

### 8. Diagnostic Procedure for Sensors

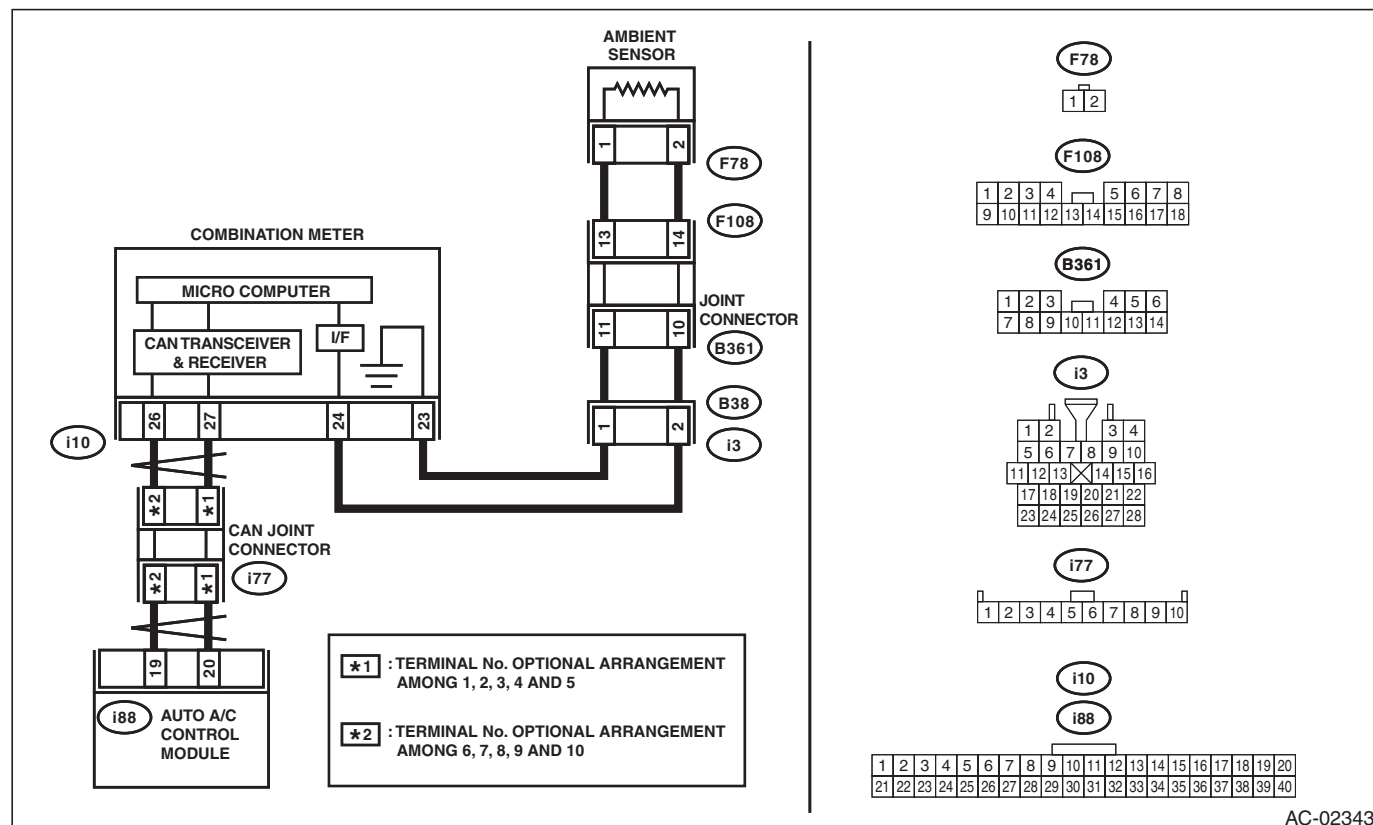
#### A: AMBIENT SENSOR

##### TROUBLE SYMPTOM:

- Fan speed is not switched when the fan dial is in AUTO position.
- Failure related to the ambient sensor is indicated in self-diagnosis.

##### WIRING DIAGRAM:

Air conditioning system, auto A/C model <Ref. to WI-77, AUTO A/C MODEL, WIRING DIAGRAM, Air Conditioning System.>



AC-02343

| Step                                                                                                                                                                                                        | Check                                     | Yes           | No                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------|----------------------------------------------------------------------------------------|
| <b>1 CHECK AMBIENT SENSOR.</b><br>Perform the inspection of ambient sensor unit.<br><Ref. to AC-45, INSPECTION, Ambient Sensor (Auto A/C Model).>                                                           | Is the ambient sensor operating properly? | Go to step 2. | Replace the ambient sensor. <Ref. to AC-44, REMOVAL, Ambient Sensor (Auto A/C Model).> |
| <b>2 CHECK INPUT SIGNAL FOR AMBIENT SENSOR.</b><br>1) Turn the ignition to ON.<br>2) Measure the voltage between connector (F78) terminals.<br><b>Connector &amp; terminal (F78) No. 2 (+) — No. 1 (-):</b> | Is the voltage approx. 5 V?               | Go to step 6. | Go to step 3.                                                                          |

## Diagnostic Procedure for Sensors

### HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

| Step                                                                                                                                                                                                                                                                                                                                                                                                                           | Check                               | Yes                                                                             | No                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>3 CHECK COMBINATION METER OUTPUT SIGNAL.</b><br>1) Turn the ignition switch to OFF.<br>2) Pull out the combination meter.<br>3) Disconnect the connector from ambient sensor.<br>4) Turn the ignition switch to ON.<br>5) Measure the voltage between the combination meter connector terminals.<br><b>Connector &amp; terminal</b><br><b>(i10) No. 24 (+) — No. 23 (-):</b>                                                | Is the voltage approx. 5 V?         | Go to step 4.                                                                   | Replace the combination meter.<br><Ref. to IDI-16, REMOVAL, Combination Meter.>                                                                                    |
| <b>4 CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND AMBIENT SENSOR.</b><br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the combination meter.<br>3) Measure the resistance of harness between combination meter and ambient sensor.<br><b>Connector &amp; terminal</b><br><b>(F78) No. 2 — (i10) No. 24:</b>                                                                                | Is the resistance less than 1 Ω?    | Go to step 5.                                                                   | Repair the open circuit of the harness between the combination meter and ambient sensor.                                                                           |
| <b>5 CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND AMBIENT SENSOR.</b><br>Measure the resistance of harness between combination meter and ambient sensor.<br><b>Connector &amp; terminal</b><br><b>(F78) No. 1 — (i10) No. 23:</b>                                                                                                                                                                                     | Is the resistance less than 1 Ω?    | Replace the combination meter.<br><Ref. to IDI-16, REMOVAL, Combination Meter.> | Repair the open circuit of the harness between the combination meter and ambient sensor.                                                                           |
| <b>6 CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND AUTO A/C CONTROL MODULE.</b><br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the combination meter.<br>3) Disconnect the auto A/C control module connector.<br>4) Measure the resistance of harness between the combination meter and auto A/C control module.<br><b>Connector &amp; terminal</b><br><b>(i88) No. 19 — (i10) No. 26:</b> | Is the resistance less than 1 Ω?    | Go to step 7.                                                                   | Repair the open circuit in the harness between the combination meter and auto A/C control module. <Ref. to LAN(diag)-6, LAN SYSTEM, CAUTION, General Description.> |
| <b>7 CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND AUTO A/C CONTROL MODULE.</b><br>Measure the resistance of harness between the combination meter and auto A/C control module.<br><b>Connector &amp; terminal</b><br><b>(i88) No. 20 — (i10) No. 27:</b>                                                                                                                                                              | Is the resistance less than 1 Ω?    | Go to step 8.                                                                   | Repair the open circuit in the harness between the combination meter and auto A/C control module. <Ref. to LAN(diag)-6, LAN SYSTEM, CAUTION, General Description.> |
| <b>8 CHECK FOR POOR CONTACT.</b><br>Check poor contact of auto A/C control module connector.                                                                                                                                                                                                                                                                                                                                   | Is there poor contact of connector? | Repair the connector.                                                           | Replace the auto A/C control module. <Ref. to AC-31, REMOVAL, Control Unit (Auto A/C Model).>                                                                      |

# Diagnostic Procedure for Sensors

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

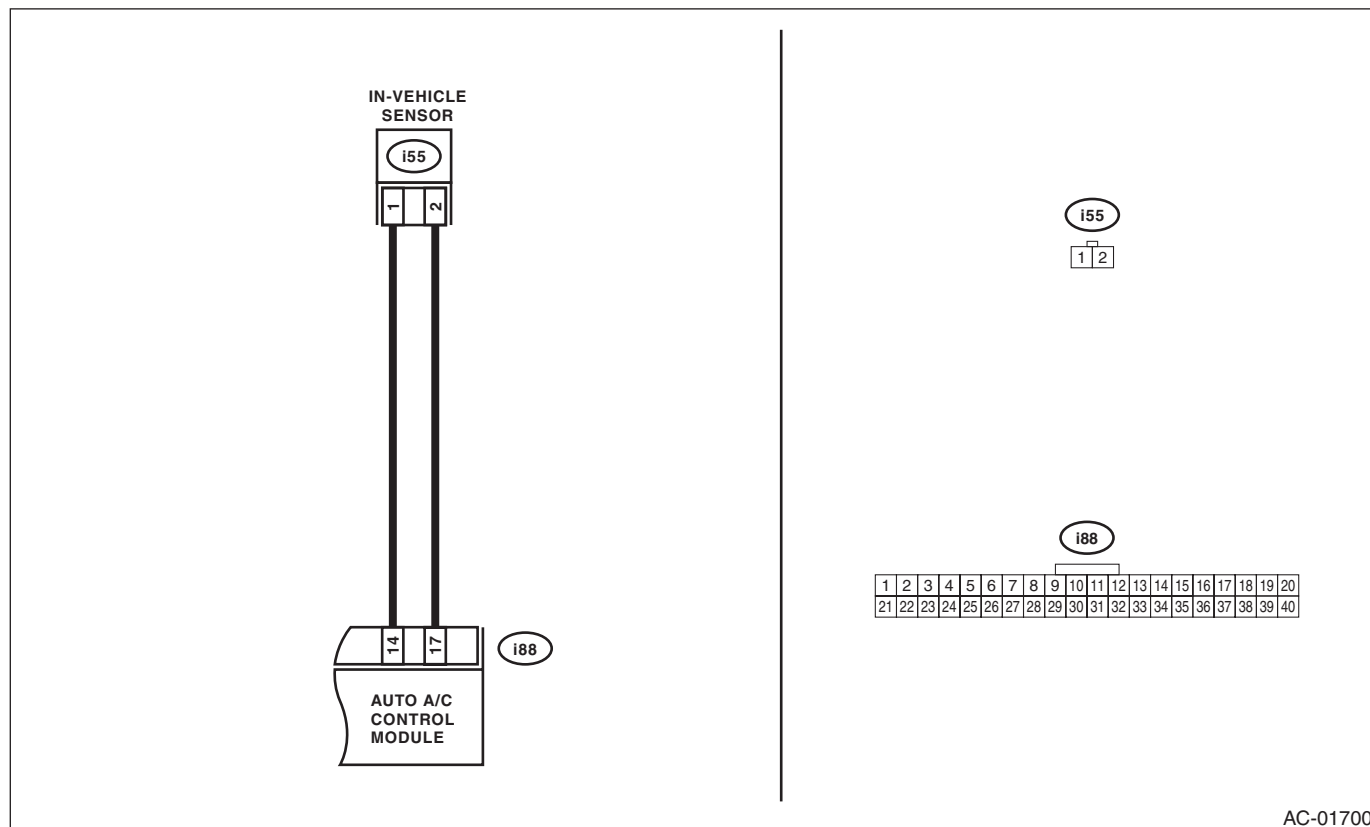
## B: IN-VEHICLE SENSOR

### TROUBLE SYMPTOM:

- Blower fan speed, air flow outlet and FRESH/RECIRC do not change after turning the AUTO switch to ON.
- Failure related to the in-vehicle sensor is indicated in self-diagnosis.

### WIRING DIAGRAM:

Air conditioning system, auto A/C model <Ref. to WI-77, AUTO A/C MODEL, WIRING DIAGRAM, Air Conditioning System.>



| Step                                                                                                                                                                                                                                                                                                                                             | Check                            | Yes           | No                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------|-------------------------------------------------------------------------------------------------|
| <b>1 CHECK IN-VEHICLE SENSOR.</b><br>Perform the inspection of in-vehicle sensor unit.<br><Ref. to AC-48, INSPECTION, In-Vehicle Sensor (Auto A/C Model).>                                                                                                                                                                                       | Is the in-vehicle sensor normal? | Go to step 2. | Replace the in-vehicle sensor.<br><Ref. to AC-47, REMOVAL, In-Vehicle Sensor (Auto A/C Model).> |
| <b>2 CHECK INPUT SIGNAL FOR IN-VEHICLE SENSOR.</b><br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between in-vehicle sensor harness connector terminals.<br><b>Connector &amp; terminal</b><br><b>(i55) No. 2 (+) — No. 1 (-):</b>                                                                                              | Is the voltage approx. 5 V?      | Go to step 6. | Go to step 3.                                                                                   |
| <b>3 CHECK AUTO A/C CONTROL MODULE OUTPUT SIGNAL.</b><br>1) Turn the ignition switch to OFF.<br>2) Remove the auto A/C control module.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between connector terminals of auto A/C control module.<br><b>Connector &amp; terminal</b><br><b>(i88) No. 17 (+) — (i88) No. 14 (-):</b> | Is the voltage approx. 5 V?      | Go to step 4. | Go to step 6.                                                                                   |

## Diagnostic Procedure for Sensors

### HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

| Step                                                                                                                                                                                                                                                                                                                                                                    | Check                                    | Yes                   | No                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------|
| <b>4</b><br><b>CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND IN-VEHICLE SENSOR.</b><br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the auto A/C control module.<br>3) Measure the resistance of harness between auto A/C control module and in-vehicle sensor.<br><b>Connector &amp; terminal</b><br><b>(i55) No. 2 — (i88) No. 17:</b> | Is the resistance less than 1 $\Omega$ ? | Go to step 5.         | Repair the harness between auto A/C control module and in-vehicle sensor.                     |
| <b>5</b><br><b>CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND IN-VEHICLE SENSOR.</b><br>Measure the resistance of harness between auto A/C control module and in-vehicle sensor.<br><b>Connector &amp; terminal</b><br><b>(i55) No. 1 — (i88) No. 14:</b>                                                                                                            | Is the resistance less than 1 $\Omega$ ? | Go to step 6.         | Repair the harness between auto A/C control module and in-vehicle sensor.                     |
| <b>6</b><br><b>CHECK FOR POOR CONTACT.</b><br>Check poor contact of auto A/C control module connector.                                                                                                                                                                                                                                                                  | Is there poor contact of connector?      | Repair the connector. | Replace the auto A/C control module. <Ref. to AC-31, REMOVAL, Control Unit (Auto A/C Model).> |

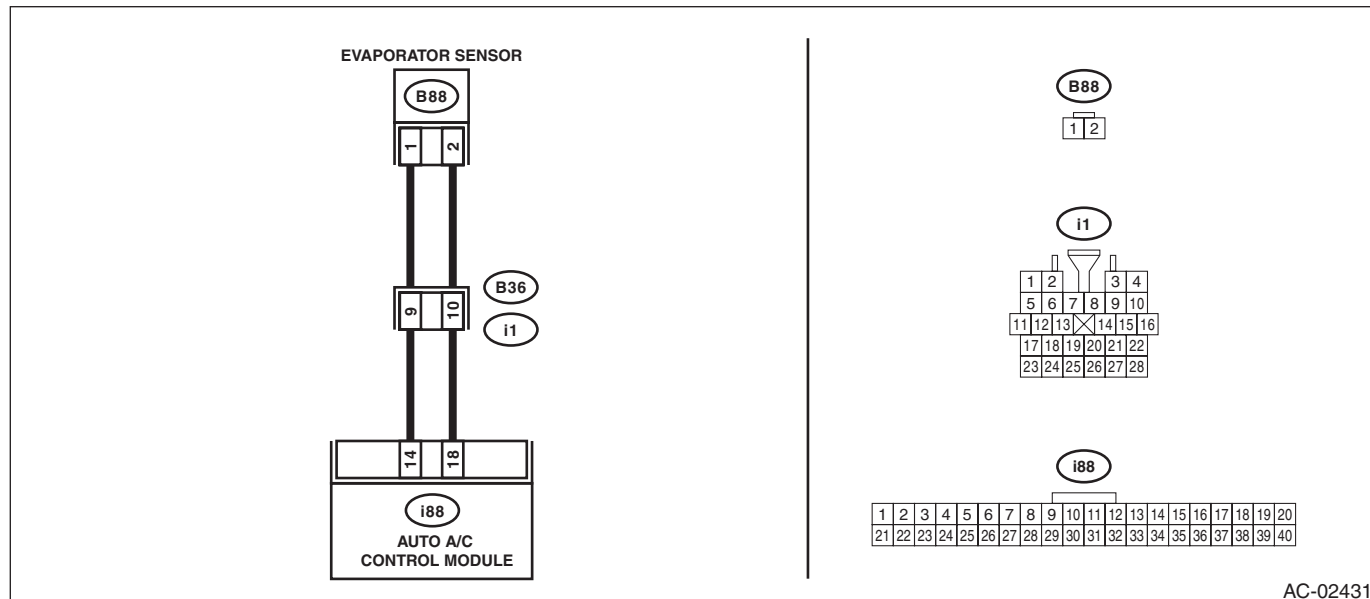
# Diagnostic Procedure for Sensors

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## C: EVAPORATOR SENSOR

### WIRING DIAGRAM:

Air conditioning system, auto A/C model <Ref. to WI-77, AUTO A/C MODEL, WIRING DIAGRAM, Air Conditioning System.>



AC-02431

| Step                                                                                                                                                                                                                                                                                                                                                                    | Check                            | Yes           | No                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------|-------------------------------------------------------------------------------------------|
| <b>1 CHECK EVAPORATOR SENSOR.</b><br>Perform the inspection of evaporator sensor unit. <Ref. to AC-40, EVAPORATOR SENSOR, INSPECTION, Evaporator.>                                                                                                                                                                                                                      | Is the evaporator sensor normal? | Go to step 2. | Replace the evaporator sensor. <Ref. to AC-37, REMOVAL, Evaporator.>                      |
| <b>2 CHECK INPUT SIGNAL FOR EVAPORATOR SENSOR.</b><br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between connector (B88) terminals.<br><b>Connector &amp; terminal</b><br><b>(B88) No. 2 (+) — No. 1 (-):</b>                                                                                                                                         | Is the voltage approx. 5 V?      | Go to step 6. | Go to step 3.                                                                             |
| <b>3 CHECK AUTO A/C CONTROL MODULE OUTPUT SIGNAL.</b><br>1) Turn the ignition switch to OFF.<br>2) Remove the auto A/C control module.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between connector terminals of auto A/C control module.<br><b>Connector &amp; terminal</b><br><b>(i88) No. 18 (+) — (i88) No. 14 (-):</b>                        | Is the voltage approx. 5 V?      | Go to step 4. | Go to step 6.                                                                             |
| <b>4 CHECK HARNESS CONNECTOR BETWEEN AUTO A/C CONTROL MODULE AND EVAPORATOR SENSOR.</b><br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the auto A/C control module.<br>3) Measure the resistance of harness between auto A/C control module and evaporator sensor.<br><b>Connector &amp; terminal</b><br><b>(B88) No. 2 — (i88) No. 18:</b> | Is the resistance less than 1 Ω? | Go to step 5. | Repair the open circuit of harness between auto A/C control module and evaporator sensor. |

## Diagnostic Procedure for Sensors

### HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

| Step                                                                                                                                                                                                                                                                   | Check                                    | Yes                   | No                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------|
| <b>5</b><br><b>CHECK HARNESS CONNECTOR BETWEEN AUTO A/C CONTROL MODULE AND EVAPORATOR SENSOR.</b><br>Measure the resistance of harness between auto A/C control module and evaporator sensor.<br><b>Connector &amp; terminal</b><br><b>(B88) No. 1 — (i88) No. 14:</b> | Is the resistance less than 1 $\Omega$ ? | Go to step 6.         | Repair the open circuit of harness between auto A/C control module and evaporator sensor.     |
| <b>6</b><br><b>CHECK FOR POOR CONTACT.</b><br>Check poor contact of auto A/C control module connector.                                                                                                                                                                 | Is there poor contact of connector?      | Repair the connector. | Replace the auto A/C control module. <Ref. to AC-31, REMOVAL, Control Unit (Auto A/C Model).> |

# Diagnostic Procedure for Sensors

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## D: SUNLOAD SENSOR

### TROUBLE SYMPTOM:

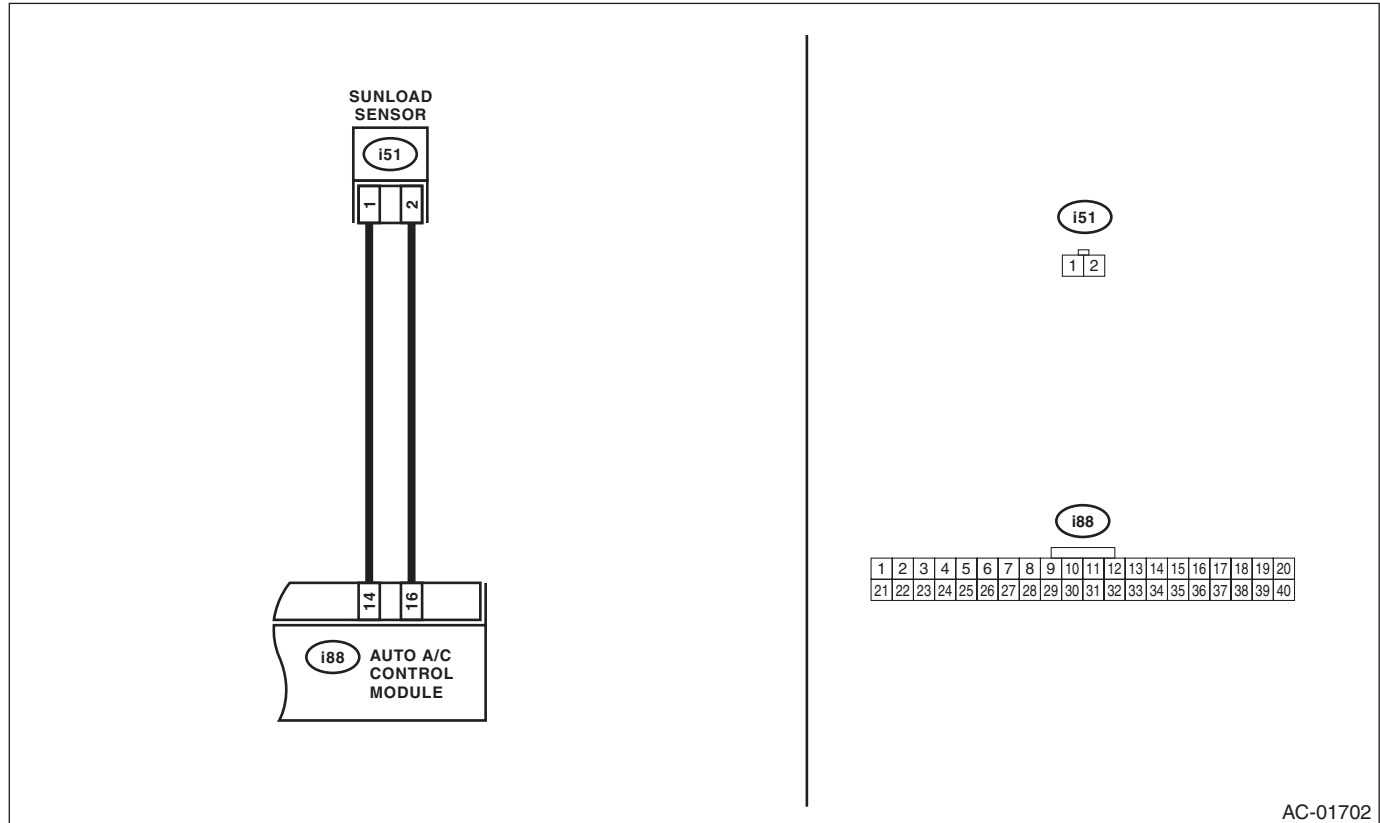
- Sensor identifies that sunlight is at maximum. Then, A/C system is controlled to COOL side.
- Sensor identifies that sunlight is at minimum. Then, A/C system is controlled to HOT side.

### NOTE:

When the sunload sensor check is performed indoors or in the shade, it could be diagnosed as having an open circuit. Always check the sunload sensor with the sun shining on it.

### WIRING DIAGRAM:

Air conditioning system, auto A/C model <Ref. to WI-77, AUTO A/C MODEL, WIRING DIAGRAM, Air Conditioning System.>



AC-01702

| Step                                                                                                                                                                                                                                                                                                                             | Check                       | Yes           | No            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------|---------------|
| 1<br><b>CHECK POWER SUPPLY VOLTAGE FOR SUNLOAD SENSOR.</b><br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from sunload sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the power supply voltage for sunload sensor.<br><b>Connector &amp; terminal</b><br><b>(i51) No. 2 (+) — No. 1 (-):</b> | Is the voltage approx. 5 V? | Go to step 4. | Go to step 2. |

## Diagnostic Procedure for Sensors

### HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

| Step                                                                                                                                                                                                                                                                                                                                                                                                | Check                                       | Yes                   | No                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------|
| <b>2</b><br><b>CHECK HARNESS CONNECTOR BETWEEN AUTO A/C CONTROL MODULE AND SUN-LOAD SENSOR.</b><br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the auto A/C control module.<br>3) Measure the resistance of the harness between the auto A/C control module and sun-load sensor.<br><i><b>Connector &amp; terminal</b></i><br><i><b>(i51) No. 2 — (i88) No. 16:</b></i> | Is the resistance less than 1 $\Omega$ ?    | Go to step 3.         | Repair the harness between auto A/C control module and sunload sensor.                        |
| <b>3</b><br><b>CHECK HARNESS CONNECTOR BETWEEN AUTO A/C CONTROL MODULE AND SUN-LOAD SENSOR.</b><br>Measure the resistance of the harness between the auto A/C control module and sunload sensor.<br><i><b>Connector &amp; terminal</b></i><br><i><b>(i51) No. 1 — (i88) No. 14:</b></i>                                                                                                             | Is the resistance less than 1 $\Omega$ ?    | Go to step 4.         | Repair the harness between auto A/C control module and sunload sensor.                        |
| <b>4</b><br><b>CHECK INPUT VOLTAGE FOR AUTO A/C CONTROL MODULE.</b><br>1) Connect the connectors of sunload sensor and auto A/C control module.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between connector terminals of auto A/C control module.<br><i><b>Connector &amp; terminal</b></i><br><i><b>(i88) No. 16 (+) — (i88) No. 14 (-):</b></i>                             | Is the voltage between approx. 1.0 — 4.0 V? | Go to step 5.         | Replace the sun-load sensor. <Ref. to AC-46, REMOVAL, Sun-load Sensor (Auto A/C Model).>      |
| <b>5</b><br><b>CHECK FOR POOR CONTACT.</b><br>Check poor contact of auto A/C control module connector.                                                                                                                                                                                                                                                                                              | Is there poor contact of connector?         | Repair the connector. | Replace the auto A/C control module. <Ref. to AC-31, REMOVAL, Control Unit (Auto A/C Model).> |