

GROUP 42Ad

SUNROOF

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SPECIFICATION(S)

SERVICE SPECIFICATION

M14206000003USA0000010000

ITEM	STANDARD VALUE
Sunroof lid glass operation current A	7 or less [at 20°C(68°F)]

SEALANT

M14206000005USA0000010000

ITEM	SPECIFIED SEALANT
Sunroof assembly	Grease: Use resin - proof silicone grease

GENERAL INFORMATION

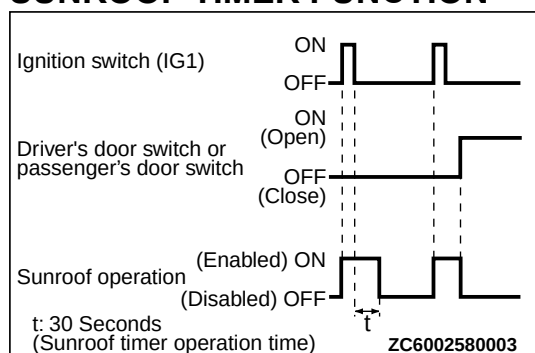
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SUNROOF FUNCTION

A motor-driven inner slide-type glass sunroof with a tilt-up mechanism is available in all models as an optional equipment. Even when the sunroof is fully

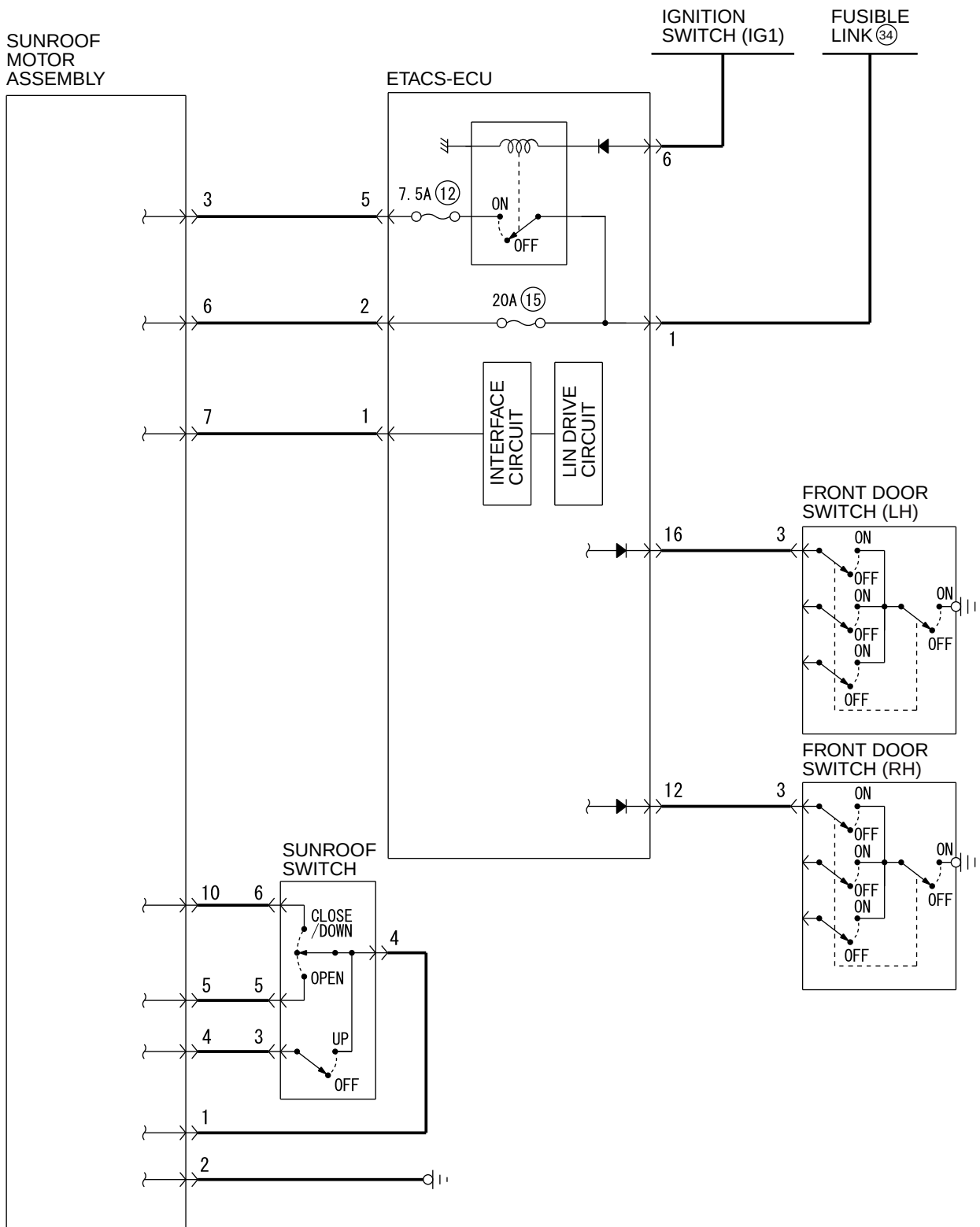
closed, a sufficient amount of lighting and a feeling of openness can still be obtained by opening the sunroof sunshade.

SUNROOF TIMER FUNCTION



The sunroof ECU (integrated into the sunroof motor assembly) receives the ignition switch (IG1) signal transmitted by ETACS-ECU. If the ignition switch (IG1) signal turns OFF, the sunroof ECU allows the sunroof switch to open/close (timer activation) the sunroof for approximately 30 seconds. During the timer operation, if the driver's or passenger's door open is detected from the door switch signal transmitted by ETACS-ECU, the sunroof timer function stops at this time.

GENERAL CIRCUIT DIAGRAM REGARDING THE SUNROOF



SUNROOF DIAGNOSIS

TROUBLESHOOTING STRATEGY

M14206000017USA0000010001

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points, Troubleshooting Contents P.00-6.

DIAGNOSTIC TROUBLE CODE CHART

M14206000019USA0000010000

⚠ CAUTION

On troubleshooting, if the ignition switch is turned ON while disconnecting connector(s), diagnostic trouble code(s) associated with other system may

be set. On completion, confirm all systems for diagnostic trouble code(s). If diagnostic trouble code(s) are set, erase them all.

Diagnostic trouble code No.	Diagnostic item	Reference page
L0630	S/R Power supply	P.42Ad-5
L0632	S/R Switch fall	P.42Ad-8
L0634	S/R Sensor signal	P.42Ad-11
L0637	S/R Position	P.42Ad-12
L0640	S/R Over load	P.42Ad-13

NOTE: S/R: Abbreviation of sunroof

TROUBLE SYMPTOM CHART

M14206000020USA0000010001

⚠ CAUTION

During diagnosis, a diagnostic trouble code associated with other system may be set when the ignition switch is turned on with connector(s)

disconnected. On completion, confirm all systems for diagnostic trouble code(s). If diagnostic trouble code(s) are set, erase them all.

TROUBLE SYMPTOM	INSPECTION PROCEDURE NUMBER	REFERENCE PAGE
Sunroof does not work at all.	1	P.42Ad-14
The sunroof lid glass does not tilt-up (tilt-down, open, and close normally).	2	P.42Ad-24
The sunroof lid glass does not open (tilt-up, tilt-down, and close normally).	3	P.42Ad-21
The sunroof lid glass does not tilt-down or close (tilt-up and open normally).	4	P.42Ad-27
Sunroof safety function does not work normally.	5	P.42Ad-31
Sunroof timer lock function does not work normally.	6	P.42Ad-30

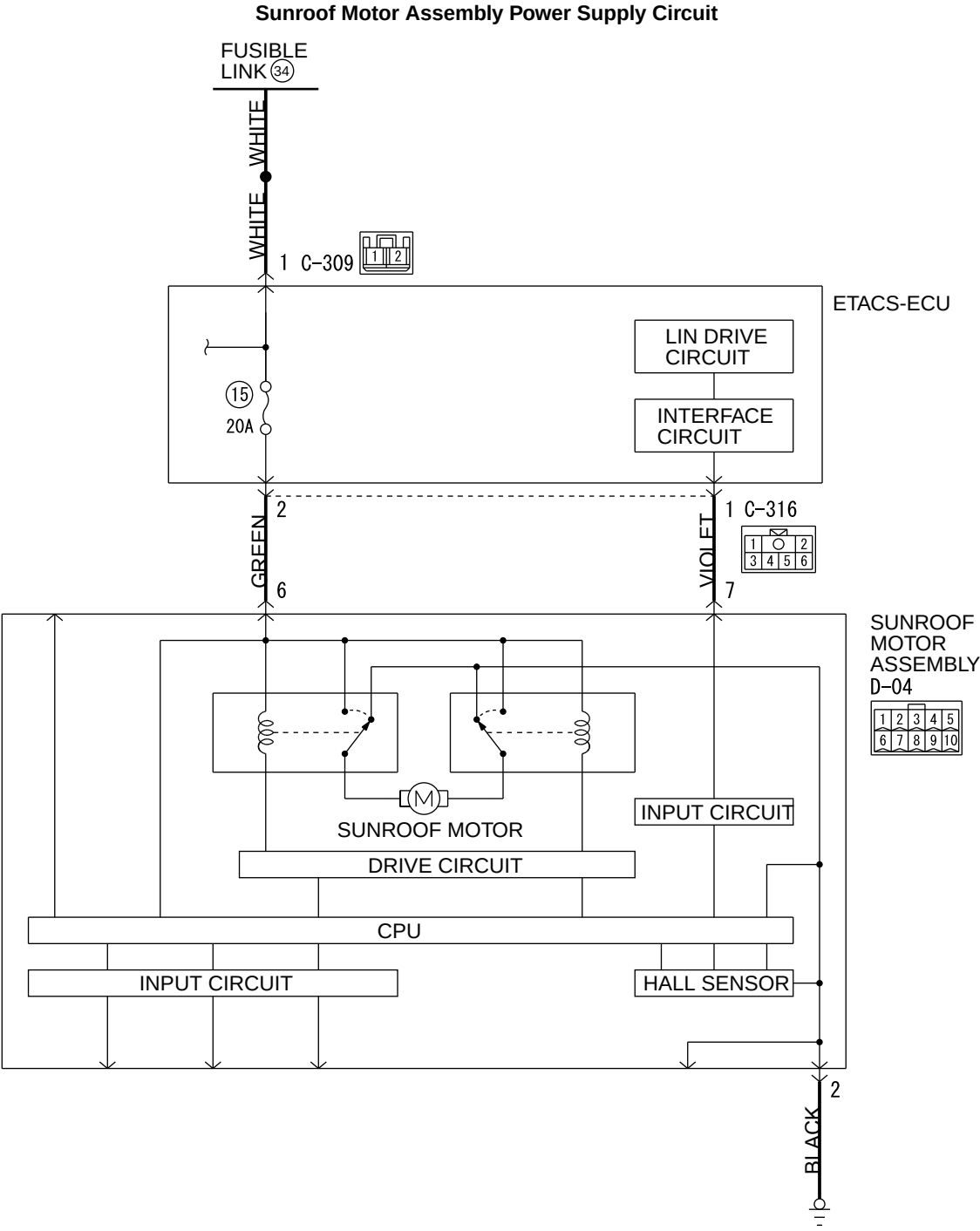
DIAGNOSTIC TROUBLE CODE PROCEDURES

Code No. L0630 S/R Power Supply

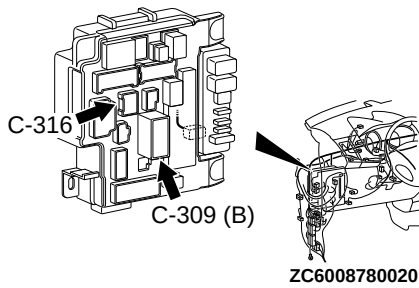
M14206000901USA0000010000

 CAUTION

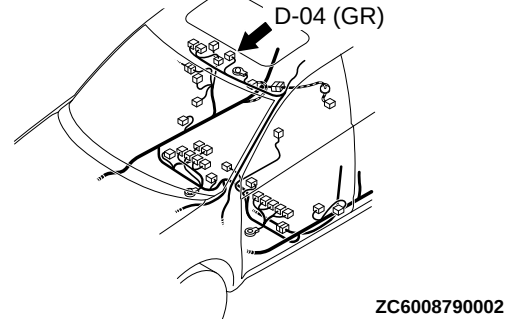
Before replacing the ECU, ensure that the input and output signal circuits are normal.



Connectors: C-309, C-316



Connector: D-04



COMMENTS ON TROUBLE SYMPTOM

Current trouble

- If the terminal voltage at the sunroof ECU has been 8 V or lower, or 18V or higher for 60 seconds, sunroof ECU sets the diagnostic trouble code No. L0630.

Past trouble

- If the diagnostic trouble code No. L0630 is set as past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus communication line. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-17).

NOTE: For a past trouble, you cannot find it by the scan tool (M. U. T.-III) CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P. 00-17 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnostic trouble code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54D, CAN Bus Line Diagnostic Flow P. 54D-10).

PROBABLE CAUSES

- Malfunction of the sunroof motor assembly
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check sunroof motor assembly connector D-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is sunroof switch connector D-04 in good condition?

YES: Go to Step 2.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P. 00E-2. Check that the sunroof works normally.

STEP 2. Check the wiring harness between sunroof motor assembly connector D-04 (terminal 6) and fusible link (34).

NOTE: Also check ETACS-ECU connectors C-309 and C-316 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If ETACS-ECU connectors C-309 and C-316 is damaged, repair or replace the damaged component (s) as described in GROUP 00E, Harness Connector Inspection P. 00E-2.

Q:Is the wiring harness between sunroof motor assembly connector D-04 (terminal 6) and fusible link (34) in good condition?

YES: Go to Step 3.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the sunroof works normally.

STEP 3. Diagnostic trouble code recheck

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
- (3) Check if the diagnostic trouble code is set.

Q:Is the diagnostic trouble code set?

YES: Replace the sunroof motor assembly.

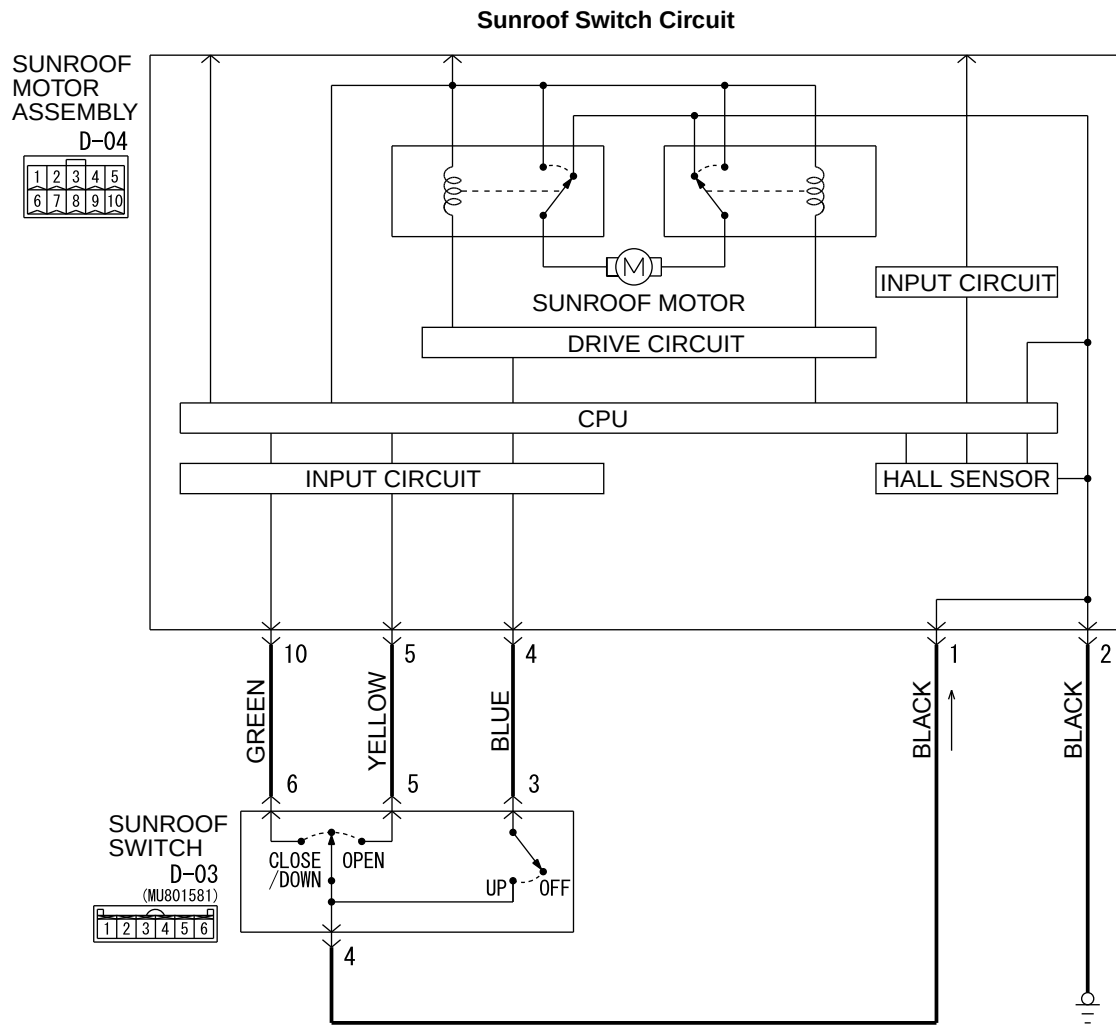
NO: The procedure is complete.

Code No. L0632 S/R Switch fall

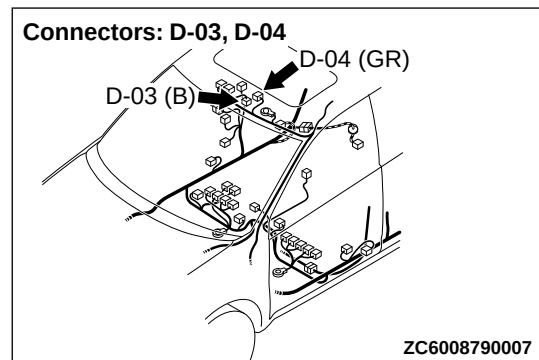
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 CAUTION

Before replacing the ECU, ensure that the input and output signal circuits are normal.



ZC6006150000



COMMENTS ON TROUBLE SYMPTOM

Current trouble

- If each switch (up, open, close/down) of the sunroof switch has been ON for 60 seconds, sunroof ECU sets the diagnostic trouble code No. L0632.

Past trouble

- If diagnostic trouble code No. L0632 is set as past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-17).

NOTE: For a past trouble, you cannot find it by the can tool (M. U. T. -III) CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P. 00-17 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnostic trouble code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54D, CAN Bus Line Diagnostic Flow P. 54D-10).

PROBABLE CAUSES

- Malfunction of the sunroof motor assembly
- Malfunction of the sunroof switch
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check sunroof switch connector D-03 and sunroof motor assembly D-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are sunroof switch connector D-03 and sunroof motor assembly D-04 in good condition?

YES: Go to Step 2.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.

STEP 2. Check the wiring harness between sunroof switch connector D-03 (terminals No. 3, 5, 6) and sunroof motor assembly connector D-04 (terminals No. 4, 5, 10).

Q: Is the wiring harness between sunroof switch connector D-03 (terminal 3, 5, 6) and sunroof motor assembly connector D-04 (terminal No. 4, 5, 10) in good condition?

YES: Go to Step 3.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the sunroof works normally.

STEP 3. Diagnostic trouble code recheck

Replace the sunroof switch. Recheck if the diagnostic trouble code is set.

(1) Erase the diagnostic trouble code.

- (2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
- (3) Check if the diagnostic trouble code is set.

Q:Is the diagnostic trouble code set?

YES: Replace the sunroof motor assembly.

NO: The procedure is complete.

Code No. L0634 S/R Sensor signal

M14206000903USA0000010000

⚠ CAUTION

Before replacing the ECU, ensure that the input and output signal circuits are normal.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- If the signal from one of two lid position detection sensors cannot be detected, sunroof ECU sets the diagnostic trouble code No. L0634.

Past trouble

- If diagnostic trouble code No. L0634 is set as past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-17).

NOTE: For a past trouble, you cannot find it by the scan tool (M. U. T. -III) CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P. 00-17 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnostic trouble code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54D, CAN Bus Line Diagnostic Flow P. 54D-10).

PROBABLE CAUSES

- Malfunction of the sunroof motor assembly

DIAGNOSTIC PROCEDURE

Diagnostic trouble code recheck

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
- (3) Check if the diagnostic trouble code is set.

Q:Is the diagnostic trouble code set?

YES: Replace the sunroof motor assembly.

NO: The procedure is complete.

Code No. L0637 S/R Position

M14206000904USA0000010000

⚠ CAUTION

Before replacing the ECU, ensure that the input and output signal circuits are normal.

COMMENTS ON TROUBLE SYMPTOM**Current trouble**

- If the roof lid glass position is out of the specified area, sunroof ECU sets the diagnostic trouble code No. L0637.

Past trouble

- If the diagnostic trouble code No. L0637 is set as past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus communication line. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-17).

NOTE: For a past trouble, you cannot find it by the scan tool (M. U. T. -III) CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P. 00-17 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnostic trouble code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54D, CAN Bus Line Diagnostic Flow P. 54D-10).

PROBABLE CAUSES

- Malfunction of the sunroof motor assembly

DIAGNOSTIC PROCEDURE**STEP 1. Check the sunroof fully closed position**

- (1) Carry out the learning procedures of the sunroof fully closed position. Refer to P.42Ad-38.
- (2) Recheck if the diagnostic trouble code is set.
Erase the diagnostic trouble code.
Turn the ignition switch from the LOCK (OFF) position to the ON position.
Check if the diagnostic trouble code is set.

Q:Is the check result normal?

YES: The procedure is complete.

NO: Go to Step 2.

STEP 2. Diagnostic trouble code recheck

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES: Replace the sunroof motor assembly.

NO: The procedure is complete.

Code No. L0640 S/R Over load

M14206000905USA0000010000

 CAUTION

Before replacing the ECU, ensure that the input and output signal circuits are normal.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- If the anti-trap function is activated consecutively five times or more, sunroof ECU sets the diagnostic trouble code No. L0640.

Past trouble

- If the diagnostic trouble code No. L0640 is set as past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus communication line. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-17).

NOTE: For a past trouble, you cannot find it by the scan tool (M. U. T. -III) CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P. 00-17 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnostic trouble code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54D, CAN Bus Line Diagnostic Flow P. 54D-10).

PROBABLE CAUSES

- Malfunction of the sunroof motor assembly

DIAGNOSTIC PROCEDURE

STEP 1. Check the sunroof fully closed position

- (1) Carry out the learning procedures of the sunroof fully closed position. Refer to P.42Ad-38.
- (2) Recheck if the diagnostic trouble code is set.
Erase the diagnostic trouble code.

Turn the ignition switch from the LOCK (OFF) position to the ON position.

Check if the diagnostic trouble code is set.

Q:Is the check result normal?

YES: The procedure is complete.

NO: Go to Step 2.

STEP 2. Diagnostic trouble code recheck

Recheck if the diagnostic trouble code is set.

(1) Erase the diagnostic trouble code.

(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.

(3) Check if the diagnostic trouble code is set.

Q:Is the diagnostic trouble code set?

YES: Replace the sunroof motor assembly.

NO: The procedure is complete.

SYMPTOM PROCEDURES

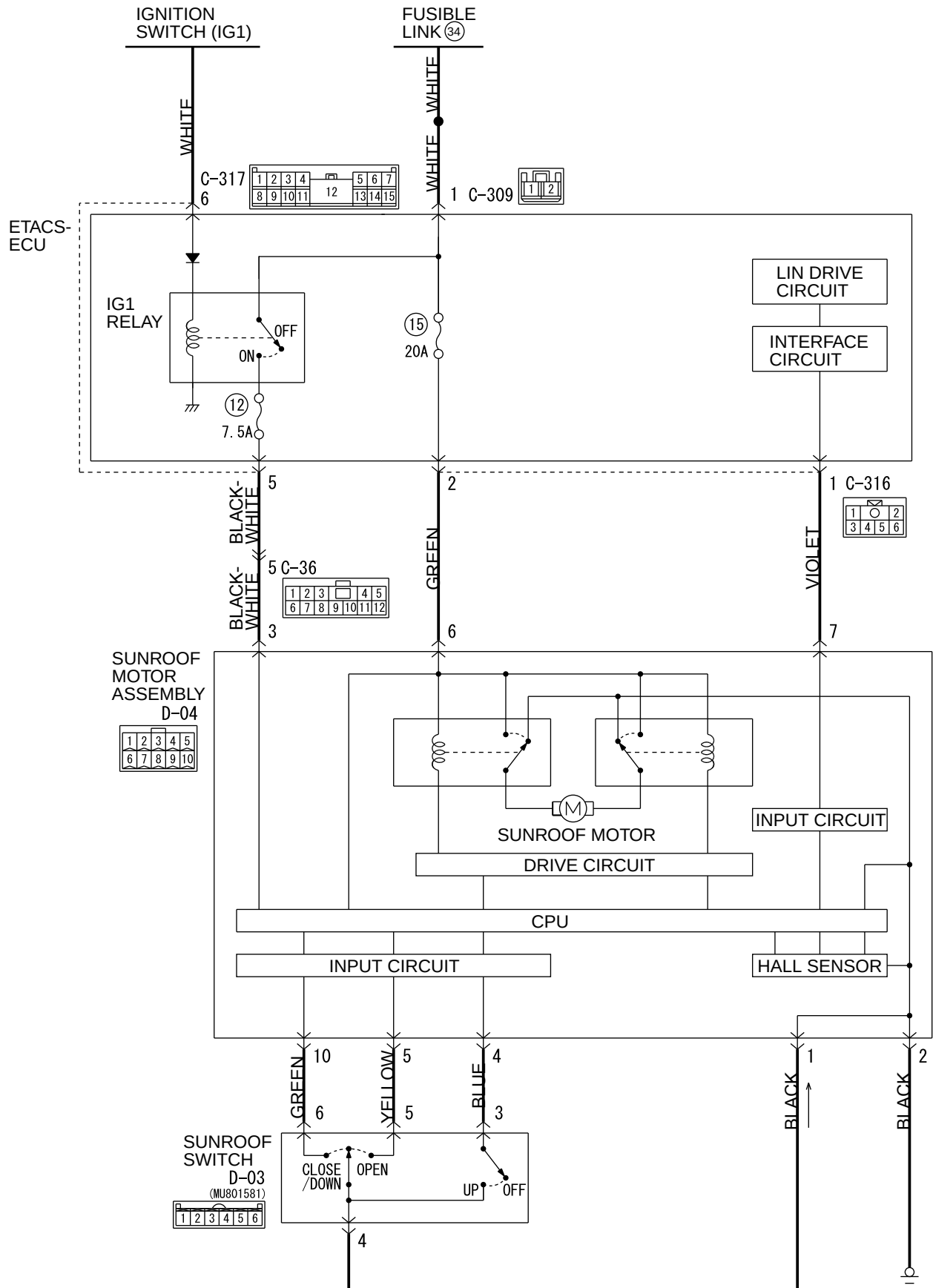
INSPECTION PROCEDURE 1: Sunroof does not Work at All.

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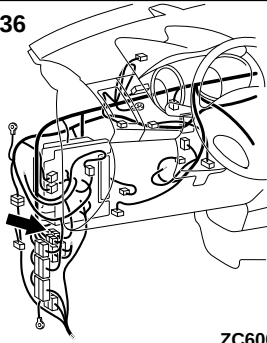
⚠ CAUTION

Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Sunroof Motor Assembly Power Supply Circuit



Connector: C-36



ZC6008750020

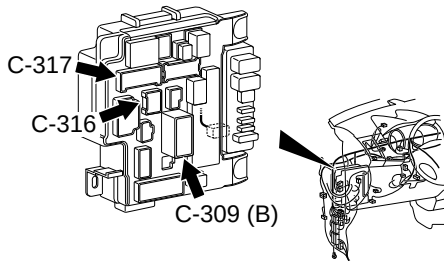
CIRCUIT OPERATION

- The sunroof motor assembly is energized through fusible link (34) by the battery.
- When the ignition switch (IG1) signal is on, the sunroof motor assembly is ready to operate.

TROUBLESHOOTING HINTS

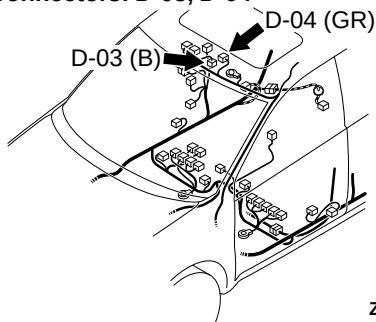
- The sunroof switch may be defective
- The sunroof motor assembly may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

Connectors: C-309, C-316, C-317



ZC6008780010

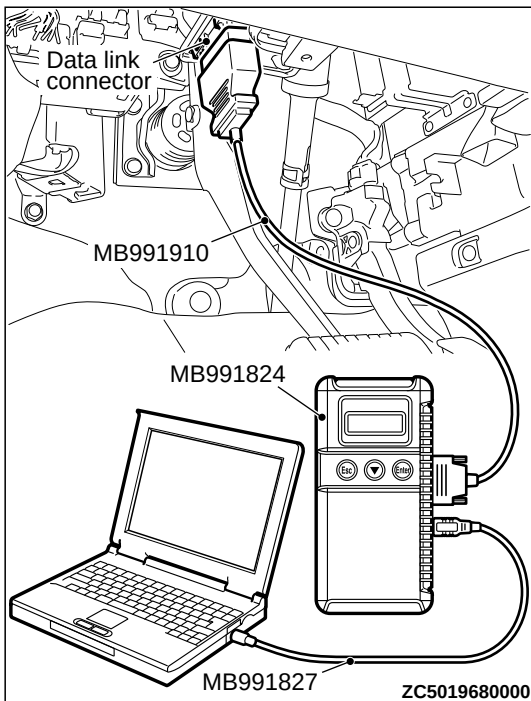
Connectors: D-03, D-04



ZC6008790007

DIAGNOSTIC PROCEDURE**Required Special Tools:**

- MB992006: Extra fine probe
- MB991223: Harness set
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958. Refer to GROUP 54Ad, "How to connect scan tool (M.U.T.-III) P.54Af-4."
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether the ETACS-ECU related DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the ETACS-ECU. Refer to P.42Ad-4.

NO: Go to Step 2.

STEP 2. Check sunroof switch connector D-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

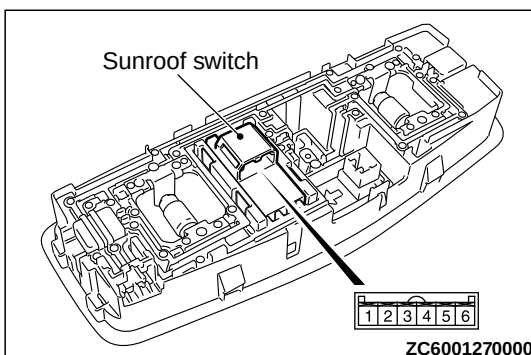
Q:Is sunroof switch connector D-03 in good condition?

YES: Go to Step 3.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.

STEP 3. Sunroof switch check

- (1) Remove the sunroof switch. Refer to P.42Ad-41.
- (2) Check continuity when the sunroof switch is operated to "OPEN", "TILT-UP" or "CLOSE/TILT-DOWN" position.



Switch position	Terminal No.	Normal value
Tilt-up	3 - 4	Continuity exists (2 Ω or less)
OFF	3 - 4, 4 - 5, 4 - 6	Open circuit
Open	4 - 5	Continuity exists (2 Ω or less)
Close/tilt-down	4 - 6	Continuity exists (2 Ω or less)

Q:Is the sunroof switch normal?

YES: Go to Step 4.

NO: Replace the sunroof switch. Check that the sunroof works normally.

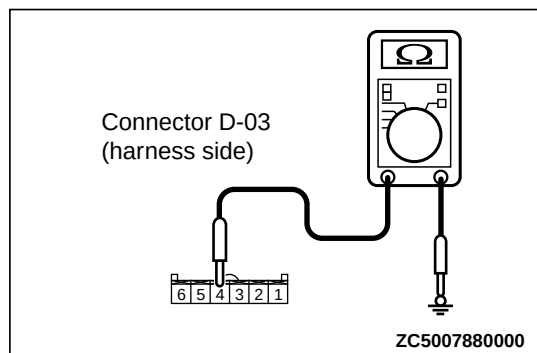
STEP 4. Check the ground circuit to the sunroof motor assembly. Measure the resistance at sunroof switch connector D-03.

- (1) Disconnect sunroof switch connector D-03 and measure the resistance available at the wiring harness side of the connector.
- (2) Measure the resistance value between terminal 4 and ground.
 - The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES: Go to Step 5.

NO: Go to Step 7.



STEP 5. Check sunroof motor assembly connector D-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is sunroof motor assembly connector D-04 in good condition?

YES: Go to Step 6.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.

STEP 6. Check the wiring harness between sunroof switch connector D-03 (terminal No. 4) and sunroof motor assembly connector D-04 (terminal No. 1).

Q: Is the wiring harness between sunroof switch connector D-03 (terminal 4) and sunroof motor assembly connector D-04 (terminal No. 1) in good condition?

YES: No action is necessary and testing is complete.

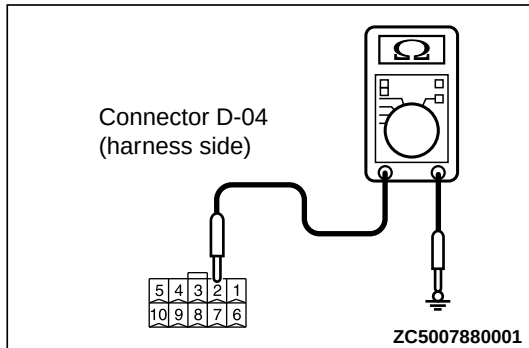
NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the sunroof works normally.

STEP 7. Check sunroof motor assembly connector D-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is sunroof motor assembly connector D-04 in good condition?

YES: Go to Step 8.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.



STEP 8. Check the ground circuit to the sunroof motor assembly. Measure the resistance at sunroof motor assembly connector D-04.

- (1) Disconnect sunroof motor assembly connector D-04 and measure the resistance available at the wiring harness side of the connector.
- (2) Measure the resistance value between terminal 2 and ground.
 - The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES: Go to Step 10.

NO: Go to Step 9.

STEP 9. Check the wiring harness between sunroof motor assembly connector D-04 (terminal 2) and ground.

Q: Is the wiring harness between sunroof motor assembly connector D-04 (terminal 2) and ground in good condition?

YES: No action is necessary and testing is complete.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the sunroof works normally.

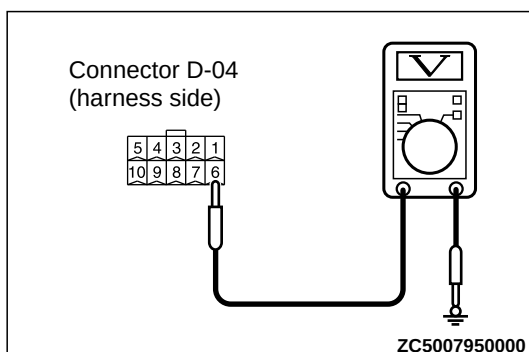
STEP 10. Check the fusible link (34) line of power supply circuit to the sunroof motor assembly. Measure the voltage at sunroof motor assembly connector D-04.

- (1) Disconnect sunroof motor assembly connector D-04 and measure the voltage available at the wiring harness side of the connector.
- (2) Measure the voltage between terminal 6 and ground.
 - The voltage should measure approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

YES: Go to Step 12.

NO: Go to Step 11.



STEP 11. Check the wiring harness between sunroof motor assembly connector D-04 (terminal 6) and fusible link (34).

NOTE: Also check ETACS-ECU connectors C-309 and C-316 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If ETACS-ECU connectors C-309 and C-316 is damaged, repair or replace the damaged component

(s) as described in GROUP 00E, Harness Connector Inspection P. 00E-2.

Q: Is the wiring harness between sunroof motor assembly connector D-04 (terminal 6) and fusible link (34) in good condition?

YES: No action is necessary and testing is complete.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the sunroof works normally.

STEP 12. Check the ignition switch (IG1) circuit to the sunroof motor assembly. Measure the voltage at sunroof motor assembly connector D-04.

(1) Disconnect sunroof motor assembly connector D-04 and measure the voltage available at the wiring harness side of the connector.

(2) Turn the ignition switch to the "ON" position.

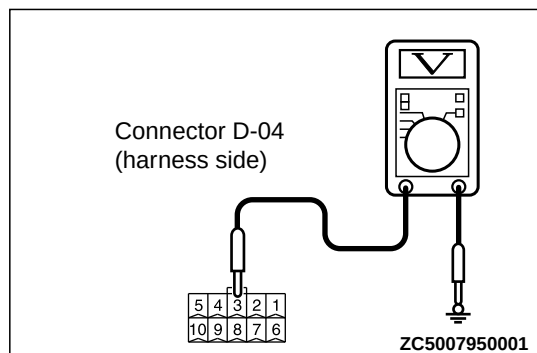
(3) Measure the voltage between terminal 3 and ground.

*The voltage should measure approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

YES: Go to Step 14.

NO: Go to Step 13.



STEP 13. Check the wiring harness between sunroof motor assembly connector D-04 (terminal 3) and ignition switch (IG1).

NOTE: Also check intermediate connector C-36 and ETACS-ECU connector C-317 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-36 and ETACS-ECU connector C-317 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P. 00E-2.

Q: Is the wiring harness between sunroof motor assembly connector D-04 (terminal 3) and the ignition switch (IG1) in good condition?

YES: No action is necessary and testing is complete.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the sunroof works normally.

STEP 14. Retest the system.

Check that the sunroof works normally.

Q: Is the check result normal?

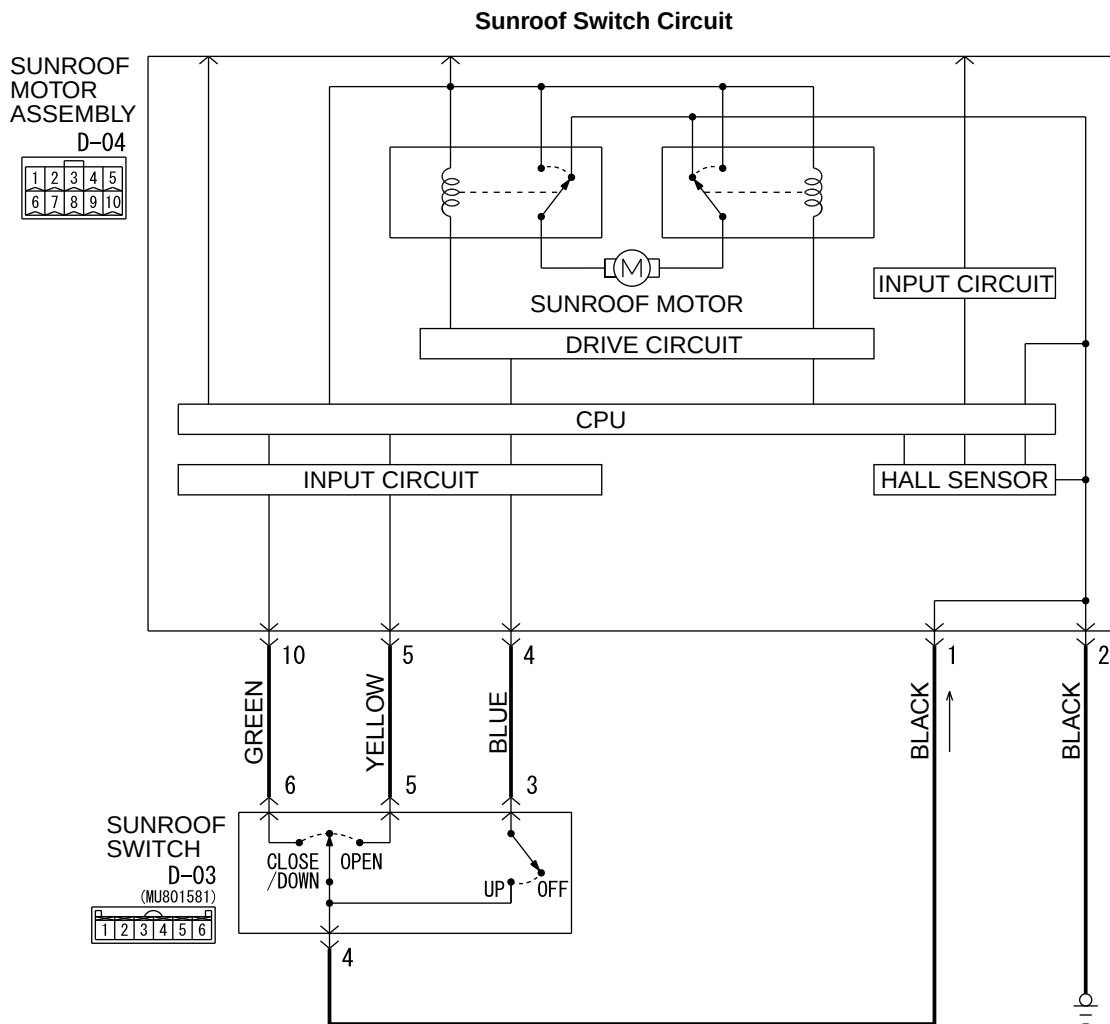
YES: No action is necessary and testing is complete.
NO: Replace the sunroof motor assembly. Check that the sunroof works normally.

INSPECTION PROCEDURE 2: The Sunroof Lid Glass does not Tilt-up (Open, Tilt-down and Close Normally).

M14206000049USA0000010000

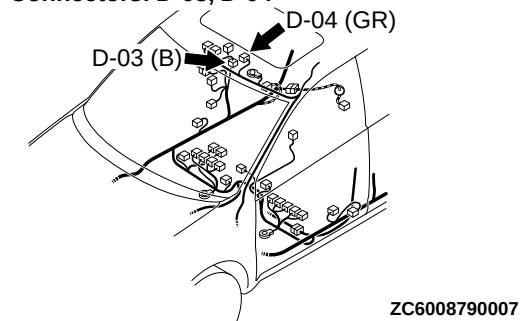
CAUTION

Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.



ZC6006150000

Connectors: D-03, D-04

**TECHNICAL DESCRIPTION (COMMENT)**

The sunroof switch or the sunroof motor assembly may be defective.

TROUBLESHOOTING HINTS

- The sunroof switch may be defective
- The sunroof motor assembly may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSTIC PROCEDURE**Required Special Tools:**

- MB992006: Extra fine probe
- MB991223: Harness set
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

CAUTION

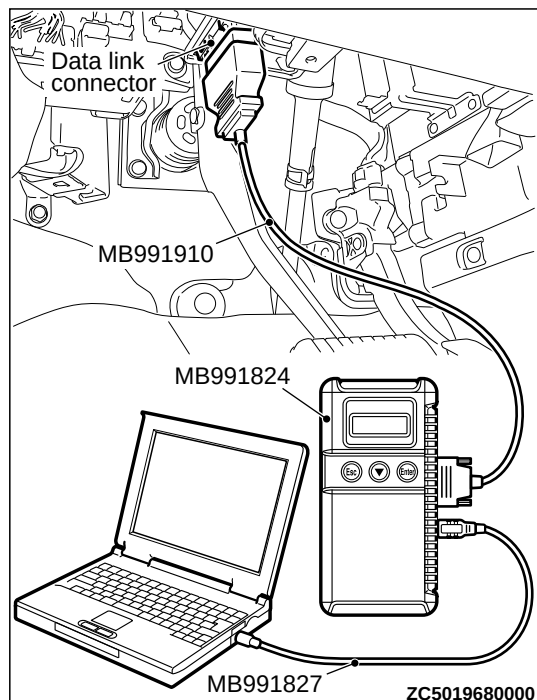
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958. Refer to GROUP 54Ad, "How to connect scan tool (M.U.T.-III) P.54Af-4."
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether the ETACS-ECU related DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the ETACS-ECU. Refer to P. 42Ad-4.

NO: Go to Step 2.



STEP 2. Check sunroof switch connector D-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

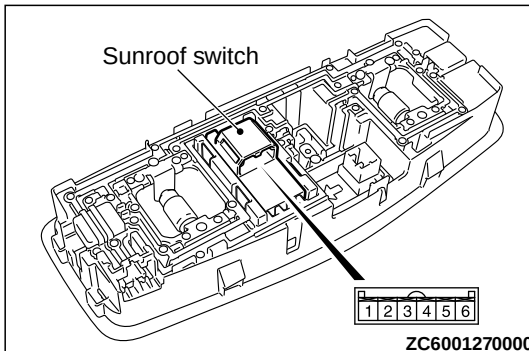
Q:Is sunroof switch connector D-03 in good condition?

YES: Go to Step 3.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.

STEP 3. Sunroof switch check

- (1) Remove the sunroof switch. Refer to P.42Ad-41.
- (2) Check continuity when the sunroof switch is operated to "TILT-UP" position.



Switch position	Terminal No.	Normal value
Tilt-up	3 - 4	Continuity exists (2 Ω or less)
OFF	3 - 4, 4 - 5, 4 - 6	Open circuit

Q: Is the sunroof switch normal?

YES: Go to Step 4.

NO: Replace the sunroof switch. Check that the sunroof works normally.

STEP 4. Check sunroof motor assembly connector D-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is sunroof motor assembly connector D-04 in good condition?

YES: Go to Step 5.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.

STEP 5. Check the wiring harness between sunroof switch connector D-03 (terminal 3) and sunroof motor assembly connector D-04 (terminal 4).

Q: Is the wiring harness between sunroof switch connector D-03 (terminal 3) and sunroof motor assembly connector D-04 (terminal No. 4) in good condition?

YES: Go to Step 6.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the sunroof works normally.

STEP 6. Retest the system.

Check that the sunroof lid glass tilts up.

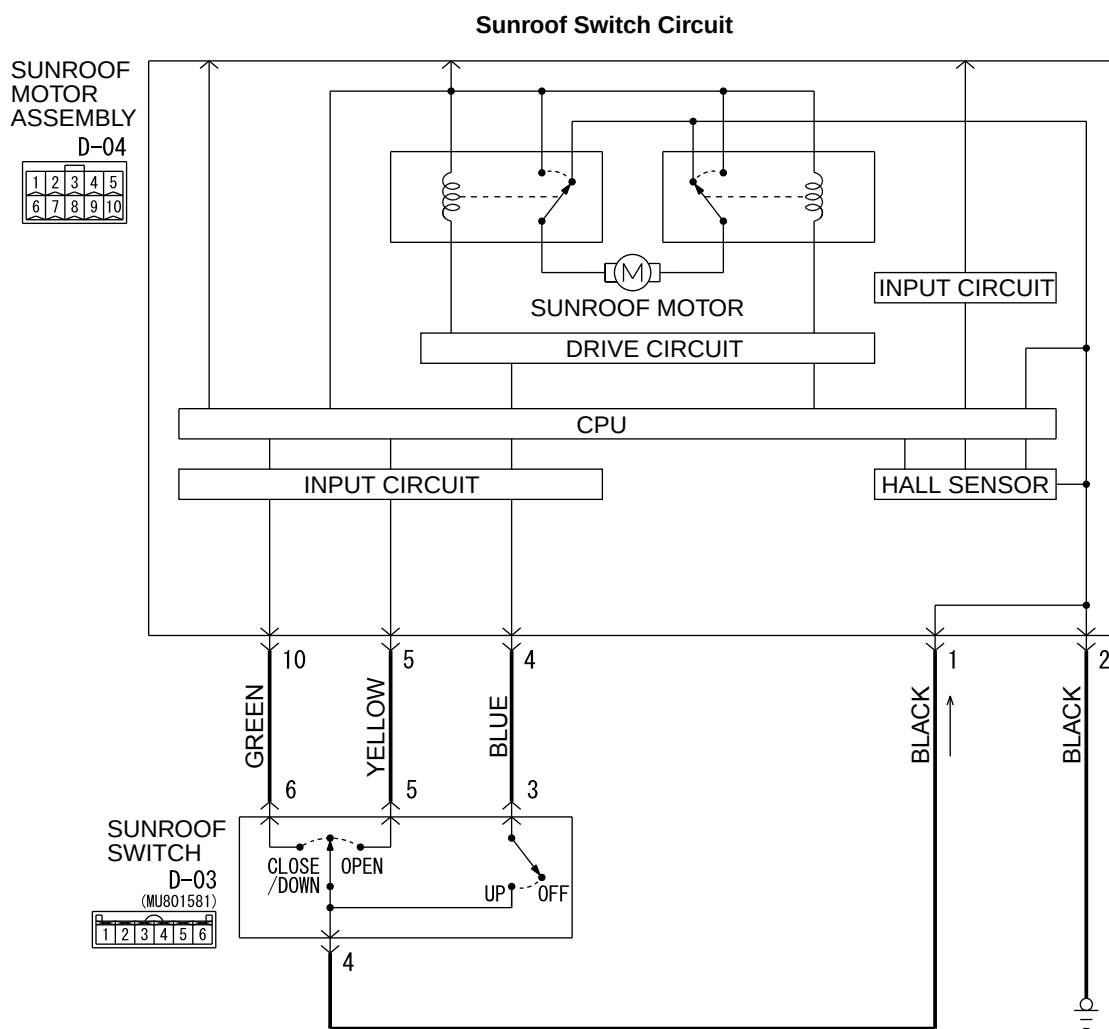
Q: Is the check result normal?

YES: No action is necessary and testing is complete.

NO: Replace the sunroof motor assembly. Check that the sunroof works normally.

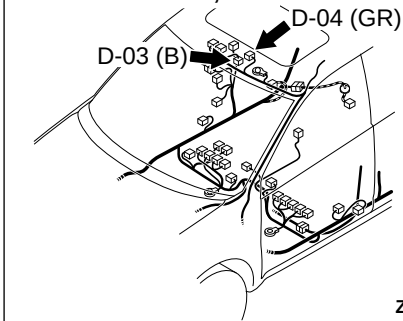
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Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.



ZC6006150000

Connectors: D-03, D-04



TECHNICAL DESCRIPTION (COMMENT)

The sunroof switch or the sunroof motor assembly may be defective.

TROUBLESHOOTING HINTS

- The sunroof switch may be defective
- The sunroof motor assembly may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSTIC PROCEDURE

Required Special Tools:

- MB992006: Extra fine probe
- MB991223: Harness set
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

CAUTION

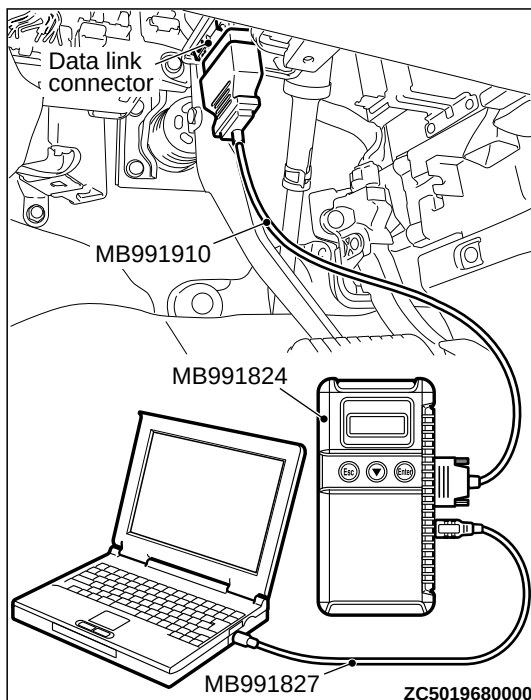
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958. Refer to GROUP 54Ad, "How to connect scan tool (M.U.T.-III) P.54Af-4."
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether the ETACS-ECU related DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the ETACS-ECU. Refer to P. 42Ad-4.

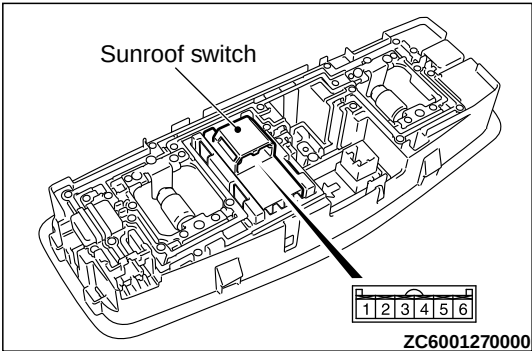
NO: Go to Step 2.



STEP 2. Check sunroof switch connector D-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is sunroof switch connector D-03 in good condition?

YES: Go to Step 3.



NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.

STEP 3. Sunroof switch check

- (1) Remove the sunroof switch. Refer to P.42Ad-41.
(2) Check continuity when the sunroof switch is operated to "OPEN" position.

Switch position	Terminal No.	Normal value
Open	4 - 5	Continuity exists (2 Ω or less)
OFF	3 - 4, 4 - 5, 4 - 6	Open circuit

Q: Is the sunroof switch normal?

YES: Go to Step 4.

NO: Replace the sunroof switch.

STEP 4. Check sunroof motor assembly connector D-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is sunroof motor assembly connector D-04 in good condition?

YES: Go to Step 5.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.

STEP 5. Check the wiring harness between sunroof switch connector D-03 (terminal 5) and sunroof motor assembly connector D-04 (terminal 5).

Q: Is the wiring harness between sunroof switch connector D-03 (terminal 5) and sunroof motor assembly connector D-04 (terminal No. 5) in good condition?

YES: Go to Step 6.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the sunroof works normally.

STEP 6. Retest the system.

Check that the sunroof lid glass opens.

Q: Is the check result normal?

YES: No action is necessary and testing is complete.

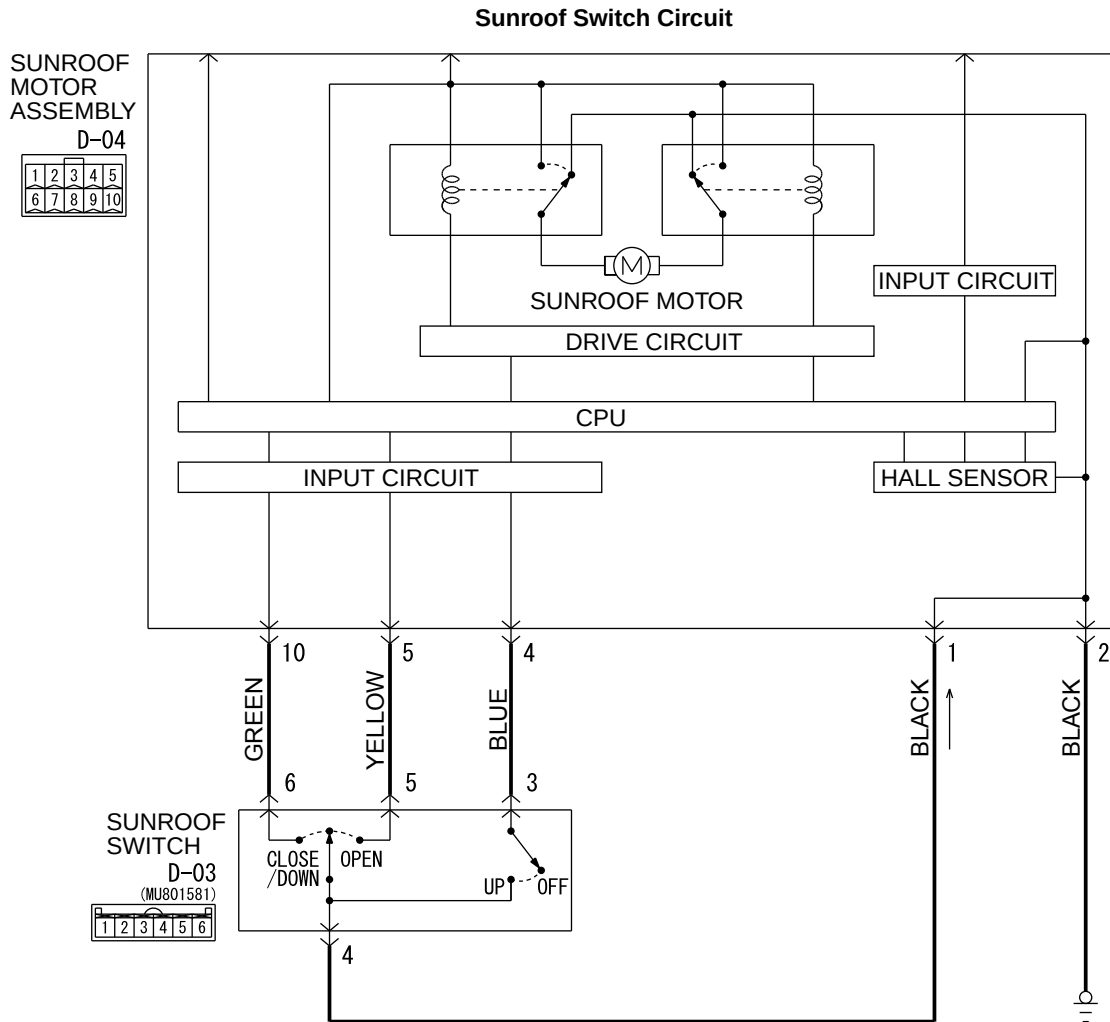
NO: Replace the sunroof motor assembly. Check that the sunroof works normally.

INSPECTION PROCEDURE 4: The Sunroof Lid Glass does not Tilt-down or Close (Tilt-up and Open Normally).

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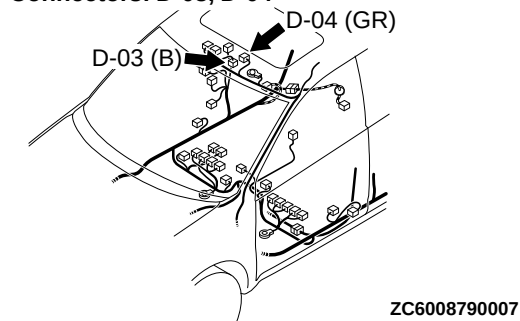
CAUTION

Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.



ZC6006150000

Connectors: D-03, D-04

**TECHNICAL DESCRIPTION (COMMENT)**

The sunroof switch or the sunroof motor assembly may be defective.

TROUBLESHOOTING HINTS

- The sunroof switch may be defective
- The sunroof motor assembly may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSTIC PROCEDURE**Required Special Tools:**

- MB992006: Extra fine probe
- MB991223: Harness set
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

CAUTION

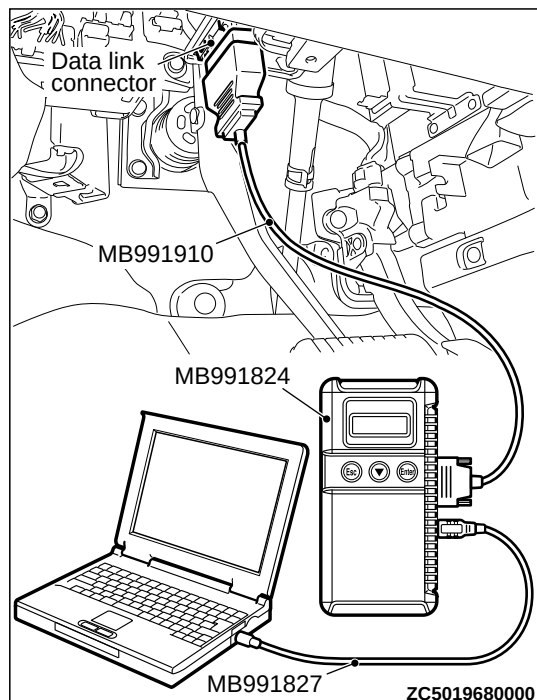
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958. Refer to GROUP 54Ad, "How to connect scan tool (M.U.T.-III) P.54Af-4."
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether the ETACS-ECU related DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the ETACS-ECU. Refer to P. 42Ad-4.

NO: Go to Step 2.



STEP 2. Check sunroof switch connector D-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

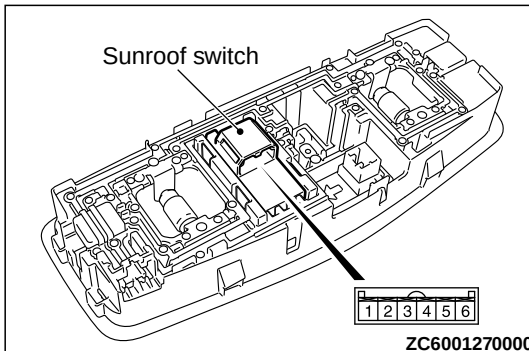
Q:Is sunroof switch connector D-03 in good condition?

YES: Go to Step 3.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.

STEP 3. Sunroof switch check

- (1) Remove the sunroof switch. Refer to P.42Ad-41.
- (2) Check continuity when the sunroof switch is operated to "CLOSE/TILT-DOWN" position.



Switch position	Terminal No.	Normal value
Close/tilt-down	4 - 6	Continuity exists (2 Ω or less)
OFF	3 - 4, 4 - 5, 4 - 6	Open circuit

Q: Is the sunroof switch normal?

YES: Go to Step 4.

NO: Replace the sunroof switch.

STEP 4. Check sunroof motor assembly connector D-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is sunroof motor assembly connector D-04 in good condition?

YES: Go to Step 5.

NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the sunroof works normally.

STEP 5. Check the wiring harness between sunroof switch connector D-03 (terminal 6) and sunroof motor assembly connector D-04 (terminal 10).

Q: Is the wiring harness between sunroof switch connector D-03 (terminal 6) and sunroof motor assembly connector D-04 (terminal No. 10) in good condition?

YES: Go to Step 6.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the sunroof works normally.

STEP 6. Retest the system.

Check that the sunroof lid glass tilts down or closes.

Q: Is the check result normal?

YES: No action is necessary and testing is complete.

NO: Replace the sunroof motor assembly. Check that the sunroof works normally.

INSPECTION PROCEDURE 5: Sunroof Safety Function does not Work Normally.

M14206000053USA0000010001

CAUTION

Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

CIRCUIT OPERATION

Malfunction of the sunroof motor assembly or incorrect learning of the sunroof fully closed position is suspected.

TROUBLESHOOTING HINTS

- Malfunction of the sunroof motor assembly
- Incorrect learning of the sunroof fully closed position

DIAGNOSTIC PROCEDURE**Required Special Tools:**

- MB992006: Extra fine probe
- MB991223: Harness set
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.**CAUTION**

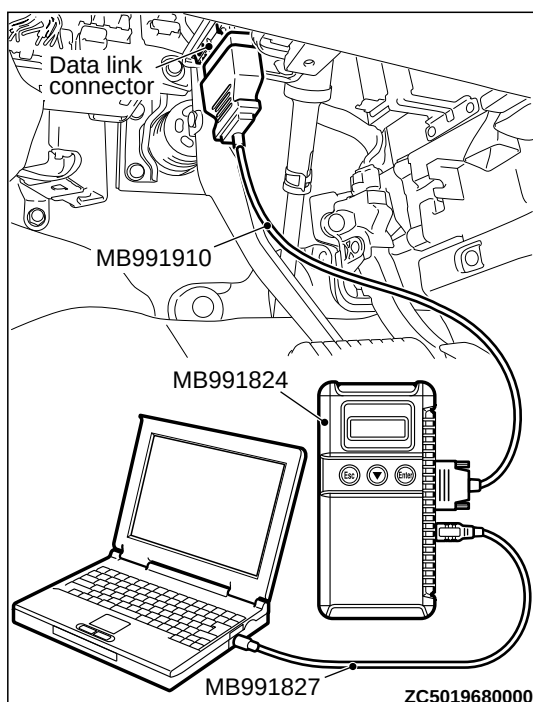
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958. Refer to GROUP 54Ad, "How to connect scan tool (M.U.T.-III) P.54Af-4."
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether the ETACS-ECU related DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the ETACS-ECU. Refer to P. 42Ad-4.

NO: Go to Step 2.



STEP 2. Check the trouble symptom.

Check the sunroof trouble symptom according to the following procedures.

- (1) Carry out the learning procedures of the sunroof fully closed position (Refer to P.42Ad-38).
- (2) Check the trouble symptom.

Q:Is the check result normal?

YES: No action is necessary and testing is complete.

NO: Replace the sunroof motor assembly. Check that the sunroof works normally.

INSPECTION PROCEDURE 6: The Sunroof Timer Function does not Work Normally.

M14206000055USA0000010001

⚠ CAUTION

Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

CIRCUIT OPERATION

- The sunroof timer function works according to the signals from the following switches:
 - Ignition switch (IG1): OFF
 - Front door switch (LH): OFF
 - Front door switch (RH): OFF
- Vehicle condition
 - Ignition switch: LOCK (OFF) position
 - Front door (LH): Closed
 - Front door (RH): Closed
- When the driver's door or the passenger's door are opened and closed while the sunroof timer function is on, the sunroof operative duration will be changed.

TECHNICAL DESCRIPTION (COMMENT)

Is the sunroof timer function does not work normally, the input circuits from the switches described in "CIRCUIT OPERATION", the sunroof motor assembly, the ETACS-ECU or the LIN communication line may be defective.

TROUBLESHOOTING HINTS

- The front door switch may be defective
- The sunroof motor assembly may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

COMMENTS ON TROUBLE SYMPTOM

If the sunroof timer function does not work normally, a malfunction of the communication circuit, the driver's door switch or the passenger's door switch input circuit, the sunroof motor assembly or ETACS-ECU is suspected.

PROBABLE CAUSES

- Malfunction of the driver's door switch
- Malfunction of the sunroof motor assembly
- Malfunction of ETACS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE**Required Special Tools:**

- MB992006: Extra fine probe
- MB991223: Harness set
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicles Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the power supply system.

With the ignition switch in the LOCK (OFF) position, check if the following function operates normally:

- Hazard warning light
- Central door locking system

Q:Is the check result normal?

YES: Go to Step 2.

NO: Refer to GROUP 54Ad, Malfunction of ETACS-ECU power supply circuit P.54Ad-57.

STEP 2. Using scan tool MB991958, read the diagnostic trouble code.**⚠ CAUTION**

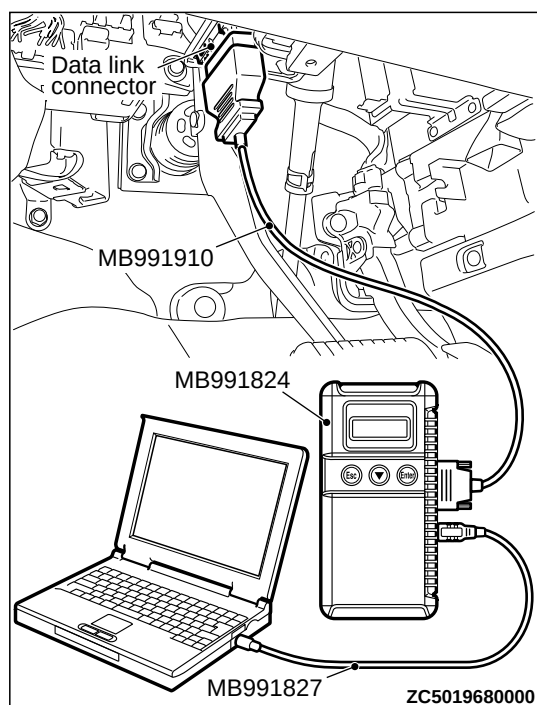
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958. Refer to GROUP 54Ad, "How to connect scan tool (M.U.T.-III) P.54Af-4."
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether the ETACS-ECU related DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

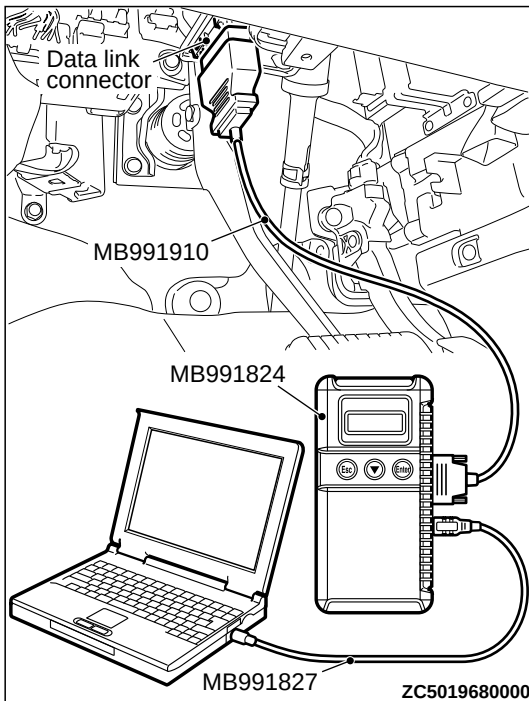
Q:Is the DTC set?

YES: Diagnose the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis P.54Ad-8.

NO: Go to Step 3.

**STEP 3. Using scan tool MB991958, check data list.**

Check the signals related to the sunroof timer function operation.



CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54Ad-5."
- (2) Turn the ignition switch to the "ON" position.
- (3) Check the data list of the ETACS.
 - *Turn the ignition switch to the LOCK (OFF) position.
 - *Close the driver's door.
 - *Close the passenger's door.

Item No.	Item name	Normal condition
254	IG voltage	Battery voltage
256	Dr door ajar switch	Close
257	As door ajar switch	Close

- (4) Turn the ignition switch to the "LOCK" (OFF) position.
OK: Normal condition is displayed.

Q:Is the check result normal?

Normal conditions are displayed for all the items.: Go to Step 4.

Normal condition is not displayed for item No. 254.: Refer to GROUP 54Ad, Inspection Procedure 2: ETACS-ECU does not receive any signal from the ignition switch (IG1) P. 54Ad-62.

Normal condition is not displayed for item No. 256.: Refer to GROUP 54Ad, Inspection Procedure 5: ETACS-ECU does not receive any signal from the front door switch (LH) P. 54Ad-73.

Normal condition is not displayed for item No. 257.: Refer to GROUP 54Ad, Inspection Procedure 6: ETACS-ECU does not receive any signal from the front door switch (RH) P. 54Ad-75.

STEP 4. Retest the system.

Check that the sunroof timer function works normally.

Q:Is the check result normal?

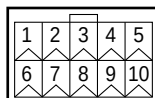
YES: No action is necessary and testing is complete.

NO: Replace the ETACS-ECU. Check that the sunroof timer function works normally.

SUNROOF MOTOR ASSEMBLY TERMINAL CHECK

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D-04

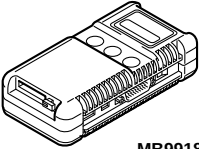
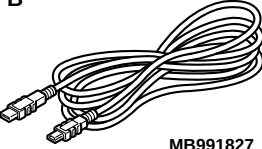
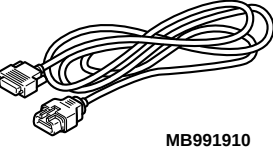
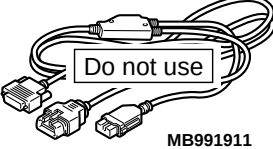
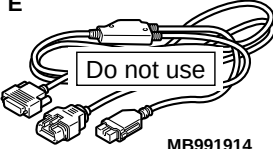
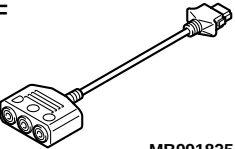
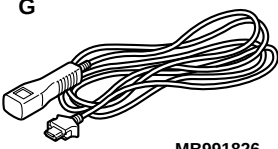


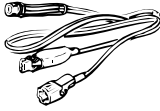
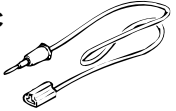
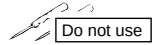
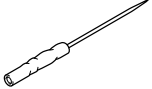
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Terminal No.	Check item	Check condition	Normal condition
1	Ground	Always	0 V
2	Ground	Sunroof in operation	0 V
3	Power supply from ignition switch (IG1)	Ignition switch: ON	System voltage
4	Input from sunroof switch (open)	Sunroof switch: Open	0 V
5	Input from sunroof switch (tilt-up)	Sunroof switch: Tilt-up	0 V
6	Battery power supply (for motor)	Always	System voltage
7	LIN communication line (between ETACS-ECU)	Always	0 to 12 V (pulse signal)
8	-	-	-
9	-	-	-
10	Input from sunroof switch (close or tilt-down)	Sunroof switch: Close or tilt-down	0 V

SPECIAL TOOLS

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TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991914 F  MB991825 G  MB991826 YB9919580001	MB991958 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826 Scan tool (M.U.T.-III sub assembly) A: Vehicle communication interface (V.C.I.) B: M.U.T.-III USB cable C: M.U.T.-III main harness A (Vehicles with CAN communication system) D: M.U.T.-III main harness B (Vehicles without CAN communication system) E: M.U.T.-III main harness C (for Daimler Chrysler models only) F: M.U.T.-III measurement adapter G: M.U.T.-III trigger harness	MB991824-KIT <i>NOTE: G: MB991826 M. U. T. -III Trigger Harness is not necessary when pushing V. C. I. ENTER key.</i>	Communication line check (ECU check and service data) ⚠ CAUTION For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  B  C  D  YB9912230001	MB991223 Harness set A: MB991219 Test harness B: MB991220 LED harness C: MB991221 LED harness adapter D: MB991222 Probe	General service tools	Making voltage and resistance measurement during troubleshooting A: Connector pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection
 MB992006	MB992006 Extra fine probe	-	Making voltage and resistance measurement during troubleshooting

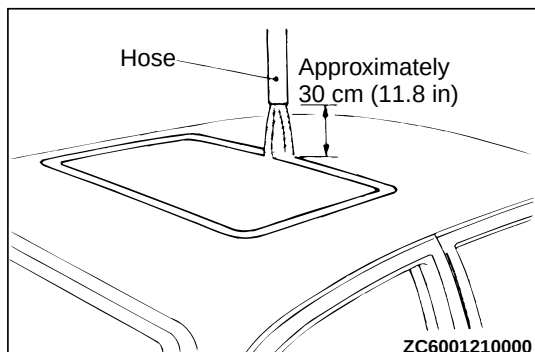
ON-VEHICLE SERVICE

WATER TEST

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Check if there are any leaks in the sunroof by the following procedure.

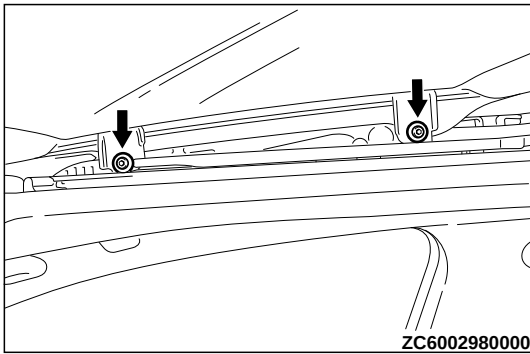
1. Fully close the sunroof lid glass.
2. Adjust the water pressure so that water comes out of the hose to a height of approximately 50 cm (19.7 inches) when the hose is held vertically facing upwards.
3. Hold the end of the hose approximately 30 cm (11.8 inches) above the roof and let the water run onto the weatherstrip for 5 minutes or more.
4. Check if any water leaks can be found in the room while watering. Even though there are any water leaks around the sunroof lid glass, it can be acceptable as long as water is caught in the drip area.



SUNROOF FIT ADJUSTMENT

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1. Fully close the sunroof lid glass.
2. Fully open the sunshade.



3. Loosen the sunroof lid glass assembly mounting screws. Adjust the sunroof lid glass height by moving the sunroof lid glass assembly along the sunroof lid guide oblong hole so that the clearance between the sunroof lid glass and the vehicle body is even throughout the circumference.
4. After adjustment, check that the sunroof operates smoothly.

SUNROOF SAFETY FUNCTION CHECK

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1. Close the sunroof lid glass while placing an approximately 10 mm thick piece of wood at right angles with the sunroof lid glass.
2. Check to see if the sunroof motor assembly turns in the opposite direction and the sunroof lid glass opens when the sunroof lid glass touches the wood. If any problem occurs, perform troubleshooting. (Refer to P.42Ad-4.)

SUNROOF CHECK

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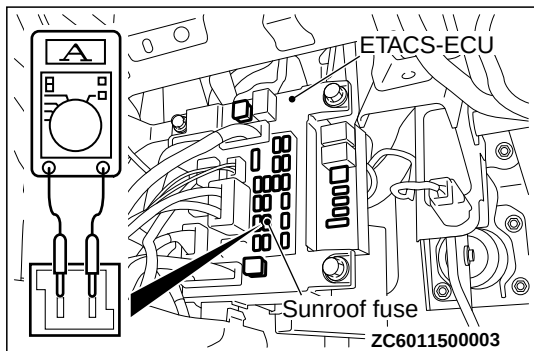
Check to see that the sunroof operates by pressing the sunroof switch. If it does not operate, perform troubleshooting. Refer to P.42Ad-4.

SUNROOF TIMER FUNCTION CHECK

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Check the system as described below. If the system does not work, carry out troubleshooting. Refer to P.42Ad-4.

- Close the door and turn the ignition switch to the LOCK (OFF) position, and then check that the sunroof operates for 30 seconds.
- Close the door and turn the ignition switch to the LOCK (OFF) position. While the timer is on, open the driver's door and front passenger's door, and check that the sunroof stays during the operation. (When the driver's door or front passenger's door is opened while the timer is on, the timer will be turned off.)



SUNROOF LID GLASS OPERATION CURRENT CHECK

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1. Remove the fuse of the sunroof, then connect the circuit tester as shown in the Figure.
2. Turn ON the sunroof switch, then measure the operating current when the sunroof lid glass is halfway opened.

Standard value: 7 A or less [at 20 °C (68 °F)]

3. Check the following areas if the operating current exceeds the standard value:

- Sunroof installation, deformation and presence of any foreign substances.
- Drive cable installation.
- Tilting of sunroof lid glass.

LEARNING PROCEDURES OF THE SUNROOF FULLY CLOSED POSITION

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SHIFTING CONDITIONS FOR THE FULLY CLOSED POSITION ADJUSTMENT MODE

- When shifting to the forced fully closed position adjustment mode

How to shift to the forced fully closed position adjustment mode

1. Turn the ignition switch to the "ON" position.
2. With the sunroof lid glass stopped (the position of the sunroof lid glass can be any position between fully opened and fully closed), press and hold the up switch for 10 seconds.

- When the anti-trap function (safety mechanism) is activated consecutively five times

- When the position information may be incorrect due to abnormal power supply during the sunroof operation

NOTE: When installing the sunroof assembly, or installing/replacing the sunroof motor assembly, operate the forced fully closed position adjustment mode to adjust the fully closed position.

HOW TO ADJUST THE FULLY CLOSED POSITION FORCED FULLY CLOSED POSITION ADJUSTMENT MODE

1. With the sunroof lid glass stopped (the position of the sunroof lid glass can be any position between fully opened and fully closed), press and hold the up switch.

NOTE: If operating the up switch moves the sunroof normally, use the open switch to fully open the sunroof

lid glass. After the sunroof lid glass stops, press and hold the up switch.

2. Use the up switch to set the sunroof lid glass to the tilt-up position. The sunroof lid glass activates for approximately 30 mm and stops automatically when the switch is pressed once. Repeat this operation until the tilt-up position is reached and hold there for 3 seconds so that the fully closed position learning is completed.

HOW TO ADJUST THE FULLY CLOSED POSITION SUCH AS WHEN THE SAFETY FUNCTION IS ACTIVATED CONSECUTIVELY FIVE TIMES

Use the up switch to set the sunroof lid glass to the tilt-up position. The sunroof lid glass activates for approximately 30 mm and stops automatically when the switch is pressed once. Repeat this operation until the tilt-up position is reached and hold there for 3 seconds so that the fully closed position learning is completed.

SUNROOF OPERATION CHECK

⚠ CAUTION

Check that the following items are normal before carrying out this operation check.

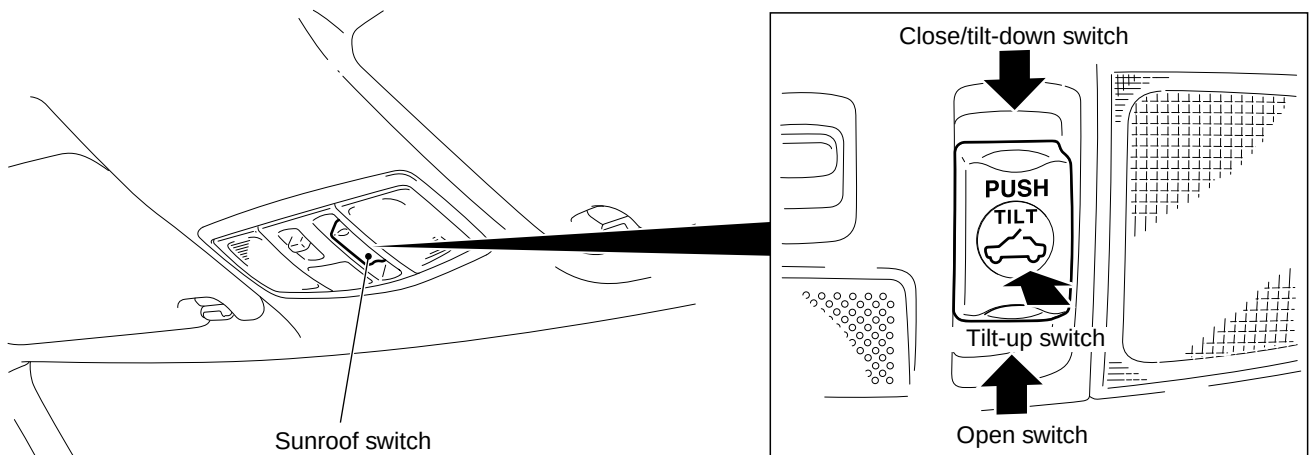
- Installation condition of the sunroof assembly
- Installation condition, deformation and contamination of the sunroof drive cable

• Installation of sunroof lid glass

• Sunroof switch and sunroof motor assembly

Check that the following items. If faulty, replace the sunroof motor assembly.

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BASIC OPERATION

NO.	SUNROOF FUNCTION	REQUIREMENTS FOR THE SUNROOF TO FUNCTION	NORMAL OPERATION
01	OPEN	1. Ignition switch: ON 2. Sunroof switch: OPEN	Automatically the sunroof fully opens.
02	CLOSE	1. Ignition switch: ON 2. Sunroof switch: CLOSE/TILT-DOWN	Automatically the sunroof fully closes.

NO.	SUNROOF FUNCTION	REQUIREMENTS FOR THE SUNROOF TO FUNCTION		NORMAL OPERATION
03	TILT-UP	1. Ignition switch: ON 2. Sunroof switch: TILT-UP		The sunroof tilts up fully and automatically.
04	TILT-DOWN	1. Ignition switch: ON 2. Sunroof switch: CLOSE/TILT-DOWN		The sunroof tilts down fully and automatically.
05	AUTOMATIC OPERATION INTERRUPTION (OPEN OR TILT-UP)	A	1. Ignition switch: ON 2. Sunroof switch: OPEN or TILT-UP	The sunroof stops the automatic opening operation.
		B	1. Ignition switch: ON 2. Sunroof switch: CLOSE/TILT-DOWN (Push the sunroof switch to the CLOSE/TILT-DOWN position while the sunroof is automatically opening and release the switch within two seconds)	The sunroof stops the automatic opening operation.
		C	1. Ignition switch: ON 2. Sunroof switch: CLOSE/TILT-DOWN (Push the sunroof switch to the CLOSE/TILT-DOWN position more than two seconds while the sunroof is automatically opening)	The sunroof stops the automatic opening operation, and the sunroof closes while the sunroof switch is pushed to the CLOSE/TILT-DOWN position.
06	AUTOMATIC OPERATION INTERRUPTION (CLOSE OR TILT-DOWN)	A	1. Ignition switch: ON 2. Sunroof switch: CLOSE/TILT-DOWN	The sunroof stops the automatic closing operation.
		B	1. Ignition switch: ON 2. Sunroof switch: OPEN or TILT-UP (Push the sunroof switch to the OPEN or TILT-UP position while the sunroof is automatically opening and release the switch within two seconds)	The sunroof stops the automatic closing operation.
		C	1. Ignition switch: ON 2. Sunroof switch: OPEN or TILT-UP (Push the sunroof switch to the OPEN or TILT-UP position more than two seconds while the sunroof is automatically opening)	The sunroof stops the automatic closing operation, and the sunroof opens while the sunroof switch is pushed to the OPEN or TILT-UP position.

SUNROOF TIMER MECHANISM

In cases except the following, the basic operation and jam preventing mechanism will be maintained for thirty seconds after the ignition switch is turned to the "LOCK" (OFF) position (Sunroof timer function).

- If you open a door within that period (i.e. a door switch is on), the sunroof timer function will be cancelled immediately.

SAFETY MECHANISM

- If any obstacle such as a hand or a head is detected to be pinched during a sunroof lid glass closing operation, the sunroof lid glass is opened by

approximately 200 mm (7.9 inches) or more. (Safety mechanism)

- During the sunroof lid glass closing operation, by continuing the sunroof close switch operation, the sunroof can be forcibly closed without activating the safety mechanism even when the obstacle is detected to be pinched.
- During the safety mechanism activation, when the sunroof close switch is operated, the sunroof lid glass stops. By continuing the close switch operation, the sunroof lid glass can be forcibly closed without activating the safety mechanism even when the obstacle is detected to be pinched.

SUNROOF ASSEMBLY

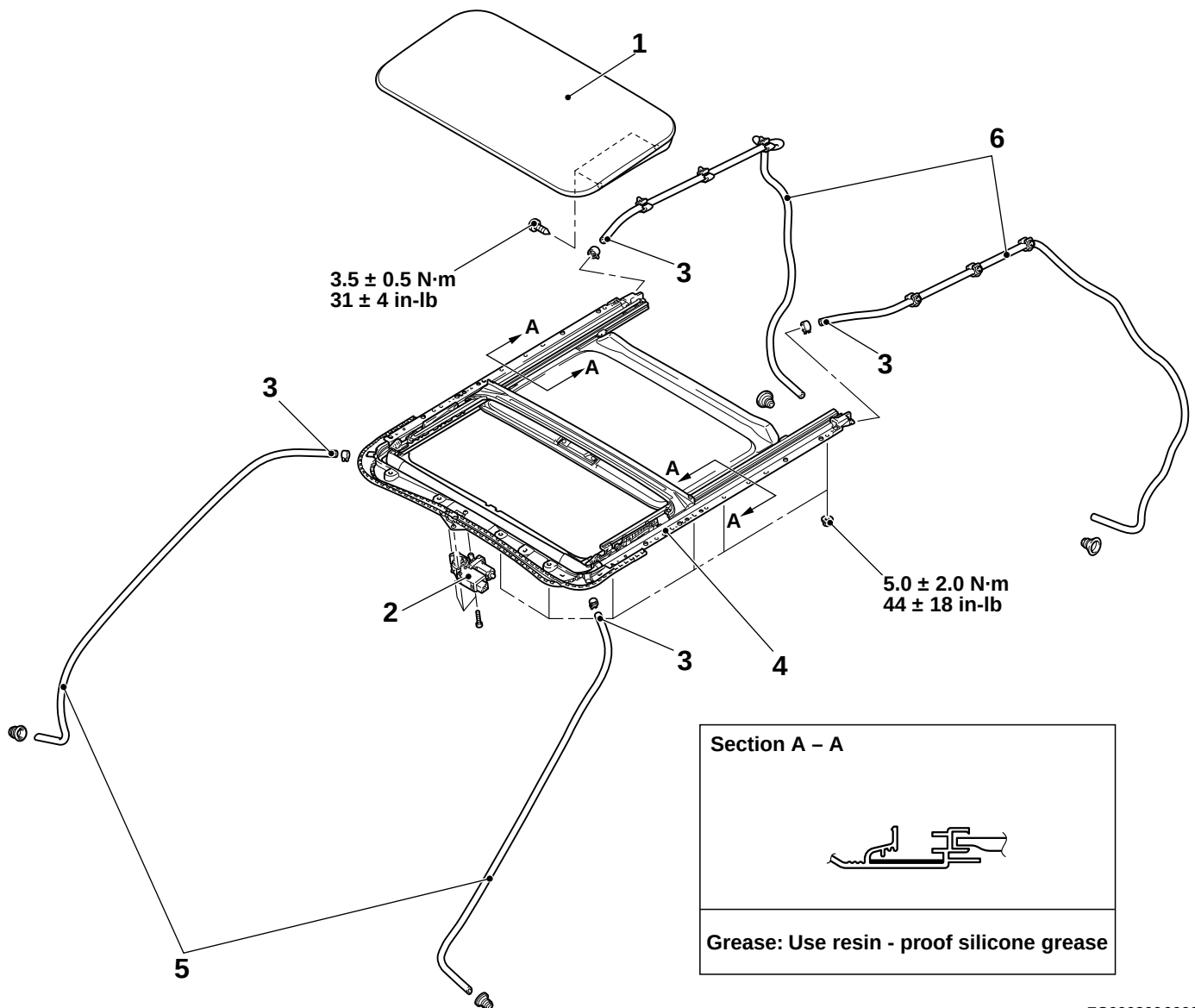
REMOVAL AND INSTALLATION

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Post-installation operation

Roof lid glass assembly and sunroof assembly

- Sunroof leakage check (Refer to P.42Ad-37.)
- Sunroof alignment (Refer to P.42Ad-36.)
- Learning procedures for sunroof fully closed position (Refer to P.42Ad-38.)



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Sunroof switch removal

Front dome light assembly (Refer to GROUP 52A, Headlining P.52A-15.)

Sunroof lid glass assembly removal

1. Sunroof lid glass assembly

Sunroof motor assembly removal steps

- Front dome light bracket (Refer to GROUP 52A, Headlining P.52A-15.)
- 2. Sunroof motor assembly

Sunroof assembly removal steps

- Front energy absorber roof bracket vehicles with curtain air bag (Refer to GROUP 52A, Headlining P.52A-15.)
- Rear monitor bracket <Vehicles with rear monitor> (Refer to GROUP 54A, Rear Display Unit P.54B-174.)

- 3. Drain pipe connection
- 4. Sunroof assembly

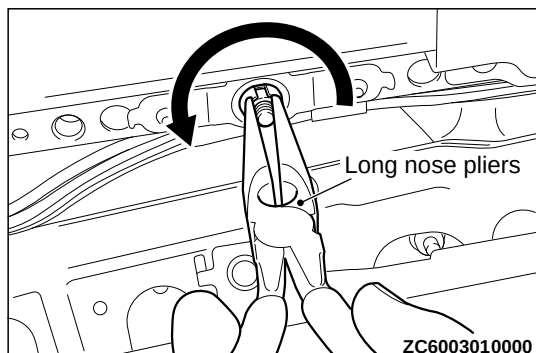
Drain pipe removal steps

- Headlining (Refer to GROUP 52A, Headlining P.52A-15.)
- Splash shield front (Refer to P. 42Aa-9.)

- <<A>>
- >>A<< 5. Front drain pipe
 - Splash shield rear (rear bumper side) (Refer to P.42Aa-9.)
 - >>A<< 6. Rear drain pipe

REMOVAL SERVICE POINT**<<A>> SUNROOF ASSEMBLY REMOVAL**

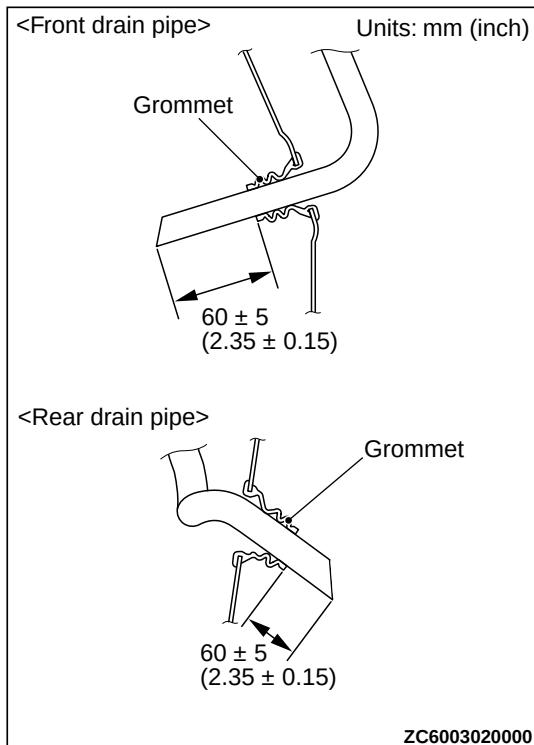
Use a pair of long nose pliers or the like to remove the sunroof assembly while turning it in the direction shown in the figure.



INSTALLATION SERVICE POINT

>>A<< FRONT DRAIN PIPE/REAR DRAIN PIPE INSTALLATION

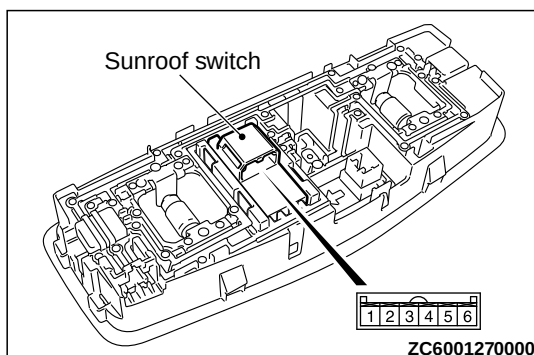
Install the grommet, and adjust the drain pipe projection as shown.



INSPECTION

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SUNROOF SWITCH CONTINUITY CHECK



Switch position	Terminal number	Normal value
Tilt-up	3 - 4	Continuity exists (2 Ω or less)
OFF	3 - 4, 4 - 5, 4 - 6	Open circuit
Open	4 - 5	Continuity exists (2 Ω or less)
Close/tilt-down	4 - 6	Continuity exists (2 Ω or less)

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