AUTOMATIC AIR CONDITIONER

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GENERAL

OUTLINE OF CHANGE

The following service procedures have been added as an automatic A/C has been equipped as standard. Other service procedures are the same as before.

SERVICE SPECIFICATIONS

| Item | | Typical value |
|--|---------------|---------------|
| r mixing damper control potentiometer resistance kΩ MAX HOT | | Around 0.18 |
| | MAX COOL | Around 4.82 |
| Mode selection damper control potentiometer resistance $k\Omega$ | DEF position | Around 0.18 |
| | FACE position | Around 4.82 |

SPECIAL TOOLS

| Tool | Number | Name | Use |
|---------|--|--|--|
| В991502 | MB991502 | MUT-II sub- assembly | Automatic air conditioner inspection |
| В991529 | MB991529 | Diagnosis code check harness | Automatic air conditioner inspection when using voltmeter |
| A | MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 | Harness set A: Check harness B: LED harness C: LED harness adapter | Checking continuity and measuring voltage at harness or connector A: For checking connector pin contact pressure B: For checking the power supply circuit C: For checking the power supply circuit |
| B | | D: Probe | D: For connecting commercial tester |
| c | | | |
| D | | | |
| C991223 | | | |

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TROUBLESHOOTING

DIAGNOSIS TROUBLESHOOTING FLOW

Refer to '97 L200 Workshop Manual (Pub. No. PWTE96E1) GROUP 00 - How to Use Troubleshooting/Inspection Service Points.

DIAGNOSIS FUNCTION

METHOD OF READING DIAGNOSIS CODES

METHOD OF ERASING DIAGNOSIS CODES

Connect the MUT-II to the 16-pin diagnosis connector. (Refer to '97 L200 Workshop Manual <Pub. No. PWTE96E1> GROUP 00 – How to Use Troubleshooting/Inspection Service Points.)

INSPECTION CHART FOR DIAGNOSIS CODES

| Code No. | Diagnosis item | Reference page |
|----------|--|----------------|
| 11 | Inside air temperature sensor system (open circuit) | 55B-3 |
| 12 | Inside air temperature sensor system (short circuit) | 55B-3 |
| 13 | Ambient temperature sensor system (open circuit) | 55B-4 |
| 14 | Ambient temperature sensor system (short circuit) | 55B-4 |
| 15 | Heater water temperature sensor system (open circuit) | 55B-4 |
| 16 | Heater water temperature sensor system (short circuit) | 55B-4 |
| 21 | Air thermo sensor system (open circuit) | 55B-5 |
| 22 | Air thermo sensor system (short circuit) | 55B-5 |
| 31 | Potentiometer system for the air mixing damper | 55B-5 |
| 32 | Potentiometer system for the mode selection damper | 55B-6 |
| 41 | Air mixing damper control motor drive system | 55B-6 |
| 42 | Mode selection damper control motor drive system | 55B-7 |

INSPECTION PROCEDURE FOR DIAGNOSIS CODES

| Code No.11, 12 Inside air temperature sensor system | Probable cause |
|--|----------------------------|
| Code No.11 is set when the inside air temperature circuit inside the A/C-ECU is open. Meanwhile, code No.12 is set when it is short. | Malfunction of the A/C-ECU |

Replace the automatic A/C control panel assembly (A/C-ECU).

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AUTOMATIC AIR CONDITIONER – Troubleshooting

| Code No.13, 14 Ambient temperature sense | r system Probable cause |
|--|---|
| Code No.13 is set when the ambient temperature sensor circu Meanwhile, code No.14 is set when it is short. | it is open. Malfunction of the ambient temperature sensor Malfunction of connector or harness Malfunction of the A/C-ECU |
| Check the Ambient temperature sensor (Refer to P.55B-28). OK Check the following connectors: A-110, A-14, C-111 |] ^{NG} → Replace |
| OK Check the trouble symptoms. NG Check the harness wire between the ambient temperature sensor and the A/C-ECU. OK |] NG ► Repair |
| Replace the automatic A/C control panel assembly (A/C-ECU). |] |

| Code No.15, 16 Heater water temperature sensor system | Probable cause |
|--|---|
| Code No.15 is output when the heater water temperature sensor circuit is open. Code No.16 is output when that circuit is short. | Malfunction of the heater water temperature sensor Malfunction of connector or harness Malfunction of the A/C-ECU |

| Check the heater water temperature sensor (Refer to P.55B-24). | | NG | Replace |
|---|--------------------------------|----|-----------------------------|
| | ок | | |
| Check the following connected | ors: C-119, C-111 | NG | Repair |
| | ок | | |
| Check the trouble symptoms. | | | |
| | NG | | |
| Check the harness wire between the heater water temperature sensor and the A/C-ECU. | | NG | Repair |
| | ок | - | |
| Replace the automatic A/C con | trol panel assembly (A/C-ECU). | | |

| Code No.21, 22 Air thermo sensor system | Probable cause |
|--|---|
| Code No.21 is set when the air thermo sensor circuit is open. Meanwhile, code No.22 is set when it is short. | Malfunction of the a Malfunction of conn Malfunction of the A |
| NG Popla | |
| OK | |
| Check the following connectors: C-113, C-56, C-111 | |

OK

| Check the trouble symptoms. | | | | |
|--|--------------------------------|----|----------|--|
| , | NG | - | | |
| Check the harness wire betwee the A/C-ECU. | en the air thermo sensor and | NG | → Repair | |
| | ОК | - | | |
| Replace the automatic A/C con | trol panel assembly (A/C-ECU). |] | | |
| | | - | | |

| Code No.31 Potentiometer system for the ai damper | ir mixing | Probable cau | se |
|--|-------------------------|--|--|
| This diagnosis code is set when the potentiometer for the air r not send any signal to the A/C-ECU due to short or open circu | nix damper does uit. | Malfunction of the mix damper Malfunction of c Malfunction of the malfunction of the mal | ne potentiometer system for the air onnector or harness ne A/C-ECU |
| Check the potentiometer system for the air mixing damper (Refer to P.55B-23). | | eplace | |
| Measure at air mixing damper control potentiometer connector | Cł | neck the following conne | ectors: C-120, C-111 |
| Disconnect the connector and measure at the harness | | OK | NG |
| side. Ignition switch: ON Voltage between terminal 2 and body earth | Ch sy | meck the trouble mptoms. | Repair |
| OK: 5V | | NG | |
| Continuity between terminal 6 and body earth OK: Continuity | Cr | neck the harness wire bet otentiometer and the A/C-E | ween the air mixing damper control ECU. |
| ОК | | OK | NG |
| | R A as | eplace the automatic /C control panel ssembly (A/C-ECU). | Repair |
| Measure at A/C-ECU connector C-111. | NG Cł | neck the following conne | ectors: C-120, C-111 |
| Connect the connector. Ianition switch: ON | | OK | NG |
| Air mix damper position: MAX HOT position Voltage between terminal 5 and body earth | Ch | neck the trouble | Repair |
| OK: 4.7 - 5.0 V | J | NG | |
| Replace the automatic A/C control panel assembly (A/C-ECU). | Cipc | heck the harness wire bet ptentiometer and the A/C- | tween the air mixing damper control ECU, and repair if necessary. |

Malfunction of the air thermo sensor Malfunction of connector or harness Malfunction of the A/C-ECU

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AUTOMATIC AIR CONDITIONER – Troubleshooting

| Code No.32 Potentiometer system for the m selection damper | node | | Probable ca | use | |
|--|---------|----------------------------|---|---|--|
| This diagnosis code is set when the potentiometer for the mode selection does not send any signal to the A/C-ECU due to open or short circuit. | | | Malfunction of the potentiometer for the mode selection damper Malfunction of connector or harness Malfunction of the A/C-ECU | | |
| Check the potentiometer for the mode selection damper (Refer to P.55B-23). | NG | Replac | e | | |
| ОК | _ NG | | | | |
| Measure at air outlet changeover damper motor connector C-121. • Disconnect the connector and measure at the harness | | Check | the following con | NG | |
| Ignition switch: ON | | Check sympto | the trouble ms. | Repair | |
| Voltage between terminal 2 and body earth OK: 5V Continuity between terminal 6 and body earth | | | NG | | |
| OK: Continuity | | Check control | the harness wire b potentiometer and | etween the mode selection damper the A/C-ECU. | |
| ŬŔ. | | | ↓ OK | NG | |
| | | Replac A/C co asseml | e the automatic ntrol panel bly (A/C-ECU). | Repair | |
| | NG | Oheele | 4h a fallanda a an | | |
| Connect the connector. | | Спеск | | NG | |
| Ignition switch: ON Mode selection damper position: DEF position | | Check | the trouble | ♥ Repair | |
| Voltage between terminal 6 and body earth OK: 4.8 - 5.2 V | | sympto | ms. | | |
| ОК | | | NG ▼ | | |
| Replace the automatic A/C control panel assembly (A/C-ECU). | | Check control necess | the harness wire b potentiometer and ary. | between the mode selection damper the A/C-ECU, and repair if | |

| Code 41 air mixing damper control motor drive system | Probable cause |
|---|--|
| This code is output when the air mixing damper control motor could not turn as far as the set aperture. | Air mixing damper control motor fault Connector or harness fault A/C-ECU fault |

| Check the air mixing damper co (Refer to P.55B-23). | NG | Replace | |
|---|--------------------------------|---------|--------|
| | ок | NG | |
| Check the following connecto | r: C-120 | | Repair |
| | ок | - | |
| Check the trouble symptoms. | Y |] | |
| | NG | | |
| Check the harness between the air mixing damper control motor and A/C-ECU, and repair if necessary. | | | Repair |
| | ОК | - | |
| Replace the automatic air cond (A/C-ECU). | itioner control panel assembly | | |



INSPECTION CHART FOR TROUBLE SYMPTOMS

| Trouble symptom | Inspection pro- cedure No. | Reference page |
|---|-------------------------------|----------------|
| Communication with MUT-II is not possible. | 1 | 55B-8 |
| The air conditioner does not operate at all. | 2 | 55B-9 |
| The air conditioner display does not appear on the display. | 3 | 55B-9 |
| A/C outlet air temperature can not be set. | 4 | 55B-10 |
| The blower motor does not operate. | 5 | 55B-11 |
| The blower motor does not operate at high speed. | 6 | 55B-12 |
| The blower air volume can not be changed. | 7 | 55B-13 |
| Air outlet vent cannot be changed. | 8 | 55B-14 |
| outside/Inside air changeover is not possible. | 9 | 55B-14 |
| The condenser fan motor does not operate <4G64>. | 10 | 55B-15 |
| The condenser fan motor does not operate <4D56>. | 11 | 55B-16 |

INSPECTION PROCEDURES FOR TROUBLE SYMPTOMS

| Communication with | the MUT-II is not poss | sible. | | Probable cause | | |
|---|--------------------------------|--|-----------------|---|--|--|
| If communication with all other systems is not possible, there is that there is a malfunction of the diagnosis line. If only the A/C communicate with the MUT-II, the diagnosis line between the d connector and the A/C-ECU may be defective. | | is a high possibility C system can not diagnosis | | Malfunction of harness or connector Malfunction of the A/C-ECU | | |
| Is communication between MUT possible? | -II and other system is | NO | Check the A/ | the diagnosis line between the diagnosis connector and C-ECU, and repair if necessary. | | |
| | YES | NO | | | | |
| Is the air conditioner operating? | | NO ► | INSPE | ISPECTION PROCEDURE FOR TROUBLE SYMPTOM 2 | | |
| | YES | NO | (nelei | 10 F.55B-9.) | | |
| Check the following connectors: C-111, C-35 | | | Repair | ir | | |
| | ок | | | | | |
| Check the trouble symptoms. | | | | | | |
| | NG | | | | | |
| Check the harness wire between the A/C-ECU and diagnosis connector. | | | Repair | epair | | |
| | ок | | | | | |
| Replace the automatic A/C con | trol panel assembly (A/C-ECU). | | | | | |

| The air conditioner does not operate at all. | Probable cause |
|---|---|
| The power supply system (including earth) for the A/C-ECU may be defective. In addition, the A/C-ECU may be inoperative due to a defective harness (such as short). | Malfunction of harness or connector Malfunction of the A/C-ECU |



Inspection procedure 3

| The air conditioner display does not appear on the display. | Probable cause |
|--|---|
| Check the harness wires between the A/C-ECU and the center display, and repair if necessary. | Malfunction of harness or connector Malfunction of the A/C-ECU |

Refer to inspection procedure 2. (P.54B-9).

| Does the A/C operate normally? | NO | • | |
|---------------------------------|------------------------------|---|--|
| | YES | | |
| Replace the automatic A/C contr | ol panel assembly (A/C-ECU). | | |

| A/C outlet air temperature of | can not be set. | Probable cause | | | lse | |
|---|--|----------------|-----------------|--|---|--|
| If the air outlet temperature can not be sensor(s) or the air mixing damper ma | e changed after a A/C tem y be defective. | nperature is | set, | Malfunction of | the inside air temperat the ambient temperatu the heater water temp the photo sensor the air mixing damper harness or connector the A/C-ECU | ture sensor ire sensor erature sensor control motor |
| | | VEO | | | | |
| MUT-II Self-Diag Code Are diagnosis codes displayed? | - | ¥ES ► | Inspect | ion chart for diagno | osis codes (Refer to P | .55B-3). |
| NO | | | | | | |
| MUT-II Data list | I | NG 🕨 | Replac | e the automatic A/C | control panel asseml | bly (A/C-ECU). |
| OK | | | | | | |
| MUT-II Data list | l | NG 🕨 | Check | the ambient temper | rature sensor system. | |
| 13 Ambient temperature sensor | | | (Refer | to P.55B-4, Code N | los.13, 14.) | |
| | I | NG | 0 | | | |
| 15 Heater water temperature sensor | | | Check (Refer | the heater water te to P.55B-4, Code N | mperature sensor sys los.15, 16.) | tem. |
| OK | | NG | | | | |
| MUT-II Data list 25 Photo sensor | | → | Check (Refer | the photo sensor (<i>i</i> to P.55B-27.) | Automatic air condition | ier). |
| ОК | | | | ОК | | NG |
| | | | | | R | eplace |
| | | | Check | the following con | nectors: C-118, C-111 | |
| | | | | ОК | | NG |
| | | | Check | the trouble | | Repair |
| | | | ey.np.te | NG | | |
| | | | Check A/C-EC | the harness wire be | etween the photo sens | sor and the |
| | | | | ОК | | NG |
| | | | Replace | e the automatic A/C bly (A/C-ECU). | control panel | Repair |
| ↓ | I | NG | | | |] |
| MUT-II Data list 31 Potentiometer for air mixing control of | damper | | (Refer | the air mixing dami to P.55B-5, Code N | per potentiometer syst lo.31). | em |
| ок | | | | | | |
| Check the air mixing damper control P.55B-23). | potentiometer (Refer to | NG ► | Replac | e | | |
| , ок | | NO | | | | |
| Check the following connectors: C-12 | 20, C-111 | NG ► | Repair | | | |
| ↓ ОК | | | | | | |
| Check the trouble symptoms. | | | | | | |
| | wiving down | NG | _ | | | |
| potentiometer and the A/C-ECU. | r mixing damper control | ► | Repai | r | | |
| OK | | | | | | |
| Replace the automatic A/C control pane | el assembly (A/C-ECU). | | | | | |

| The blower motor do | es not operate. | | Probable cause | | | |
|---|------------------------------|---------|---|---|--|--|
| If no air comes out of the blower even though the blower switcl cause is probably a malfunction of the front blower relay circuit. | | | | Malfunction of the front blower relay Malfunction of the blower motor Malfunction of harness or connector Malfunction of the A/C-ECU | | |
| | | | | | | |
| MUT-II Actuator Test | | OK | Replac | te the automatic A/C control panel assembly (A/C-ECU | | |
| | ОК | | | | | |
| Check the blower relay | | NG | Replace | e | | |
| | ОК | | | | | |
| Check the blower motor | Y | NG | - Replac | ce de la constante de la const | | |
| | ОК | | | | | |
| Measure at blower relay conne | ector C-83 | (1) NG | Check | the following connectors: C-86, C-83 | | |
| Disconnect the connector, a | and measure at the J/B side. | | | OK NG | | |
| Ignition switch: ON (1) Continuity between termina | I 1 and body earth | | Chook | | | |
| OK: Continuity | and hady carth | | Check | NG Repair | | |
| OK: System voltage | and body earth | | | V . | | |
| (3) Voltage between terminal 5 OK: System voltage | and body earth | (2) NG | Check the harness wire between the blower relay and the earth, and repair if necessary. | | | |
| | OK (3) NG | | Curin, e | | | |
| | | | Check | the following connectors: C-83, C-88 | | |
| | | | | VK NG | | |
| | | | Check | the trouble symptoms. | | |
| | | | | NG | | |
| | | | Check ignition | the harness wire between the blower relay and the switch (IG2), and repair if necessary. | | |
| | | | | | | |
| | | | Check | the following connectors: C-83, C-82 | | |
| | | | | OK NG | | |
| | | | Check | the trouble symptoms. Repair | | |
| | | | | NG | | |
| | | | Check link (6 | the harness wire between the blower relay and fusible), and repair if necessary. | | |
| | V | — NG | | | | |
| Measure at blower motor con | nector C-23. | ► | Check | the following connectors: C-23, C-89, C-83, C-82 | | |
| side. | and measure at the namess | | | OK NG | | |
| Ignition switch: ON Voltage between terminal | 1 and body earth | | Check | the trouble symptoms. Repair | | |
| UK: System voltage | | | | ↓ NG | | |
| | ОК | | Check link (6) | the harness wire between the blower relay and fusible , and repair if necessary. | | |
| Check the following connect | v ors: C-23 | NG ► | - Dono! | | | |
| | ОК | | repai | 1 | | |
| | V V | NG | | | | |
| Check the trouble symptoms. | | | Replac | ce the automatic A/C control panel assembly (A/C-ECU | | |

Inspection procedure 6 The blower motor does not operate at high speed. Probable cause If the blower motor does not operate at high speed when the temperature is set Malfunction of the blower high speed relay • to 17 or 32, the blower high speed relay circuit system may be defective. Malfunction of harness or connector Malfunction of the A/C-ECU OK Replace the automatic A/C control panel assembly (A/C-ECU). **MUT-II Actuator Test** 01, 02, 03, 04 Blower motor ↓ ок NG Check the blower high speed relay (Refer to P.55B-20.) Replace οк NG Check the blower motor. Replace OK (1) NG Measure at front blower high speed relay connector C-116. Check the following connector: C-116 Disconnect the connector, and measure at the harness OK NG side. Ignition switch: ON Check the trouble symptoms. (1) Continuity between terminal 1 and body earth Repair OK: Continuity NG (2) Voltage between terminal 3 and body earth (2) NG **OK:** System voltage Check the harness wire between the blower high speed relay Voltage between terminal 4 and body earth (3) and the blower motor, and repair if necessary. OK: System voltage OK (3) NG Check the following connectors: C-116, C-86 NG OK Check the trouble symptoms. Repair NG Check the harness wire between the blower high speed relay and the earth, and repair if necessary. Check the following connectors: C-116, C-86, C-88 NG OK Check the trouble symptoms. Repair NG Check the harness wire between the blower high speed relay and ignition switch (IG2), and repair if necessary NO Disconnect the A/C-ECU connector C-111 Check the following connectors: C-117, C-111 Ignition switch: ON NG Does the blower motor operate when A/C-ECU connector ↓ ок terminal 12 is earthed? Check the trouble symptoms. Repair YES NG Check the harness wire between the blower high speed relay and A/C-ECU, and repair if necessary. NG Replace the automatic A/C control panel assembly (A/C-ECU). Check the trouble symptoms.

| The blower air volume can not be ch | anged. | Probable cause | | | |
|--|-------------------------|---|--|--|--|
| If the air volume can not be controlled, the power tradefective. | ansistor circuit may be | Malfunction of the power transistor Malfunction of harness or connector Malfunction of the A/C-ECU | | | |
| MUT-II Actuator Test 01, 02, 03, 04 Blower motor | <u>ОК</u> | - Replace the automatic A/C control panel assembly (A/C-ECU). | | | |
| Measure at power transistor connector C-117. Blower switch: ON (1) Continuity between terminal 1 and body earth OK: Continuity Ignition switch: ON (2) Voltage between terminal 2 and body earth OK: System voltage – 2V (3) Voltage between terminal 4 and body earth OK: Approximately 1.3V | (1) NG | Check the following connector: C-117 OK NG Check the trouble symptoms. NG Replace the power transistor | | | |
| (3) NG | (2) NG | Check the following connectors: C-117, C-86 OK Check the trouble symptoms. NG Check the harness wire between the power transistor and the earth, and repair if necessary. | | | |
| Measure at power transistor connector C-117 | ►NG | Check the following connectors: C-117, C-23, C-89 V OK V NG Check the trouble symptoms. Repair | | | |
| Blower switch: ON Ignition switch: ON (1) Voltage between terminal 1 and body earth OK: Approximately 7V (2) Voltage between terminal 2 and body earth OK: Approximately 1.3V | | OK NG NG | | | |

| Air outlet vent ca | nnot be changed. | | | Probable ca | use | |
|--|--|----------------------------------|--|--|--|--------------|
| When the air outlet vents cannot be changed even if the changeover switch is operated, the mode selection damper control circuit may be defective. | | | Malfunction of motor Malfunction of potentiometer Malfunction of Malfunction of | f the mode selection dam f the mode selection dam f harness or connector f the A/C-ECU | per control | |
| | | VEC | | | | |
| Is either No.32 or No.42 | output? | TE5 ► | Diagn | osis code chart (R | efer to P.55B-3.) | |
| | NO | | | | | |
| MUT-II service data | er control notentiometer | | Chec | the mode selection | on damper control potention | ometer |
| 32 mode selection dampe | NO | | syster | | 6, coue 32) | |
| | V | | | | |] |
| MUT-II actuator list 08, 09, 10 mode selection | n damper control motor | | Check (Refer | the mode selection to P.55B-7, Code | n damper control motor c No.42). | lrive system |
| | ОК | | | | | |
| Beplace the automatic A/ | C control panel assembly (A/C-ECU) | 7 | | | | |
| | ····· | | | | | |
| Inspection proced | ure 9 | | | _ | | |
| outside/inside all | r changeover is not possib | le. | | Probable ca | IUSE | |
| When inside air cannot l changeover switch is on, may be defective. | be changed to outside air or vice vers , the outside/inside air selection dampo | a even if its er control syst | tem | Malfunction of damper contro Malfunction of Malfunction of | f the outside/inside air se ol motor f harness or connector f the A/C-ECU | lection |
| | | | | I | | |
| MUT-II Actuator Test | | _OK ► | Replac | ce the automatic A/ | C control panel assembly | y (A/C-ECU). |
| 13, 14 outside/inside air s | selection damper control motor | | | | | |
| | | ⊐ NG | | | | |
| Check the outside/inside (Refer to GROUP 55B-23 | air selection damper control motor 3). | | Replac | e | | |
| | , OK | NG | | | | |
| Measure at outside/inside | e air selection damper control motor | ▶ | Check | the following cor | nnector: C-114 | |
| Disconnect the conne | ctor and measure at the harness | | | OK ▼ | | NG ▼ |
| Ignition switch: ON | | | Check | the trouble | R | epair |
| Voltage between term OK: System voltage | inal 1 and body earth | | sympt | oms. | | |
| , , , | ОК | | | TNG ▼ | | |
| Check the following cor | nnectors: C-114, C-112 | | | Replace | | |
| ОК | NG | | | | | |
| Check the trouble | v Repair | | | | | |
| ↓ NG |] | | | | | |
| Check the harness wire to selection damper control | petween the outside/inside air motor and the A/C-ECU. | - NG | Repai | r | | |
| | ОК | | | | | |
| Replace the automatic A | C control panel assembly (A/C-ECU). | | | | | |
| | | | | | | |

| The condenser fan motor does not operate <4G64>. | | | Probable cause | |
|---|----------|-------------------|---|--|
| If the condenser fan does not operate, the condenser fan relay or motor may be defective. | | ay be | Malfunction of the conde Malfunction of the conde Malfunction of harness of | enser fan relay enser fan motor or connector |
| | NO | | | |
| Check the condenser fan relay. | NG | Replac | e | |
| OK | NG | Replac | e | |
| | | | - | |
| | | | | |
| Measure at condenser fan relay connector A-59X. • Disconnect the connector, and measure at the harn | ess | Check | the following connectors: / | A-59X, A-14, C-01, C-112 |
| side. (1) Voltage between terminal 4 and body earth (A/C sw | vitch: | | OK | v NG |
| ON) | | Check | the trouble symptoms. | Repair |
| OK: System voltage | al 2 and | | NG | • |
| body earth | | | • | |
| OK: Continuity | (2) NG | Check | the harness wire between the switch and repair if necess | e condenser fan relay and |
| OK: The condenser fan motor operates. | | | | July. |
| (3) NG | | Check | the following connectors: | A-59X, A-14 |
| | | | OK | NG |
| | | Check | the trouble symptoms. | Repair |
| | | L | NG | |
| | | Check earth, a | the harness wire between the and repair if necessary. | e condenser fan relay and |
| * | | | | |
| Measure at condenser fan motor connector A-69. | NG ► | Check | the following connectors: | A-69, A-14 |
| side. | -55 | | OK | NG |
| Voltage between terminal 2 and body earth OK: System voltage | | Ohaali | 4h - 4u | Repair |
| | | Check | the trouble symptoms. | |
| OK | | | NG V | |
| | | Check fusible | the harness wire between the link (7), and repair if necessa | e condenser fan motor and ary. |
| Check the following connectors: A-59X, A-69 | NG | Repair | | |
| ОК | | | | |
| Check the trouble symptoms. | | | | |
| NG | | | | |
| Check the harness wire between the condenser fan me relay and condenser fan motor, and repair if necessary | otor | | | |

| The condenser fan motor does not operate <4D56>. If the condenser fan motor does not operate, the condenser fan relay or motor may be defective. | | T | Probable cause | | | |
|--|---------|-------------------|----------------|--------------------|---|----------------------|
| | | an relay or motor | | or | Malfunction of the condenser fan relay Malfunction of the condenser fan motor Malfunction of harness or connector | |
| Theck the condenser fan relay | N | G | | Donloo | - | |
| OK | | | | керіас | e | |
| Check the condensar for motor | N | G | | Replace | 9 | |
| | | | | | - | |
| | \ | 'ES | Г | Chook | the engine FOLL terminal values | |
| Disconnect the connector and measure at the harnes | ss | | • | (Refer | to GROUP 13G - Troubleshooting |) |
| side. Ignition switch: ON Terminal 7 is earthed. OK: The condenser fan motor operates. | | | | | | |
| NO | | | | | | |
| Veasure at condenser fan relay connector A-59X. | (| 1) NG | . [| Check | the following connectors: A-59X | A-14 C-94 C-81 |
| Disconnect the connector, and measure at the harne side. | ess | | | C-88 | | , , , , 0-04, 0-01, |
| 1) Voltage between terminal 4 and body earth (Ignition $ON = A/C$ switch: ON | switch: | | | | ОК | NG |
| OK: System voltage | | | | Check | the trouble symptoms. | Repair |
| OK: Continuity | | | | | NG | |
| Terminal 1 is earthed. OK: The condenser fan motor operates. | (| 2) NG | | Check t | the harness wire between the con- | denser fan relay and |
| (3) NG O | Ж | | L | ine igni | $\frac{1}{100}$ | essary. |
| | | L | ► [| Check | the following connectors: A-59X | , A-14 |
| | | | | | OK | NG V |
| | | | | Check | the trouble symptoms. | Repair |
| | | | | Check earth, a | the harness wire between the con and repair if necessary. | denser fan relay and |
| | | | _► | Check | the following connectors: A-59X | , A-14, C-49 |
| | | | L | | ОК | NG |
| | | | | Check t | the trouble symptoms. | Repair |
| | | | | | NG | |
| | | | | Check i engine- | the harness wire between the con ECU, and repair if necessary. | denser fan relay and |
| Veasure at condenser fan motor connector A-69. | N | G | ₋ | Check | the following connectors: A co | A 14 |
| Disconnect the connector and measure at the harnes side | SS | | | Спеск | OK | A-14 |
| Voltage between terminal 2 and body earth OK: System voltage | | | | Check | the trouble symptoms. | |
| ок | | | | | NG | |
| Check the following connectors: A-59X, A-69 | | | | Check t | the harness wire between the cond | denser fan motor an |
| OK |] | | 1 | fusible I | link (7), and repair if necessary. | |
| Check the trouble symptoms |] | | | | | |
| NG | | | | | | |
| 1 | | | | | | |

DATA LIST REFERENCE TABLE

| Item No. | Check item | Inspection contents | | |
|----------|---|--|--|--|
| 11 | Inside air temperature sensor | Ignition switch: ON | Inside air temperature and tempera- ture displayed on the MUT-II are identical. | |
| 13 | Ambient temperature sensor | Ignition switch: ON | Outside air temperature and temper- ature displayed on the MUT-II are identical. | |
| 15 | Heater water temperature sensor | Ignition switch: ON | Heater core surface temperature and temperature displayed on the MUT-II are identical. | |
| 21 | Air thermo sensor | Ignition switch: ON | Evaporator outlet temperature and temperature displayed on the MUT-II are identical. | |
| 25 | Photo sensor | Ignition switch: ON | Amount of incident light is propor- tional to voltage displayed on the MUT-II. | |
| 31 | Potentiometer for the air mixing damper control | Ignition switch: ON Damper position: MAX HOT | Opening angle: Approximately 100% | |
| | | Ignition switch: ON Damper position: MAX COOL | Opening angle: Approximately 0% | |
| 32 | Potentiometer for the mode selection damper control | Ignition switch: ON Damper position: FACE | Opening angle: Approximately 0% | |
| | | Ignition switch: ON Damper position: FOOT | Opening angle: Approximately 50% | |
| | | Ignition switch: ON | Opening angle: Approximately 75% | |
| | | Damper position: FOOT/DEF | | |
| | | Ignition switch: ON Damper position: DEF | Opening angle: Approximately 100% | |

ACTUATOR TEST TABLE

| Item No. | Check item | Drive Contents |
|----------|---|-----------------------------------|
| 01 | Blower motor | Stopped |
| 02 | _ | Low speed |
| 03 | _ | Medium speed |
| 04 | | High speed |
| 05 | Air mixing damper control motor | Opening angle: Approximately 0% |
| 06 | _ | Opening angle: Approximately 50% |
| 07 | _ | Opening angle: Approximately 100% |
| 08 | Mode selection damper control motor | FACE |
| 09 | _ | FOOT |
| 10 | _ | DEF |
| 11 | Compressor ON/OFF | OFF |
| 12 | | ON |
| 13 | Outside/inside air selection damper control motor | Outside air |
| 14 | | Inside air |

55B-18

CHECK AT A/C-ECU TERMINALS

 1
 2
 3
 4
 5
 6
 7
 8
 9
 10

 11
 12
 13
 14
 15
 16
 17
 18
 19
 20

2122232425262728 2930313233343536

W0763AU

| Termi- nal No. | Check item | Check conditions | Normal condition |
|-------------------|--|--|---|
| 1 | Power transistor collector output | When blower switch OFF position | System voltage |
| | | When blower switch LO position | Approximately 7V |
| | | When blower switch HI position | Faint voltage (0.5 V) |
| 2 | Power transistor base output | When blower switch OFF position | 0 V |
| | | When blower switch LO position | Approximately 1.3V |
| | | When blower switch HI position | Approximately 2.5V |
| 3 | Backup power supply | At all times | System voltage |
| 4 | Input from heater water temperature sensor | When sensor temperature: $25^{\circ}C$ (4 k Ω) | 2.3 – 2.9 V |
| 5 | Input to air mixing damper control potentiometer | When the damper is moving to the MAX. HOT position | 4.7 – 5.0 V |
| 6 | Input to mode selection damper control potentiometer | When the damper flap is moving to the DEF position | 4.8 – 5.2 V |
| 7 | Input from ambient temperature sensor | When sensor temperature: $25^{\circ}C$ (4 k Ω) | 2.3 – 2.9 V |
| 8 | Input from air thermo sensor | Sensor temperature: 25°C (4 kΩ) | 2.3 – 2.9 V |
| 9 | Photo sensor (-) | Illuminance 1000 lux | 5.0 – 7.6 mV |
| | | Illuminance 100 lux | 0.5 – 0.76 mV |
| 10 | Sensor power supply | At all times | 4.8 – 5.2 V |
| 12 | Blower high speed relay | Blower switch: HI | 1.5V or less |
| | | Blower switch: except HI | System voltage |
| 13 | Earth | At all times | Continuity |
| 16 | Power supply to ignition switch (IG2) | Ignition switch: ON | System voltage |
| 17 | Diagnosis output | Ignition switch: ON | A voltmeter needle fluctuates between 0 and 12 V. |
| 18 | Diagnosis control output | Ignition switch: ON | System voltage – 2V |
| 19 | Photo sensor (+) | At all times | 0 V |
| 20 | Earth to potentiometer | At all times | 0 V |
| 21 | Mode selection damper control motor (FACE) | When the damper flap is moving to the FACE position. | 10 V |
| | | When the damper flap is moving to the DEF position. | Faint voltage (0.5 V) |
| 22 | Air mixing damper control motor (MAX COOL) | When the damper flap is moving to the MAX COOL position. | 10 V |
| | | When the damper flap is moving to the MAX HOT position. | Faint voltage (0.5 V) |

| Termi- nal No. | Check item | Check conditions | Normal condition |
|---|--|--|-----------------------|
| 23 | Outside/inside air selection damper control motor (Outside) | When the damper flap is moving to the outside position. | 10 V |
| | | When the damper flap is moving to the inside position. | Faint voltage (0.5 V) |
| 24 | 24 Mode selection damper control motor (DEF) When the damper flap is moving to the DEF position. | | 10 V |
| | | When the damper flap is moving to the FACE position. | Faint voltage (0.5 V) |
| 25 Air mixing damper control motor (MAX HOT) | | When the damper flap is moving to the MAX HOT position. | 10 V |
| | | When the damper flap is moving to the MAX COOL position. | Faint voltage (0.5 V) |
| 26 | Outside/inside air selection damper control motor | When the damper flap is moving to the inside position. | 10 V |
| | (Inside) | When the damper flap is moving to the outside position. | Faint voltage (0.5 V) |
| 29 | Illumination earth | At all times | Continuity |
| 30 | Power supply to illumination | Lighting switch: ON | System voltage |
| 34 | A/C output | When the A/C is OFF | 0 V |
| | | When the A/C is ON | System voltage |
| 35 | Earth | At all times | Continuity |



ON-VEHICLE SERVICE BLOWER HIGH SPEED RELAY CONTINUITY CHECK

| Battery voltage | Terminal No. | | | |
|-----------------------|--------------|-----------|---|----|
| | 2 | 4 | 1 | 3 |
| Power is not supplied | 0 | -0 | | |
| Power is supplied | — | $-\Theta$ | 0 | —0 |

IDLE-UP INSPECTION <4D56>

- (1) Before the check, set the following conditions.
 - Engine cooling water temperature: 80'90
 - Lamps, electric cooling fan, accessories operations: OFF
 - Transmission: N range
- (2) Confirm that the idling speed is set to the typical value.

Standard value: 750 \pm 30 rpm

NOTE

The idling speed does not need adjusting as it is automatically controlled by the ISC system.

(3) Check that the idling speed conforms with the standard value when the A/C switch is turned ON and the air conditioning operates.

Standard value: 850 \pm 50 r/min

AUTOMATIC AIR CONDITIONER CONTROL PANEL ASSEMBLY (A/C-ECU)

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operations
 Driver Side Under Cover, Meter Bezel Assembly, Glove Box Assembly, Center Under Cover Removal and Installation (Refer to GROUP 52A – Instrument Panel.)*



AV0152AA

Removal steps

- 1. Aspirator hose
- 2. Automatic air conditioner control panel bracket

3. Automatic air conditioner control panel assembly (A/C-ECU)

NOTE:

*: Refer to the '97 L200 Workshop Manual (Pub. No. PWTE96E1)

MOTOR

REMOVAL AND INSTALLATION



Power transistor removal steps

- Glove box assembly (Refer to GROUP 52A.)*
- 1. Powér transistor

Outside/inside air selection damper control motor removal steps

- Glove box assembly (Refer to GROUP 52A.)*
- 2. Outside/inside air selection damper control motor

Mode selection damper control motor removal steps

- Driver side under cover (Refer to GROUP 52A.)*
- 3. Mode selection damper control motor

NOTE:

*: Refer to the '97 L200 Workshop Manual (Pub. No. PWTE96E1)

Air mixing damper control motor removal steps

 Front floor console, Glove box assembly (Refer to GROUP 52A.)*

A10009AA

- Driver side under cover (Refer to GROUP 52A.)*
- Meter bezel assembly (Refer to GROUP 52A.)*
- Center reinforcement A (Refer to GROUP 52A.)*
- 4. Air mixing damper control motor



INSPECTION OUTSIDE/INSIDE AIR SELECTION DAMPER CONTROL MOTOR CHECK

| Battery connection terminal lever operation | | Operating the lever |
|---|---|--------------------------|
| 1 | 2 | |
| — —— | | Turn to outside air side |
| Θ | | Turn to cabin air side |

Caution

When the lever is in the inside air position or outside air position, no power is supplied.



MODE SELECTION DAMPER CONTROL MOTOR CHECK

| Battery connection | n terminal | Lever operation |
|--------------------|------------|--------------------|
| 1 | 3 | |
| — | | Turn to DEF. side. |
| Θ | | Turn to FACE side. |

NOTE

When the lever is in the FACE position or DEF position, no power is supplied.

POTENTIOMETER CHECK

When measuring the resistance between connector terminals nos. 2 and 5, and between terminals 5 and 6 under the same conditions as the mode selection damper control motor check, confirm that the resistance gradually fluctuates within the standard value range.

Standard value: 0.18 – 4.82 k Ω



AIR MIXING DAMPER CONTROL MOTOR CHECK

| Battery connection terminal | | Lever operation |
|-----------------------------|---|--------------------|
| 1 | 3 | |
| — —— | Θ | Turn to COOL side. |
| Θ | | Turn to HOT side. |

NOTE

When the lever is in the MAX HOT position or MAX COOL position, no power is supplied.

Potentiometer Check

When measuring the resistance between connector terminals nos. 2 and 5, and between terminals 5 and 6 under the same conditions as the air mixing damper motor check, confirm that the resistance gradually fluctuates within the standard value range.

Standard value: 0.18 – 4.82 k Ω

HEATER UNIT

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation Refrigerant Discharging and Charging Engine Coolant Draining and Refilling

- Instrument Panel Removal and Installation •
- Joint Duct Removal and Installation

Caution: SRS When removing and installing the heater unit from vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or the components.



Removal steps

- 1. Center reinforcement
- 2. Center ventilation duct
- 3. Drain hose
- 4. Liquid pipe B and suction pipe connection
- 5. O-ring
- 6. Heater hose connection
- 7. Evaporator

- 8. Heater unit
- 9. Mode selection damper control motor
- 10. Air mixing damper control motor
- 11. Aspirator
- 12. Heater core
- A 13. Heater water temperature sensor clip
 - 14. Heater water temperature sensor

REMOVAL SERVICE POINTS

∢A► LIQUID PIPE B/SUCTION PIPE DISCONNECTION

To prevent the entry of dust or other foreign bodies, plug the dismantled pipes and nipples.

◆B▶CLIP/HEATER WATER TEMPERATURE SENSOR REMOVAL

Remove the clip from the side of the heater unit and lift the heater water temperature sensor out of the heater unit.

INSTALLATION SERVICE POINTS

►A HEATER WATER TEMPERATURE SENSOR/CLIP

Insert the heater water temperature sensor into the mounting hole on the side of the heater unit and secure the sensor with the clip.

NOTE

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hoses and nipples.

INSPECTION

HEATER WATER TEMPERATURE SENSOR CHECK

Measure the resistance between the sensor terminals under at least two different temperatures. The resistance values should generally match those in the graph.



EVAPORATOR

DISASSEMBLY AND REASSEMBLY





Disassembly steps

- 1. Clip
- Evaporator cover (upper)
 Lining, upper
- 4. Thermostat
- 5. Evaporator cover (lower)

- 6. Lining, lower
 7. Expansion valve
 8. O-ring
- 9. Evaporator



INSPECTION

AIR THERMO SENSOR CHECK

Measure the resistance between the sensor terminals under at least two different temperatures. The resistance values should generally match those in the graph.

NOTE

The temperature at the check should not exceed the range in the graph.

PHOTO SENSOR

REMOVAL AND INSTALLATION

• Instrument Panel Removal and Installation (Refer to GROUP 52A.)*



A10014AA

Removal steps

1. Defroster nozzle 2. Photo sensor

NOTE:

*: Refer to the '97 L200 Workshop Manual (Pub. No. PWTE96E1)

INSPECTION PHOTO SENSOR CHECK

When the full automatic air conditioner is operating, cover the insolation sensor photo-sensor with your hand. If the blower speed drops, it is normal. If the blower speed does not drop, replace the photo sensor.

AMBIENCE TEMPERATURE SENSOR

REMOVAL AND INSTALLATION

• Front bumper (Refer to GROUP 51.)





INSPECTION

AMBIENCE TEMPERATURE SENSOR CHECK

Measure the resistance between the sensor terminals under at least two different temperatures. The resistance values should generally match those in the graph.

REFRIGER LINE

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operations

- Refrigerant Discharging and Charging
 Badiator Grill Removal and Installation
- Radiator Grill Removal and Installation
 Front Bumper Removal and Installation
- Battery Removal and Installation
- Windshield Washer Tank Removal and Installation



Removal steps

1. Suction flexible hose

1A 🗅

∢AÞ

- 2. Suction pipe A
- 3. Liquid pipe A
- 4. Discharge hose
- 5. Liquid pipe B
- 6. Liquid pipe C

- 7. O-ring
- 8. Hood latch
- 9. Hood lock stay
- 10. Receiver assembly
- 11. Receiver bracket
- 12. Suction pipe braclet

REMOVAL SERVICE POINTS

To prevent the entry of dust or other foreign bodies, plug the condenser, compressor, pipes and nipples.

THROTTLE CABLE

REMOVAL AND INSTALLATION



A10015AA

Removal steps

1. Screw 2. Knob Nut
 Throttle cable

NOTES