-17 ↔ A21-11	RLW ↔ GND	LG-R ↔ W-B	Display code 21	PULSE
A18-18 ↔ A21-11	HR ↔ GND	L-Y ↔ W-B	Display code 21	Below 1 V
A18-23 ↔ A21-11	WVS ↔ GND	G-W ↔ W-B	Change display code 29 to display code 20 While moving the W/V servomotor	Below 1 V
A18-24 ↔ A21-11	AIR ↔ GND	P-B ↔ W-B	Display code 23	10 ~ 14 V
A18-25 ↔ A21-11	ABSDr ↔ GND	L-R ↔ W-B	Change display code 22 to display code 23 While moving the A/B servomotor	10 ~ 14 V
A18-26 ↔ A21-11	ABSPa ↔ GND	V-Y ↔ W-B	Change display code 22 to display code 23 While moving the A/B servomotor	10 ~ 14 V
A19-1 ↔ A19-16	S5 ↔ SG	W-R ↔ Y-G	IG ON	4.5 ~ 5.5 V
A19-2 ↔ A19-16	TR ↔ SG	L ↔ Y-G	IG ON	1.8 ~ 2.2 V
			Cabin temp: 40°C (104°F)	1.2 ~ 1.6 V
A19-3 ↔ A19-16	TAM ↔ SG	L-W ↔ Y-G	IG ON	1.35 ~ 1.75 V
			Cabin temp: 40°C (104°F)	0.85 ~ 1.25 V
A19-4 ↔ A19-16	TE ↔ SG	Y-R ↔ Y-G	IG ON	2.0 ~ 2.4 V
			Evaporator ambient temp: 15°C (59°F)	1.4 ~ 1.8 V
A19-6 ↔ A19-16	TSDr ↔ SG	W ↔ Y-G	IG ON	0.8 ~ 4.3 V
			Solar sensor covered by a cloth	Below 0.8 V
A19-7 ↔ A19-16	TSPa ↔ SG	GR ↔ Y-G	IG ON	0.8 ~ 4.3 V
			Solar sensor covered by a cloth	Below 0.8 V
A19-8 ↔ A19-16	TPI ↔ SG	R-W ↔ Y-G	Display code 20	0.5 ~ 1.8 V
			Display code 23	3.5 ~ 4.5 V

Terminals	Symbols	Wiring Color	Condition		Standard Value
A19-9 ↔ A19-16	TFACEDr ↔ SG	GR-R ↔ Y-G	IG ON	Duct sensor temp: 25°C (77°F)	1.95 ~ 2.05 V
				Duct sensor temp: 50°C (122°F)	0.95 ~ 1.15 V
A19-10 ↔ A19-16	TFACEPa ↔ SG	GR-L ↔ Y-G	IG ON	Duct sensor temp: 25°C (77°F)	1.95 ~ 2.05 V
				Duct sensor temp: 50°C (122°F)	0.95 ~ 1.15 V
A19-11 ↔ A19-16	TPBDr ↔ SG	V-G ↔ Y-G	Change display code 29 to display code 20		3.5 ~ 4.5 V
			Change display code 22 to display code 23		0.5 ~ 1.8 V
A19-12 ↔ A19-16	TPBPpa ↔ SG	R-B ↔ Y-G	Change display code 29 to display code 20		3.5 ~ 4.5 V
			Change display code 22 to display code 23		0.5 ~ 1.8 V
A19-16 ↔ Body Ground	SG ↔ Body Ground	Y-G ↔ Body Ground	Always		Below 1 Ω
A20-1 ↔ A21-11	IGN ↔ GND	B-Y ↔ W-B	Start the engine		PULSE
A20-2 ↔ A21-11	REOST ↔ GND	W-G ↔ W-B	IG ON and turn head light control SW to TAIL position Turn Rheostat volume from most right to left position		Below 1 V ↓ 10 ~ 14 V
A20-3 ↔ A21-11	TELIN ↔ GND	O ↔ W-B	Hand free Telephone ON		Below 1.5 V
A20-4 ↔ A21-11	SPD ↔ GND	V-W ↔ W-B	The vehicle move		PULSE
A20-5 ↔ A21-11	AMOUT ↔ GND	L ↔ W-B	IG ON		PULSE
A20-6 ↔ A21-11	TW ↔ GND	V ↔ W-B	IG ON		PULSE
A20-7 ↔ A21-11	ILL+ ↔ GND	G ↔ W-B	Turn the light control switch to TAIL position		10 ~ 14 V
A20-8 ↔ A21-11	TC ↔ GND	B-R ↔ W-B	IG ON and turn head light control switch to TAIL position	Turn rheostat to most right	Below 1 V
				Turn rheostat to most left	10 ~ 14 V
A20-9 ↔ A21-11	A/C IN ↔ GND	B-W ↔ W-B	Operate the compressor		10 ~ 14 V
			Not operate the compressor		Below 1 V
A20-11 ↔ A19-16	LOCK ↔ SG	W-G ↔ Y-G	A/C switch ON		PULSE
A21-1 ↔ A21-11	+B ↔ GND	W-R ↔ W-B	Always		10 ~ 14 V
A21-2 ↔ A21-11	IG ↔ GND	R-L ↔ W-B	Turn ignition switch ON		10 ~ 14 V
A21-3 ↔ A21-11	AMDr1 ↔ GND	V-R ↔ W-B	Change display code 29 to display code 20 While moving the A/M step motor		PULSE
A21-4 ↔ A21-11	AMDr2 ↔ GND	O ↔ W-B	Change display code 29 to display code 20 While moving the A/M step motor		PULSE
A21-5 ↔ A21-11	AMDr3 ↔ GND	P-L ↔ W-B	Change display code 29 to display code 20 While moving the A/M step motor		PULSE
A21-6 ↔ A21-11	AMDr4 ↔ GND	Y-B ↔ W-B	Change display code 29 to display code 20 While moving the A/M step motor		PULSE

Terminals	Symbols	Wiring Color	Condition	Standard Value
A21-7 ↔ A21-11	AMPa1 ↔ GND	GR-G ↔ W-B	Change display code 29 to display code 20 While moving the A/M step motor	PULSE
A21-8 ↔ A21-11	AMPa2 ↔ GND	LG-B ↔ W-B	Change display code 29 to display code 20 While moving the A/M step motor	PULSE
A21-9 ↔ A21-11	AMPa3 ↔ GND	BR-W ↔ W-B	Change display code 29 to display code 20 While moving the A/M step motor	PULSE
A21-10 ↔ A21-11	AMPa4 ↔ GND	G-Y ↔ W-B	Change display code 29 to display code 20 While moving the A/M step motor	PULSE
A21-11 ↔ Body Ground	GND ↔ Body Ground	W-B ↔ Body Ground	Always	Below 1 Ω
A21-12 ↔ A21-11	ACC ↔ GND	P-L ↔ W-B	Turn ignition switch ACC	10 ~ 14 V
A21-13 ↔ A21-11	ST ↔ GND	B ↔ W-B	Start the engine	6 ~ 14 V
A21-14 ↔ A21-11	AODr1 ↔ GND	Y ↔ W-B	Change display code 29 to display code 20	PULSE
A21-15 ↔ A21-11	AODr2 ↔ GND	B-Y ↔ W-B	Change display code 29 to display code 20	PULSE
A21-16 ↔ A21-11	AODr3 ↔ GND	R-B ↔ W-B	Change display code 29 to display code 20	PULSE
A21-17 ↔ A21-11	AODr4 ↔ GND	P-G ↔ W-B	Change display code 29 to display code 20	PULSE
A21-18 ↔ A21-11	AOPa1 ↔ GND	G-O ↔ W-B	Change display code 29 to display code 20	PULSE
A21-19 ↔ A21-11	AOPa2 ↔ GND	L-B ↔ W-B	Change display code 29 to display code 20	PULSE
A21-20 ↔ A21-11	AOPa3 ↔ GND	G-R ↔ W-B	Change display code 29 to display code 20	PULSE
A21-21 ↔ A21-11	AOPa4 ↔ GND	P ↔ W-B	Change display code 29 to display code 20	PULSE





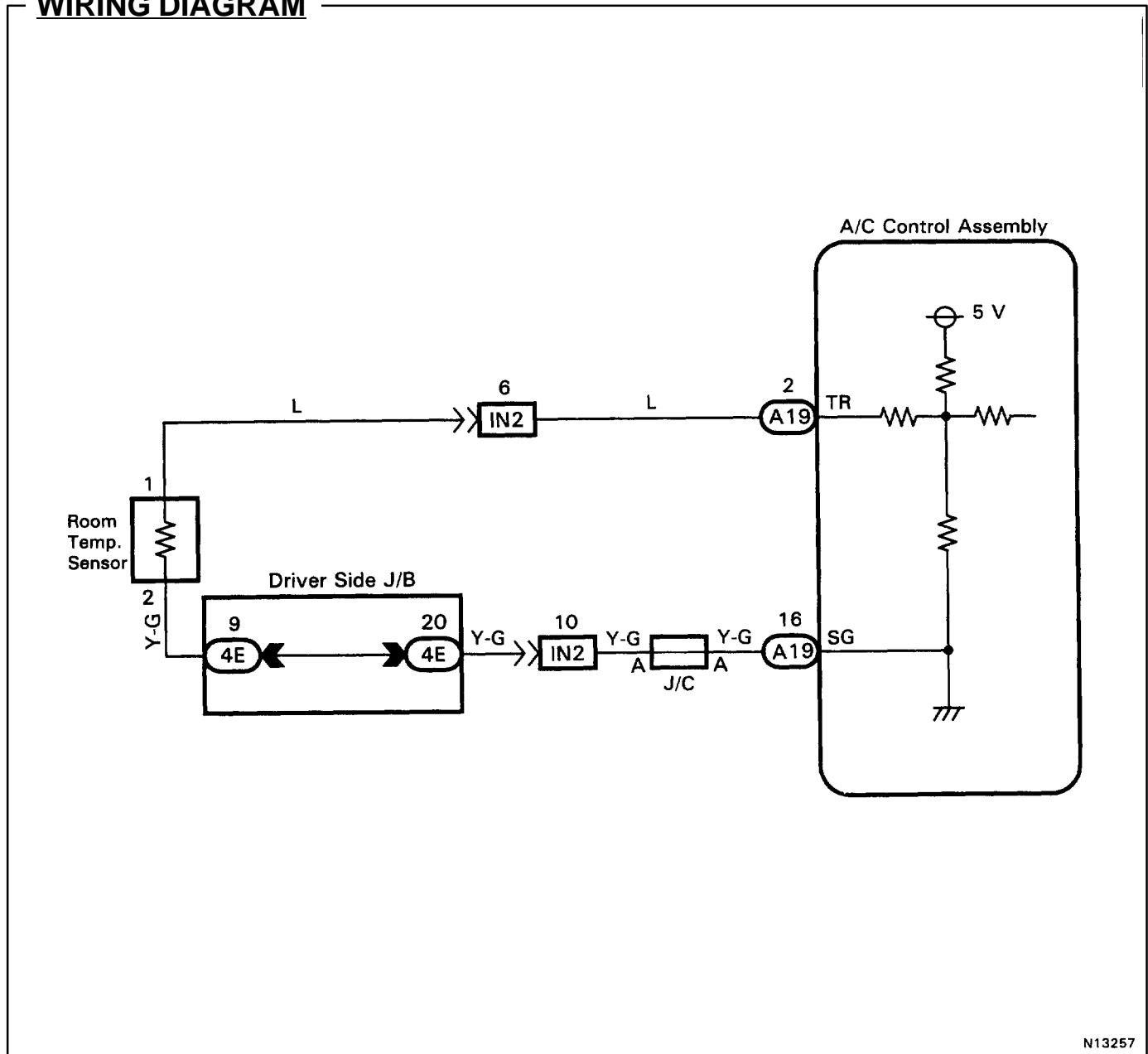
<b>DTC</b>	<b>11</b>	<b>Room Temperature Sensor Circuit</b>
------------	-----------	--

### — CIRCUIT DESCRIPTION —

This sensor detects the temperature inside the cabin and sends the appropriate signals to the air conditioning control assembly.

DTC No.	DTC Detecting Condition	Trouble Area
11	Open or short in room temperature sensor circuit.	<ul style="list-style-type: none"> <li>• Room temperature sensor.</li> <li>• Harness or connector between room temperature sensor and A/C control assembly.</li> <li>• A/C control assembly.</li> </ul>

### WIRING DIAGRAM

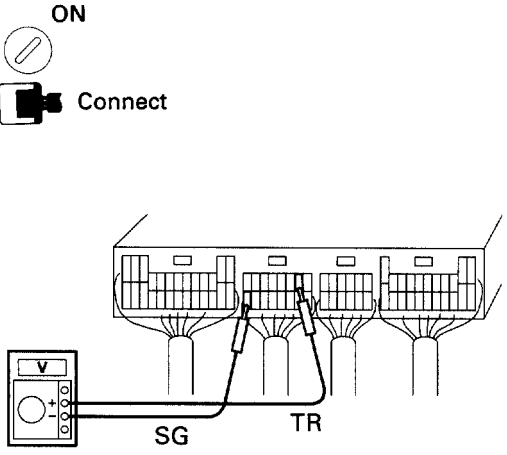




# INSPECTION PROCEDURE

**1** Check voltage between terminals TR and SG of air conditioning control assembly connector.

**ON**



BE3840  
N13220

**P** Remove air conditioning control assembly with connectors still connected.

**C** 4. Turn ignition switch on.  
5. Measure voltage between terminals TR and SG of air conditioning control assembly connector at each temperature.

**OK** Voltage:

at 25°C (77°F)	: 1.8 ~ 2.2 V
at 40°C (104°F)	: 1.2 ~ 1.6 V

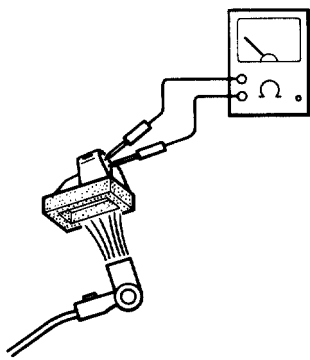
**Hint** As the temperature increases, the voltage decreases.

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 11 is displayed, check and replace air conditioning control assembly.

**2** Check room temperature sensor.



N13786

**P** 1. Remove instrument panel No. 1 under cover.  
2. Disconnect room temperature sensor connector.

**C** Check resistance between terminals 1 and 2 of room temperature sensor connector at each temperature.

**OK** Resistance:

at 25°C (77°F)	: 1.65 ~ 1.75 kΩ
at 50°C (122°F)	: 0.55 ~ 0.65 kΩ

**Hint** As the temperature increases, the resistance decreases.

**OK**

**NG**

Replace room temperature sensor.

**3** Check harness and connector between air conditioning control assembly and room temperature sensor (See page IN-29).

**OK**

**NG**

Repair or replace harness or connector.

Check and repair air conditioning control assembly.

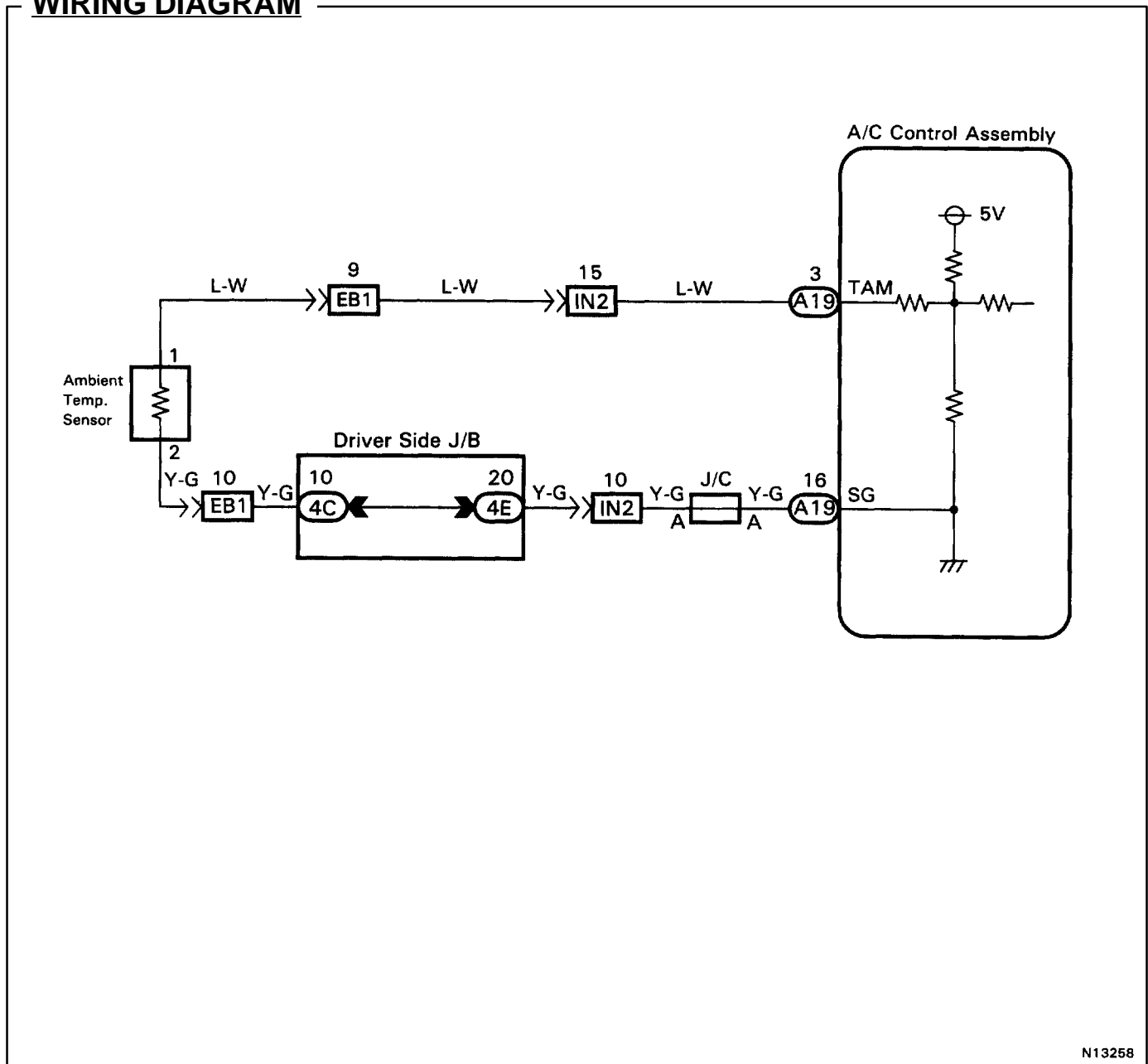
<b>DTC</b>	<b>12</b>	<b>Ambient Temperature Sensor Circuit</b>
------------	-----------	---

**— CIRCUIT DESCRIPTION —**

This sensor detects the ambient temperature and sends the appropriate signals to the A/C control assembly.

DTC No.	DTC Detecting Condition	Trouble Area
12	Open or short in ambient temperature sensor circuit.	<ul style="list-style-type: none"> <li>• Ambient temperature sensor.</li> <li>• Harness or connector between ambient temperature sensor and A/C control assembly.</li> <li>• A/C control assembly.</li> </ul>

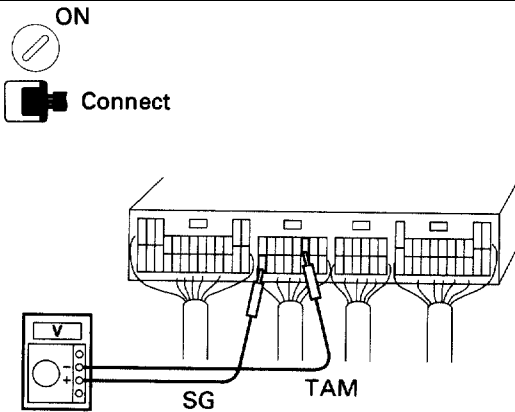
**WIRING DIAGRAM**



# INSPECTION PROCEDURE

**1** Check voltage between terminals TAM and SG of air conditioning control assembly connector.

ON



BE3840  
N13221

**P** Remove air conditioning control assembly with connectors still connected.

**C**

1. Turn ignition switch on.
2. Check voltage between terminals TAM and SG of air conditioning control assembly connector at each temperature.

**OK** Voltage:

at 25°C (77°F)	: 1.35 ~ 1.75 V
at 40°C (104°F)	: 0.85 ~ 1.25 V

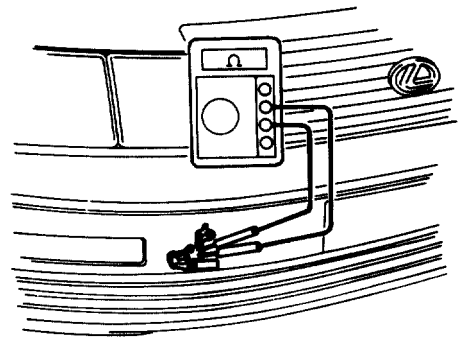
**Hint** As the temperature increases, the voltage decreases.

NG

OK

Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 12 is displayed, check and replace air conditioning control assembly.

**2** Check ambient temperature sensor.



N06479

**P**

1. Remove front radiator grille.
2. Disconnect ambient temperature sensor connector.

**C**

1. Check resistance between terminals 1 and 2 of ambient temperature sensor connector at each temperature.

**OK** Resistance:

at 25°C (77°F)	: 1.6 ~ 1.8 kΩ
at 50°C (122°F)	: 0.5 ~ 0.7 kΩ

**Hint** As the temperature increases, the resistance decreases.

**Notice:** When installing the ambient temperature sensor, be sure to connect the sensor connector before connecting the battery.

OK

NG

Replace ambient temperature sensor.

**3** Check harness and connector between air conditioning control assembly and ambient temperature sensor (See page IN-29).

OK

NG

Repair or replace harness or connector.

Check and replace air conditioning control assembly.

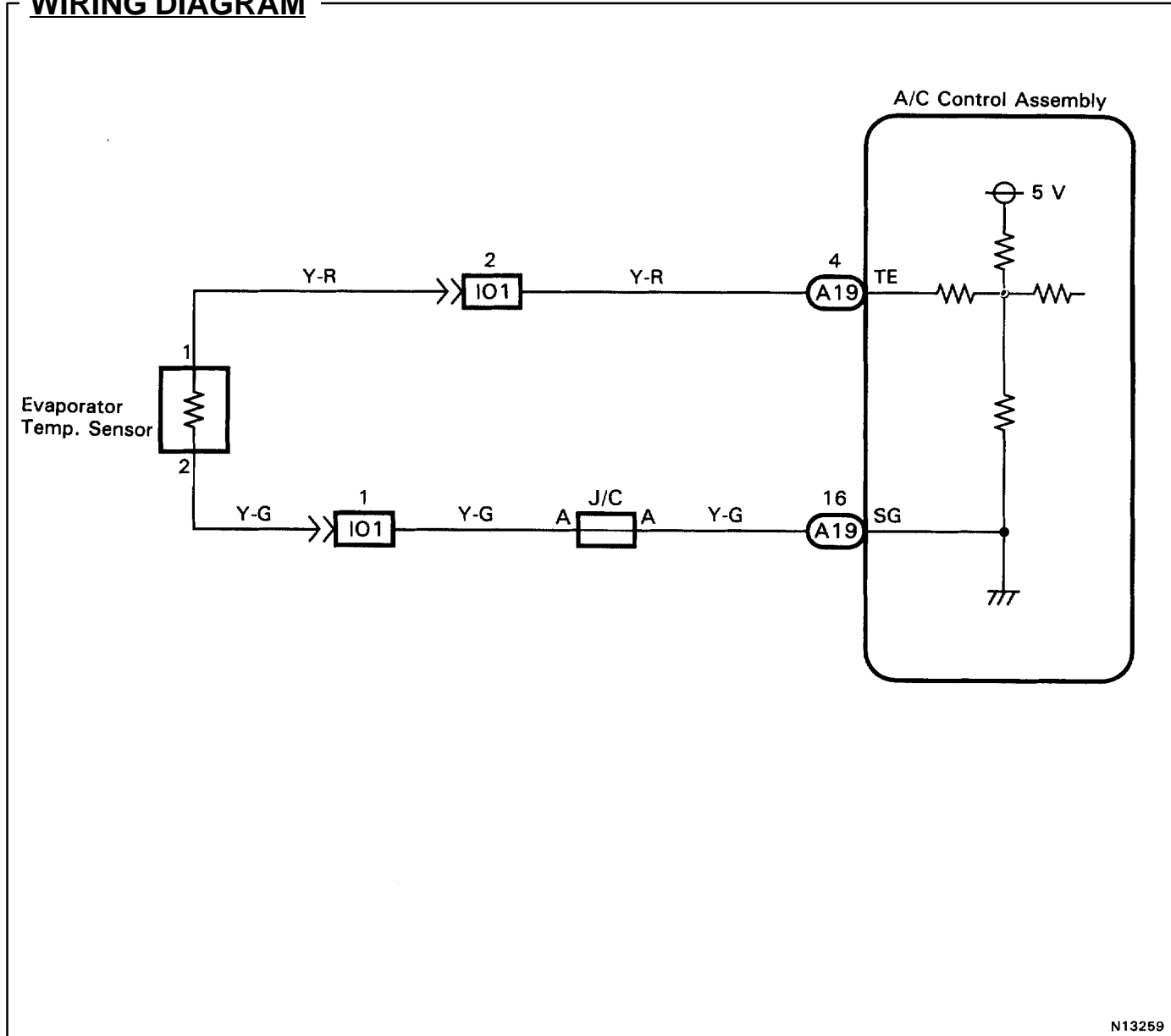
<b>DTC</b>	<b>13</b>	<b>Evaporator Temperature Sensor Circuit</b>
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**— CIRCUIT DESCRIPTION —**

This sensor detects the temperature inside the cooling unit and sends the appropriate signals to the air conditioning control assembly.

DTC No.	DTC Detecting Condition	Trouble Area
13	Open or short in evaporator temperature sensor circuit.	<ul style="list-style-type: none"> <li>• Evaporator temperature sensor.</li> <li>• Harness or connector between evaporator temperature sensor and A/C control assembly.</li> <li>• A/C control assembly.</li> </ul>

**WIRING DIAGRAM**



# INSPECTION PROCEDURE

**1** Check voltage between terminals TE and SG of air conditioning control assembly connector.

**P** Remove air conditioning control assembly with connectors still connected.

**C** 1. Turn ignition switch on.  
2. Measure voltage between terminals TE and SG of air conditioning control assembly connector at each temperature.

**OK** Voltage:

at 0°C (32°F)	: 2.0 ~ 2.4 V
at 15°C (59°F)	: 1.4 ~ 1.8 V

**Hint** As the temperature increases, the voltage decreases.

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 13 is displayed, check and replace air conditioning control assembly.

**2** Check evaporator temperature sensor.

**P** Remove evaporator temperature sensor (See page AC-117).

**C** Check resistance between terminals 1 and 2 of evaporator temperature sensor connector at each temperature.

**OK** Resistance:

at 0°C (32°F)	: 4.5 ~ 5.2 kΩ
at 15°C (59°F)	: 2.0 ~ 2.7 kΩ

**Hint** As the temperature increases, the resistance decreases.

**OK**

**NG**

Replace evaporator temperature sensor.

**3** Check harness and connector between air conditioning control assembly and evaporator temperature sensor (See page IN-29).

**OK**

**NG**

Repair or replace harness or connector.

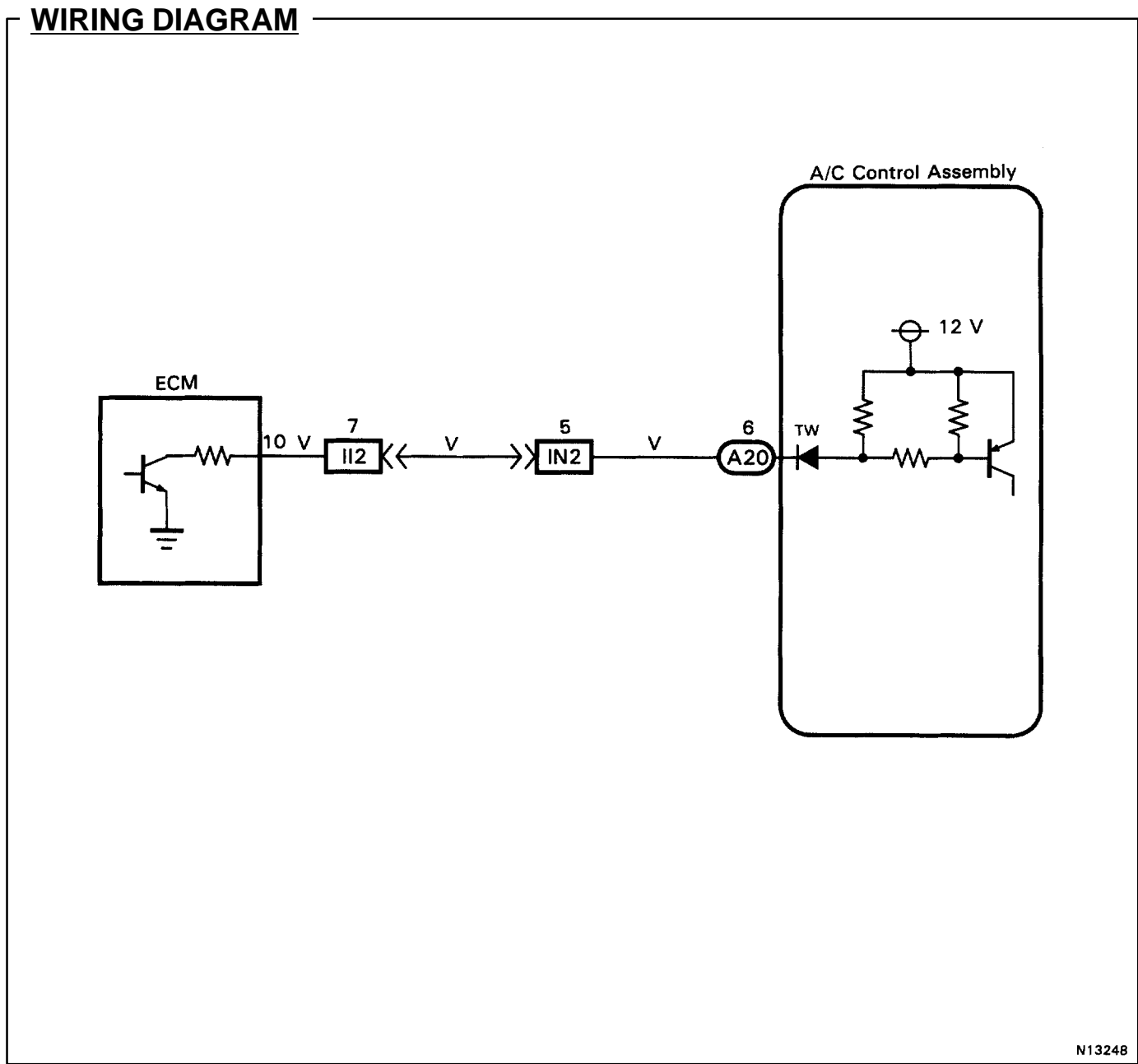
Check and repair air conditioning control assembly.

<b>DTC</b>	<b>14</b>	<b>Engine Coolant Temperature Circuit</b>
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**— CIRCUIT DESCRIPTION —**

This sensor detects the coolant temperature and sends the appropriate signals to the air conditioning control assembly. These signals are used for warm up control when the engine is cold.

DTC No.	DTC Detecting Condition	Trouble Area
14	Open or short in engine coolant temperature circuit	<ul style="list-style-type: none"> <li>• ECM</li> <li>• Harness or connector between ECM and A/C control assembly.</li> <li>• A/C control assembly.</li> </ul>

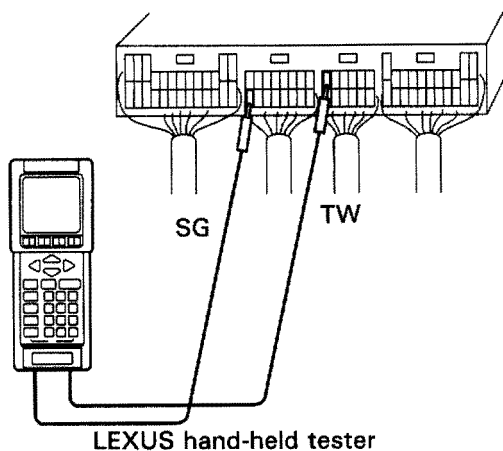


## INSPECTION PROCEDURE

**1** Check voltage between terminals TW and SG of air conditioning control assembly connector.

ON

Connect



LEXUS hand-held tester

BE3840  
N13245**P** Remove air conditioning control assembly with connectors still connected.

- C**
1. Turn ignition switch on.
  2. Measure voltage between terminals TW and SG of air conditioning control assembly connector at each temperature.

**OK** Signal

at less than 30°C (86°F)	<p>Approx. 8 ms</p> <p>12 V</p> <p>0 V</p> <p>Approx. 420 ms</p>
at 50°C (122°F)	<p>Approx. 150 ms</p> <p>12 V</p> <p>0 V</p> <p>Approx. 420 ms</p>
at more than 90°C (194°F)	<p>Approx. 410 ms</p> <p>12 V</p> <p>0 V</p> <p>Approx. 420 ms</p>

OK

NG

Replace engine coolant temperature sensor.

**2** Check harness and connector between air conditioning control assembly and ECM (See page [IN-29](#))

OK

NG

Repair or replace harness or connector.

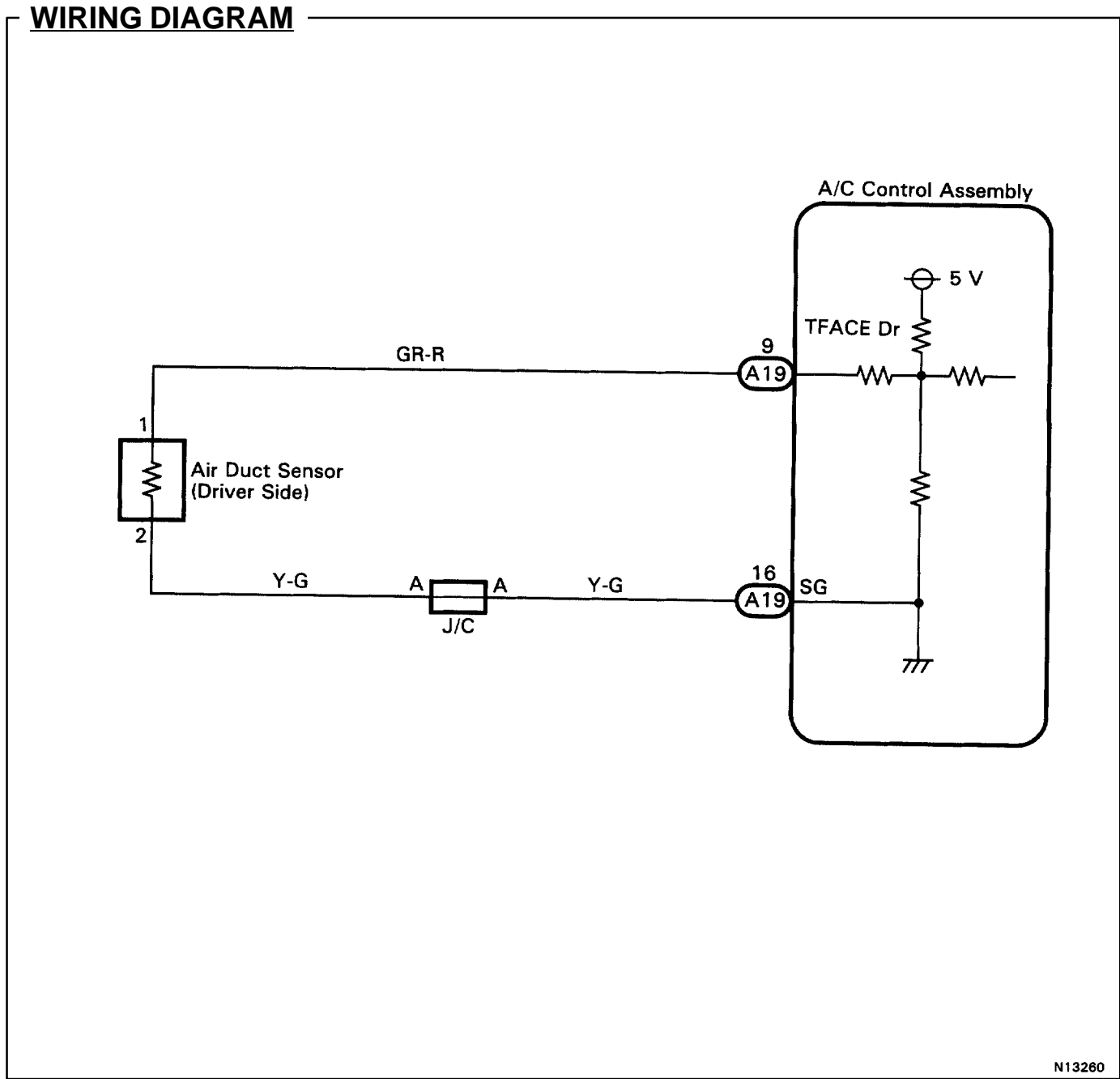
Check and replace air conditioning control assembly.

<b>DTC</b>	<b>15</b>	<b>Air Duct Sensor Circuit (Driver Side)</b>
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**— CIRCUIT DESCRIPTION —**

This sensor detects the temperature inside the cabin and sends the appropriate signals to the air conditioning control assembly.

DTC No.	DTC Detecting Condition	Trouble Area
15	Open or short in duct sensor circuit	<ul style="list-style-type: none"> <li>• Duct sensor</li> <li>• Harness or connector between duct sensor and A/C control assembly</li> <li>• A/C control assembly</li> </ul>





# INSPECTION PROCEDURE

**1** Check voltage between terminals TFACE Dr and SG of air conditioning control assembly connector.

**ON**

**Connector**

SG                      TFACE Dr

BE3840  
N13223

**P** Remove air conditioning control assembly with connectors still connected.

**C** 1. Turn ignition switch on.  
2. Check voltage between terminals TFACE Dr and SG of air conditioning control assembly connector at each temperature.

**OK** Voltage:

at 0°C (32°F)	: 1.95 ~ 2.05 V
at 50°C (122°F)	: 0.95 ~ 1.15 V

**Hint** As the temperature increases, the voltage decreases.

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 13 is displayed, check and replace air conditioning control assembly.

**2** Check duct sensor.

Duct Sensor

N13224

**P** Remove duct sensor (See page AC-117).

**C** Check resistance between terminals and of duct sensor connector at each temperature.

**OK** Resistance:

at 0°C (32°F)	: 4.8 ~ 5.2 kΩ
at 50°C (122°F)	: 1.6 ~ 2.0 kΩ

**Hint** As the temperature increases, the resistance decreases.

**OK**

**NG**

Replace duct sensor.

**3** Check harness and connector between air conditioning control assembly and duct sensor (See page IN-29).

**OK**

**NG**

Repair or replace harness or connector.

Check and replace air conditioning control assembly.

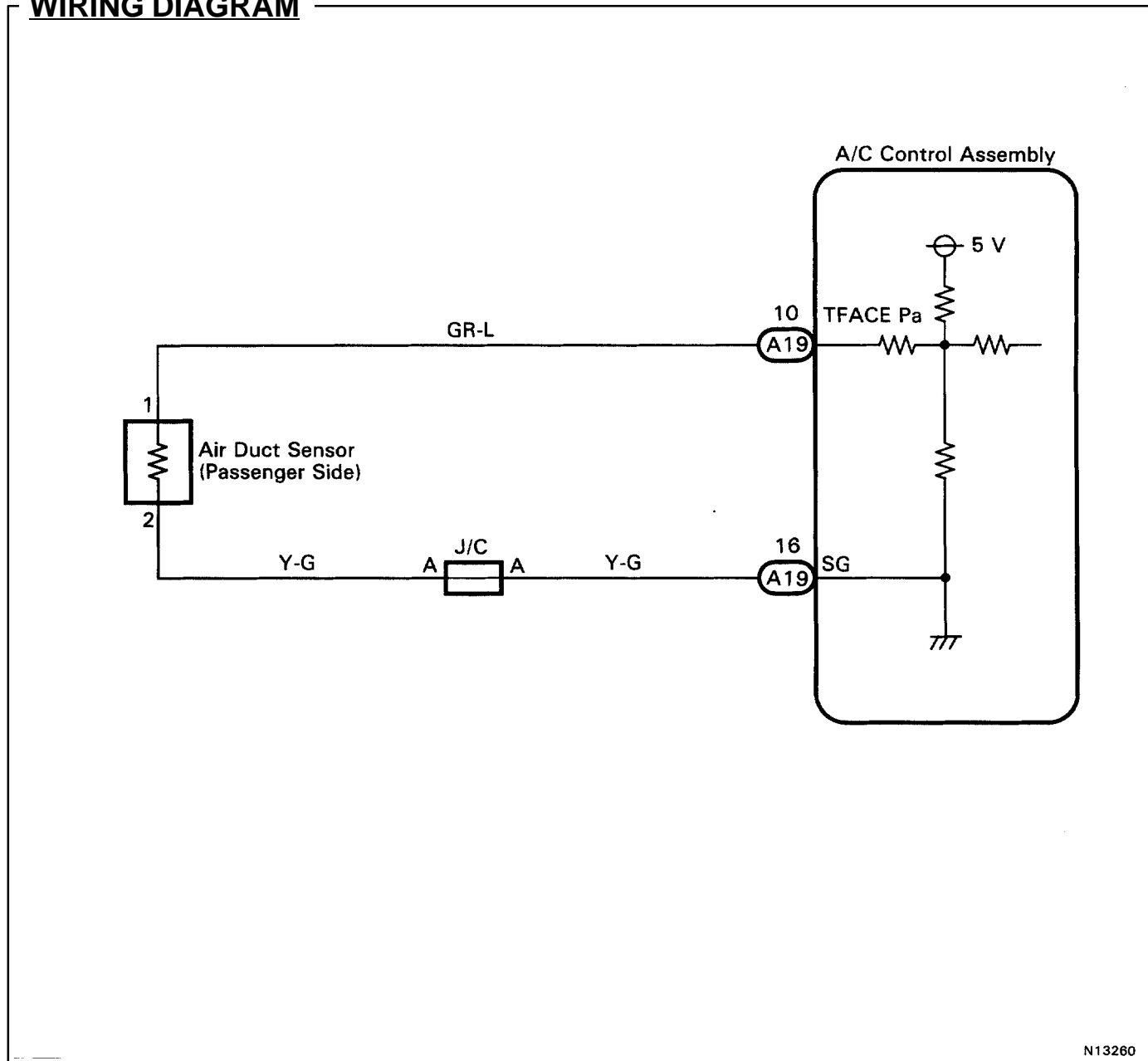
<b>DTC</b>	<b>16</b>	<b>Air Duct Sensor Circuit (Passenger Side)</b>
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**— CIRCUIT DESCRIPTION —**

This sensor detects the temperature inside and sends the appropriate signals to the air conditioning control assembly.

DTC No.	DTC Detecting Condition	Trouble Area
16	Open or short in duct sensor circuit	<ul style="list-style-type: none"> <li>• Duct Sensor</li> <li>• Harness or connector between duct sensor and A/C control assembly.</li> <li>• A/C control assembly</li> </ul>

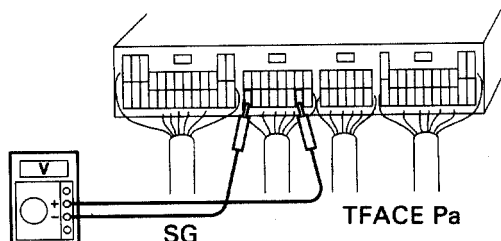
**WIRING DIAGRAM**



## INSPECTION PROCEDURE

### 1 Check voltage between terminals TFACE Pa and SG of air conditioning control assembly connector.

ON



BE3840  
N13225

**P** Remove air conditioning control assembly with connectors still connected.

**C** 1. Turn ignition switch on.  
2. Check voltage between terminals TFACE Pa and SG of air conditioning control assembly connector at each temperature.

**OK** Voltage:

at 0°C (32°F)	: 1.95 ~ 2.05 V
at 50°C (122°F)	: 0.95 ~ 1.15 V

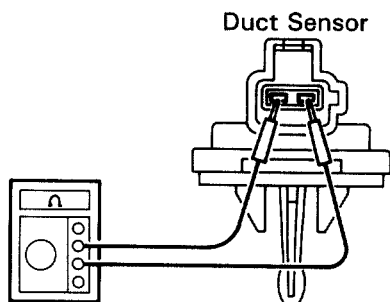
**Hint** As the temperature increases, the voltage decreases.

NG

OK

Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 13 is displayed, check and replace air conditioning control assembly.

### 2 Check duct sensor.



N13224

**P** Remove duct sensor (See page AC-117).

**C** Check resistance between terminals 1 and 2 of duct sensor connector at each temperature.

**OK** Resistance:

at 0°C (32°F)	: 4.8 ~ 5.2 kΩ
at 50°C (122°F)	: 1.6 ~ 2.0 kΩ

**Hint** As the temperature increases, the resistance decreases.

OK

NG

Replace duct sensor.

### 3 Check harness and connector between air conditioning control assembly and duct sensor (See page IN-29).

OK

NG

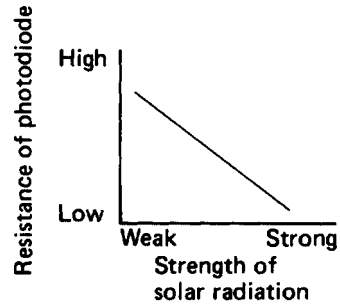
Repair or replace harness or connector.

Check and replace air conditioning control assembly.

<b>DTC</b>	<b>21</b>	<b>Solar Sensor Circuit (Passenger Side)</b>
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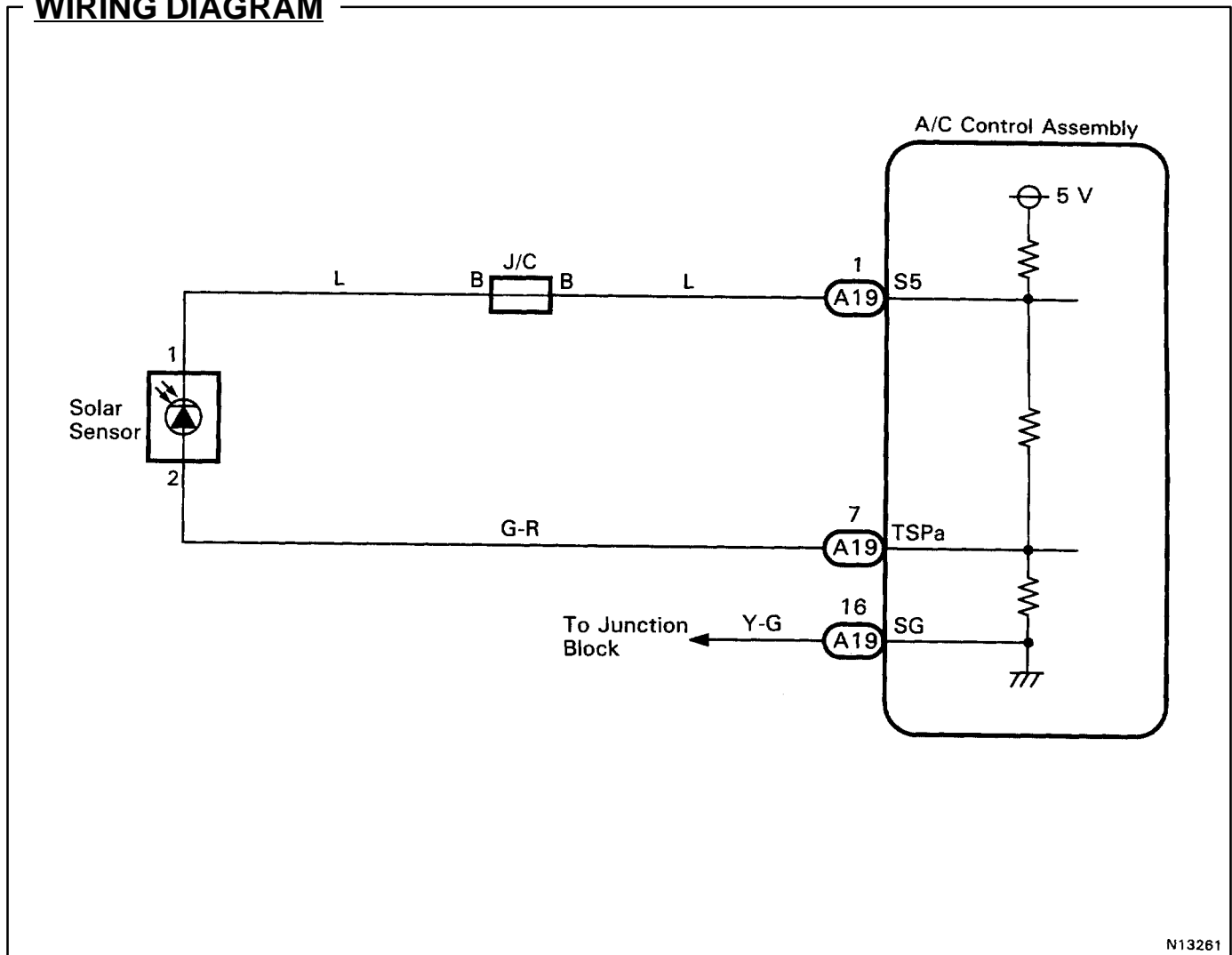
**— CIRCUIT DESCRIPTION**

A photo diode in the solar sensor detects solar radiation and sends signals to the air conditioning control assembly.



DTC No.	DTC Detecting Condition	Trouble Area
21	Open or short in solar sensor circuit. (Please note that display of diagnostic trouble code 21 is not abnormal when the sensor is not receiving solar radiation.)	<ul style="list-style-type: none"> <li>• Solar sensor.</li> <li>• Harness or connector between solar sensor and A/C control assembly.</li> <li>• A/C control assembly.</li> </ul>

**WIRING DIAGRAM**



# INSPECTION PROCEDURE

**1** Check voltage between terminals TSPa and SG of air conditioning control assembly connector.

BE3840  
N13226

**P** Remove air conditioning control assembly with connector still connected.

**C**

1. Turn ignition switch on.
2. Measure voltage between terminals TSPa and SG of air conditioning control assembly connector when the solar sensor is subjected to an electric light, and when the sensor is covered by a cloth.

**OK**

Condition	Voltage
Sensor subjected to electric light	more than 1 V
Sensor covered by a cloth	less than 1 V

**Hint** As the inspection light is moved away from the sensor, the voltage increases.

NG

**OK** Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 21 is displayed, check and replace air conditioning control assembly.

**2** Check solar sensor.

AC2935

**P**

1. Remove glove box.
2. Disconnect solar sensor connector.

**C**

1. Cover the sensor by a cloth.
2. Measure resistance between terminals 1 and 2 of solar sensor connector.

**Hint** Connect positive ⊕ lead of ohmmeter to terminal 1 and negative ⊖ lead to terminal 2 of the solar sensor.

**OK** Resistance: ∞ Ω (no continuity)

**P**

1. Remove the cloth from the solar sensor and subject the sensor to electric light.
2. Measure resistance.

**OK** Resistance: Approx. 4 kΩ (continuity)

**Hint** As the electric light is moved away from the sensor, the resistance increases.

OK

**NG** Replace solar sensor.

**3** Check harness and connector between air conditioning control assembly and solar sensor (See page IN-29).

OK

**NG** Repair or replace harness or connector.

Check and replace air conditioning control assembly.

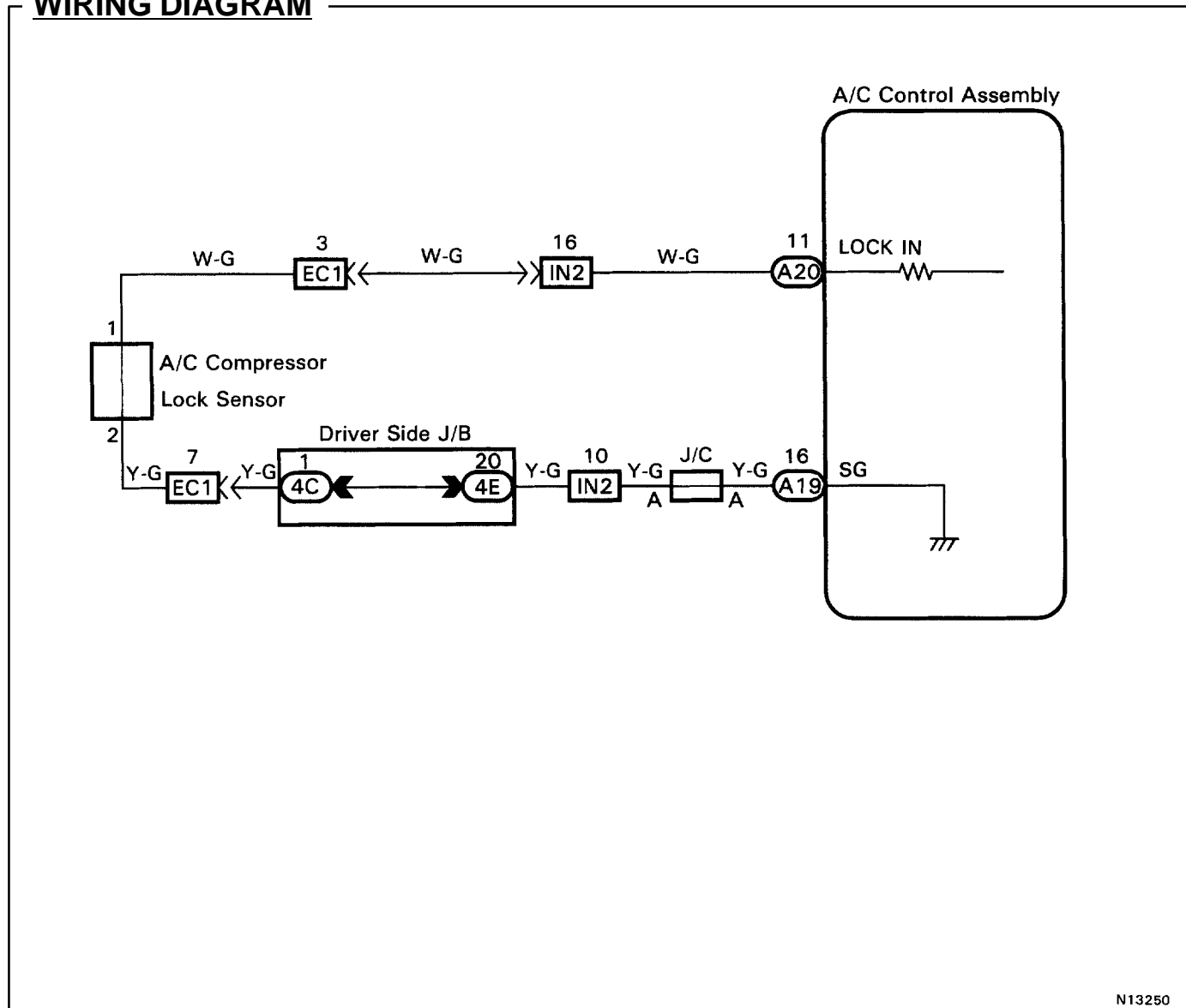
<b>DTC</b>	<b>22</b>	<b>Compressor Lock Sensor Circuit</b>
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**— CIRCUIT DESCRIPTION —**

This sensor sends 4 pulses per engine revolution to the air conditioning control assembly. If the number ratio of the compressor speed divided by the engine speed is smaller than a predetermined value, the air conditioning control assembly turns the compressor off. And, the indicator flashes at about 1 second intervals.

DTC No.	DTC Detecting Condition	Trouble Area
22	All conditions below are detected for 3 secs. or more (a) Engine speed: 450 rpm or more (b) Ratio between engine and compressor speed deviates 20% or more in comparison to normal operation.	<ul style="list-style-type: none"> <li>• Compressor</li> <li>• Compressor drive belt.</li> <li>• Compressor lock sensor.</li> <li>• Harness and connector between Compressor and A/C control assembly.</li> <li>• A/C control assembly.</li> </ul>

**WIRING DIAGRAM**



## INSPECTION PROCEDURE

### 1 Check compressor.

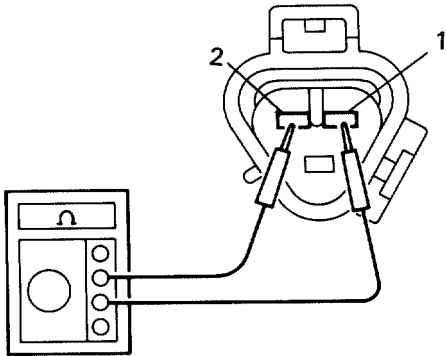
- P**
1. Check compressor drive belt tension (See page [AC-88](#)).
  2. Check if the compressor does not lock during operation with engine started and blower switch and A/C switch ON.

**OK**

**NG**

Adjust drive belt tension or repair compressor.

### 2 Check compressor lock sensor.



N13227

- P**
1. Jack up the vehicle.
  2. Disconnect compressor lock sensor connector.

**C** Measure resistance between terminals 1 and 2 of compressor lock sensor connector.

**OK** Resistance: at 20°C (68°F): 1050 – 570 Ω  
at 100°C (212°F): 1440 – 720 Ω

**OK**

**NG**

Replace compressor lock sensor.

### 3 Check harness and connectors between air conditioning control assembly and compressor lock sensor (See page [IN-29](#)).

**OK**

**NG**

Repair or replace harness or connector.

Proceed to next circuit inspection shown on matrix chart (See page [AC-26](#)). However, if Diagnostic trouble code 22 is displayed, check and replace air conditioning control assembly.

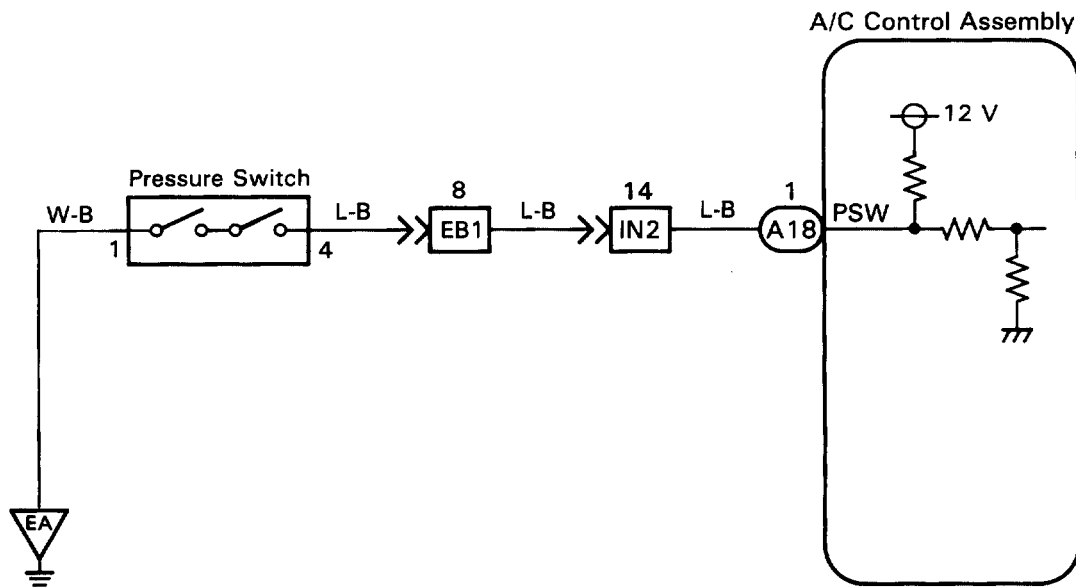
<b>DTC</b>	<b>23</b>	<b>Pressure Switch Circuit</b>
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**— CIRCUIT DESCRIPTION —**

The pressure switch sends the appropriate signals to the air conditioning control assembly when the air conditioning refrigerant pressure drops too low or rises too high. When the air conditioning control assembly receives these signals, it outputs signals via the ECM to switch off the compressor relay and turns the magnetic clutch off.

DTC No.	DTC Detecting Condition	Trouble Area
23	<ul style="list-style-type: none"> <li>• Open in pressure sensor circuit.</li> <li>• Abnormal refrigerant pressure [below 196 kPa (2.0 kg/cm, 28 psi) over 3,140 kPa (32.0 kgf/cm, 455 psi)]</li> </ul>	<ul style="list-style-type: none"> <li>• Pressure switch.</li> <li>• Harness or connector between pressure switch and A/C control assembly</li> <li>• Refrigerant pipe line.</li> <li>• A/C control assembly</li> </ul>

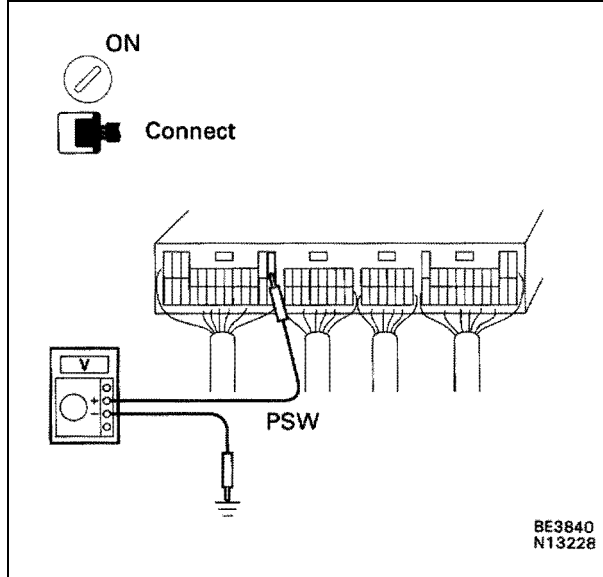
**WIRING DIAGRAM**





# INSPECTION PROCEDURE

**1** Check voltage between terminals PSW of air conditioning control assembly and body ground.



**P** Install the manifold gauge set.

**C**

1. Turn ignition switch ON.
2. Check voltage between terminal PSW of air conditioner control assembly connector and body ground when air conditioner gas pressure is changed.

**OK** The voltage changes with gas pressure, as shown in the diagram below.

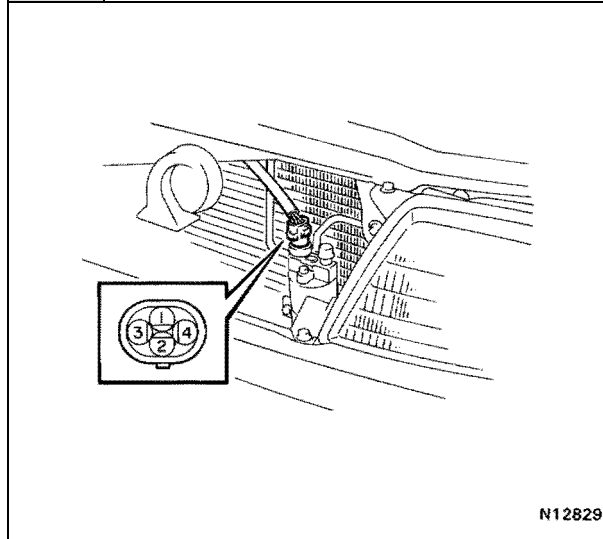
Low Pressure Cut Side	Reference: High Pressure Cut Side
ON (0 V)  196 kPa OFF (12 V)	ON (0 V)  OFF (12 V) 3,140 kPa

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26).

**2** Check pressure switch.



**P** 1. Disconnect pressure switch connector.

**C**

1. Turn ignition switch on.
2. Check continuity between terminals 1 and 4 of pressure switch when air conditioning gas pressure is changed.

**OK** The continuity changes with gas pressure, as shown below.

Low Pressure Cut Side	Reference: High Pressure Cut Side
ON (continuity)  196 kPa OFF (no continuity)	ON (continuity)  OFF (no continuity) 3,140 kPa

**OK**

**NG**

Repair or replace harness or connector.

**3** Check harness and connector between air conditioning control assembly and pressure switch, pressure switch and body ground (See page IN-29).

**OK**

**NG**

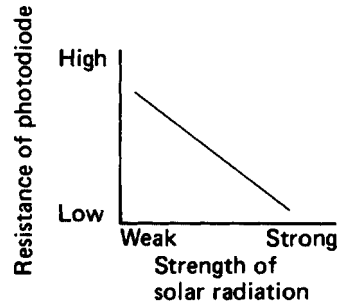
Repair or replace harness or connector.

Check and replace air conditioning control assembly.

<b>DTC</b>	<b>24</b>	<b>Solar Sensor Circuit (Drive Side)</b>
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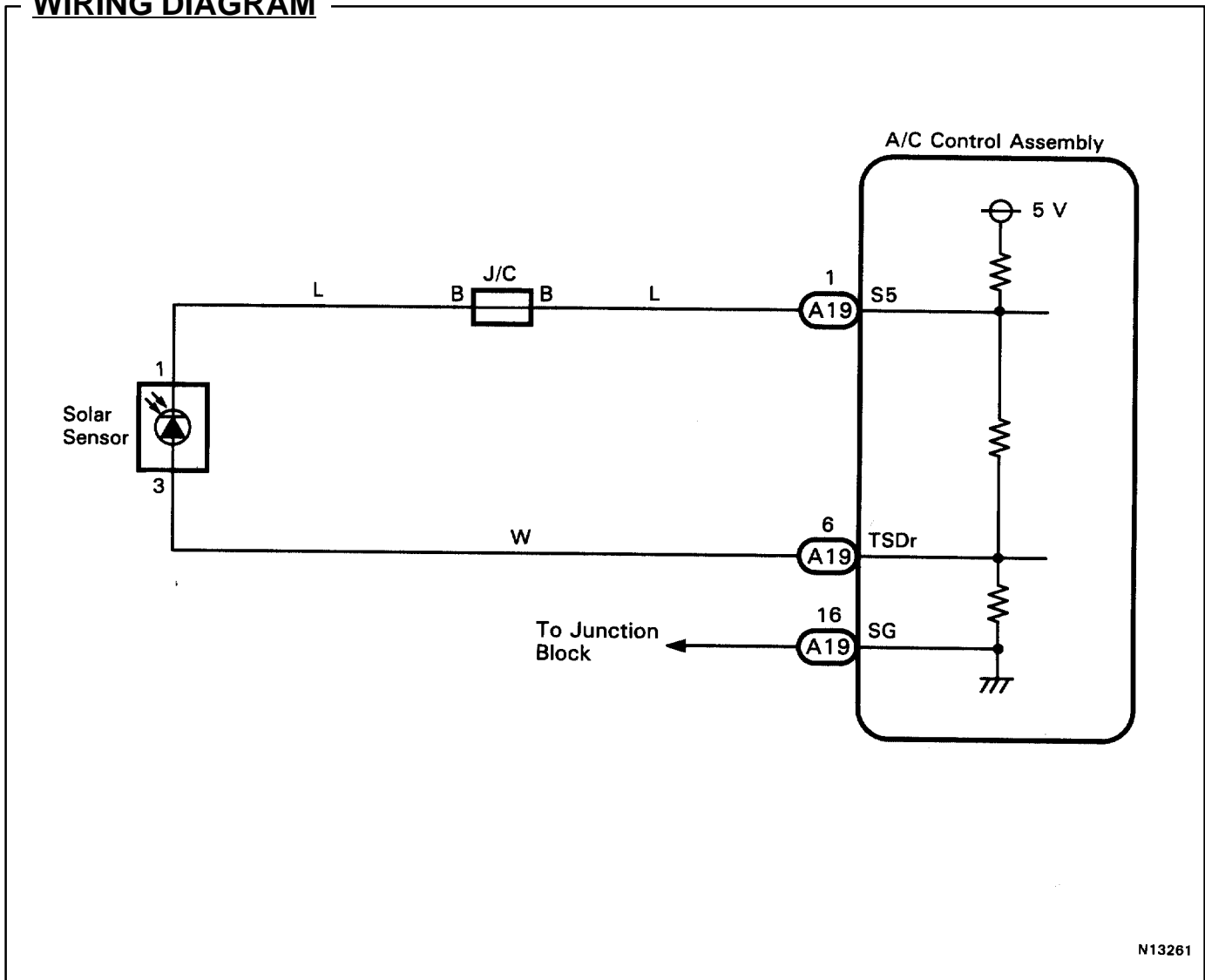
**— CIRCUIT DESCRIPTION —**

A photo diode in the solar sensor detects solar radiation and sends signals to the air conditioning control assembly.



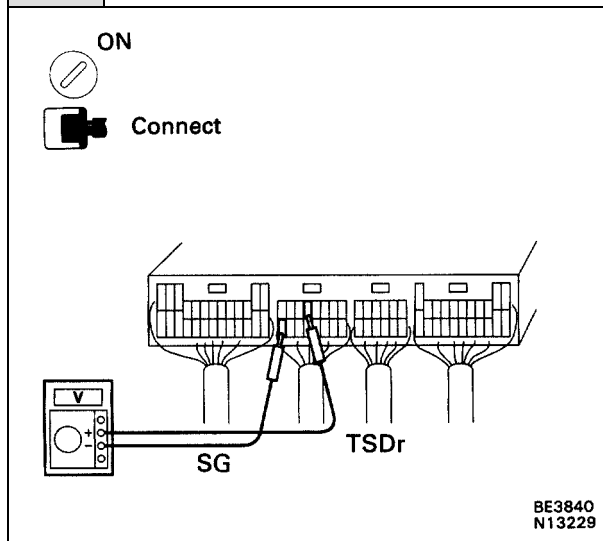
DTC No.	DTC Detecting Condition	Trouble Area
24	Open or short in solar sensor circuit. (Please note that display of diagnostic trouble code 24 is not abnormal when the sensor is not receiving solar radiation.)	<ul style="list-style-type: none"> <li>• Solar sensor.</li> <li>• Harness or connector between solar sensor and A/C control assembly.</li> <li>• A/C control assembly.</li> </ul>

**WIRING DIAGRAM**



# INSPECTION PROCEDURE

## 1 Check voltage between terminals TSDr and SG of air conditioning control assembly connector.



**P** Remove air conditioning control assembly with connectors still connected.

- C**
1. Turn ignition switch on.
  2. Measure voltage between terminals TSDr and SG of air conditioning control assembly connector when the solar sensor is subjected to an electric light, and when the sensor is covered by a cloth.

**OK**

Condition	Voltage
Sensor subjected to electric light	Less than 1 V
Sensor covered by a cloth	more than 1 V

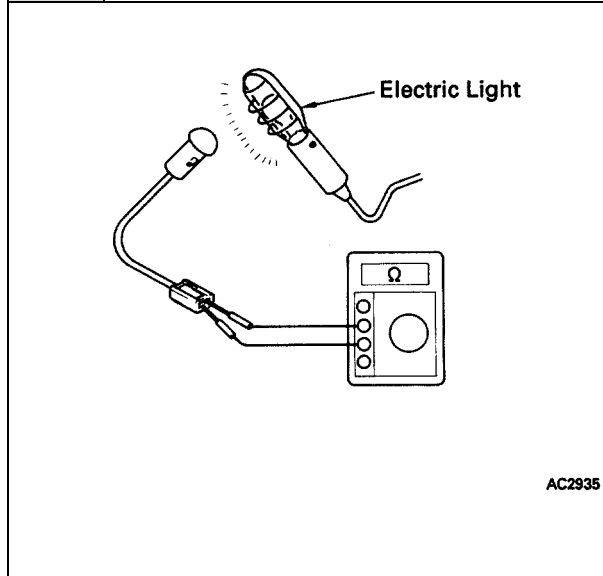
**Hint** As the inspection light is moved away from the sensor, the voltage increases.

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 21 is displayed, check and replace air conditioning control assembly.

## 2 Check solar sensor.



- P**
1. Remove glove box.
  2. Disconnect solar sensor connector.

- C**
1. Cover the sensor by a cloth.
  2. Measure resistance between terminals 1 and 2 of solar sensor connector.

**Hint** Connect positive ⊕ lead of ohmmeter to terminal 1 and negative ⊖ lead to terminal 2 of the solar sensor.

**OK Resistance: ∞ Ω (no continuity)**

- P**
1. Remove the cloth from the solar sensor and subject the sensor to electric light.
  2. Measure resistance.

**OK Resistance: Approx. 4 kΩ (continuity)**

**Hint** As the electric light is moved away from the sensor, the resistance increases.

**OK**

**NG**

Repair solar sensor.

## 3 Check harness and connector between air conditioning control assembly and solar sensor (See page IN-29).

**OK**

**NG**

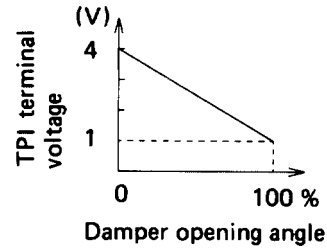
Repair or replace harness or connector.

Check and replace air conditioning control assembly.

**DTC 32, 42 Air Inlet Damper Position Sensor Circuit**

**CIRCUIT DESCRIPTION**

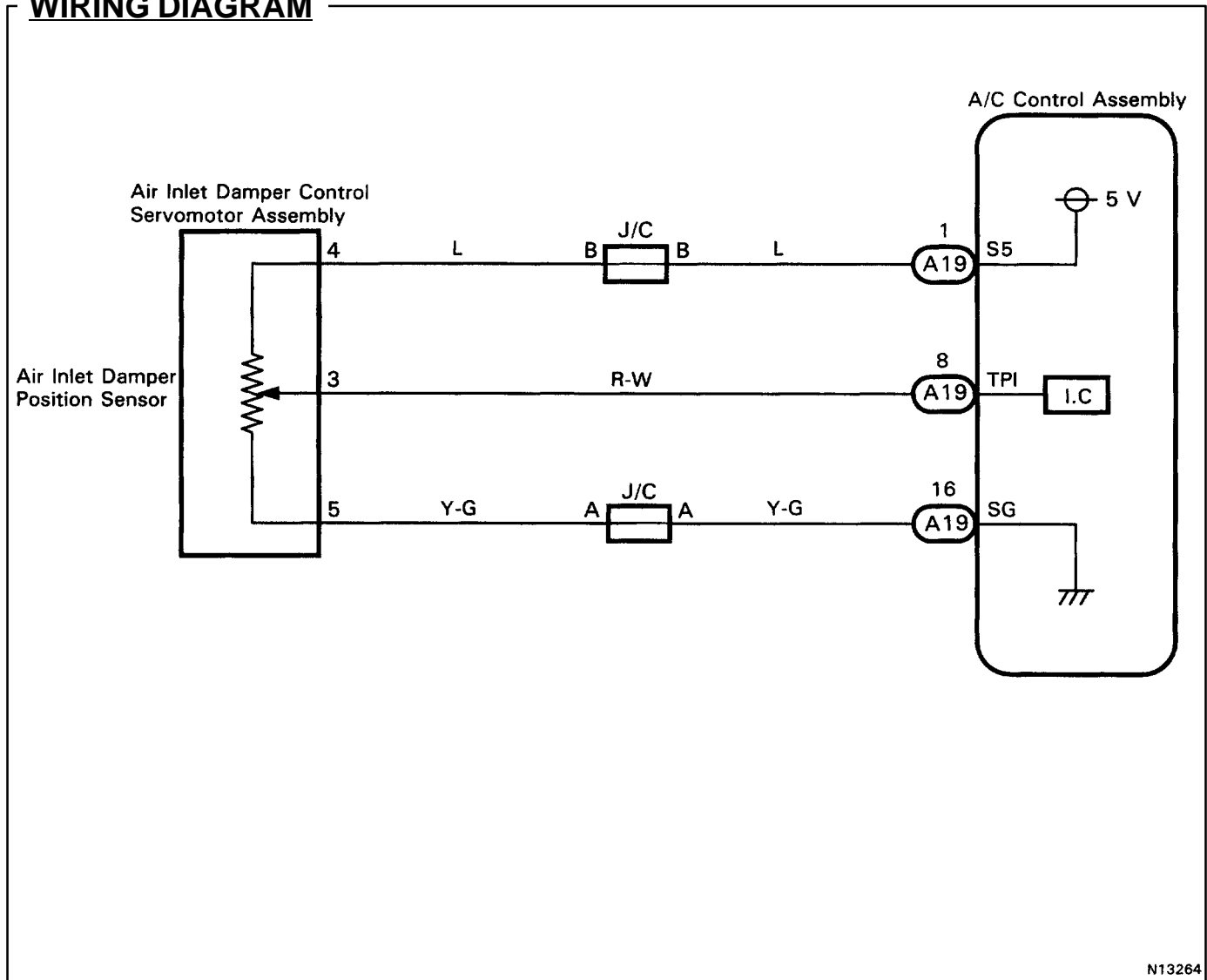
This sensor detects the position of the air inlet damper and sends the appropriate signals to the air conditioning control assembly. The position sensor is built into the air inlet damper control servomotor assembly.



AC2184

DTC No.	DTC Detecting Condition	Trouble Area
32	<ul style="list-style-type: none"> <li>Short to ground or power source circuit in air inlet damper position sensor circuit.</li> </ul>	<ul style="list-style-type: none"> <li>Air inlet damper position sensor.</li> <li>Harness or connector between air inlet damper control servomotor assembly and A/C control assembly.</li> <li>A/C control assembly.</li> </ul>
42	<ul style="list-style-type: none"> <li>Air inlet damper position sensor value does not change even if A/C control assembly operates air inlet damper control servomotor.</li> </ul>	

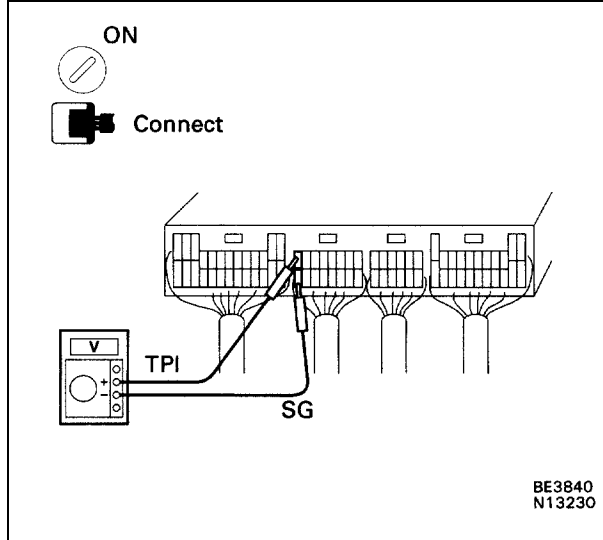
**WIRING DIAGRAM**



N13264

# INSPECTION PROCEDURE

## 1 Check voltage between terminals TPI and SG of air conditioning control assembly connector.



**P** Remove air conditioning control assembly with connectors still connected.

- C**
1. Turn ignition switch on.
  2. Press REC/FRS switch to change air inlet between fresh and recirculation air, and measure voltage between terminals TPI and SG of air conditioning control assembly when the air inlet damper control servomotor operates.

**OK**

FRS-REC Switch	Voltage
REC	3.5 ~ 4.5 V
FRS	0.5 ~ 1.8 V

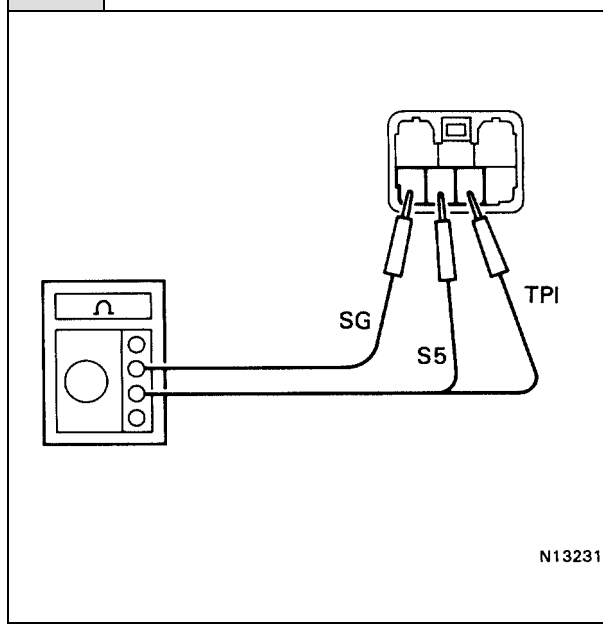
**Hint** As the air inlet damper control servomotor is moved from REC side to FRS side, the voltage decreases.

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 32 or 42 is displayed, check and replace air conditioning control assembly.

## 2 Check air inlet damper position sensor.



- P**
1. Remove heater unit.
  2. Disconnect air inlet damper control servomotor assembly connector.

**C** Measure resistance between terminals S5 and SG of air inlet damper control servomotor assembly connector.

**OK** Resistance: 4.7 ~ 7.2 kΩ

**C** While operating air inlet damper control servomotor, following the procedure on page AC-54, measure resistance between terminals TPI and SG of air inlet damper control servomotor assembly connector.

**OK** Resistance

Damper Position	Resistance
REC side	3.76 ~ 5.76 kΩ
FRS side	0.94 ~ 1.44 kΩ

**Hint** As the air inlet damper control servomotor moves from REC side to FRS side, the resistance decreases.

**OK**

**NG**

Replace air inlet damper control servomotor assembly.

## 3 Check harness and connector between air conditioning control assembly and air inlet damper control servomotor assembly (See page IN-29).

**OK**

**NG**

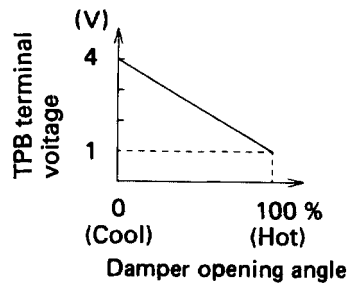
Repair or replace harness or connector.

Check and replace air conditioning control assembly.

<b>DTC</b>	<b>34</b>	<b>Max Cool Damper Position Sensor Circuit (Driver Side)</b>
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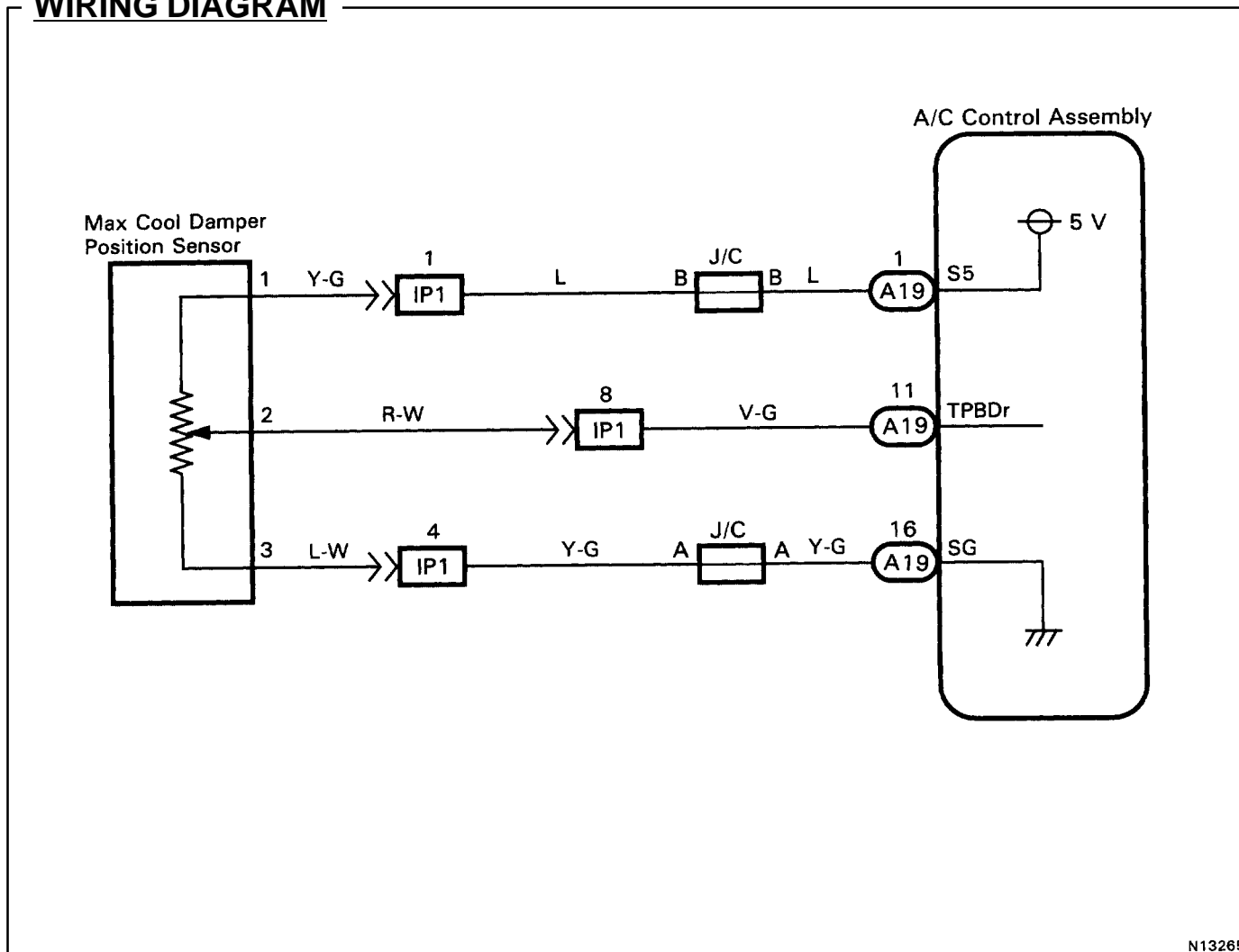
**CIRCUIT DESCRIPTION**

This sensor detects the position of the max cool damper and sends the appropriate signals to the air conditioning control assembly. The position sensor is built into the max cool damper control servomotor assembly.



DTC No.	DTC Detecting Condition	Trouble Area
34	Short to ground or power source circuit in max cool damper position sensor circuit.	<ul style="list-style-type: none"> <li>Max cool damper position sensor.</li> <li>Harness or connector between max cool damper servomotor assembly and A/C control assembly.</li> <li>A/C control assembly</li> </ul>

**WIRING DIAGRAM**



# INSPECTION PROCEDURE

**1** Check voltage between terminals TPBDr and SG of air conditioning control assembly connector.

**P** Remove air conditioning control assembly with connectors still connected.

**C**

1. Turn ignition switch on.
2. Change the set temperature to activate the max cool damper control servomotor, and measure the voltage between terminals TPBDr and SG of air conditioning control assembly connector each time when the set temperature is changed.

**OK**

Set Temperature	Voltage
Max. cool	3.5 - 4.5 V
Max. hot	0.5 - 1.8 V

**Hint** As the set temperature increases the voltage decreases.

N13232

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 34 or 44 is displayed, check and replace air conditioning control assembly.

**2** Check max cool damper position sensor.

**P**

1. Remove heater unit.
2. Disconnect max cool damper control servomotor assembly connector.

**C** Measure resistance between terminals S5 and SG of max cool damper control servomotor assembly connector.

**OK** Resistance: 4.7 ~ 7.2 kΩ

**C** While operating max cool damper control servomotor, following the procedure on page AC-56, measure resistance between terminals TPBDr and SG of max cool damper control servomotor assembly connector.

**OK**

Position	Resistance
Max. cool	3.76 - 5.76 kΩ
Max. warm	0.94 - 1.44 kΩ

**Hint** As the max cool damper control servomotor moves from cool side to warm side, the resistance decreases.

N13233

**OK**

**NG**

Replace max cool damper control servomotor assembly.

**3** Check harness and connector between air conditioning control assembly and max cool damper control servomotor assembly (See page IN-29).

**OK**

**NG**

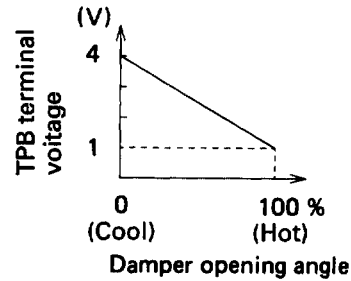
Repair or replace harness or connector.

Check and replace air conditioning control assembly.

<b>DTC</b>	<b>35</b>	<b>Max Cool Damper Position Sensor Circuit (Passenger Side)</b>
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**CIRCUIT DESCRIPTION**

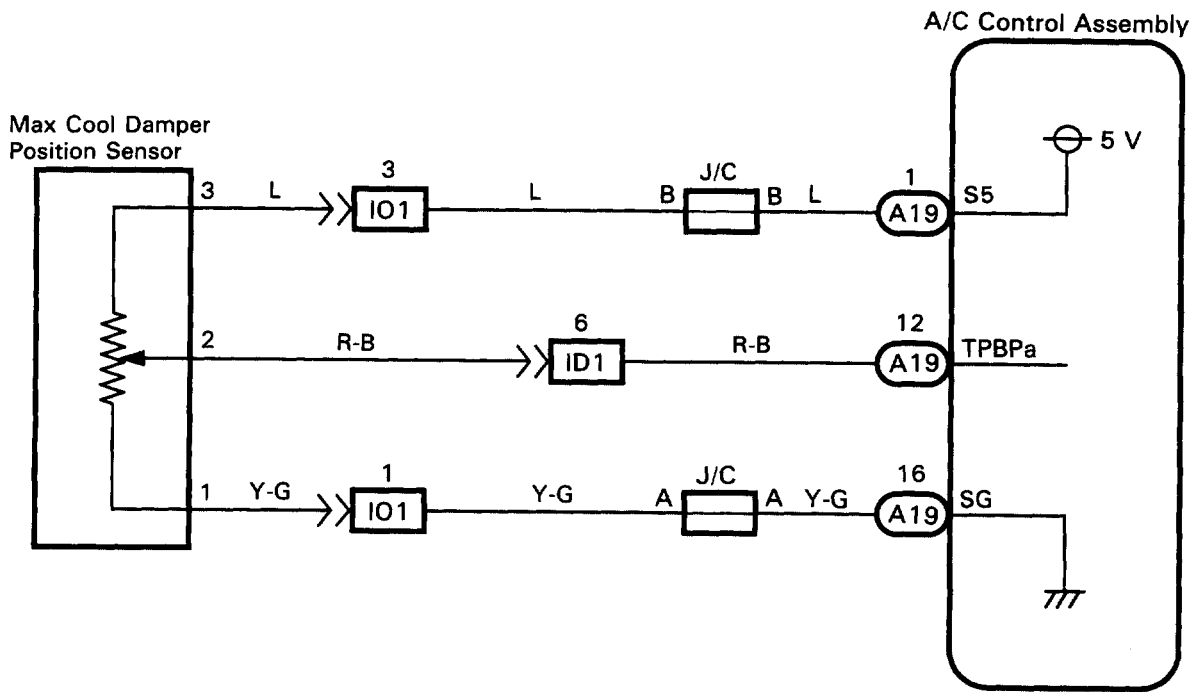
This sensor detects the position of the max cool damper and sends the appropriate signals to the air conditioning control assembly. The position sensor is built into the max cool damper control servomotor assembly.



AC2184

DTC No.	DTC Detecting Condition	Trouble Area
35	Short to ground or power source circuit in max cool damper position sensor circuit	<ul style="list-style-type: none"> <li>• Max cool damper position sensor.</li> <li>• Harness or connector between max cool damper servomotor assembly and A/C control assembly</li> <li>• A/C control assembly</li> </ul>

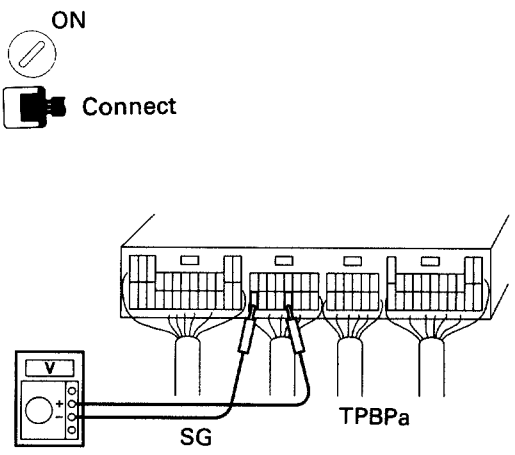
**WIRING DIAGRAM**





# INSPECTION PROCEDURE

**1** Check voltage between terminals TPBP<sub>a</sub> and SG of air conditioning control assembly connector.



**P** Remove air conditioning control assembly with connectors still connected.

**C**

1. Turn ignition switch on.
2. Change the set temperature to activate the max cool damper control servomotor, and measure the voltage between terminals TPBP<sub>a</sub> and SG of air conditioning control assembly connector each time when the set temperature is changed.

**OK**

Set Temperature	Voltage
Max. cool	3.5 - 4.5 V
Max. hot	0.5 - 1.8 V

**Hint** As the set temperature increases the voltage decreases.

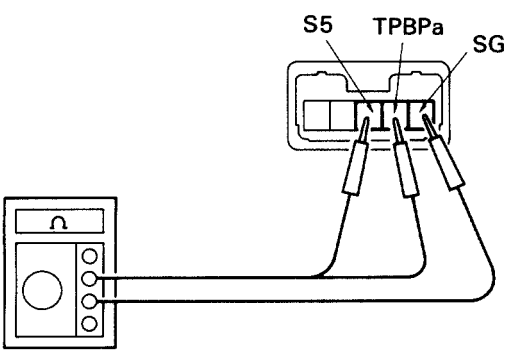
BE3840  
N13226

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26). However, if Diagnostic trouble code 34 or 44 is displayed, check and replace air conditioning control assembly.

**2** Check max cool damper position sensor.



**P**

1. Remove heater unit.
2. Disconnect max cool damper control servomotor assembly connector.

**C** Measure resistance between terminals S5 and SG of max cool damper control servomotor assembly connector.

**OK** Resistance: 4.2 ~ 7.2 kΩ

**C** While operating max cool damper control servomotor, following the procedure on page AC-58, measure resistance between terminals TPBP<sub>a</sub> and SG of max cool damper control servomotor assembly connector.

**OK**

Position	Resistance
Max. cool	3.76 - 5.76 kΩ
Max. warm	0.94 - 1.44 kΩ

**Hint** As the max cool damper control servomotor moves from cool side to warm side, the resistance decreases.

N13233

**OK**

**NG**

Replace max cool damper control servomotor assembly.

**3** Check harness and connector between air conditioning control assembly and max cool damper control servomotor assembly (See page IN-29).

**OK**

**NG**

Repair or replace harness or connector.

Check and replace air conditioning control assembly.

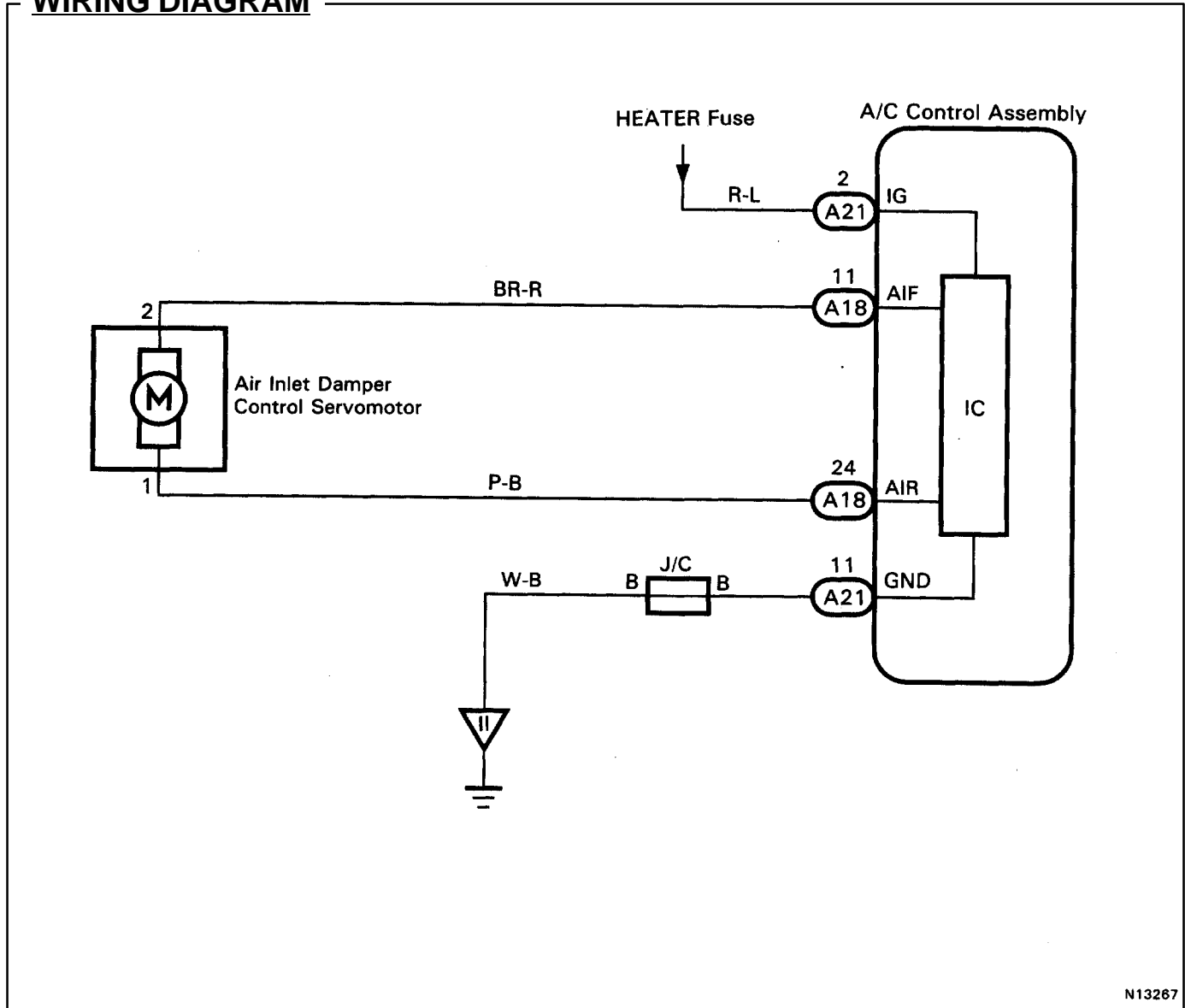
**DTC 42 Air Inlet Damper Control Servomotor Circuit**

**CIRCUIT DESCRIPTION**

The air inlet damper control servomotor is controlled by the air conditioning control assembly and moves the air inlet damper to the desired position.

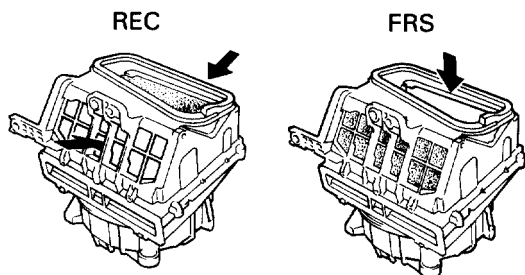
DTC No.	DTC Detecting Condition	Trouble Area
42	Air inlet damper position sensor value does not change even if A/C control assembly operated air inlet damper control servomotor.	<ul style="list-style-type: none"> <li>Air inlet damper position sensor.</li> <li>Harness or connector between air inlet damper control servomotor assembly and A/C control assembly.</li> <li>A/C control assembly.</li> </ul>

**WIRING DIAGRAM**





## INSPECTION PROCEDURE

### 1 Actuator check.



N13217 N13249

- P** 1. Remove glove box to see and check the air inlet damper operation.  
2. Set to the actuator check mode (See page AC-22).  
3. Press the up  switch and change it to step operation.

**C** Press the up  switch in order and check the operation of air inlet damper.

**OK**

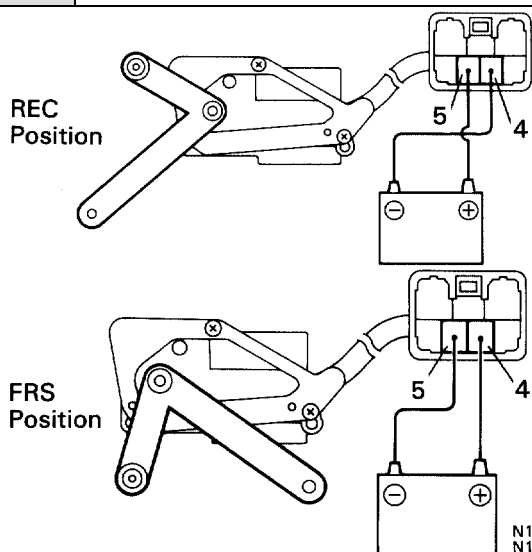
Display Code	Air Inlet Damper
20 ~ 21	FRS
22	F/R
23	REC
24 ~ 29	FRS

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26).

### 2 Check air inlet damper control servomotor.



**P** Remove cooling unit.

**C** Connect positive  $\oplus$  lead to terminal 5 and negative  $\ominus$  lead to terminal 4.

**OK** The lever moves smoothly to REC position.

**C** Connect negative  $\ominus$  lead to terminal 5 and positive  $\oplus$  lead to terminal 4.

**OK** The lever moves smoothly to FRS position.

N13218  
N13219

**OK**

**NG**

Replace air inlet damper control servomotor assembly.

### 3 Check harness and connector between air conditioning control assembly and air inlet damper control servomotor (See page IN-29).

**OK**

**NG**

Repair or replace harness or connector.

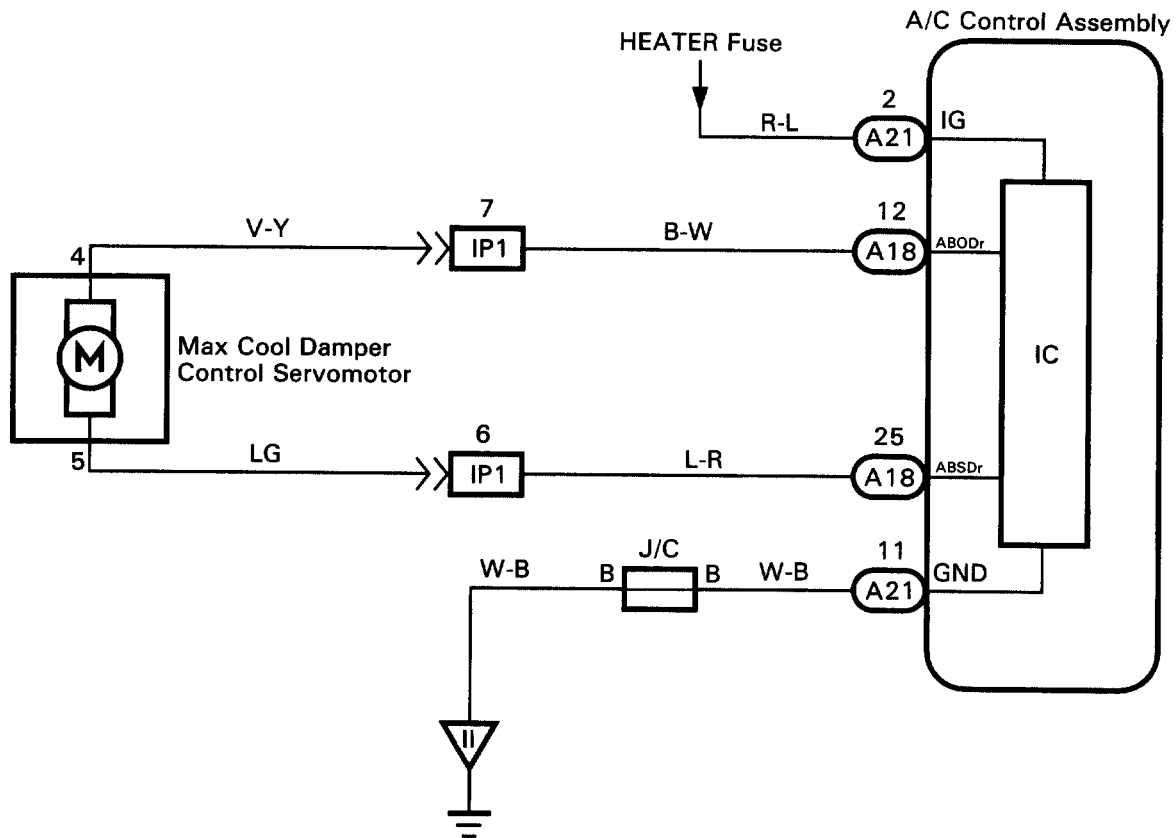
Check and replace air conditioning control assembly.

## Max Cool Damper Control Servomotor Circuit (Driver Side)

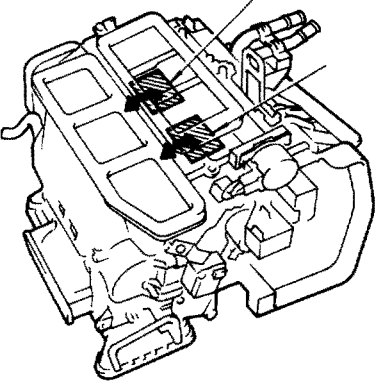
### CIRCUIT DESCRIPTION

The max cool servomotor is controlled by the A/C control assembly and moves the max cool damper to the desired position.

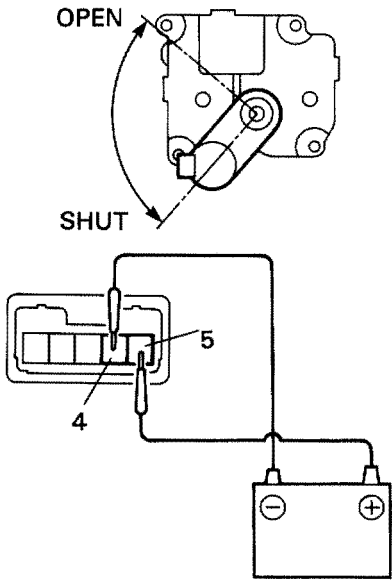
### WIRING DIAGRAM



# INSPECTION PROCEDURE

<b>1</b>	<b>Actuator check.</b>							
<p>Max. Cool Damper</p>  <p style="text-align: right; font-size: small;">N13253</p>		<p><b>P</b> 1. Set to the actuator check mode (See page AC-22). 2. Press the up  switch and change it to step operation.</p> <p><b>C</b> Push the temperature control switch and check that the max. cool damper operates with changes in the vent blower output and damper operation noise.</p> <p><b>OK</b></p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Display Code</th> <th style="padding: 5px;">Max. Cool Damper</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">20 ~ 22</td> <td style="padding: 5px;">Open</td> </tr> <tr> <td style="padding: 5px;">23 ~ 29</td> <td style="padding: 5px;">Shut</td> </tr> </tbody> </table>	Display Code	Max. Cool Damper	20 ~ 22	Open	23 ~ 29	Shut
Display Code	Max. Cool Damper							
20 ~ 22	Open							
23 ~ 29	Shut							

<b>NG</b>	<b>OK</b> Proceed to next circuit inspection shown on matrix chart (See page AC-26).
-----------	--

<b>2</b>	<b>Check max. cool damper control servomotor.</b>	
 <p style="text-align: right; font-size: small;">N13235</p>		<p><b>P</b> Remove heater unit.</p> <p><b>C</b> Connect positive <math>\oplus</math> lead to terminal 5 and negative <math>\ominus</math> lead to terminal 4.</p> <p><b>OK</b> The lever moves smoothly to Shut position.</p> <p><b>C</b> Connect negative <math>\ominus</math> lead to terminal 5 and positive <math>\oplus</math> lead to terminal 4.</p> <p><b>OK</b> The lever moves smoothly to Open position.</p>

<b>OK</b>	<b>NG</b> Replace max. cool damper control servomotor
-----------	---

<b>3</b>	<b>Check harness and connector between air conditioning control assembly and max. cool damper control servomotor, max. cool damper control servomotor and battery (See page IN-29).</b>
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<b>OK</b>	<b>NG</b> Repair or replace harness or connector.
-----------	---

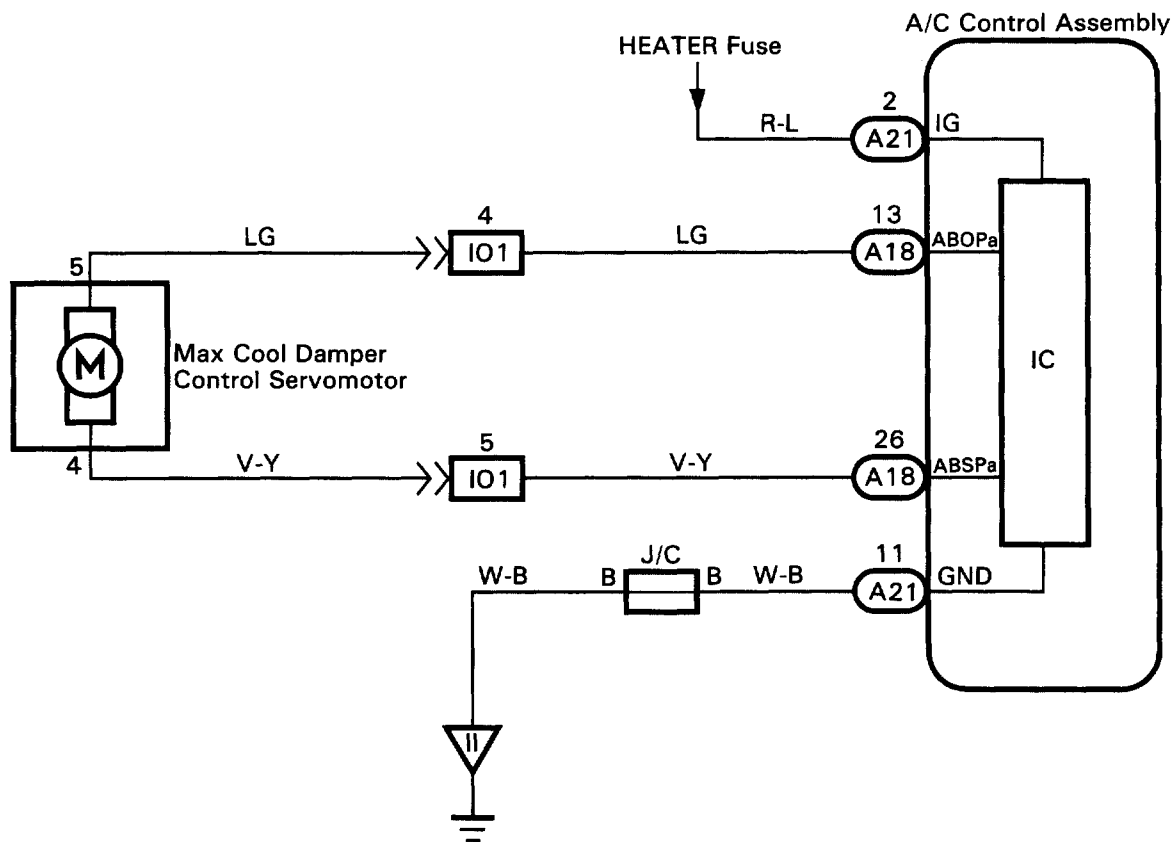
Check and replace air conditioning control assembly.

## Max Cool Damper Control Servomotor Circuit (Passenger Side)

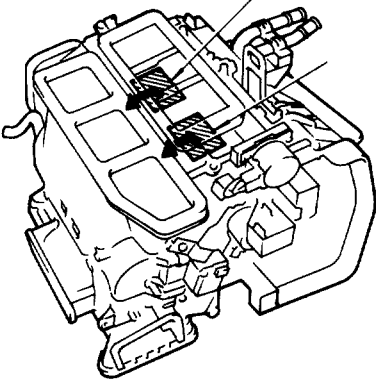
### CIRCUIT DESCRIPTION

The max cool servomotor is controlled by the A/C control assembly and moves the max cool damper to the desired position.

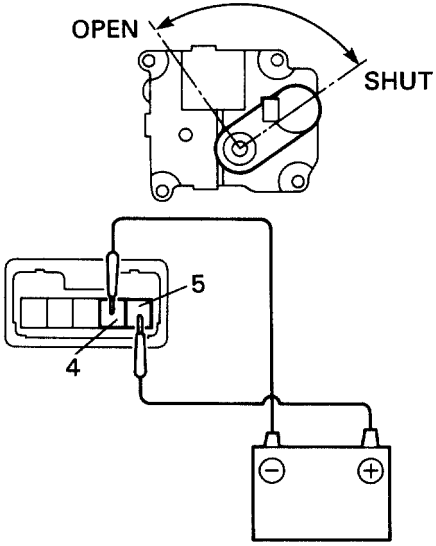
### WIRING DIAGRAM



# INSPECTION PROCEDURE

<b>1</b>	<b>Actuator check.</b>							
<p>Max. Cool Damper</p>  <p style="text-align: right; font-size: small;">N13253</p>		<p><b>P</b> 1. Set to the actuator check mode (See page AC-22). 2. Press the up  switch and change it to step operation.</p> <p><b>C</b> Push the temperature control switch and check that the max. cool damper operates with changes in the vent blower output and damper operation noise.</p> <p><b>OK</b></p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Display Code</th> <th style="padding: 5px;">Max. Cool Damper</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">20 ~ 22</td> <td style="padding: 5px;">Open</td> </tr> <tr> <td style="padding: 5px;">23 ~ 29</td> <td style="padding: 5px;">Shut</td> </tr> </tbody> </table>	Display Code	Max. Cool Damper	20 ~ 22	Open	23 ~ 29	Shut
Display Code	Max. Cool Damper							
20 ~ 22	Open							
23 ~ 29	Shut							

<b>NG</b>	<b>OK</b> Proceed to next circuit inspection shown on matrix chart (See page AC-26).
-----------	--

<b>2</b>	<b>Check max. cool damper control servomotor.</b>	
 <p style="text-align: right; font-size: small;">N13246</p>		<p><b>P</b> Remove heater unit.</p> <p><b>C</b> Connect positive <math>\oplus</math> lead to terminal 5 and negative <math>\ominus</math> lead to terminal 4.</p> <p><b>OK</b> The lever moves smoothly to Shut position.</p> <p><b>C</b> Connect negative <math>\ominus</math> lead to terminal 5 and positive <math>\oplus</math> lead to terminal 4.</p> <p><b>OK</b> The lever moves smoothly to Open position.</p>

<b>OK</b>	<b>NG</b> Replace max. cool damper control servomotor
-----------	---

<b>3</b>	<b>Check harness and connector between air conditioning control assembly and max. cool damper control servomotor, max. cool damper control servomotor and battery (See page IN-29).</b>	
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<b>OK</b>	<b>NG</b> Repair or replace harness or connector.
-----------	---

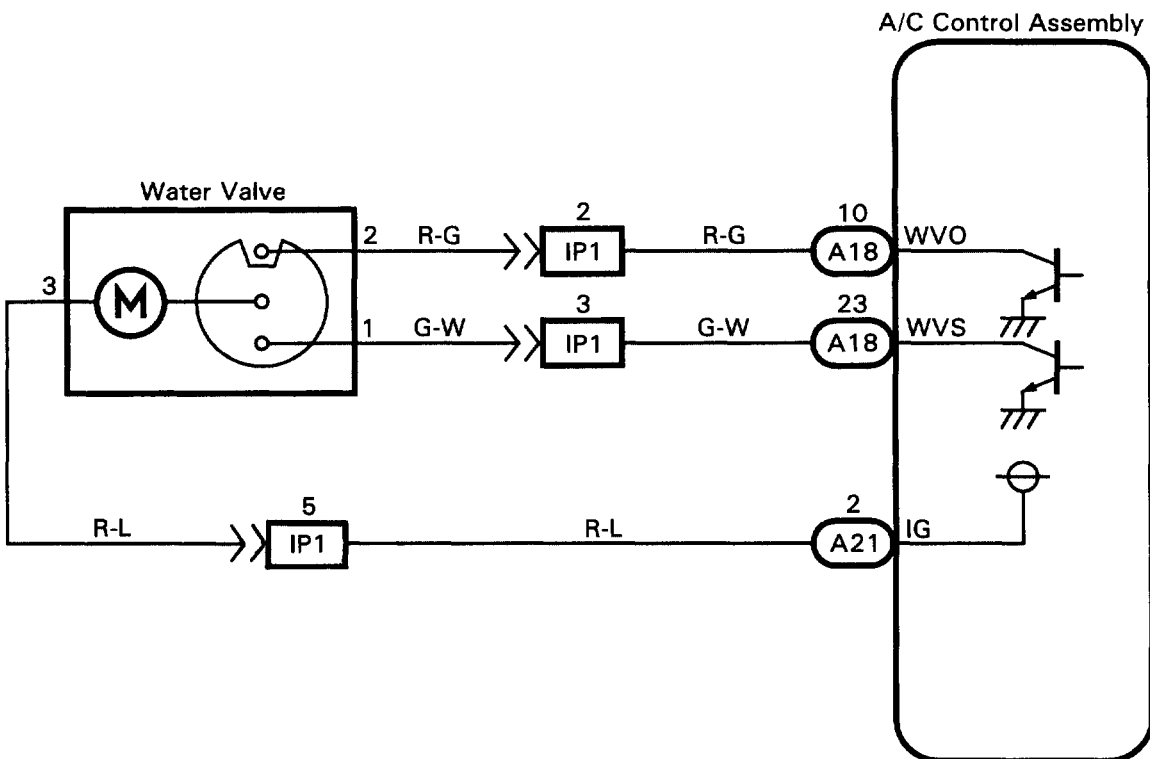
Check and replace air conditioning control assembly.

## Water Valve Control Servomotor Circuit

### CIRCUIT DESCRIPTION

This circuit turns the servomotor and changes each mode damper position by the signals from the A/C control assembly

### WIRING DIAGRAM

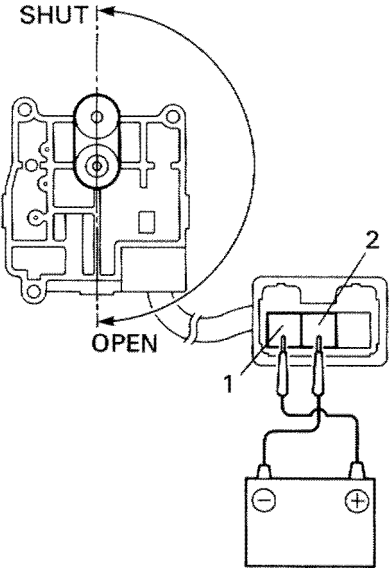




# INSPECTION PROCEDURE

<b>1</b>	<b>Actuator check.</b>							
		<p><b>P</b> 1. Remove glove box to see and check the air inlet damper operation.</p> <p>2. Set to the actuator check mode (See page AC-22).</p> <p>3. Press the up  switch and change it to step operation.</p> <p><b>C</b> Press the up  switch in order and check the operation of air inlet damper.</p> <p><b>OK</b> The condition of the water valve changes with the change in the temperature display, as shown in the table.</p>						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Display Code</th> <th style="width: 50%;">Water Valve</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">20 ~ 22</td> <td style="text-align: center;">SHUT</td> </tr> <tr> <td style="text-align: center;">23 ~ 29</td> <td style="text-align: center;">OPEN</td> </tr> </tbody> </table>		Display Code	Water Valve	20 ~ 22	SHUT	23 ~ 29	OPEN	
Display Code	Water Valve							
20 ~ 22	SHUT							
23 ~ 29	OPEN							

<b>NG</b>	<b>OK</b> Proceed to next circuit inspection shown on matrix chart (See page AC-26).
-----------	--

<b>2</b>	<b>Check water valve control servomotor.</b>	
		<p><b>P</b> Remove cooling unit.</p> <p><b>C</b> Connect positive ⊕ lead to terminal 1 and negative ⊖ lead to terminal 2.</p> <p><b>OK</b> The lever moves smoothly to Open position.</p> <p><b>C</b> Connect negative ⊖ lead to terminal 3 and positive ⊕ lead to terminal 1.</p> <p><b>OK</b> The lever moves smoothly to Shut position.</p>

<b>OK</b>	<b>NG</b> Replace water valve control servomotor assembly.
-----------	--




<b>3</b>	<b>Check harness and connector between air conditioning control assembly and water valve control servomotor (See page IN-29).</b>	
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<b>OK</b>	<b>NG</b> Repair or replace harness or connector.
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Check and replace air conditioning control assembly.

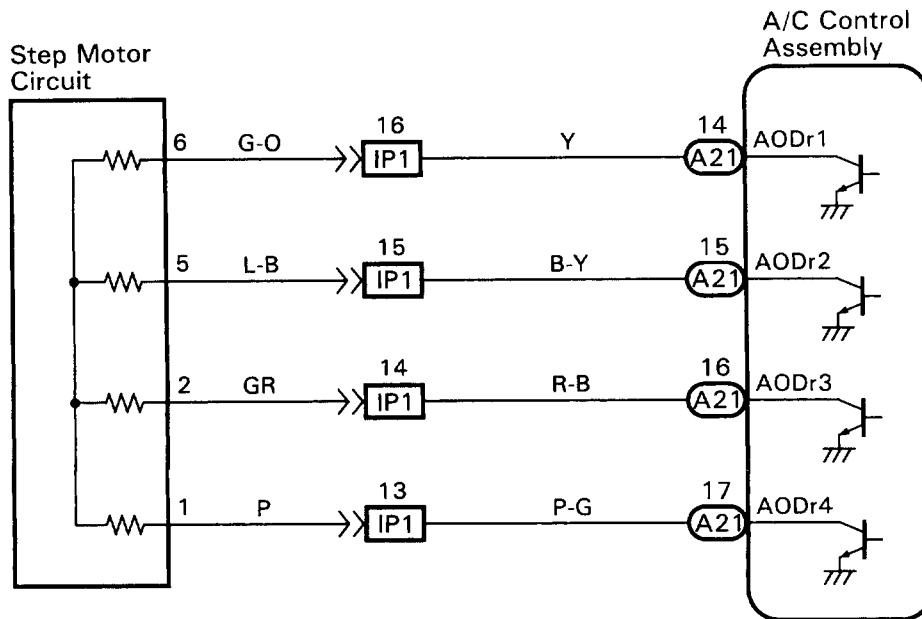
# Air Vent Mode Damper Control Servomotor Circuit

## — CIRCUIT DESCRIPTION —

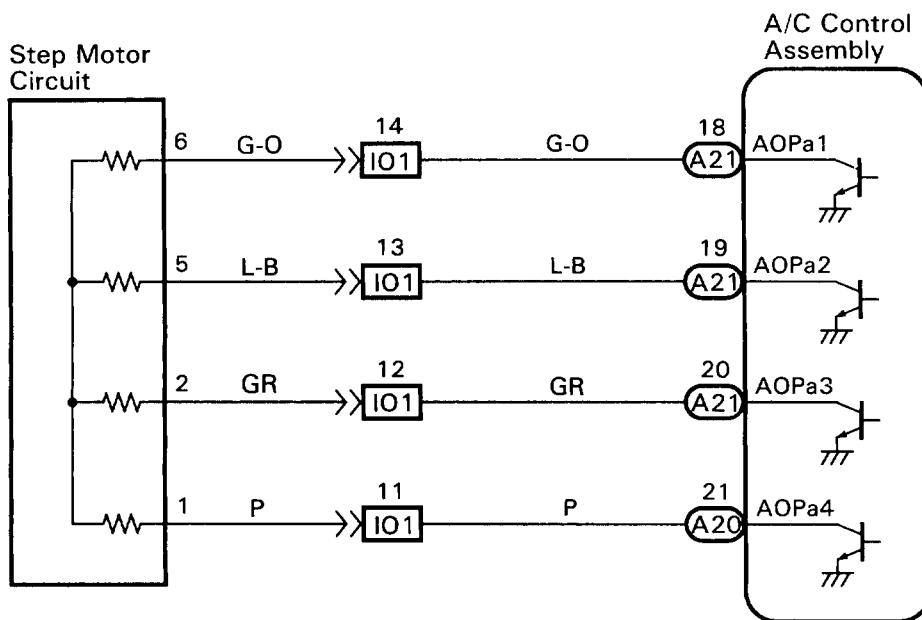
This circuit turns the servomotor and changes each mode damper position by the signals from the A/C control assembly. When the AUTO switch is on, the A/C control assembly changes the mode automatically between  (FACE),  (BI-LEVEL) and  (FOOT) according to the temperature setting.

## WIRING DIAGRAM

< Driver Side >



< Passenger Side >



# INSPECTION PROCEDURE

**1** Actuator check.

Display Code	Air Flow Mode
20 ~ 23	FACE
24 ~ 25	BI-LEVEL
26 ~ 27	FOOT
28	FOOT DEF
29	DEF

**P** 1. Set to the actuator check mode (See page AC-22).  
2. Press the up switch and change to step operation.

**C** Press the up switch in order and check the condition of the air flow mode.

**OK** The mode changes with the change in the temperature display, as shown in the table.

**NG** **OK** Proceed to next circuit inspection shown on matrix chart (See page AC-26).

**2** Check air vent mode damper control step motor

**P** Remove heater unit (See page AC-91).

**C** 1. Measure resistance between terminals ③ ④ and other terminals.

**OK** Resistance

①	②	③	④	⑤	⑥	Standard value
-		+	+			16.0 ~ 18.0 Ω
	-	+	+			↑
		+	+	-		↑
		+	+		-	↑

N13247

**OK** **NG** Replace air vent mode control servomotor.

**3** Check harness and connector between air conditioning control assembly and air vent mode damper control servomotor, air vent mode damper control servomotor and battery, air vent mode damper control servomotor and body ground (See page IN-29).

**OK** **NG** Repair or replace harness or connector.

Check and replace air conditioning control assembly.

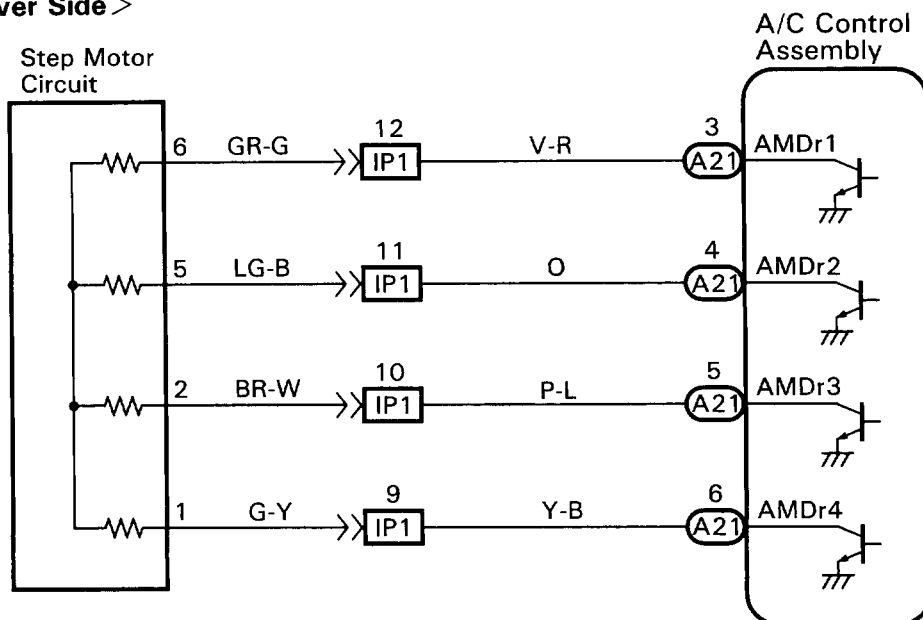
# Air Mix Damper Control Servomotor Circuit

## CIRCUIT DESCRIPTION

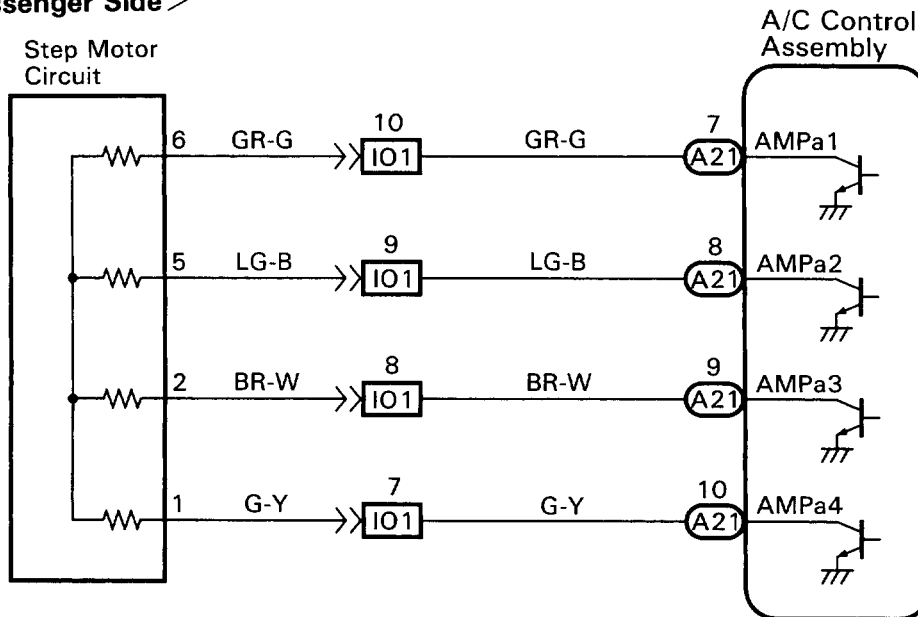
This circuit turns the servomotor and changes each mode damper position by the signals from the A/C control assembly. When the AUTO switch is on, the Air mix damper changes automatically.

## WIRING DIAGRAM

### < Driver Side >



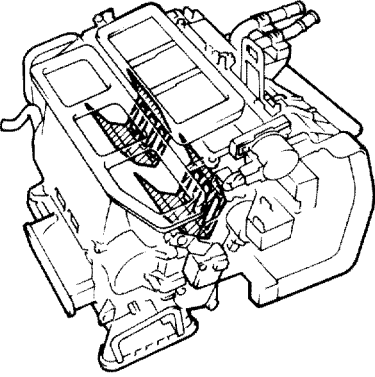
### < Passenger Side >



# INSPECTION PROCEDURE

**1 Actuator check.**

Air Mix Damper



N13255

**P** 1. Warm up the engine.  
2. Set to the actuator check mode (See page AC-22).  
3. Press the up switch and change it to step operation.

**C** Press the up temperature control switch and check the operation of air mix damper and the condition of the blower.

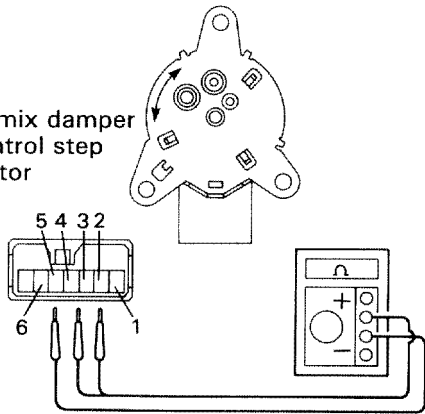
**OK**

Display Code	Air Mix Damper	Condition
20 ~ 23	0%(Fully closed)	Cool air comes out
24 ~ 26	50%	
27 ~ 29	100%(Fully opened)	Warm air comes out

**NG** **OK** Proceed to next circuit inspection shown on matrix chart (See page AC-26).

**2 Check air mix damper control step motor.**

Airmix damper control step motor



N13247

**P** Remove heater unit.

**C** 1. Measure resistance between terminals ③ ④ and other terminals.

**OK** Resistance

①	②	③	④	⑤	⑥	Standard value
—		+	+			16.0 ~ 18.0 Ω
	—	+	+			↑
		+	+	—		↑
		+	+		—	↑

**OK** **NG** Replace air mix damper control step motor.

**3 Check harness and connector between air conditioning control assembly and air mix damper control step motor, air mix damper control step motor and battery, air vent mode damper control step motor and body ground (See page IN-29).**

**OK** **NG** Repair or replace harness or connector.

Check and replace air conditioning control assembly.

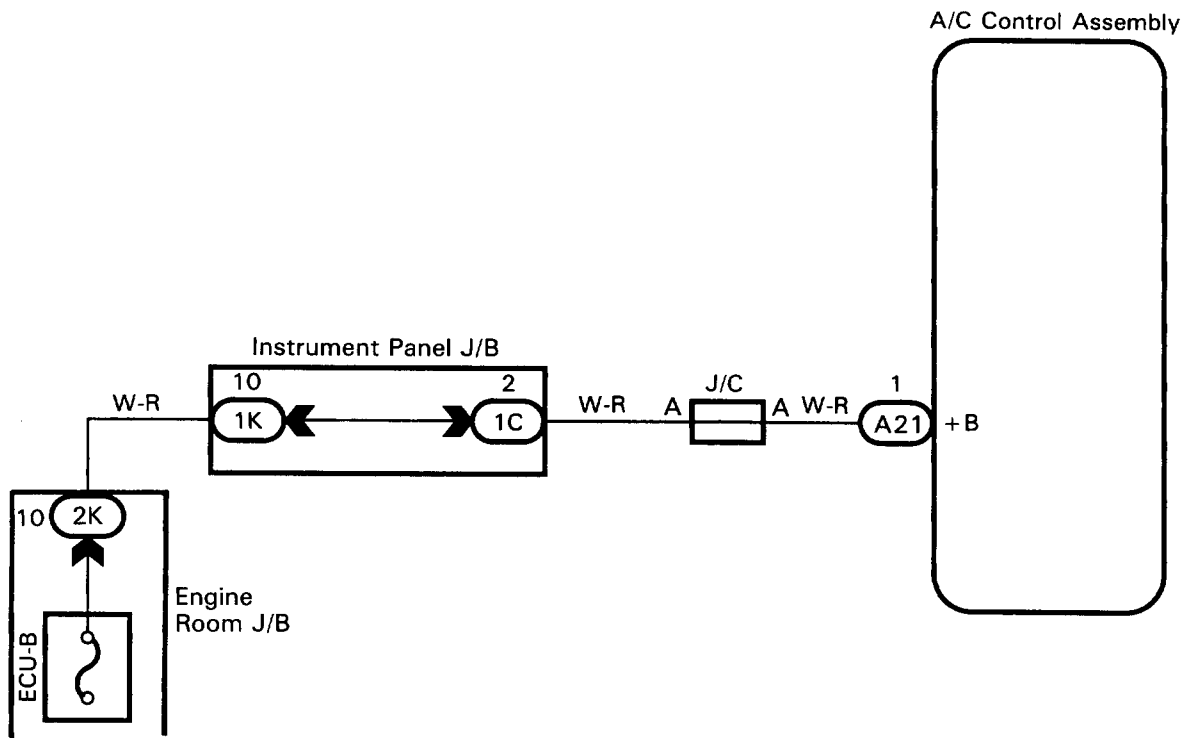
## CIRCUIT INSPECTION

### Back Up Power Source Circuit

#### — CIRCUIT DESCRIPTION —

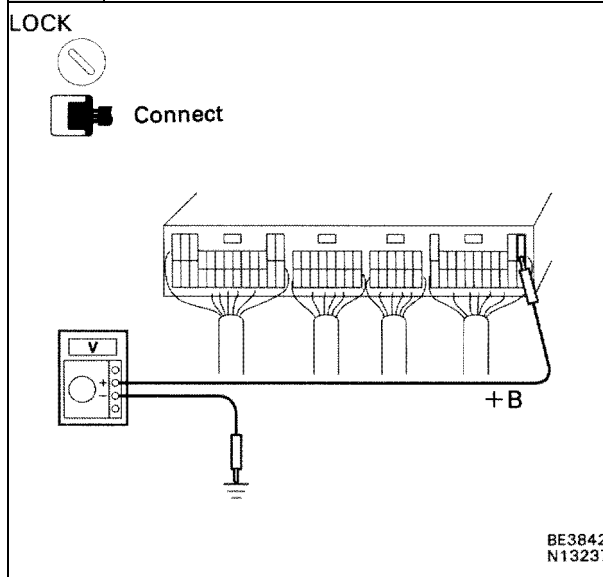
This is the backup power source for the air conditioning control assembly. Power is supplied even when the ignition switch is off and is used for diagnostic trouble code memory, etc.

#### WIRING DIAGRAM



# INSPECTION PROCEDURE

## 1 Check voltage between terminal +B of air conditioning control assembly connector and body ground.



**P** Remove the air conditioning control assembly with connector still connected.

**C** Measure voltage between terminal +B of air conditioning control assembly connector and body ground.

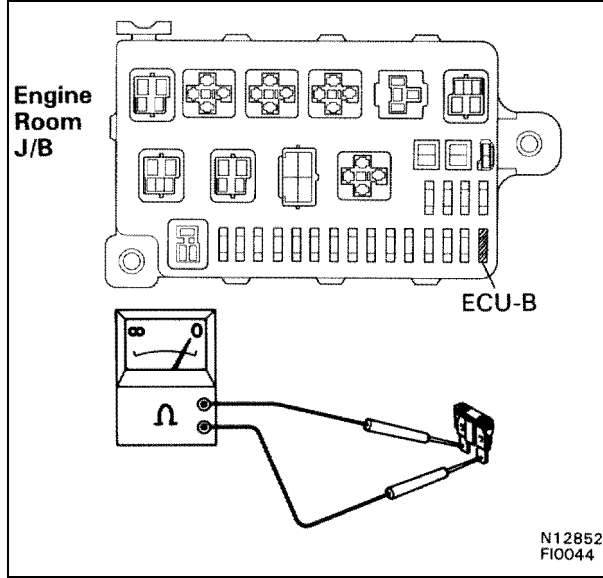
**OK** Voltage: **Battery positive voltage**

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-32).

## 2 Check ECU-B fuse.



**P** Remove ECU-B fuse from Engine Room J/B.

**C** Check continuity of ECU-B fuse.

**OK** Continuity

**OK**

**NG**

Check for short in all the harness and components connected to the ECU-B fuse (See attached wiring diagram).

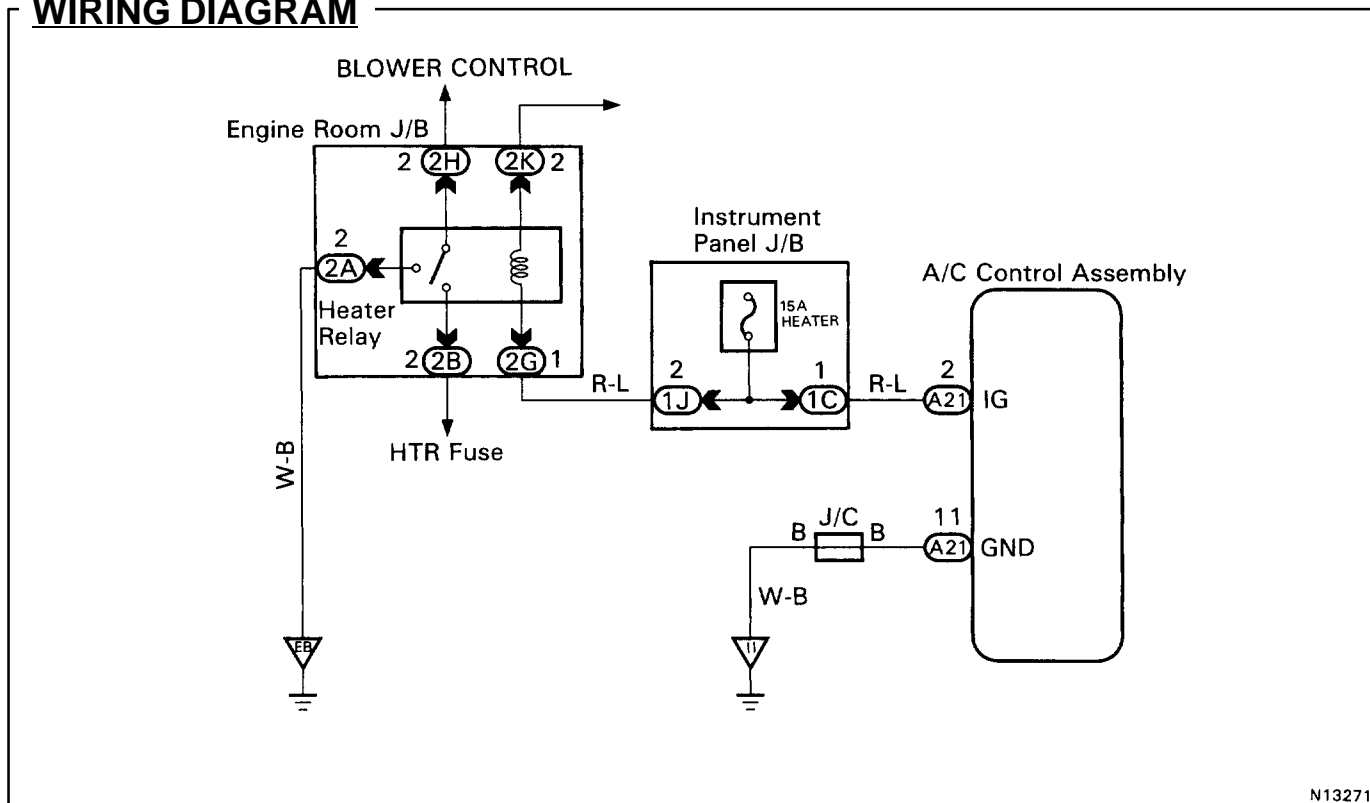
Check and repair harness and connector between air conditioning control assembly and battery.

## IG Power Source Circuit

### CIRCUIT DESCRIPTION

This is the power source for air conditioning control assembly and servomotors, etc.

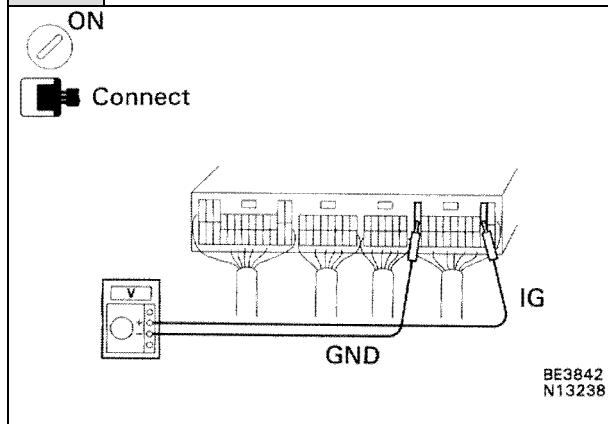
### WIRING DIAGRAM



N13271

### INSPECTION PROCEDURE

#### 1 Check voltage between terminals IG and GND of air conditioning control assembly connector.



**P** Remove air conditioning control assembly with connectors still connected.

- C**
1. Turn ignition switch on.
  2. Measure voltage between terminals IG and GND of air conditioning control assembly.

**OK** Voltage: Battery positive voltage

**NG**

**OK**

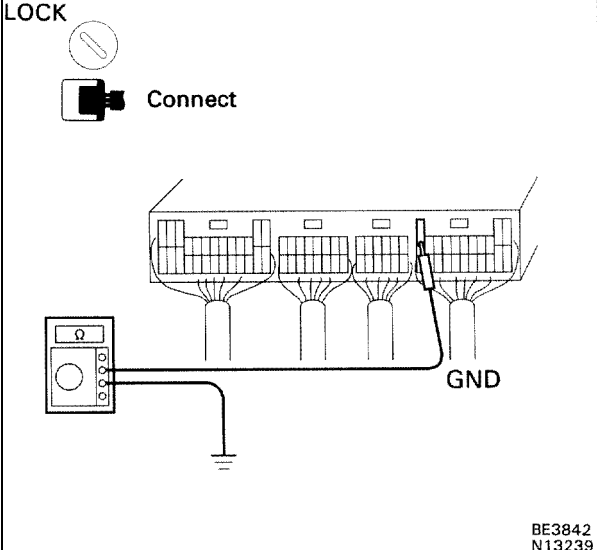
Proceed to next circuit inspection shown on matrix chart. (See page AC-26)

Go to step 2.



**2** Check continuity between terminal GND of air conditioning control assembly and body ground.

LOCK



**C** Measure resistance between terminal GND of air conditioning control assembly and body ground.

**OK** Resistance: 0 Ω (continuity)

BE3842  
N13239

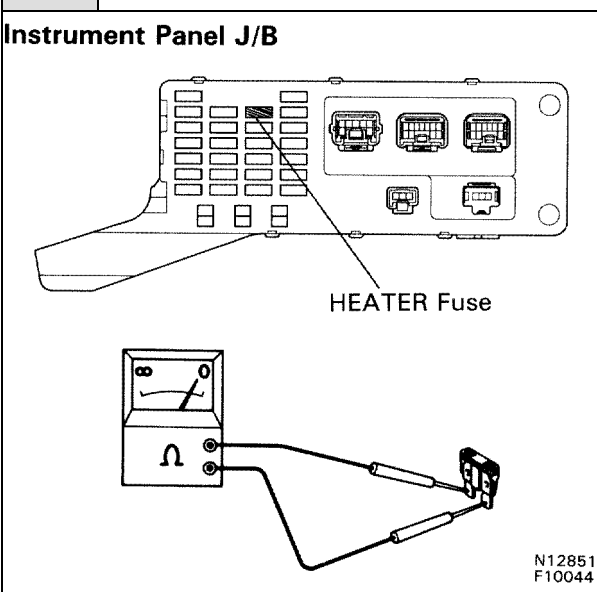
**OK**

**NG**

Repair or replace harness or connector.

**3** Check HEATER fuse.

Instrument Panel J/B



**P** Remove HEATER fuse from Instrument Panel J/B.

**C** Check continuity of HEATER fuse.

**OK** Continuity

N12851  
F10044

**OK**

**NG**

Check for short in all the harness and components connected to the HEATER fuse (See attached wiring diagram).

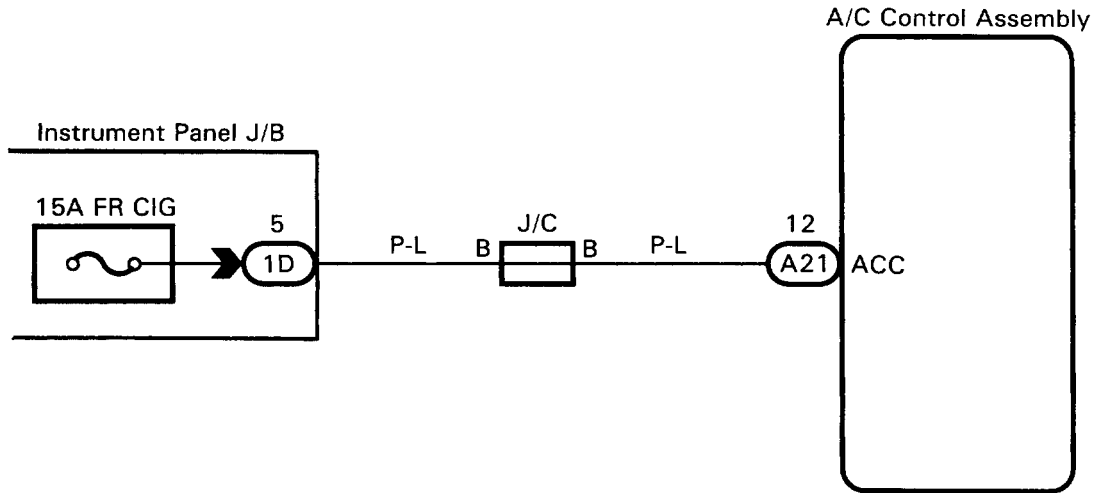
Check and repair harness and connector between air conditioning control assembly and battery.

# ACC Power Source Circuit

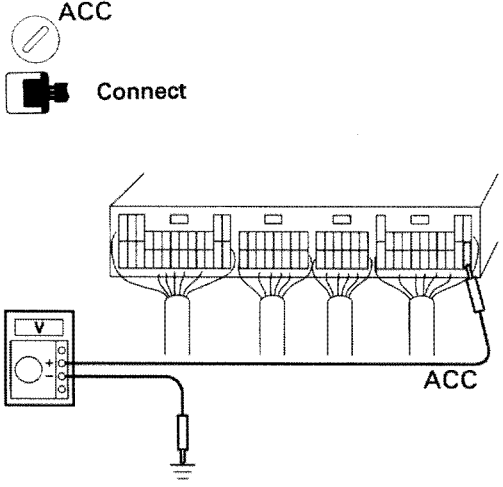
## CIRCUIT DESCRIPTION

This circuit supplies power to the air conditioning control assembly.

## WIRING DIAGRAM



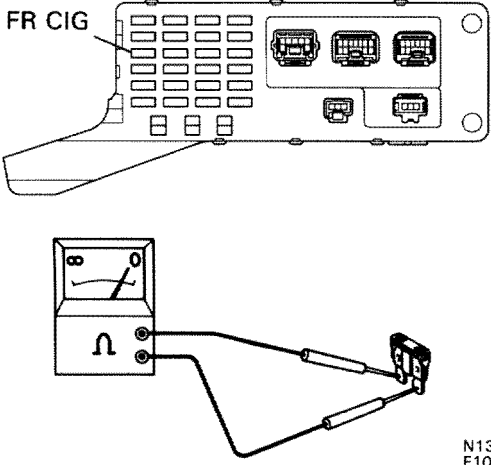
# INSPECTION PROCEDURE

<b>1</b>	<b>Check voltage between terminal ACC of air conditioning control assembly connector and body ground.</b>	
 <p style="text-align: right; font-size: small;">BE3840 N13240</p>		<p><b>P</b> Remove air conditioning control assembly with connector still connected.</p> <p><b>C</b></p> <ol style="list-style-type: none"> <li>1. Turn ignition switch to ACC.</li> <li>2. Measure voltage between terminal ACC of air conditioning control assembly connector and body ground.</li> </ol> <p><b>OK</b> Voltage: <b>Battery positive voltage.</b></p>

NG

OK

Proceed to next circuit inspection shown on matrix chart (See page AC-26).

<b>2</b>	<b>Check FR CIG fuse.</b>	
<p><b>Instrument Panel J/B</b></p>  <p style="text-align: right; font-size: small;">N13328 F10044</p>		<p><b>P</b> Remove FR CIG fuse from Instrument Panel J/B.</p> <p><b>C</b> Check continuity of FR CIG fuse.</p> <p><b>OK</b> Continuity</p>

OK

NG

Check for short in all the harness and components connected to the FR CIG fuse (See attached wiring diagram).

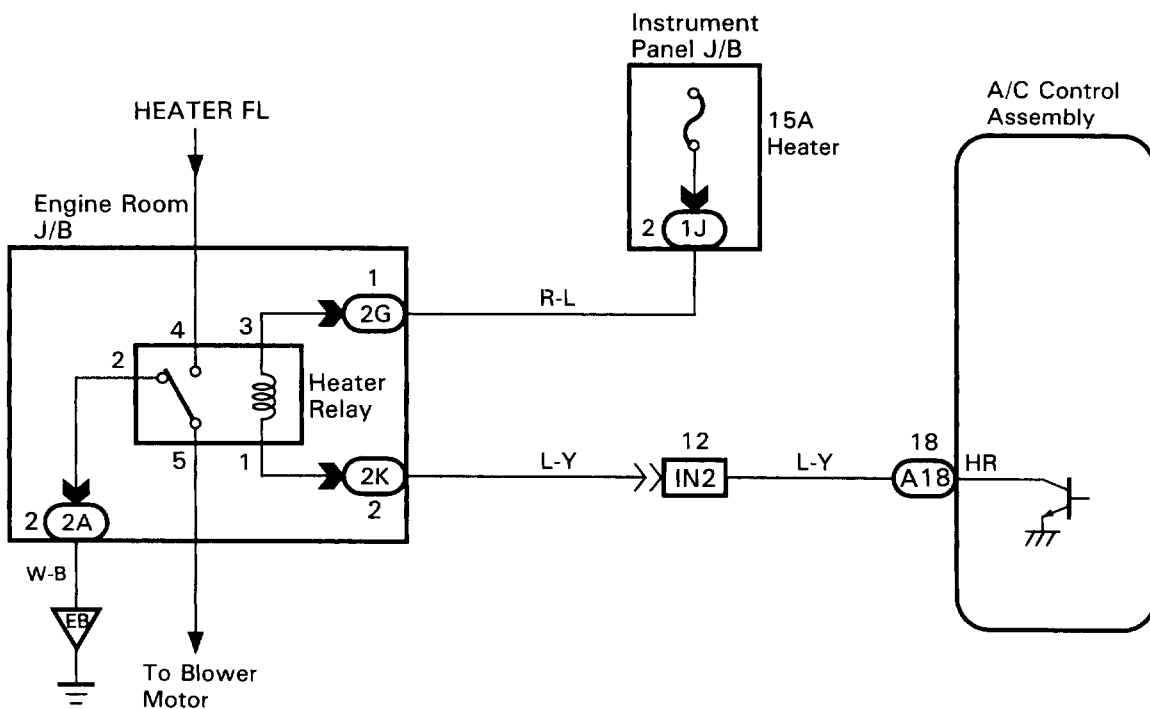
**Check and repair harness and connector between air conditioning control assembly and battery.**

## Heater Main Relay Circuit

### CIRCUIT DESCRIPTION

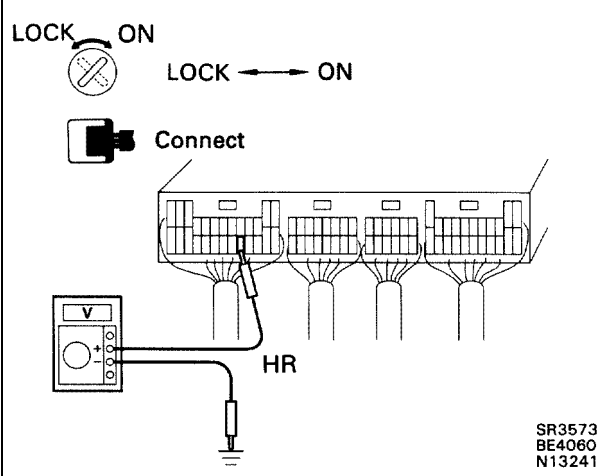
The heater main relay is switched on by signals from the air conditioning control assembly, and switches power to the blower motor.

### WIRING DIAGRAM



# INSPECTION PROCEDURE

**1** Check voltage between terminal HR of air conditioning control assembly connector and body ground.



SR3573  
BE4060  
N13241

**P** Remove air conditioning control assembly with connectors still connected.

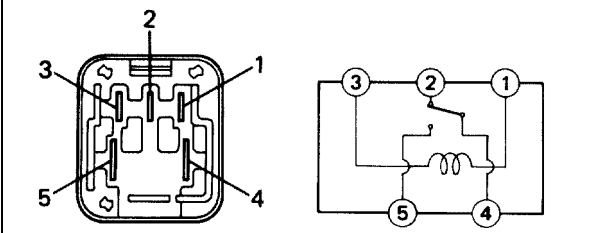
**C** Measure voltage between terminal HR of air conditioning control assembly and body ground when ignition switch is on and off.

**OK**

Ignition Switch	Voltage	
OFF	0 V	
ON	Blower ON	0 V
	Blower OFF	Battery positive voltage

**NG** **OK** Proceed to next circuit inspection shown on matrix chart (See page AC-26).

**2** Check heater relay.



BE1850 BE1844

**C** Check continuity between each pair of terminals of heater relay shown below.

**OK**

Terminals 4 and 5	Open
Terminals 1 and 3 Terminals 2 and 4	Continuity

**P**

1. Apply battery positive voltage between terminals 1 and 3.
2. Check continuity between each pair of terminals shown below.

**OK**

Terminals 2 and 4	Open
Terminals 4 and 5	Continuity

**OK** **NG** Replace heater relay.

**3** Check HEATER fuse.

**OK** **NG** Check for short in all the harness and components connected to the HEATER fuse (See attached wiring diagram).

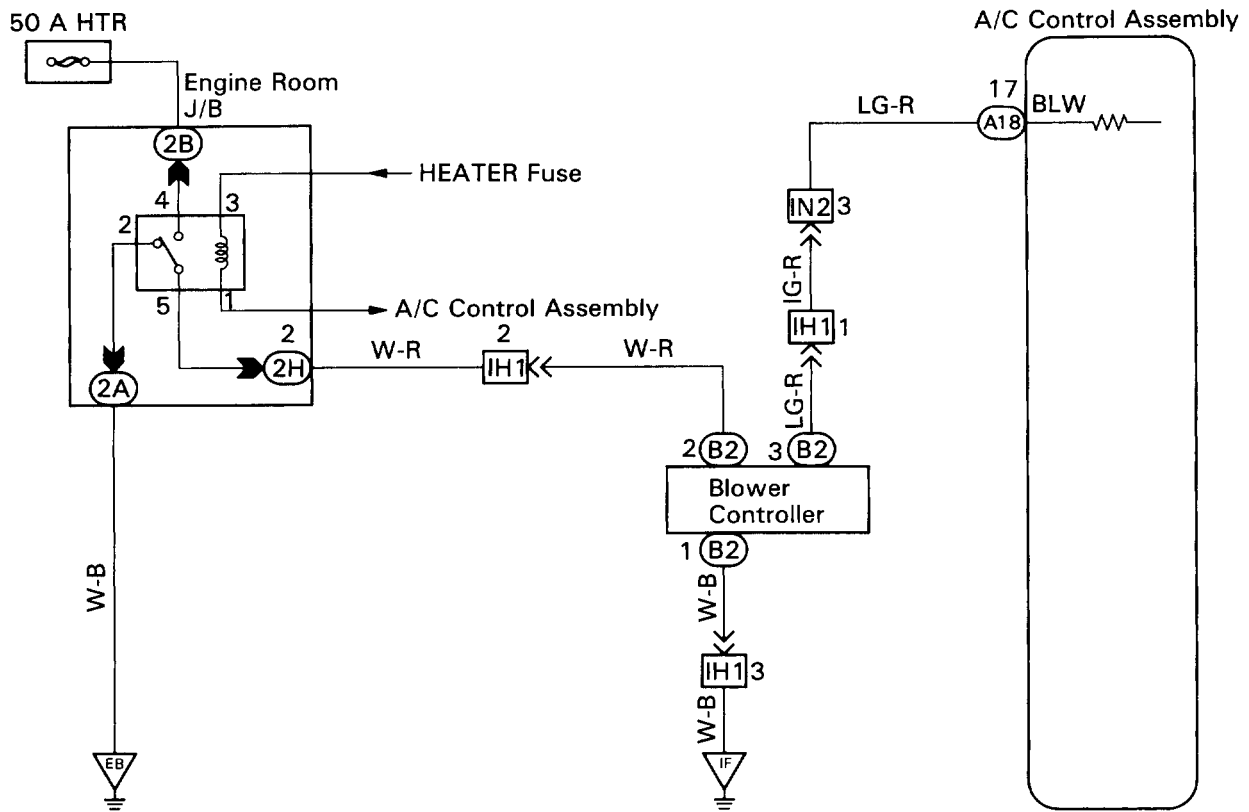
Check and repair harness and connector between air conditioning control assembly and battery.

# Blower Motor Circuit

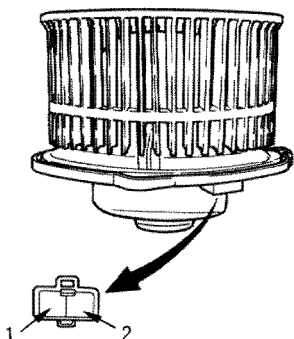
## CIRCUIT DESCRIPTION

This is the power source for the blower motor.

## WIRING DIAGRAM



## INSPECTION PROCEDURE

<b>1</b>	<b>Check blower motor.</b>
	
<p><b>P</b> Remove blower motor (See page <a href="#">AC-111</a>).</p> <p><b>C</b> Connect positive <math>\oplus</math> lead connected to terminal 2 of blower motor connector, negative <math>\ominus</math> lead to terminal 1.</p> <p><b>OK</b> Blower motor operates smoothly.</p>	
N13787	

**OK**

**NG**

Replace blower motor.

<b>2</b>	<b>Check standard value between terminals BLW and GND of A/C control assembly (See page <a href="#">IN-23</a>).</b>
----------	---

**OK**

**NG**

Replace A/C control assembly.

<b>3</b>	<b>Check harness and connector between battery and blower motor, blower motor and body ground (See page <a href="#">IN-29</a>).</b>
----------	---

**OK**

**NG**

Repair or replace harness or connector.

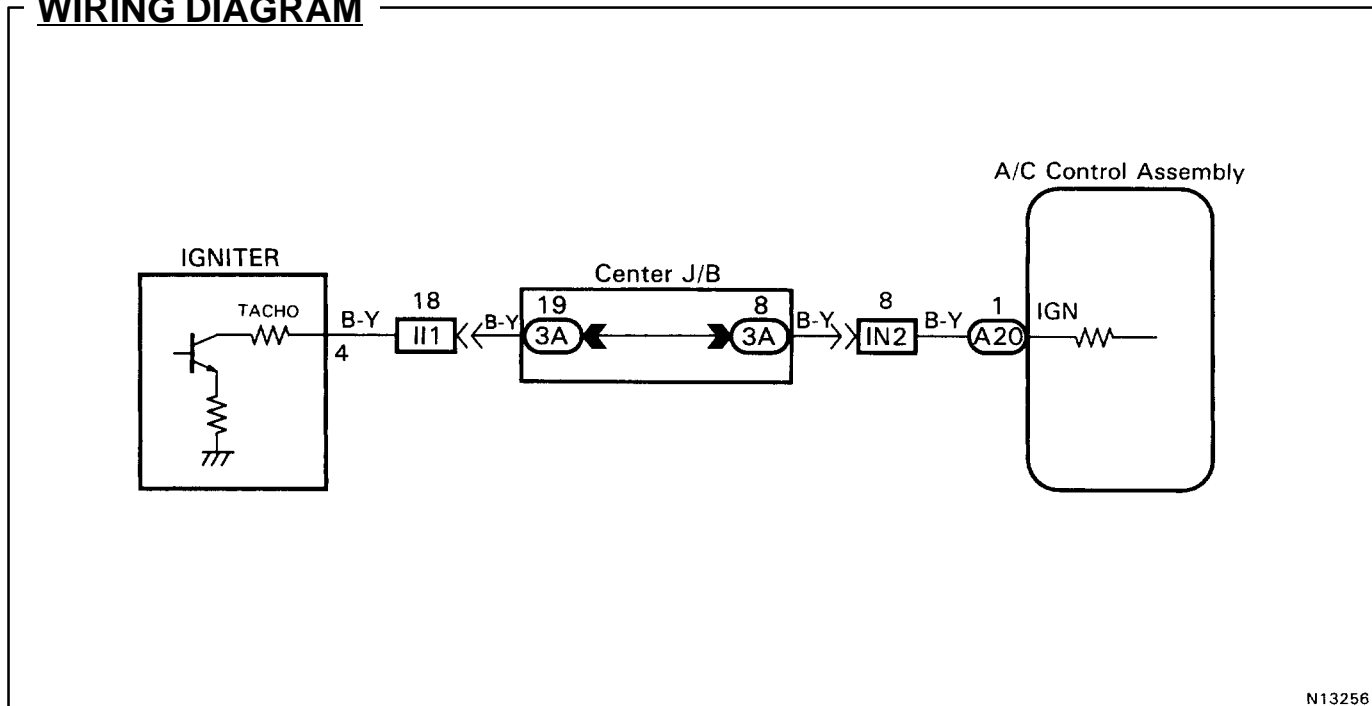
Replace blower controller.

## Igniter Circuit

### CIRCUIT DESCRIPTION

The air conditioning control assembly monitors the engine speed through signals sent from the igniter. The air conditioning control assembly uses these signals and compressor speed signals to detect the compressor lock condition.

### WIRING DIAGRAM



### INSPECTION PROCEDURE

**1** Check operation of tachometer.

**P** Check that the tachometer operates normally.

OK

NG

Proceed to combination, meter troubleshooting (See page [BE-131](#)).

**2** Check harness and connector between air conditioning control assembly and igniter (See page [IN-29](#)).

OK

NG

Repair or replace harness or connector.

Proceed to next circuit inspection shown on matrix chart (See page [AC-26](#)).



# Compressor Circuit

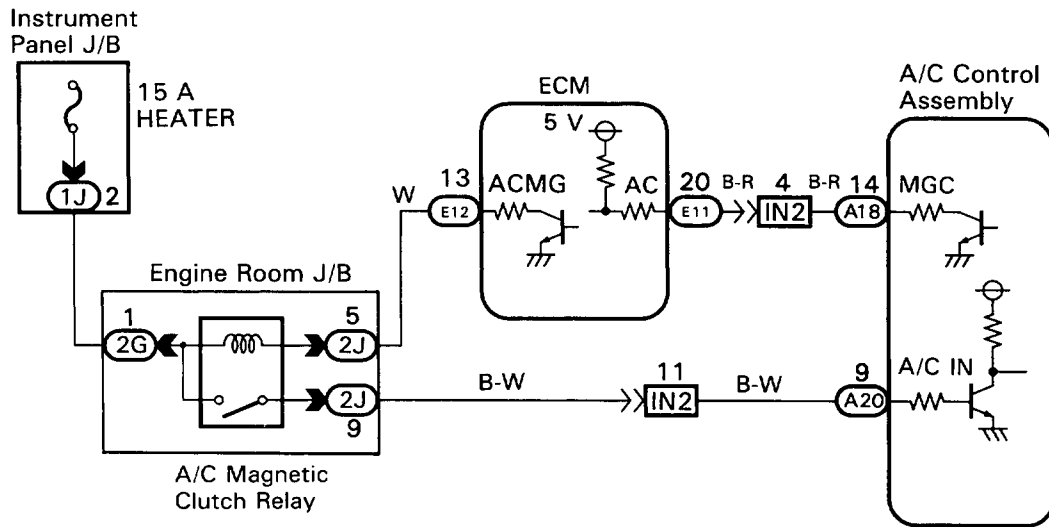
## CIRCUIT DESCRIPTION

The air conditioning control assembly outputs the magnetic clutch ON signal from terminal MGC to the ECM. When the ECM receives this signal, it sends a signal from terminal ACMG and switches the air conditioning magnetic clutch relay on, thus turning the air conditioning compressor magnetic clutch on. The air conditioning control assembly also monitors at terminal A/C IN whether or not power is being supplied to the magnetic clutch.

## DIAGNOSTIC CHART

See next page for the Diagnostic Chart.

## WIRING DIAGRAM



# INSPECTION PROCEDURE

**1** Check voltage between terminal A/C IN of air conditioning control assembly connector and body ground.

ON

Connect

A/C IN

BE3840  
N13242

**P** Remove air conditioning control assembly with connectors still connected.

**C**

1. Start the engine.
2. Push one of fan speed control switches (Lo, Med or Hi).
3. Check voltage between terminal A/C IN of air conditioning control assembly connector and body ground when A/C switch is on and off.

**OK**

A/C Switch	Voltage
ON	Battery positive voltage
OFF	0 V

OK

NG

Go to step 4.

**2** Check A/C compressor magnetic clutch.

Compressor

N06478

**P** Disconnect magnetic clutch connector.

**C** Connect positive ⊕ lead connected to battery to magnetic clutch connector terminal.

**OK** Magnetic clutch is energized.

OK

NG

Repair A/C compressor magnetic clutch.

**3** Check harness and connector between A/C compressor and compressor relay (See page [IN-29](#)).

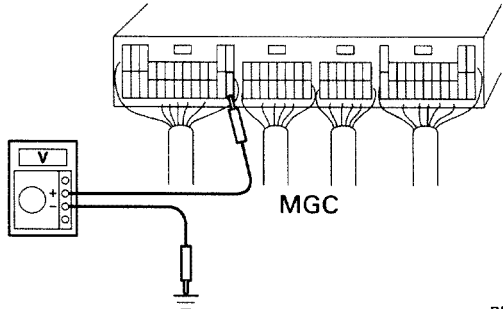
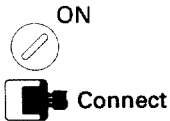
OK

NG

Repair or replace harness or connector.

Proceed to next circuit inspection shown on matrix chart (See page [AC-26](#)).

**4 Check connector between terminal MGC of air conditioning control assembly connector and body ground.**



BE3840  
N13243

**C**

1. Turn ignition switch on.
2. Push one of the switches (Lo, Med or Hi).
3. Check voltage between terminal MGC of air conditioning control assembly connector and body ground when A/C switch is on and off.

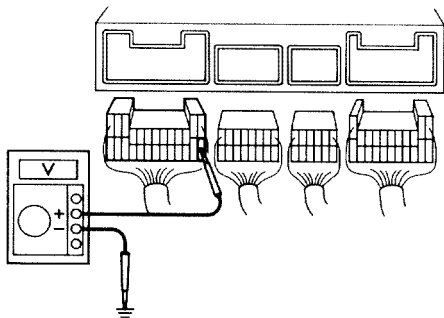
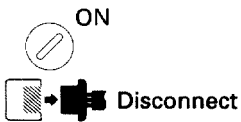
**OK**

A/C Switch	Voltage
ON	0 V
OFF	10 - 14 V

**NG**

**OK** Go to step 7.

**5 Check voltage between terminal MGC of air conditioning control assembly harness side connector and body ground.**



BE3841  
N13244

**P**

Disconnect air conditioning control assembly connector.

**C**

1. Turn ignition switch on.
2. Check voltage between terminal MGC of air conditioning control assembly harness side connector and body ground.

**OK** Voltage: 10 - 14 V

**NG**

**OK** Check and replace air conditioning control assembly.

**6 Check harness and connector between air conditioning control assembly and ECM (See page IN-29).**

**OK**

**NG** Repair or replace harness or connector.

Check and replace ECM.

**7 Check magnetic clutch relay.**

BE1647 BE1840

**P** Remove magnetic clutch relay.

**C** Check continuity between each pair of terminals shown below, for the magnetic clutch relay.

**OK**

Terminals 1 and 3	Continuity
Terminals 2 and 4	Open

**P**

1. Apply battery positive voltage between terminals 1 and 3.
2. Check continuity between terminals 2 and 4.

**OK**

Terminals 2 and 4	Continuity
-------------------	------------

OK

NG

**Replace magnetic clutch relay.**

**8 Check voltage between terminal A/C MG of ECM and body ground.**

BE3840 F16830

**P** Remove ECM with connectors still connected.

**C**

1. Turn ignition switch on.
2. Push one of the fan speed control switches (Lo, Med or Hi).
3. Measure voltage between terminal A/C MG of ECM connector and body ground.

**OK**

A/C Switch	Voltage
ON	Approx. 1.3 V
OFF	Battery positive voltage ~ 1.3 V

NG

OK

**Go to step 10.**

**9 Check harness and connector between ECM and battery (See page IN-29).**

OK

NG

**Repair or replace harness or connector.**

Check and replace ECM.

**10 Check harness and connector between air conditioning control assembly and compressor relay, compressor relay and battery (See page IN-29).**

OK

NG

**Repair or replace harness or connector.**

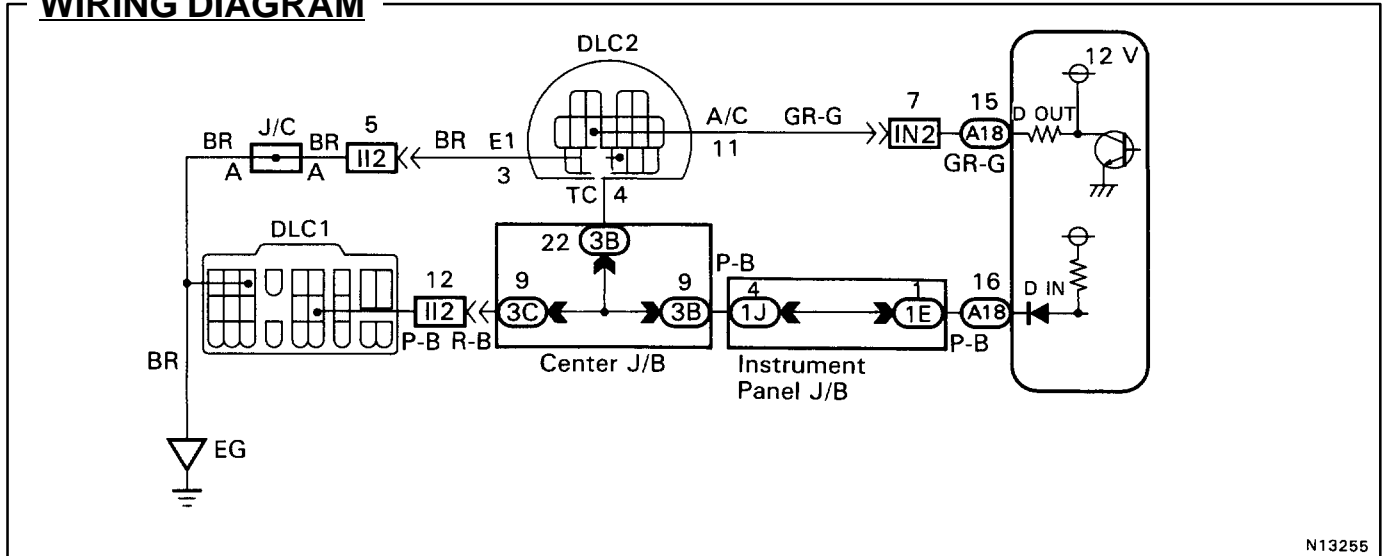
Check and replace air conditioning control assembly.

# Diagnosis Circuit

## CIRCUIT DESCRIPTION

This circuit sends signals to the A/C control assembly requesting output of diagnostic trouble codes.

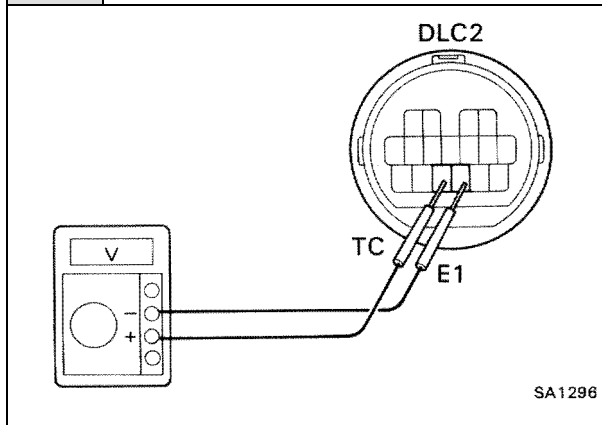
## WIRING DIAGRAM



N13255

## INSPECTION PROCEDURE

### 1 Check voltage between terminals Tc and E1 of DLC2.



SA1296

- C**
1. Turn ignition switch on.
  2. Check voltage between terminals TC and E1 of DLC2.

**OK** Voltage: Battery positive voltage

**NG**

**OK**

Proceed to next circuit inspection shown on matrix chart (See page AC-26).

### 2 Check harness and connector between air conditioning control assembly and DLC2, DLC2 and body ground (See page IN-29).

**OK**

**NG**

Repair or replace harness or connector.

Check and replace air conditioning control assembly.

# REFRIGERANT SYSTEM INSPECTION WITH MANIFOLD GAUGE SET

AC0N0-0H

This is a method in which the trouble is located by using a manifold gauge set.

(See "USE OF MANIFOLD GAUGE SET" on page AC-11)

Read the manifold gauge pressure when the following conditions are established:

- Temperature at the air inlet with the switch set at RECIRC is 30–35°C (86–95°F)
- Engine running at 1,500 rpm
- Blower speed control switch set at high
- Temperature control set at max. cool

**HINT:** It should be noted that the gauge indications may vary slightly due to ambient temperature conditions.

## 1. NORMALLY FUNCTIONING REFRIGERATION SYSTEM

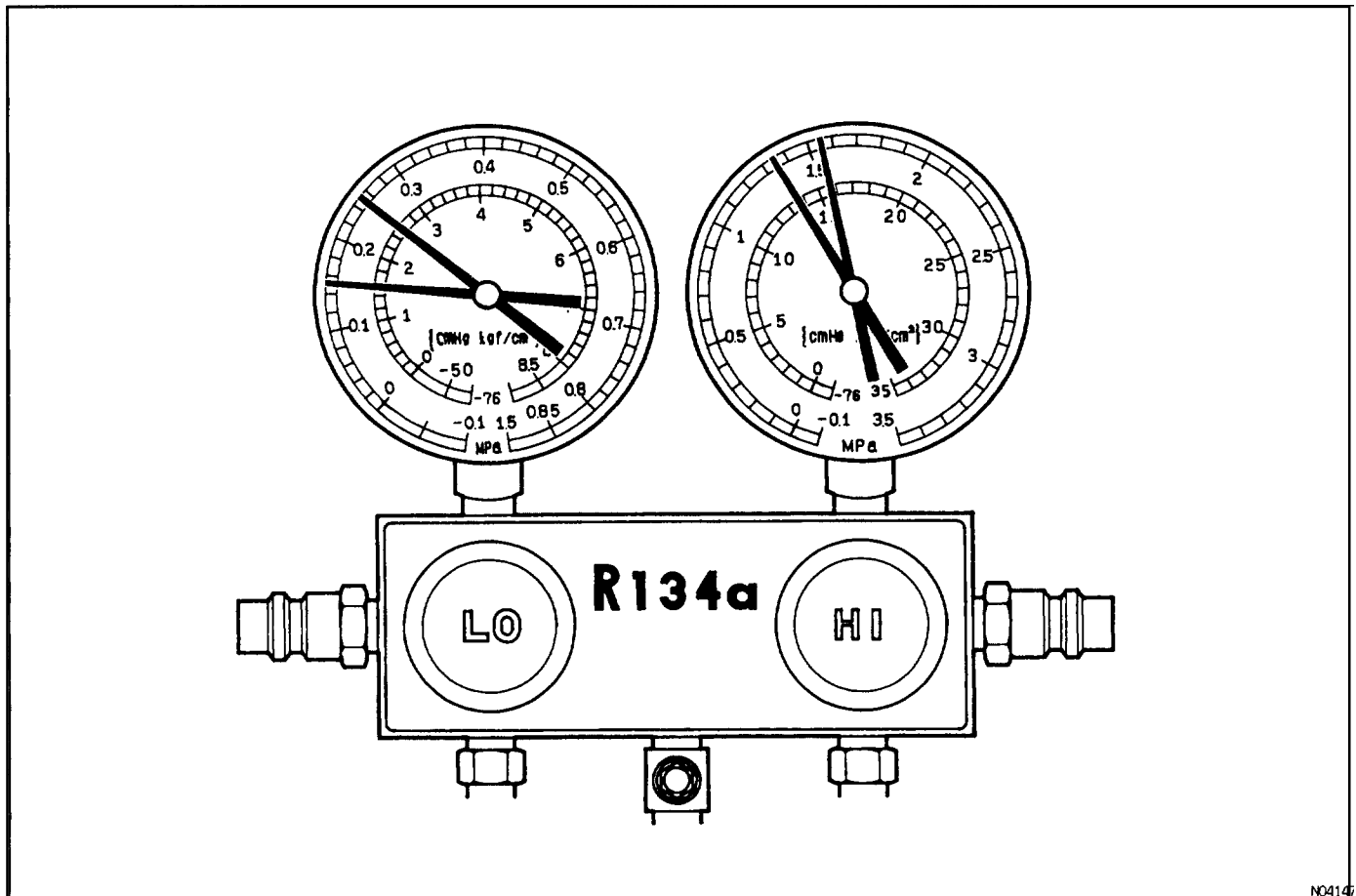
Gauge reading:

Low pressure side:

0.15–0.25 MPa (1.5–2.5 kgf/cm)

High pressure side:

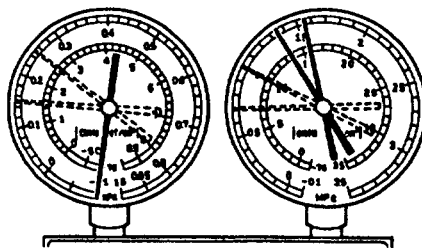
1.37–1.57 MPa (14–16 kgf/cm)



N04147

## 2. MOISTURE PRESENT IN REFRIGERATION SYSTEM

Condition: Periodically cools and then fails to cool

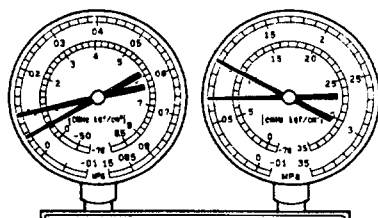


NO4148

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>During operation, pressure on low pressure side sometimes becomes a vacuum and sometimes normal</li> </ul>	<ul style="list-style-type: none"> <li>Moisture entered in refrigeration system freezes at expansion valve orifice and temporarily stops cycle, but normal state is restored after a time when the ice melts</li> </ul>	<ul style="list-style-type: none"> <li>Drier in oversaturated state ↓</li> <li>Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant</li> </ul>	<ol style="list-style-type: none"> <li>Replace receiver/drier</li> <li>Remove moisture in cycle through repeatedly evacuating air</li> <li>Charge new refrigerant to proper amount</li> </ol>

## 3. INSUFFICIENT REFRIGERANT

Condition: Insufficient cooling

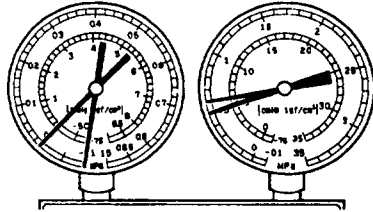


NO4149

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>Pressure low on both low and high pressure sides</li> <li>Bubbles seen in sight glass continuously</li> <li>Insufficient cooling performance</li> </ul>	<ul style="list-style-type: none"> <li>Gas leakage at some place in refrigeration system</li> </ul>	<ul style="list-style-type: none"> <li>Insufficient refrigerant in system ↓</li> <li>Refrigerant leaking</li> </ul>	<ol style="list-style-type: none"> <li>Check for gas leakage with leak detector and repair if necessary</li> <li>Charge refrigerant to proper amount</li> <li>If pressure indicated value is near 0 when connected to gauge, create the vacuum after inspecting and repairing the location of the leak</li> </ol>

4. POOR CIRCULATION OF REFRIGERANT

Condition: Insufficient cooling

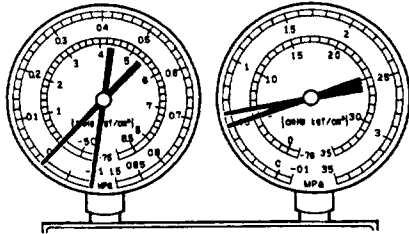


N04150

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>• Pressure low on both low and high pressure sides</li> <li>• Frost on tubes from receiver to unit</li> </ul>	<ul style="list-style-type: none"> <li>• Refrigerant flow obstructed by dirt in receiver</li> </ul>	<ul style="list-style-type: none"> <li>• Receiver clogged</li> </ul>	<ul style="list-style-type: none"> <li>• Replace receiver</li> </ul>

5. REFRIGERANT DOES NOT CIRCULATE

Condition: Does not cool (Cools from time to time in some cases)



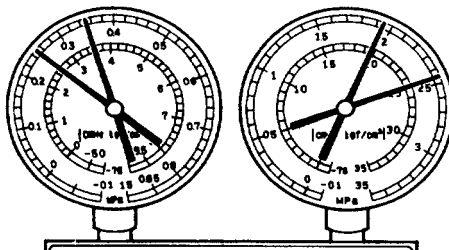
N04150

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>• Vacuum indicated on low pressure side, very low pressure indicated on high pressure side</li> <li>• Frost or dew seen on piping before and after receiver/drier or expansion valve</li> </ul>	<ul style="list-style-type: none"> <li>• Refrigerant flow obstructed by moisture or dirt in refrigeration system</li> <li>• Refrigerant flow obstructed by gas leakage from expansion valve heat sensing tube</li> </ul>	<ul style="list-style-type: none"> <li>• Refrigerant does not circulate</li> </ul>	<ol style="list-style-type: none"> <li>(1) Check heat sensing tube, expansion valve and EPR</li> <li>(2) Clean out dirt in expansion valve by blowing with air If not able to remove dirt, replace expansion valve</li> <li>(3) Replace receiver</li> <li>(4) Evacuate air and charge new refrigerant to proper amount. For gas leakage from heat sensing tube, replace expansion valve.</li> </ol>



## 6. REFRIGERANT OVERCHARGE OR INSUFFICIENT COOLING OF CONDENSER

Condition: Insufficient Cooling

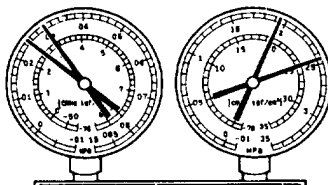


N04151

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>Pressure too high on both low and high pressure sides</li> <li>No air bubbles seen through the sight glass even when the engine rpm is lowered.</li> </ul>	<ul style="list-style-type: none"> <li>Unable to develop sufficient performance due to excessive refrigerant in system</li> <li>Insufficient cooling of condenser</li> </ul>	<ul style="list-style-type: none"> <li>Excessive refrigerant in cycle → refrigerant overcharged</li> <li>Condenser cooling insufficient → condenser fins clogged or fan motor faulty</li> </ul>	<ol style="list-style-type: none"> <li>Clean condenser</li> <li>Check fan motor operation</li> <li>If (1) and (2) are in normal state, check amount of refrigerant Charge proper amount of refrigerant</li> </ol>

## 7. AIR PRESENT IN REFRIGERATION SYSTEM

Condition: Insufficient Cooling



NOTE: These gauge indications are shown when the refrigeration system has been opened and the refrigerant charged without vacuum purging.

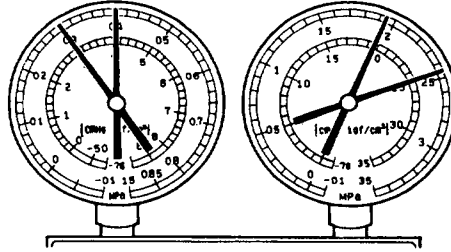
N04153

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>Pressure too high on both low and high pressure sides</li> <li>The low pressure piping is hot to the touch</li> <li>Bubbles seen in sight glass</li> </ul>	<ul style="list-style-type: none"> <li>Air entered in refrigeration system</li> </ul>	<ul style="list-style-type: none"> <li>Air present in refrigeration system ↓</li> <li>Insufficient vacuum purging</li> </ul>	<ol style="list-style-type: none"> <li>Check compressor oil to see if dirty or insufficient</li> <li>Evacuate air and charge new refrigerant</li> </ol>

V01033

**8. EXPANSION VALVE IMPROPERLY MOUNTED/HEAT SENSING TUBE DEFECTIVE (OPENS TOO WIDE)**

Condition: Insufficient cooling

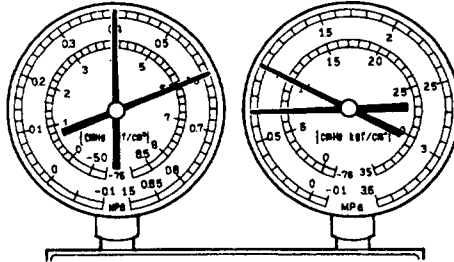


N04152

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>• Pressure too high on both low and high pressure sides</li> <li>• Frost or large amount of dew on piping on low pressure side</li> </ul>	<ul style="list-style-type: none"> <li>• Trouble in expansion valve or heat sensing tube not installed correctly</li> </ul>	<ul style="list-style-type: none"> <li>• Excessive refrigerant in low pressure piping ↓</li> <li>• Expansion valve opened too wide</li> </ul>	<ul style="list-style-type: none"> <li>(1) Check heat sensing tube installed condition</li> <li>(2) If (1) is normal, check expansion valve Replace if defective</li> </ul>

**9. DEFECTIVE COMPRESSION COMPRESSOR**

Condition: Does not cool



N04146

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>• Pressure too high on low pressure side</li> <li>• Pressure too low on high pressure side</li> </ul>	<ul style="list-style-type: none"> <li>• Internal leak in compressor</li> </ul>	<ul style="list-style-type: none"> <li>• Compression defective ↓</li> <li>• Valve leaking or broken, sliding parts</li> </ul>	<ul style="list-style-type: none"> <li>• Repair or replace compressor</li> </ul>