

## WINDSHIELD WIPER AND WASHER

### GENERAL DESCRIPTION CONCERNING THE WINDSHIELD WIPER AND WASHER

M1549021500257

The following ECUs affect the functions and control of the windshield wiper and washer.

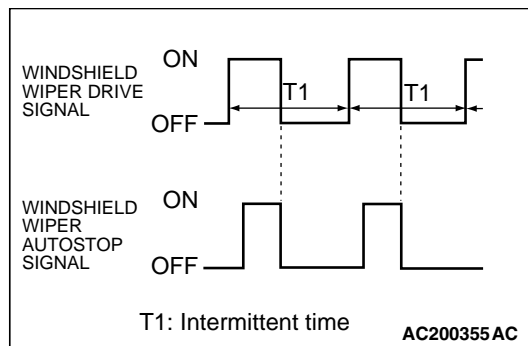
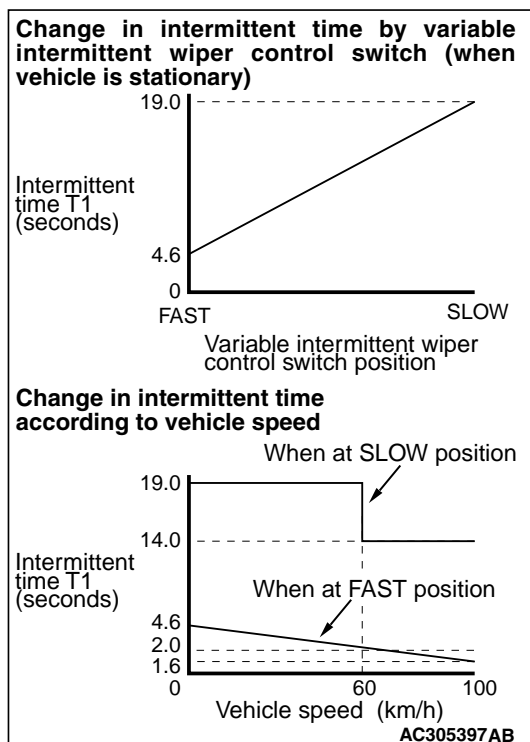
FUNCTION	CONTROL ECU
Windshield wiper and washer control function	Intermittent control (Vehicle speed-dependent variable type)
	Mist wiper control
	Low speed wiper and high speed wiper control
	Washer control

### Windshield wiper and washer control function

#### Intermittent control (vehicle speed-dependent variable type)

ETACS-ECU uses the dial position of the variable intermittent wiper control switch and the vehicle speed signal sent by the combination meter to calculate the interval to be sent to the front-ECU.

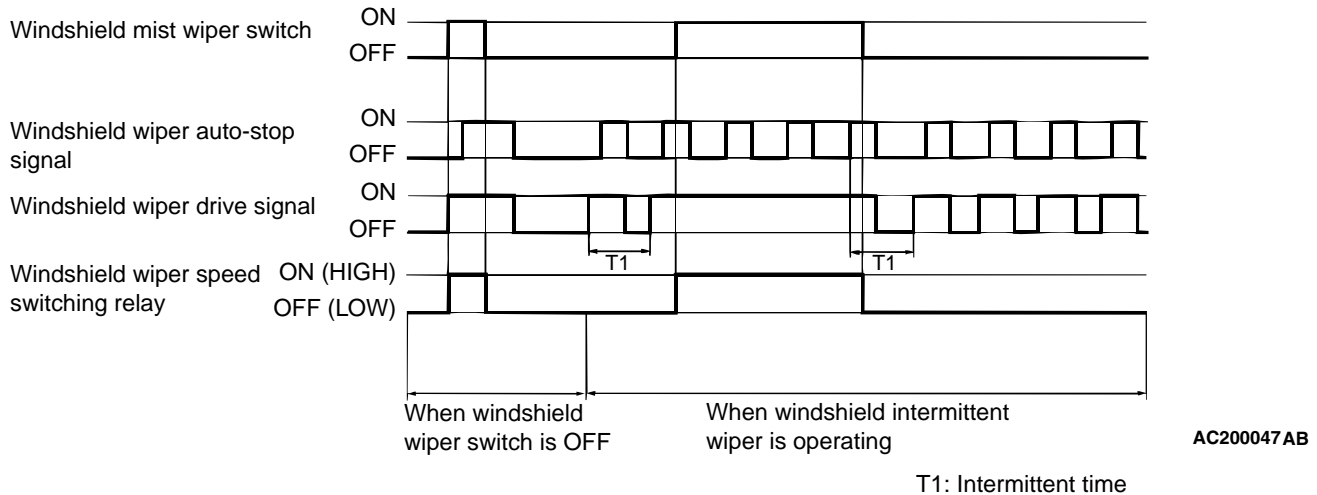
*NOTE: The speed-sensitive wiper can be customized on vehicles equipped with a multi center display (middle grade type). Refer to P.54B-555.*



The front-ECU determines the intermittent time T1 from the input SWS data signal, and turns ON the windshield wiper drive signal. When the wiper is at the STOP position, the windshield wiper auto-stop signal goes OFF, then turns OFF the windshield wiper drive signal. After the intermittent time T1 seconds from when the windshield wiper drive signal turned ON, the windshield wiper drive signal is turned ON again and the above operation is repeated.

*NOTE: If the intermittent time T1 is within 2 seconds, the wiper is operated consecutively at LOW-speed by the front-ECU.*

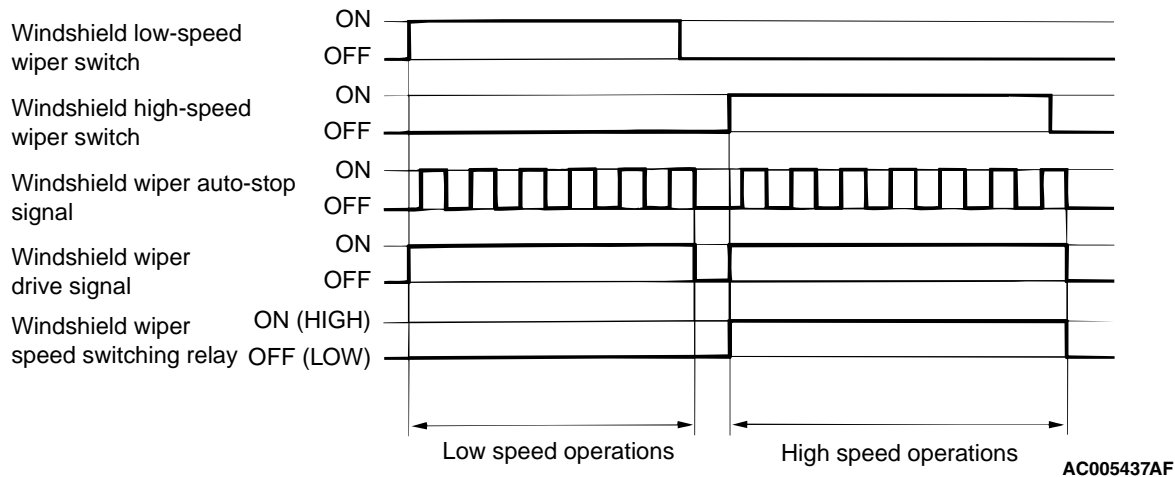
**Mist wiper control**



When the ignition switch is in the ACC or ON position, and the windshield mist wiper switch is turned ON, the front-ECU turns ON the windshield wiper drive signal. At the same time, the wiper speed switching relay is turned ON (HIGH-SPEED). While the windshield mist wiper switch is ON, the windshield wiper will operate at high speed. Then, if the windshield mist wiper switch is turned off, the wiper operates at low speed until it stops at the predetermined park position.

When the windshield mist switch is turned on briefly, the wiper operates once at low speed. At the point the windshield mist switch is turned ON, if the windshield wiper has been operating intermittently, the same operations as the above will be performed while the windshield mist wiper switch is ON. After the windshield mist wiper switch goes OFF, the intermittent operations will be set again T1 seconds after the last windshield wiper auto-stop signal turning ON.

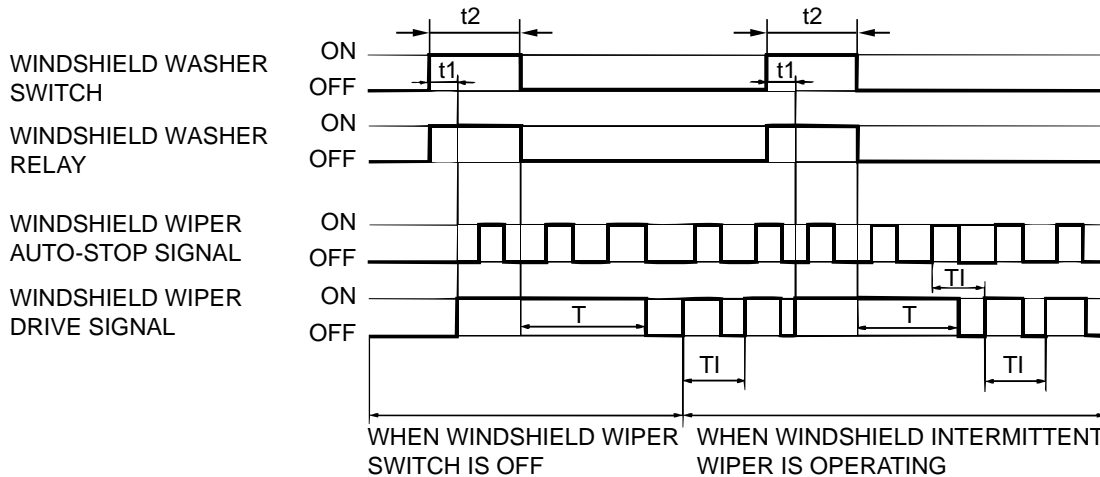
**Low speed wiper and high speed wiper control**



When the ignition switch is at the ACC or ON position, and the windshield low speed wiper switch of the column switch is turned ON, the front-ECU turns ON the windshield wiper drive signal, turns OFF (LO) the windshield wiper speed relay, and operates the

windshield wiper at low speed. Next, when the windshield high speed wiper switch is turned ON, the windshield wiper drive signal is turned ON, the windshield wiper speed switching relay is turned ON (HI), and the windshield wiper is operated at high speed.

**Washer control**



T: WIPER OPERATING TIME AFTER WINDSHIELD WASHER SWITCH IS OFF  
 TI: INTERMITTENT TIME    t1: 0.15 SECONDS    t2: WINDSHIELD WASHER OPERATING TIME    AC306460 AB

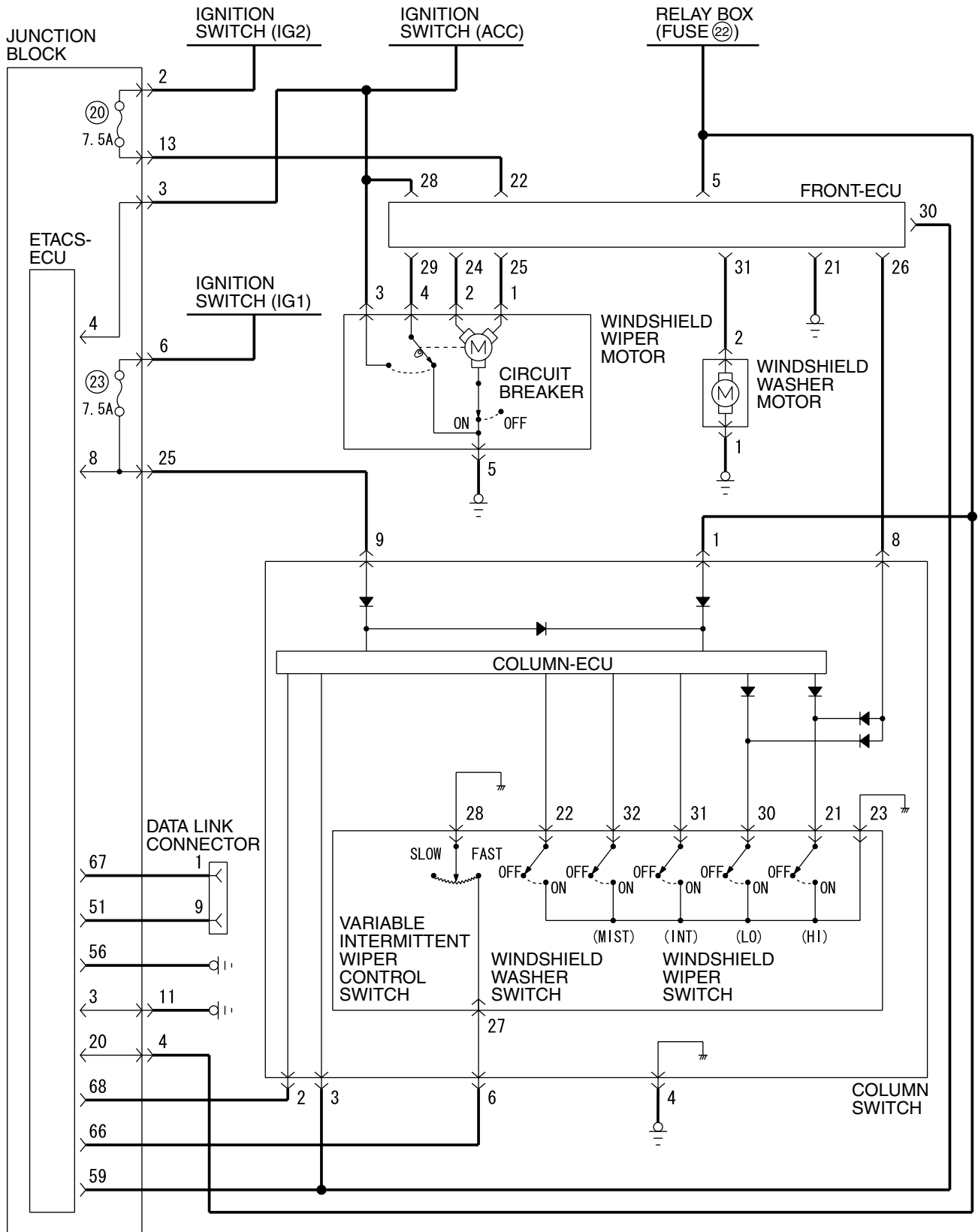
When the ignition switch is in the ACC or ON position, and the windshield washer switch is turned ON, the front-ECU turns ON the windshield washer relay. The windshield wiper drive signal is turned ON after 0.15 seconds until 2 seconds after the windshield

washer switch goes OFF to operate the windshield wiper continuously. When the windshield washer switch is turned ON, if the windshield wiper is operating intermittently, intermittent operations will be continued after continuous operations.

*NOTE: The wiper drive signal output time varies according to the conditions. Refer to the following table for details.*

	WHEN WIPER SWITCH IS OFF			WHEN WIPER SWITCH IS SET TO INT			WHEN WIPER SWITCH IS SET TO LO OR HI		
	t2	T	TI	t2	T	TI	t2	T	TI
	0.15 second or less	0 second	0.15 second or less	0.15 - 0.8 second	0 second	0.15 - 0.8 second	0.8 second or more	0 second	0.15 second or less
	0.15 - 0.8 second	1.2 seconds	0.15 - 0.8 second	0.8 second or more	1.2 seconds	0.8 second or more	0.15 second or less	1.2 seconds	0.15 - 0.8 second
	0.8 second or more	2 seconds	0.8 second or more	2 seconds	2 seconds	2 seconds	0.8 second or more	2 seconds	0.8 second or more

GENERAL CIRCUIT DIAGRAM FOR THE WINDSHIELD WIPER AND WASHER

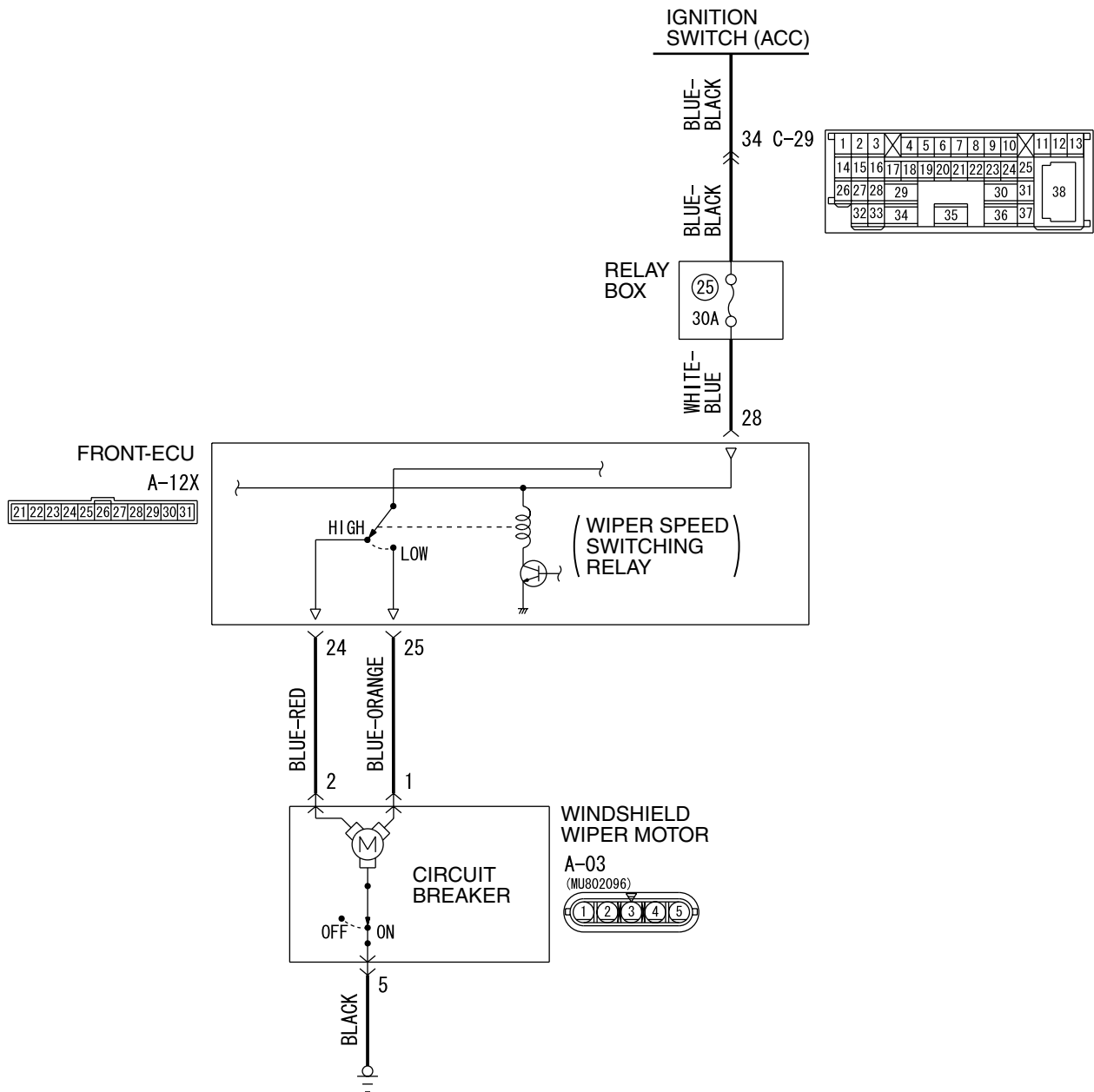


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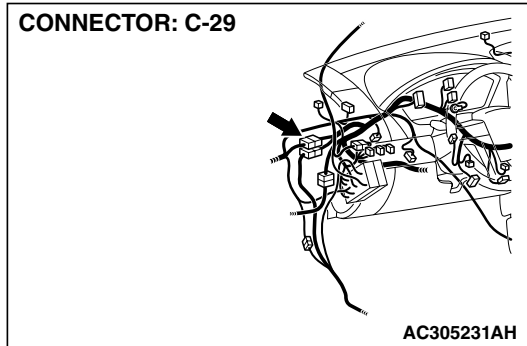
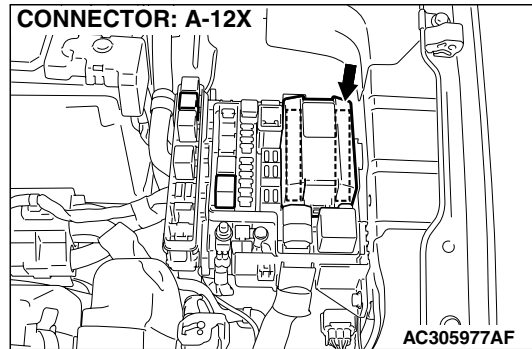
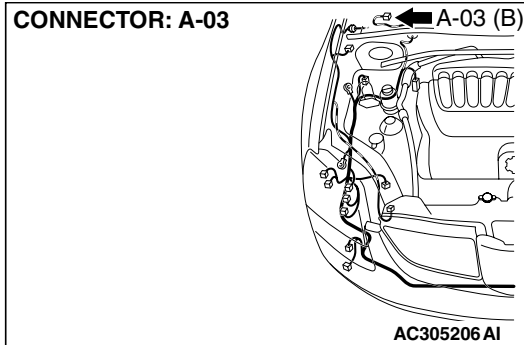
**INSPECTION PROCEDURE G-1: Windshield Wiper and Washer: The windshield wiper do not work at all.**

*NOTE: This troubleshooting procedure requires use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Windshield Wiper Motor Circuit**



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## CIRCUIT OPERATION

- The windshield wiper and washer switch sends a signal through the column-ECU (incorporated in the column switch) to the front-ECU. If the column-ECU sends a windshield wiper and washer switch "ON" signal to the front-ECU, the front-ECU turns on the relay (incorporated in the front-ECU), thus causing the windshield wiper and washer motor to be turned on.
- If the SWS communication line is defective, the front-ECU operates windshield wiper motor by using the other communication lines (wiper backup circuit) instead of that line. In this case, the windshield wiper works at low speed regardless of the windshield wiper and washer switch positions ("LO" or "HIGH").

## TECHNICAL DESCRIPTION (COMMENT)

If the windshield wiper does not work at all, the windshield wiper motor, column switch (windshield wiper and washer switch) or the front-ECU may be defective.

## TROUBLESHOOTING HINTS

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The wiper motor may be defective
- The column switch may be defective
- The front-ECU may be defective

## DIAGNOSIS

### Required Special Tools:

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

**STEP 1.** Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.

Check the following ECUs:

- Column-ECU
- Front-ECU

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

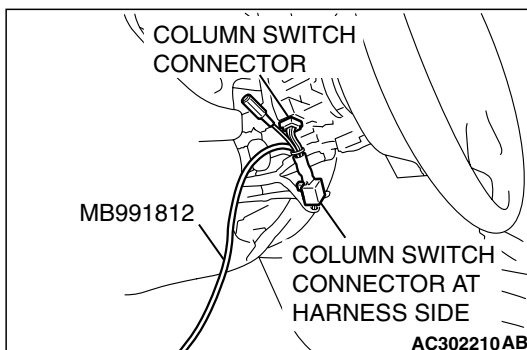
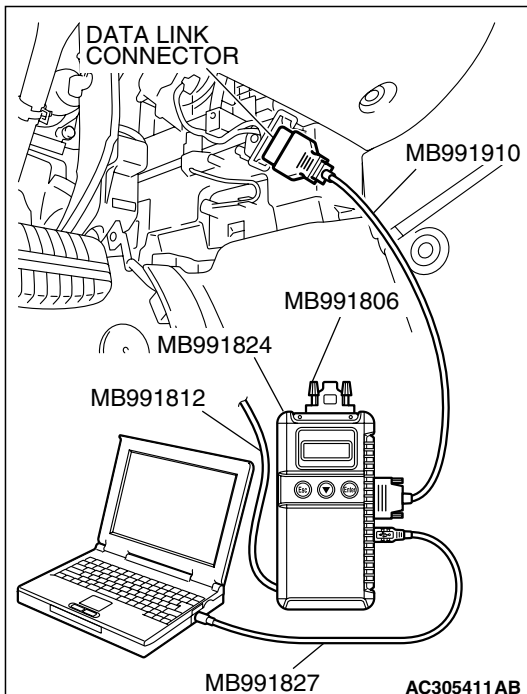
- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "ON" position.
- (3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM Check."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "ECU COMM Check."
- (4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menus for both the "COLUMN ECU" and the "FRONT ECU" menus.

**Q: Is "OK" displayed for the "COLUMN ECU" and "FRONT ECU" menu?**

"OK" is displayed for all the items : Go to Step 2.

"NG" is displayed for the "COLUMN ECU" menu : Refer to Inspection Procedure A-2 "Communication with the column switch (column-ECU) is not possible P.54B-71."

"NG" is displayed for the "FRONT ECU" menu : Refer to Inspection procedure A-4 "Communication with the front-ECU is not possible P.54B-86."



**STEP 2. Check the input signal by using "FUNCTION DIAG." menu of the SWS monitor.**

Check the input signals from the following switches:

- Ignition switch: ACC
- Windshield wiper switch: INT

- (1) Operate the MUT-III according to the procedure below to display "F.WIPER INT."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "WIPER."
  - g. Select "F.WIPER INT."
- (2) Check that normal conditions are displayed for the items described in the table below.

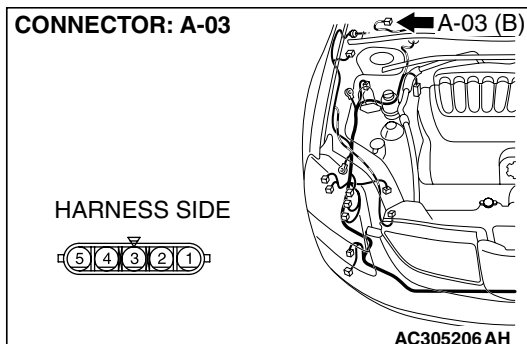
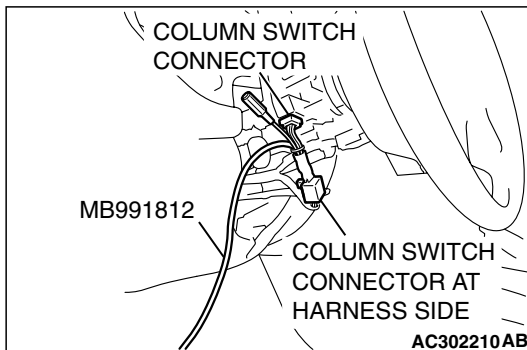
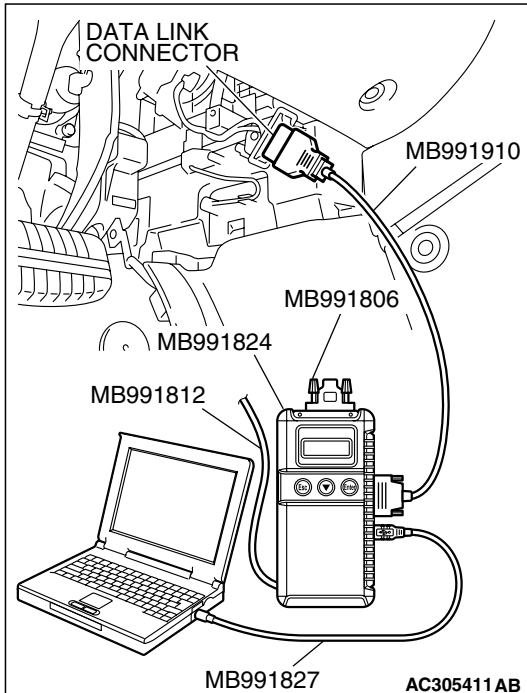
ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 05	INT WIPER SW	ON
ITEM 70	FRONT ECU ACK	NORMAL ACK or HI-BEAM ACK

**Q: Are normal conditions displayed for "INT WIPER SW" and "FRONT ECU ACK"?**

**Normal conditions displayed for all the items :** Go to Step 3.

**Normal condition is not displayed for the "INT WIPER SW" :** Replace the column switch. Verify that the windshield wiper works normally.

**Normal condition is not displayed for the "FRONT ECU ACK" :** Replace the front-ECU. Verify that the windshield wiper works normally.



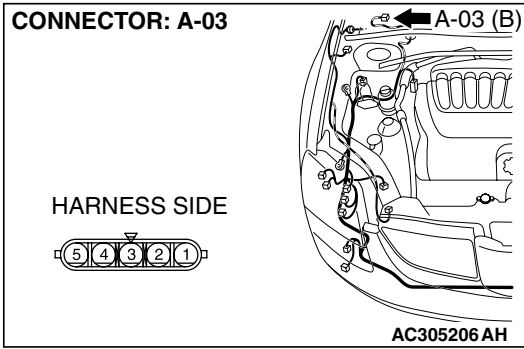
**STEP 3. Check windshield wiper motor connector A-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield wiper motor connector A-03 in good condition?**

**YES :** Go to Step 4.

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





**STEP 4. Check the windshield wiper motor.**

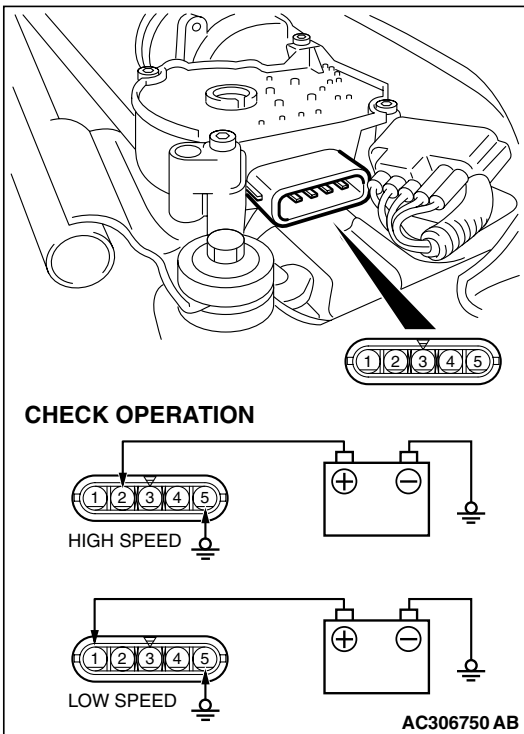
(1) Disconnect windshield wiper motor connector A-03.

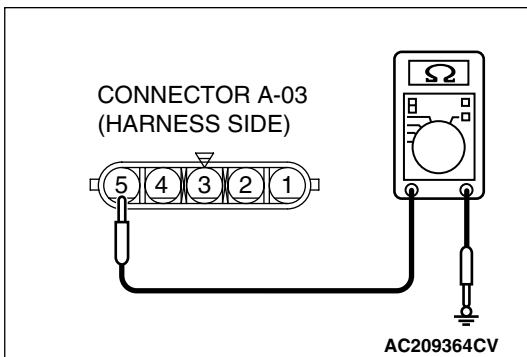
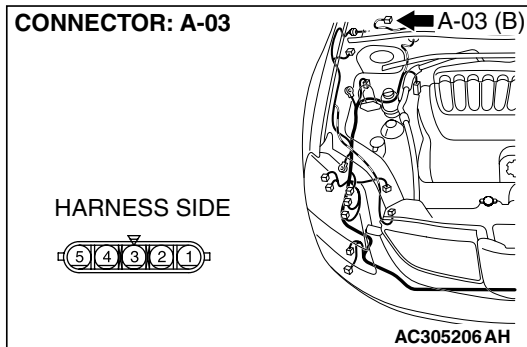
(2) Connect a battery to the windshield wiper motor as shown. Then check that the windshield wiper motor operates normally at high and low speeds.

**Q: Does the windshield wiper motor operate normally?**

**YES :** Go to Step 5.

**NO :** Replace the windshield wiper motor. Verify that the windshield wiper works normally.





**STEP 5. Check the ground circuit to the windshield wiper motor. Measure the resistance at the windshield wiper motor connector A-03.**

(1) Disconnect windshield wiper motor connector A-03 and measure the resistance available at the wiring harness side of the connector.

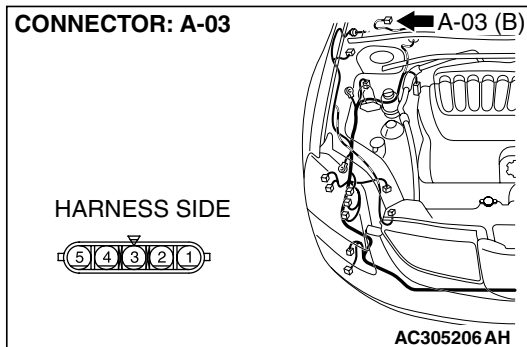
(2) Measure the resistance value between terminal 5 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 7.

**NO :** Go to Step 6.

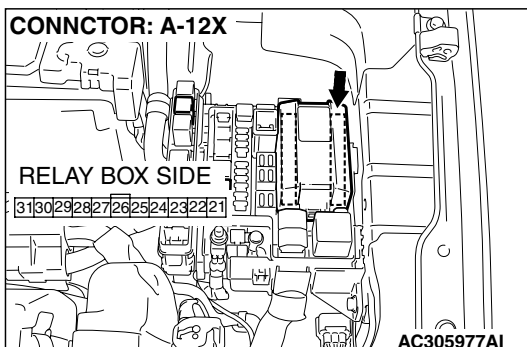


**STEP 6. Check the wiring harness between windshield wiper motor connector A-03 (terminal 5) and ground.**

**Q: Is the wiring harness between windshield wiper motor connector A-03 (terminal 5) 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. Verify the windshield wiper works normally.

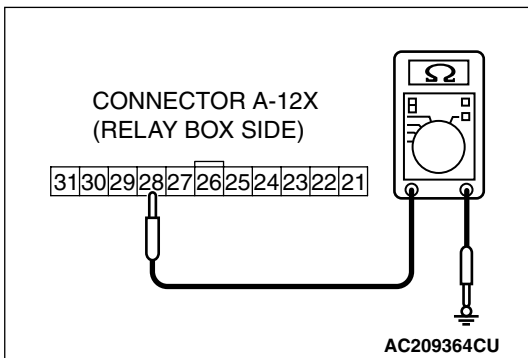
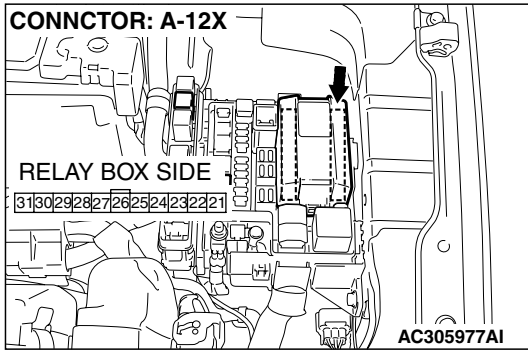


**STEP 7. Check front-ECU connector A-12X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-12X 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](#). Verify that the windshield wiper works normally.



**STEP 8. Check the ignition switch (ACC) circuit to the front-ECU. Measure the voltage at front-ECU connector A-12X.**

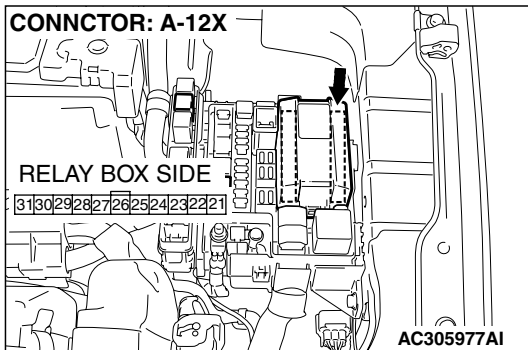
- (1) Disconnect front-ECU connector A-12X and measure the resistance available at the relay box side of the connector.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 28 and ground.
  - The voltage should measure approximately 12 volts (battery positive voltage).

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

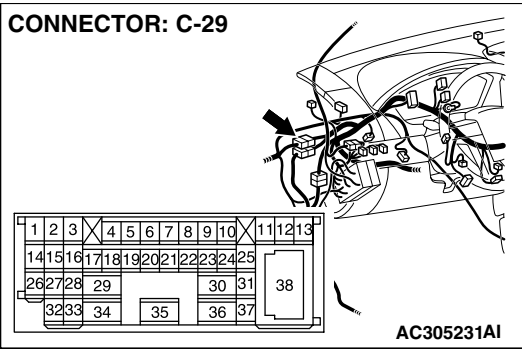
**YES :** Replace the front-ECU. Verify that the windshield wiper works normally.

**NO :** Go to Step 9.



**STEP 9. Check the wiring harness between front-ECU connector A-12X (terminal 28) and the ignition switch (ACC).**

CONNECTOR: C-29



*NOTE: Also check intermediate connector C-29 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-29 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 front-ECU connector A-12X (terminal 28) and the ignition switch (ACC) in good condition?**

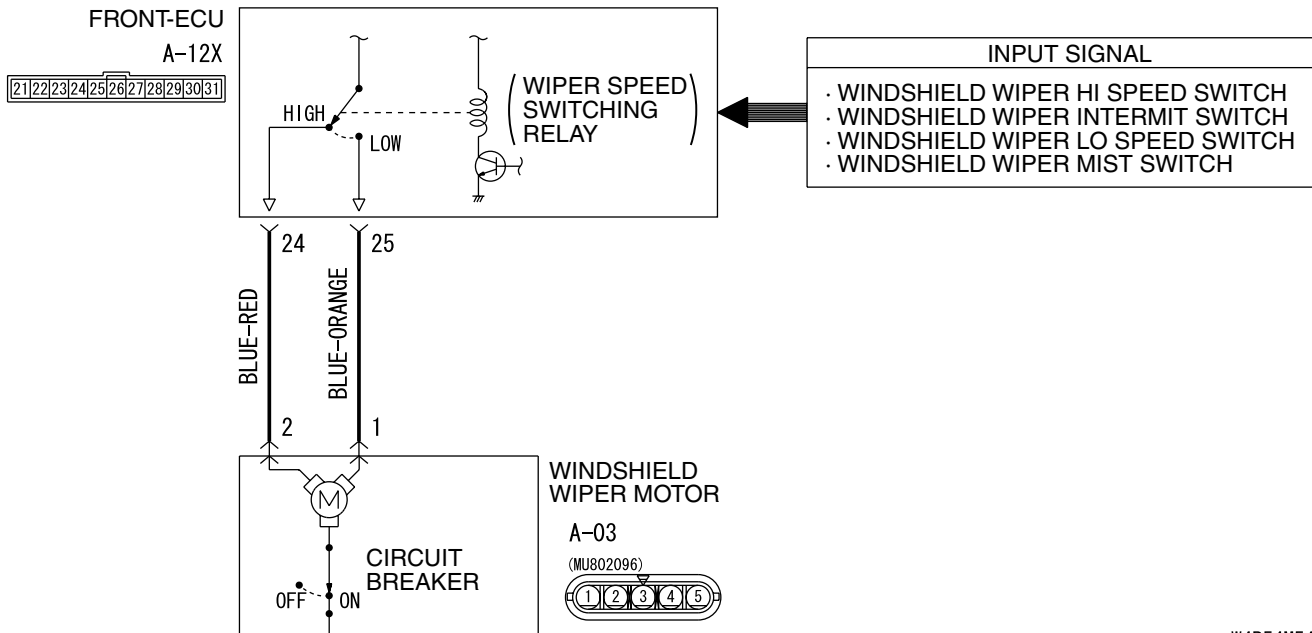
**YES :** No action is necessary and testing is complete.

**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. Verify that the windshield wiper works normally.

**INSPECTION PROCEDURE G-2: Windshield Wiper and Washer: The windshield wipers do not work when the windshield wiper switch is at "INT" or "MIST" position or the windshield washer switch is at "ON" position. However, the wipers work at low speed when the windshield wiper switch is at "LO" or "HI."**

*NOTE: This troubleshooting procedure requires use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

Windshield Wiper Motor Circuit



W4P54M54AA

## TECHNICAL DESCRIPTION (COMMENT)

This system may be at fail-safe mode as the SWS communication line is defective.

If the system cannot receive any signal from the column switch (windshield wiper and washer switch) due to an open circuit in the SWS communication line or other reasons, the system will enter the fail-safe mode when the ignition switch is at the "ACC" position.

## TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The column switch may be defective
- The front-ECU may be defective

## DIAGNOSIS

### Required Special Tools:

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.

Check the following ECUs:

- Column-ECU
- Front-ECU

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

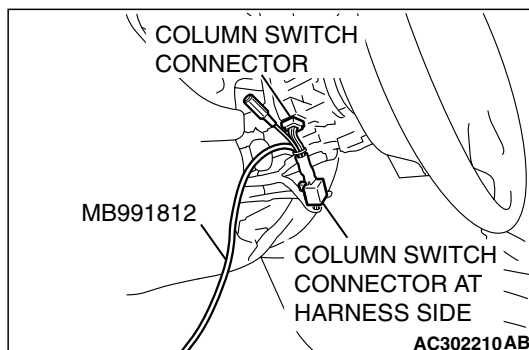
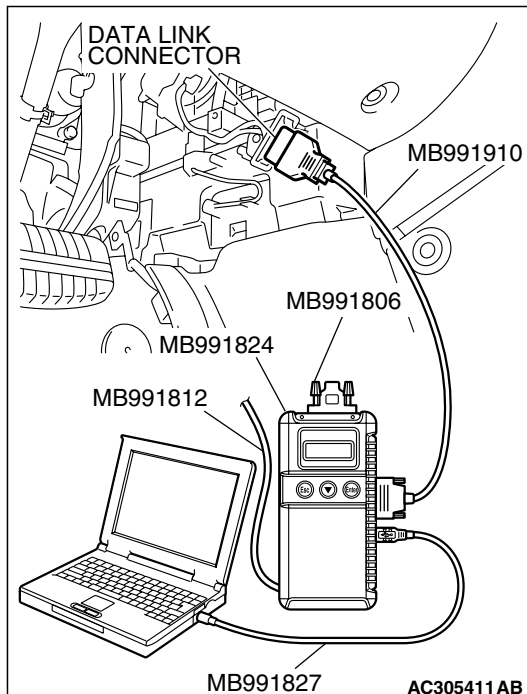
- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "ON" position.
- (3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM CHECK."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "ECU COMM Check."
- (4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menus for both the "COLUMN ECU" and the "FRONT ECU" menus.

**Q: Is "OK" displayed for the "COLUMN ECU" and "FRONT ECU" menu?**

**"OK" is displayed for all the items :** Replace the front-ECU. Verify that the windshield wiper works normally.

**"NG" is displayed for the "COLUMN ECU" menu :** Refer to Inspection Procedure A-2 "Communication with the column switch (column-ECU) is not possible P.54B-71."

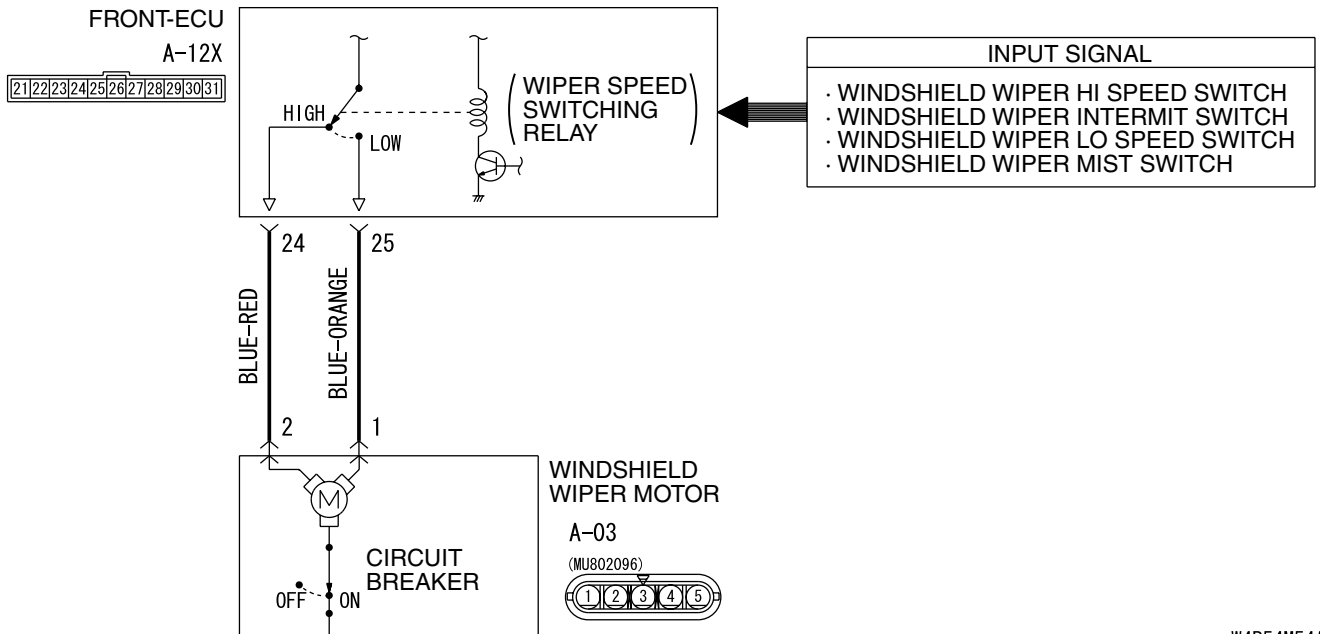
**"NG" is displayed for the "FRONT ECU" menu :** Refer to Inspection procedure A-4 "Communication with the front-ECU is not possible P.54B-86."



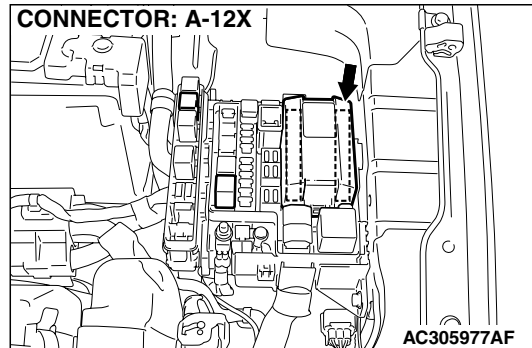
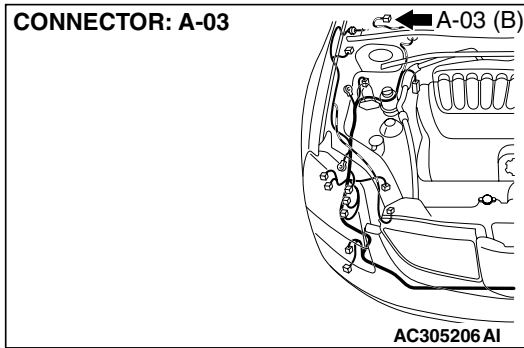
**INSPECTION PROCEDURE G-3: Windshield Wiper and Washer: All of the windshield wiper switch positions are defective.**

*NOTE: This troubleshooting procedure requires use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

Windshield Wiper Motor Circuit



W4P54M54AA



**TECHNICAL DESCRIPTION (COMMENT)**

If either of the windshield wiper switch positions is defective, the windshield wiper motor, column switch (windshield wiper and washer switch) or the front-ECU may be defective.

**TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The wiper motor may be defective
- The front-ECU may be defective

**DIAGNOSIS**

**Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

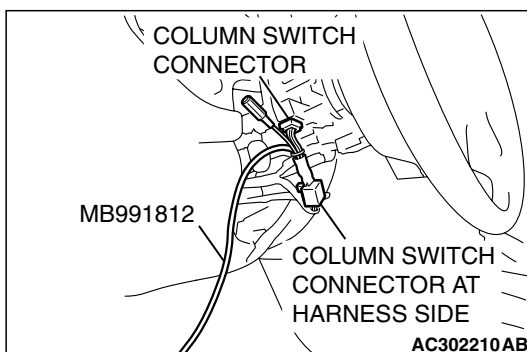
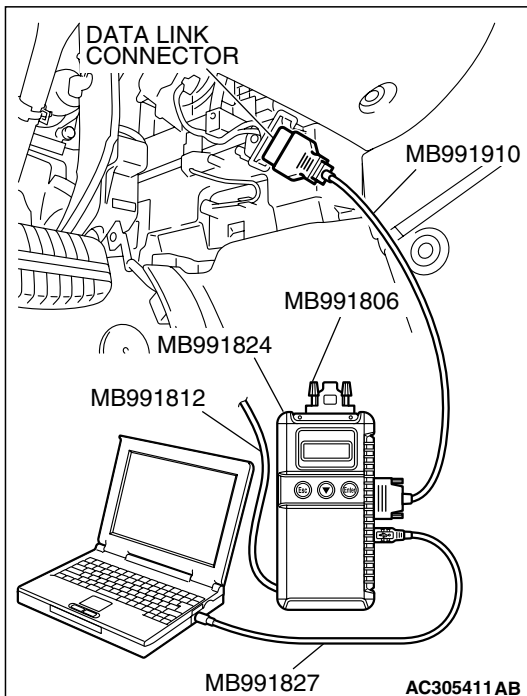
**STEP 1. Check the input signal by using "DATA LIST" menu of the SWS monitor.**

Turn the ignition switch to the ACC position before checking input signals from the windshield wiper switch.

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Operate scan tool MB991958 according to the procedure below to display "COLUMN ECU."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Data List."
  - f. Select "COLUMN ECU."
- (3) Check that normal conditions are displayed for the items described in the table below.



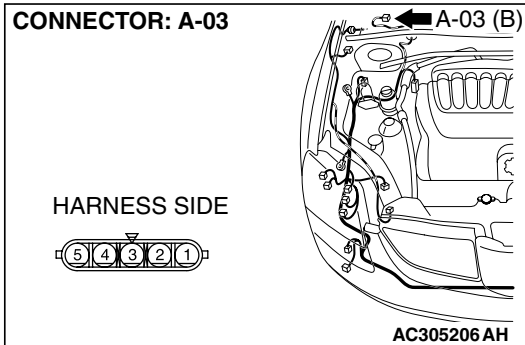
ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 05	INT WIPER SW	ON
ITEM 06	LO WIPER SW	ON
ITEM 07	HI WIPER SW	ON
ITEM 08	MIST WIPER SW	ON

**Q: Are normal conditions displayed for "INT WIPER SW", "LO WIPER SW", "HI WIPER SW" and "MIST WIPER SW"?**

**YES :** Go to Step 2.

**NO :** Refer to Inspection Procedure M-6 "ETACS-ECU does not receive any signal from the windshield mist wiper switch P.54B-488."



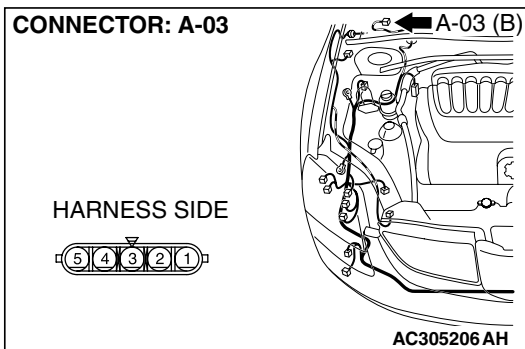


**STEP 2. Check windshield wiper motor connector A-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield wiper motor connector A-03 in good condition?**

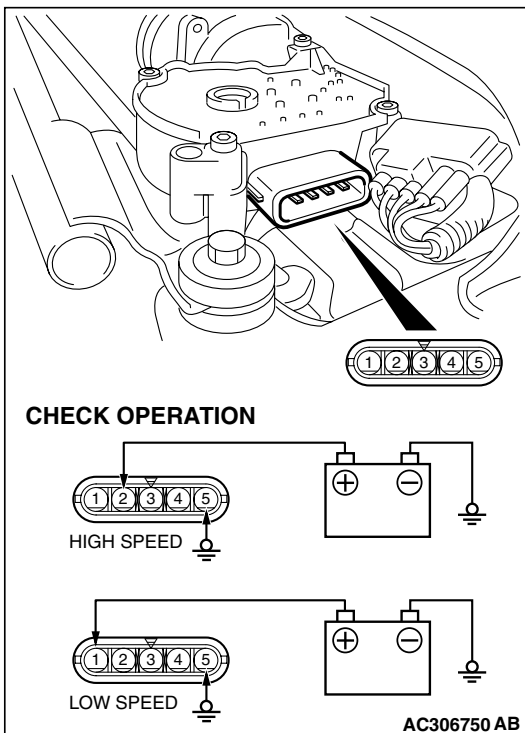
**YES :** Go to Step 3.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.



**STEP 3. Check the windshield wiper motor.**

(1) Disconnect windshield wiper motor connector A-03.

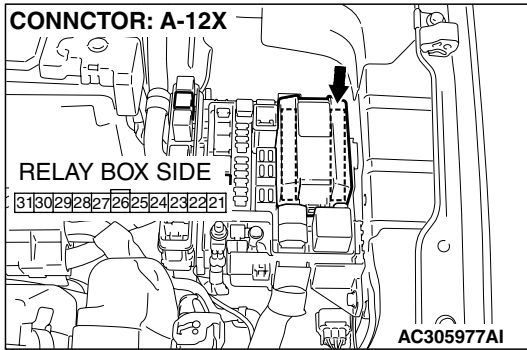


(2) Connect a battery to the windshield wiper motor as shown. Then check the windshield wiper motor operates normally at high and low speeds.

**Q: Does the windshield wiper motor operate normally?**

**YES :** Go to Step 4.

**NO :** Replace the windshield wiper motor. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

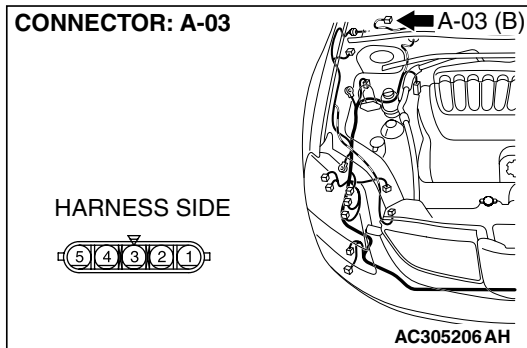


**STEP 4. Check front-ECU connector A-12X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-12X 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](#). Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

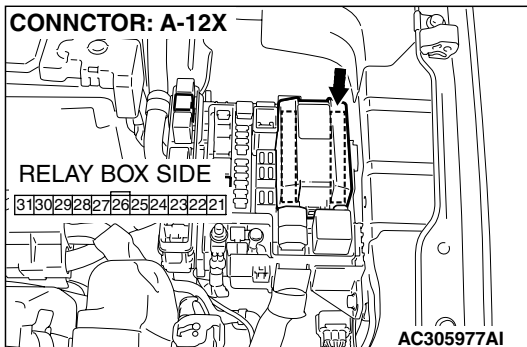


**STEP 5. Check the wiring harness between windshield wiper motor connector A-03 (terminals 1 and 2) and front-ECU connector A-12X (terminals 25 and 24).**

**Q: Is the wiring harness between windshield wiper motor connector A-03 (terminals 1 and 2) and front-ECU connector A-12X (terminals 25 and 24) in good condition?**

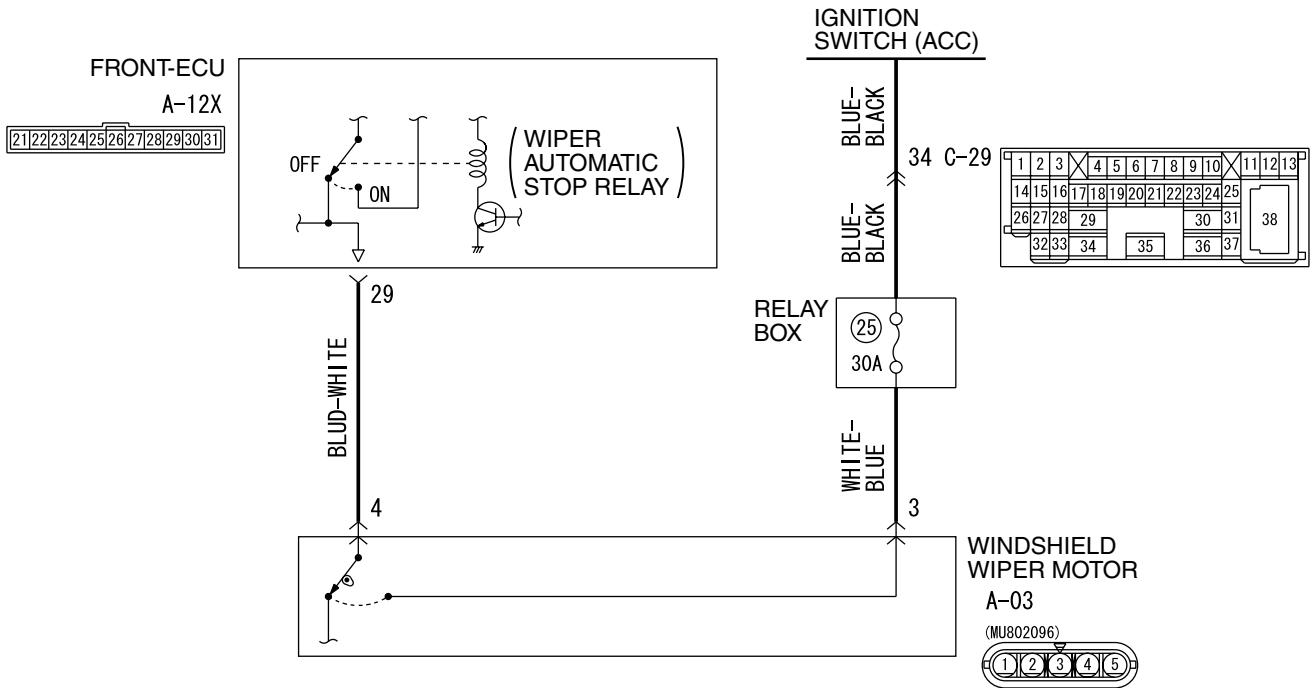
**YES :** No action is necessary and testing is complete.

**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. Verify that the windshield wiper operates normally when the windshield wiper switch is moved to each position.

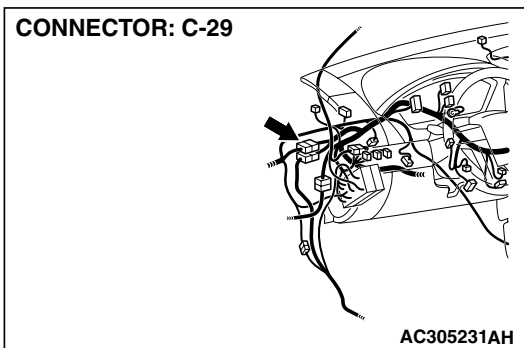
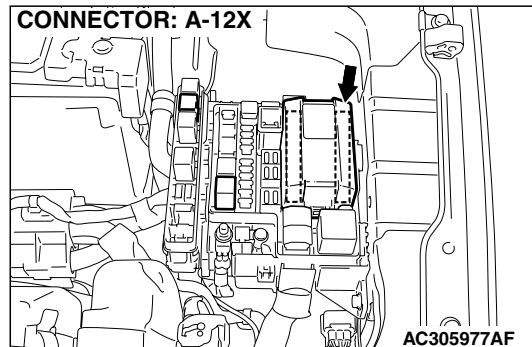
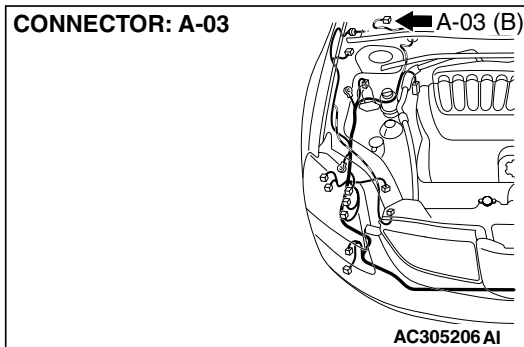


**INSPECTION PROCEDURE G-4: Windshield Wiper and Washer: Windshield wipers does not stop at the predetermined park position.**

**Windshield Wiper Automatic Stop Relay Circuit**



W4P54M55AA



**TECHNICAL DESCRIPTION (COMMENT)**

If the windshield wipers do not stop at predetermined park position, the windshield wiper motor or the front-ECU may be defective.

**TROUBLESHOOTING HINTS**

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The windshield wiper motor may be defective
- The front-ECU may be defective

**DIAGNOSIS****Required Special Tool:**

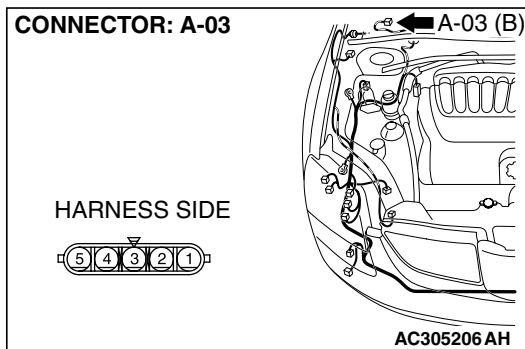
- MB991223: Harness Set

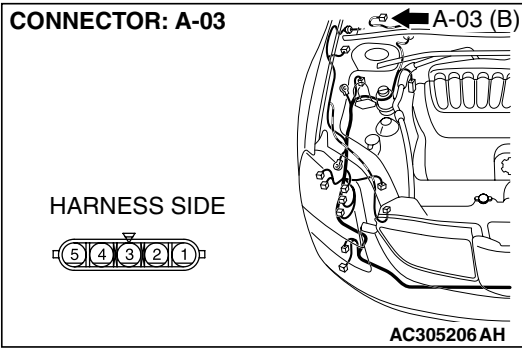
**STEP1. Check windshield wiper motor connector A-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield wiper motor connector A-03 in good condition?**

**YES :** Go to Step 2.

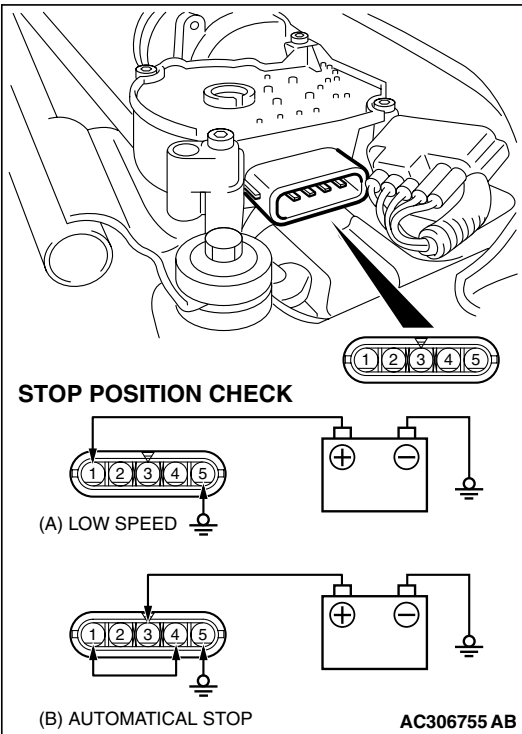
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the windshield wiper works normally.





**STEP 2. Check the windshield wiper motor.**

(1) Disconnect windshield wiper motor connector A-03.



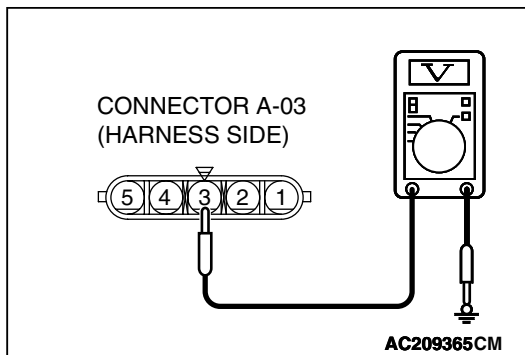
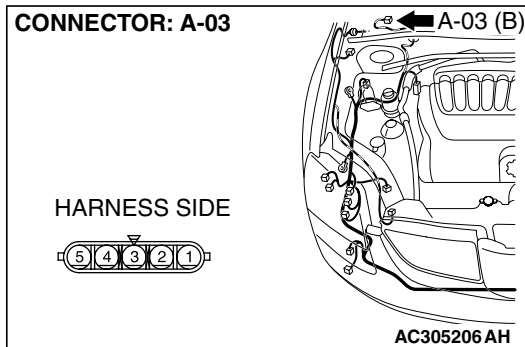
(2) Connect the vehicle battery to the windshield wiper motor connector as shown, and operate the windshield wiper at low speed. While the windshield wiper is working, disconnect the battery at positions other than the predetermined park position to stop the windshield wiper motor.

(3) When the battery is connected as shown, the motor should run at low speed, and then stop at the predetermined park position.

**Q: Does the windshield wiper motor operate normally?**

**YES :** Go to Step 3.

**NO :** Replace the windshield wiper motor. The windshield wiper should now stop at the predetermined park position.



**STEP 3. Check the ignition switch (ACC) circuit to the windshield wiper motor. Measure the voltage at windshield wiper motor connector A-03.**

(1) Disconnect windshield wiper motor connector A-03 and measure the voltage available at the wiring harness side of the connector.

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

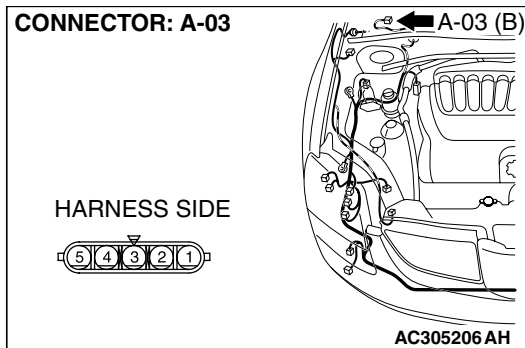
(3) Measure the voltage between terminal 3 and ground.

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

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

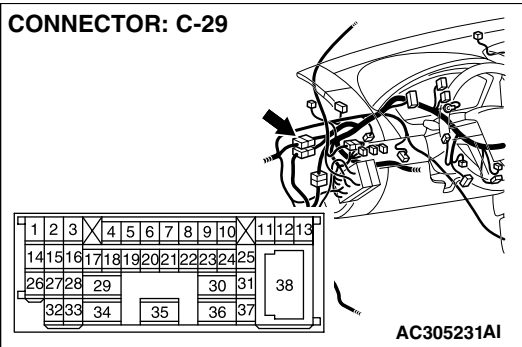
**YES :** Go to Step 5.

**NO :** Go to Step 4.



**STEP 4. Check the wiring harness between windshield wiper motor connector A-03 (terminal 3) and the ignition switch (ACC).**

**CONNECTOR: C-29**



*NOTE: Also check intermediate connector C-29 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-29 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 windshield wiper motor connector A-03 (terminal 3) and the ignition switch (ACC) in good condition?**

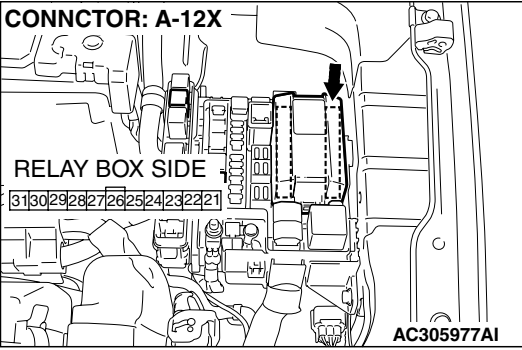
- YES :** No action is necessary and testing is complete.
- NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the windshield wiper works normally.

**STEP 5. Check front-ECU connector A-12X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-12X 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. The windshield wiper should stop at the predetermined park position.

**CONNECTOR: A-12X**

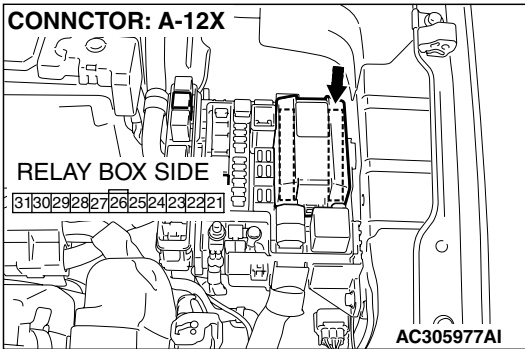
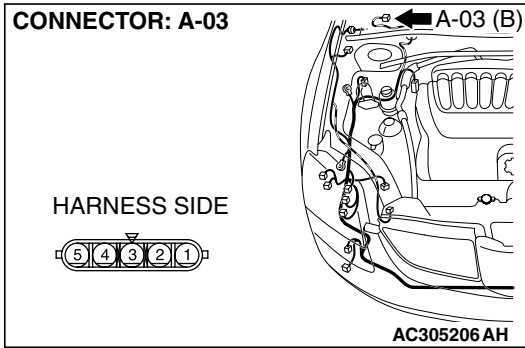


**STEP 6. Check the wiring harness between windshield wiper motor connector A-03 (terminal 4) and front-ECU connector A-12X (terminal 29).**

**Q: Is the wiring harness between windshield wiper motor connector A-03 (terminal 4) and front-ECU connector A-12X (terminal 29) in good condition?**

**YES :** Replace the front-ECU. The windshield wiper should stop at the predetermined park position.

**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. Verify that the windshield wiper works normally

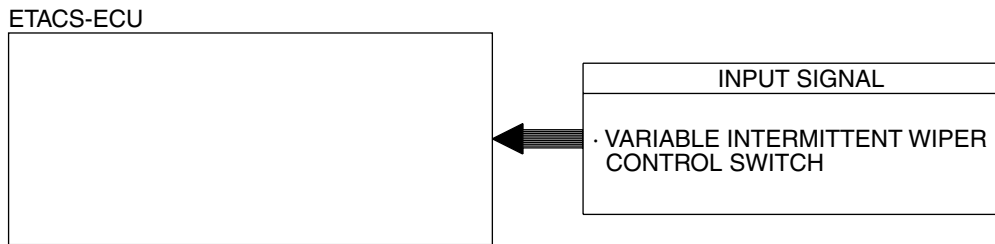




**INSPECTION PROCEDURE G-5: Windshield Wiper and Washer: The windshield intermittent wiper interval cannot be adjusted by using the variable intermittent wiper control switch.**

*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Variable Intermittent Wiper Control Switch Input Signal**



W4P54M56AA

**TECHNICAL DESCRIPTION (COMMENT)**

If the windshield intermittent wiper interval is not changed by operating the windshield intermittent wiper interval adjusting knob or according to the vehicle speed, the column switch, the ETACS-ECU or the front-ECU may be defective.

**TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The ETACS-ECU may be defective
- The front-ECU may be defective

**DIAGNOSIS**

**Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

**Check the input signal by using "DATA LIST" menu of the SWS monitor.**

Set each switch to the following condition to check input signals from the variable intermittent wiper control switch:

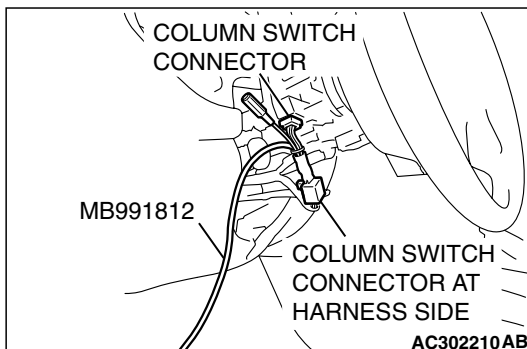
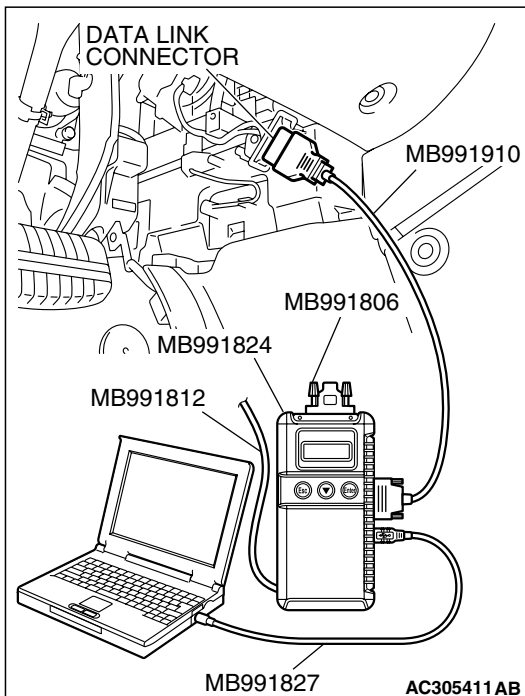
- Ignition switch: ACC
- Windshield wiper switch: INT

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Operate scan tool MB991958 according to the procedure below to display "F.WIPER INT."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "WIPER."
  - g. Select "F.WIPER INT."
- (3) Check that normal conditions are displayed for the items described in the table below.

*NOTE: Also check that the windshield wiper interval changes smoothly when the variable intermittent wiper control switch is rotated from "SLOW" to "FAST" position.*



ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 37	INT WIPER TIME	1.6 – 19.0 s

**Q: Does the value change within the normal range when the windshield intermittent wiper interval adjusting knob is rotated?**

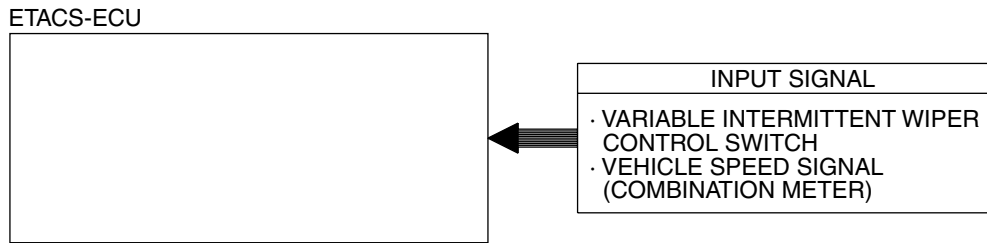
**YES :** Replace the front-ECU. Check that the windshield intermittent wiper interval changes according to the vehicle speed or while the windshield intermittent wiper interval adjusting knob is rotated.

**NO :** Refer to Inspection Procedure M-7 "ETACS-ECU does not receive any signal from the variable intermittent wiper control switch P.54B-491."

**INSPECTION PROCEDURE G-6: Windshield Wiper and Washer: The windshield intermittent wiper interval is not changed according to the vehicle speed.**

*NOTE: This troubleshooting procedure requires use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Variable Intermittent Wiper Control Switch Input Signal**



W4P54M57AA

**TECHNICAL DESCRIPTION (COMMENT)**

If the windshield intermittent wiper interval does not change according to the vehicle speed, the ETACS-ECU or the front-ECU may be defective.

**TROUBLESHOOTING HINTS**

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The combination meter may be defective
- The ETACS-ECU may be defective
- The front-ECU may be defective

**DIAGNOSIS**

**Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

**STEP 1.** Using scan tool MB991958, diagnose the CAN bus line.

**⚠ CAUTION**

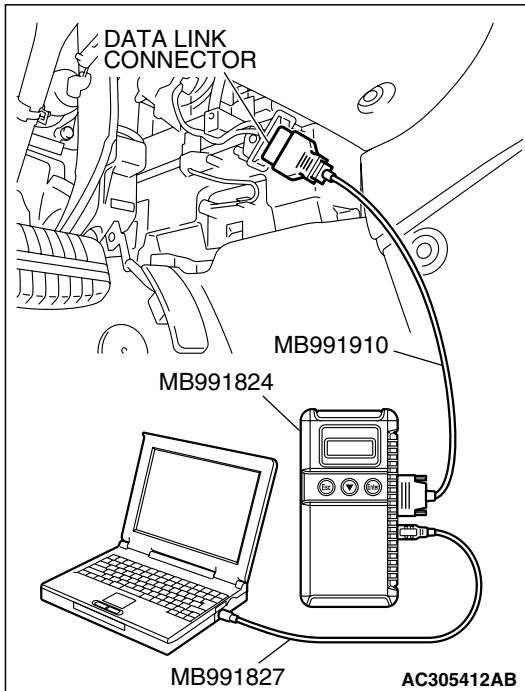
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the CAN bus line found to be normal?**

**YES :** Go to Step 2.

**NO :** Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).



**STEP 2.** Using scan tool MB991958, read the combination meter diagnostic trouble code.

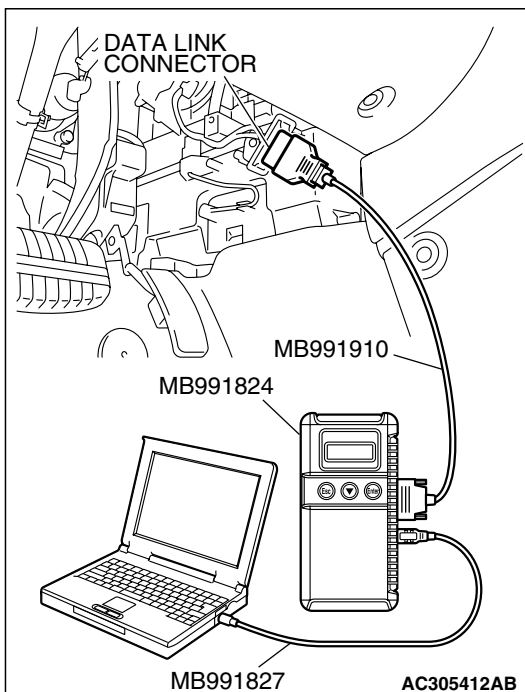
Check whether the combination meter-related DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check whether the combination meter-related DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the DTC set?**

**YES :** Diagnose the combination meter. Refer to P.54A-52.

**NO :** Go to Step 3.



**STEP 3. Check the input signal by using "DATA LIST" menu of the SWS monitor.**

Check the input signals from the following switches:

- Ignition switch: ACC
- Windshield wiper switch: INT
- Intermittent wiper control: slow side

**⚠ CAUTION**

**Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.**

(1) Operate the scan tool MB991958 according to the procedure below to display "F.WIPER INT."

- a. Select "System select."
- b. Select "SWS."
- c. Select "SWS MONITOR."
- d. Select "Function Diag."
- e. Select "WIPER."
- f. Select "F.WIPER INT."

(2) Check that normal conditions are displayed for the items described in the table below.

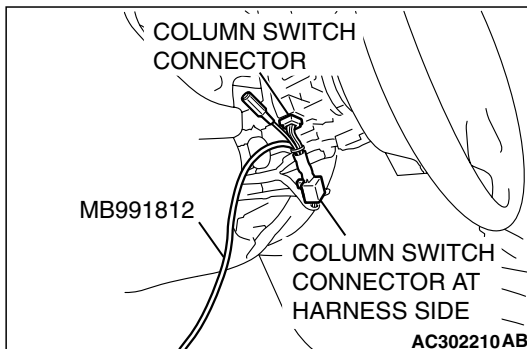
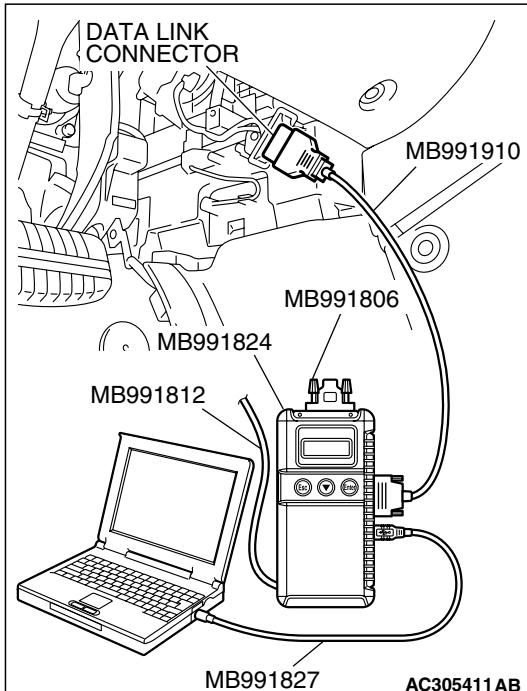
*NOTE: Also check that the wiper interval changes smoothly when the vehicle is accelerated from 0 km/h (0 mph) to 60 km/h (37.5 mph).*

ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 37	INT WIPER TIME	14.0 – 19.0 s

**Q: Does the value change within the normal range when the variable intermittent wiper control switch is rotated?**

**YES :** Replace the front-ECU. The windshield intermittent wiper interval should change according to the vehicle speed.

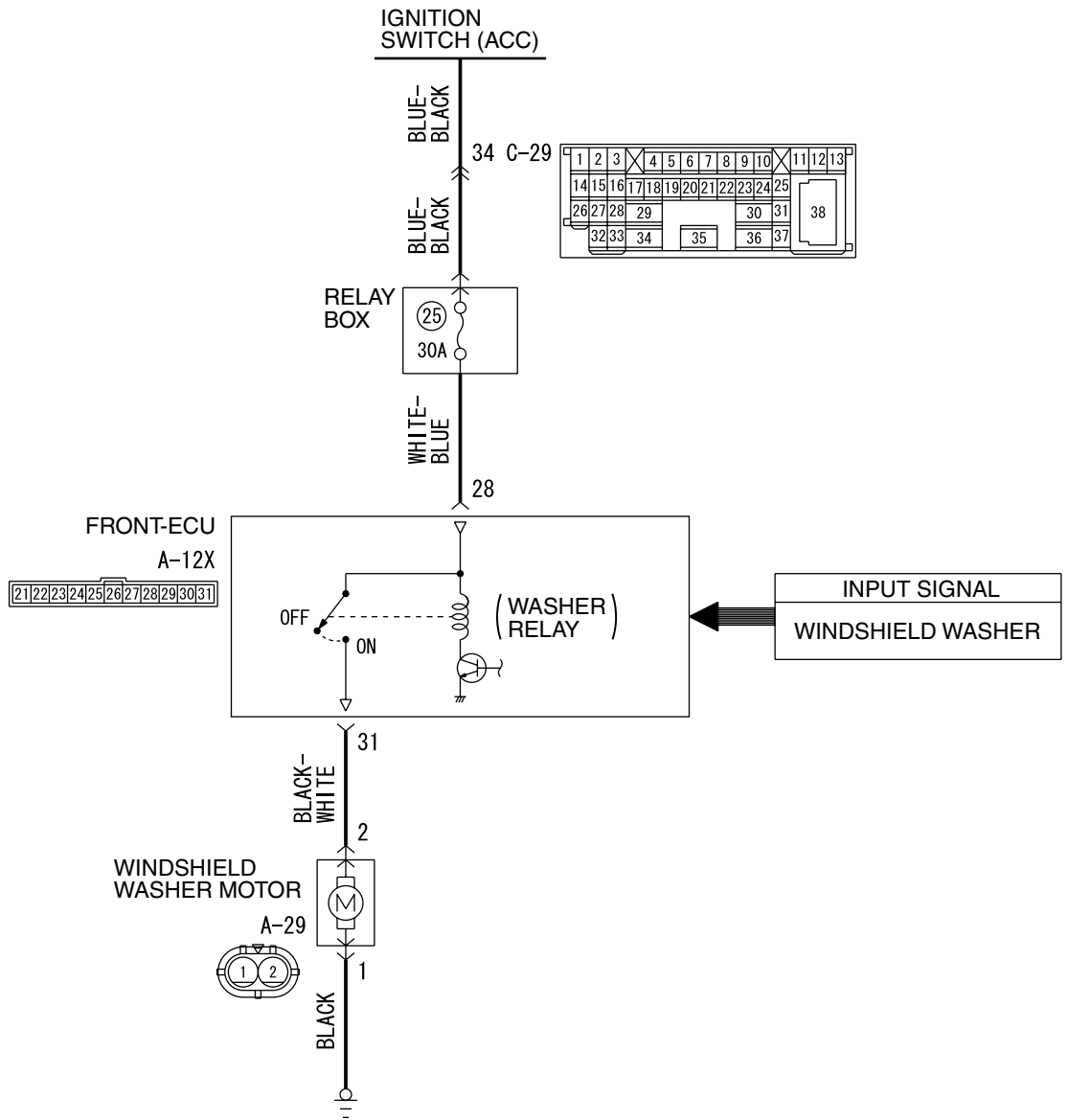
**NO :** Replace the ETACS-ECU. The windshield intermittent wiper interval should change according to the vehicle speed.



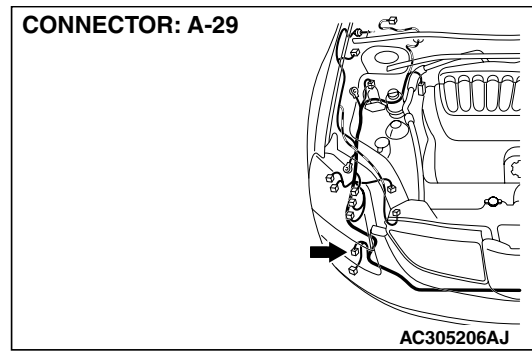
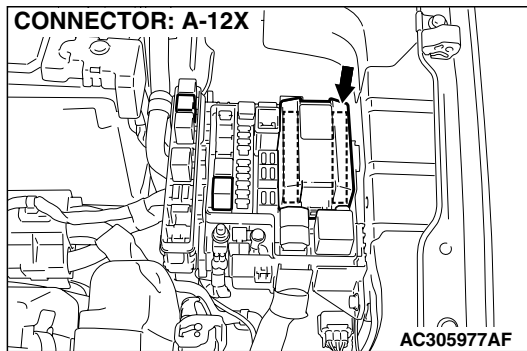
**INSPECTION PROCEDURE G-7: Windshield Wiper and Washer: The windshield washer does not work.**

*NOTE: This troubleshooting procedure requires use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Windshield Washer Motor Circuit**



W4P54M58AA



### **CIRCUIT OPERATION**

The windshield washer switch sends a signal through the column-ECU (incorporated in the column switch) to the front-ECU. If the column-ECU sends a windshield washer switch "ON" signal to the front-ECU, the front-ECU turns on the relay (incorporated in the front-ECU), thus causing the windshield washer motor to be turned on.

### **TECHNICAL DESCRIPTION (COMMENT)**

If the windshield washer does not work normally, the windshield washer motor, the column switch (windshield wiper and washer switch) or the front-ECU may be defective.

### **TROUBLESHOOTING HINTS**

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The windshield washer motor may be defective
- The column switch may be defective
- The front-ECU may be defective

### **DIAGNOSIS**

#### **Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

#### **STEP 1. Verify the windshield wiper operation.**

#### **Q: Does the windshield wiper operate normally?**

**YES** : Go to Step 2.

**NO** : Refer to Inspection Procedure G-1 "The windshield wiper do not work at all [P. 54B-259.](#)"

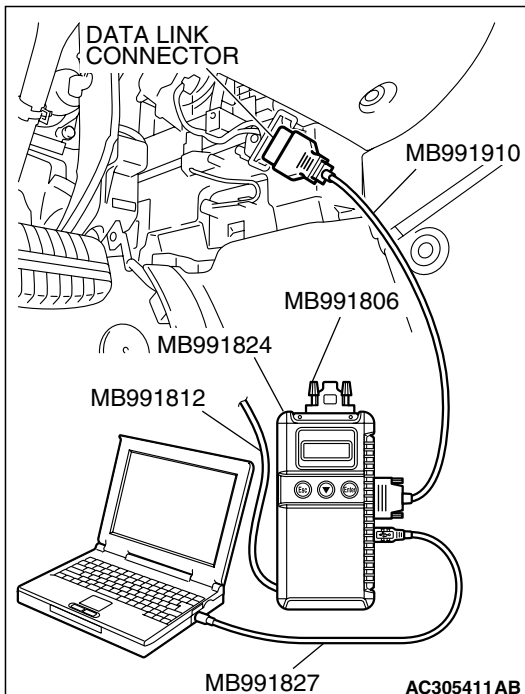
**STEP 2.** Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.

Check the following ECUs:

- Column-ECU
- Front-ECU

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.



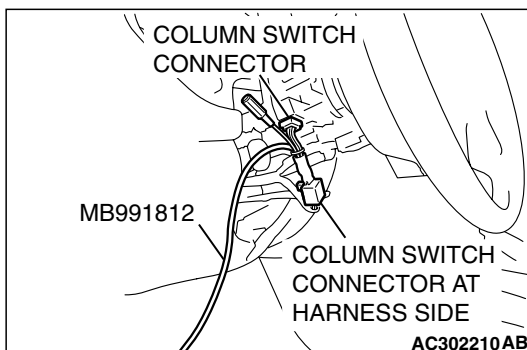
- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "ON" position.
- (3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM Check."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "ECU COMM Check."
- (4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menus for both the "COLUMN ECU" and the "FRONT ECU" menus.

**Q: Is "OK" displayed for the "COLUMN ECU" and "FRONT ECU" menu?**

**"OK" is displayed for all the items :** Go to Step 3.

**"NG" is displayed for the "COLUMN ECU" menu :** Refer to Inspection Procedure A-2 "Communication with the column switch (column-ECU) is not possible P.54B-71."

**"NG" is displayed for the "FRONT ECU" menu :** Refer to Inspection procedure A-4 "Communication with the front-ECU is not possible P.54B-86."





**STEP 3. Check the input signal by using "FUNCTION DIAG." menu of the SWS monitor.**

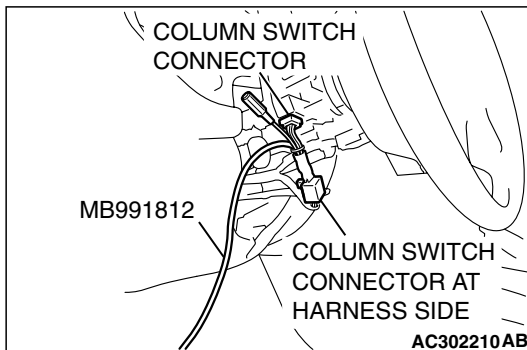
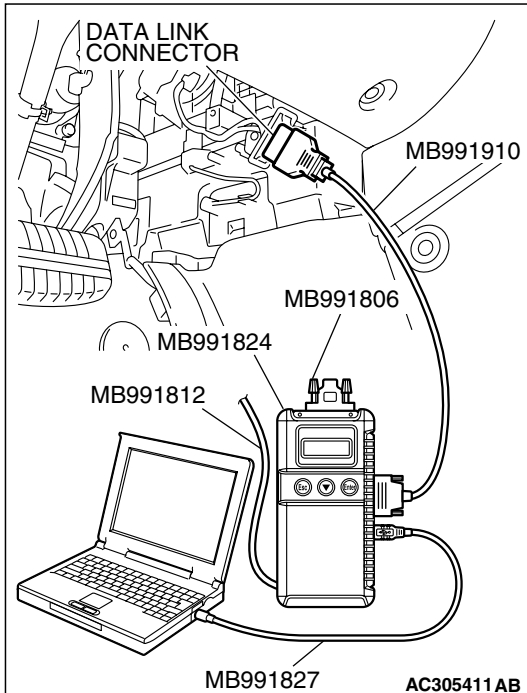
Check the input signals from the following switches:

- Ignition switch: ACC
- Windshield washer switch: ON

- (1) Operate the scan tool MB991958 according to the procedure below to display "F.WIPER WASH."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "WIPER."
  - g. Select "F.WIPER WASH."

- (2) Check that normal conditions are displayed for the items described in the table below.

ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 09	FRONT WASH.SW	ON
ITEM 70	FRONT ECU ACK	NORMAL ACK or HI-BEAM ACK



**Q: Are normal conditions displayed for "FRONT WASH.SW" and "FRONT ECU ACK"?**

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

**Normal condition is not displayed for the "FRONT WASH.SW" :** Replace the column switch. Verify that the windshield washer works normally.

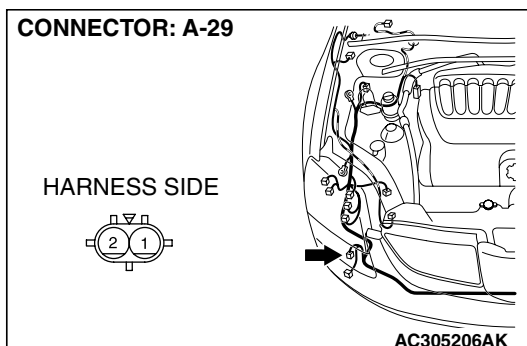
**Normal condition is not displayed for the "FRONT ECU ACK" :** Replace the front-ECU. Verify that the windshield washer works normally.

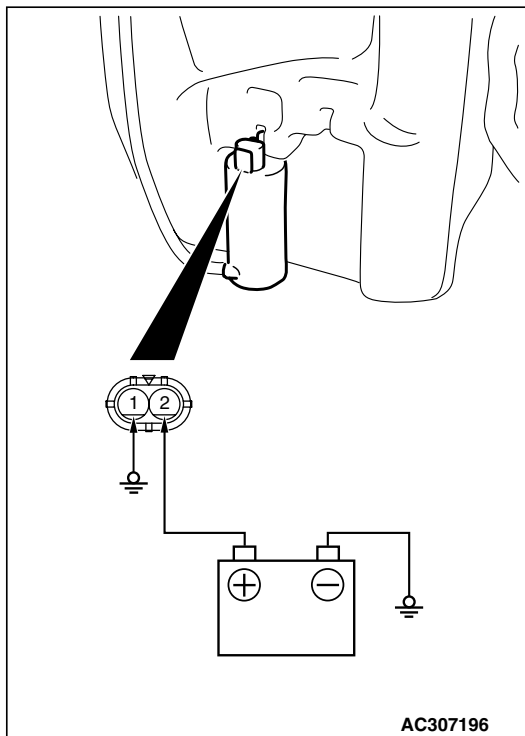
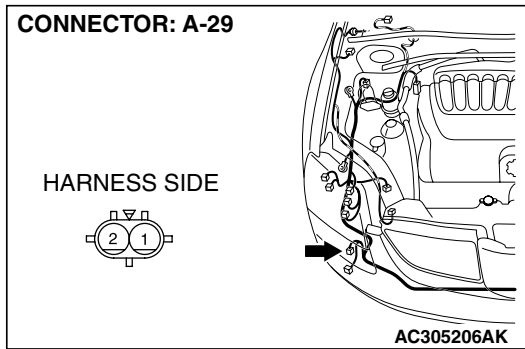
**STEP 4. Check windshield washer motor connector A-29 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is windshield washer motor connector A-29 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](#). Verify that the windshield washer works normally.



**STEP 5. Check the windshield washer motor.**

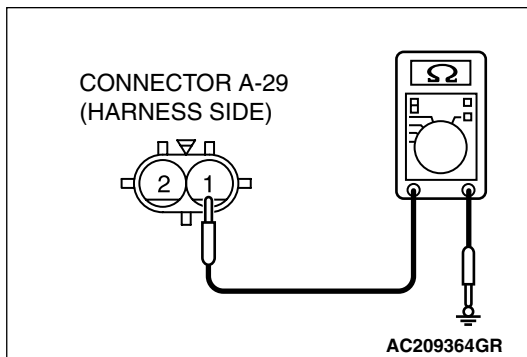
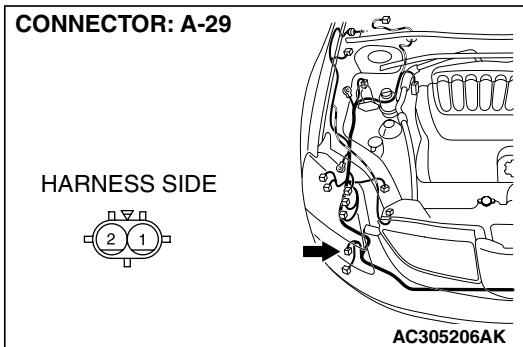
- (1) Disconnect windshield washer motor connector A-29, and check at windshield washer motor connector side.
- (2) Fill the windshield washer tank with washer fluid.

- (3) When battery voltage is applied between terminals 1 and 2, washer fluid should spray out.

**Q: Does the windshield washer motor operate normally?**

**YES** : Go to Step 6.

**NO** : Replace the windshield washer motor. Verify that the windshield washer works normally.



**STEP 6. Check the ground circuit to the windshield washer motor. Measure the resistance at the windshield washer motor connector A-29.**

(1) Disconnect windshield washer motor connector A-29 and measure the resistance available at the wiring harness side of the connector.

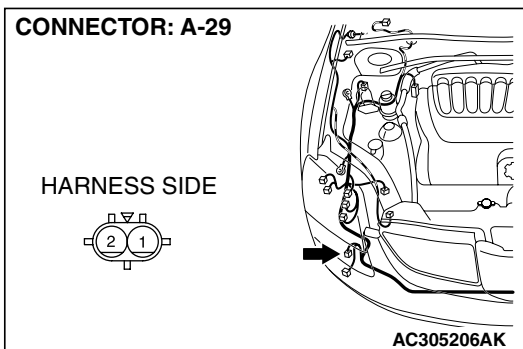
(2) Measure the resistance value between terminal 1 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 8.

**NO :** Go to Step 7.

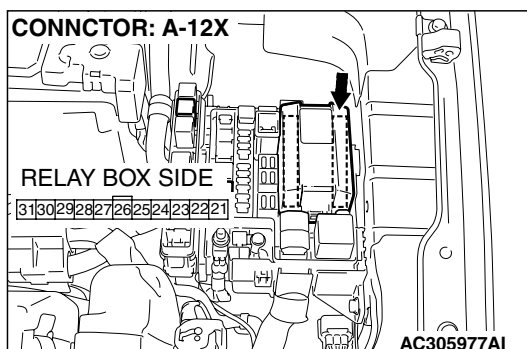


**STEP 7. Check the wiring harness between windshield washer motor connector A-29 (terminal 1) and ground.**

**Q: Is the wiring harness between windshield washer motor connector A-29 (terminal 1) 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. Verify that the windshield washer works normally.

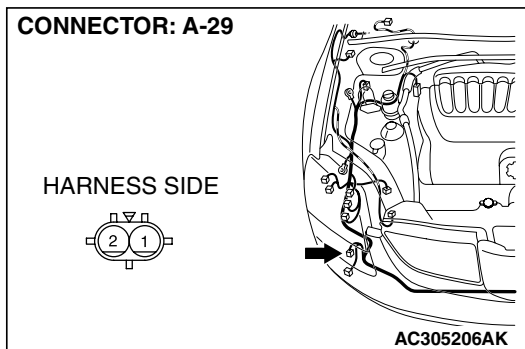
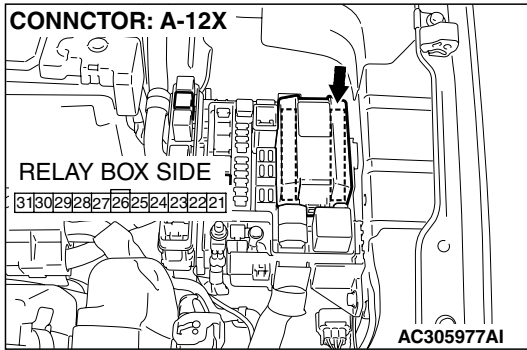


**STEP 8. Check front-ECU connector A-12X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-12X in good condition?**

**YES :** Go to Step 9.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the windshield washer works normally.



**STEP 9. Check the wiring harness between windshield washer motor connector A-29 (terminal 2) and front-ECU connector A-12X (terminal 31).**

**Q: Is the wiring harness between windshield washer motor connector A-29 (terminal 2) and front-ECU connector A-12X (terminal 31) 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. Verify that the windshield washer works normally.

## HEADLIGHT AND TAILLIGHT

### GENERAL DESCRIPTION CONCERNING THE HEADLIGHTS AND TAILLIGHTS

M1549021300264

The following ECUs affect the functions and control of the headlights and the taillights.

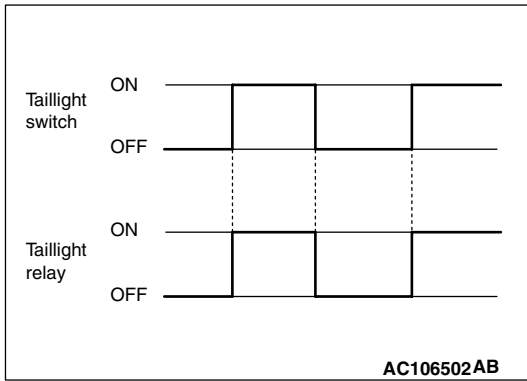
FUNCTION	CONTROL ECU
Taillights	Front-ECU, column switch
Headlights	ETACS-ECU, front-ECU, column switch
High-beam indicator light	ETACS-ECU, column switch
Headlight automatic-shutoff function	ETACS-ECU, front-ECU, column switch
Dimmer automatic reset function	Front-ECU, column switch

Taillights and headlights illumination

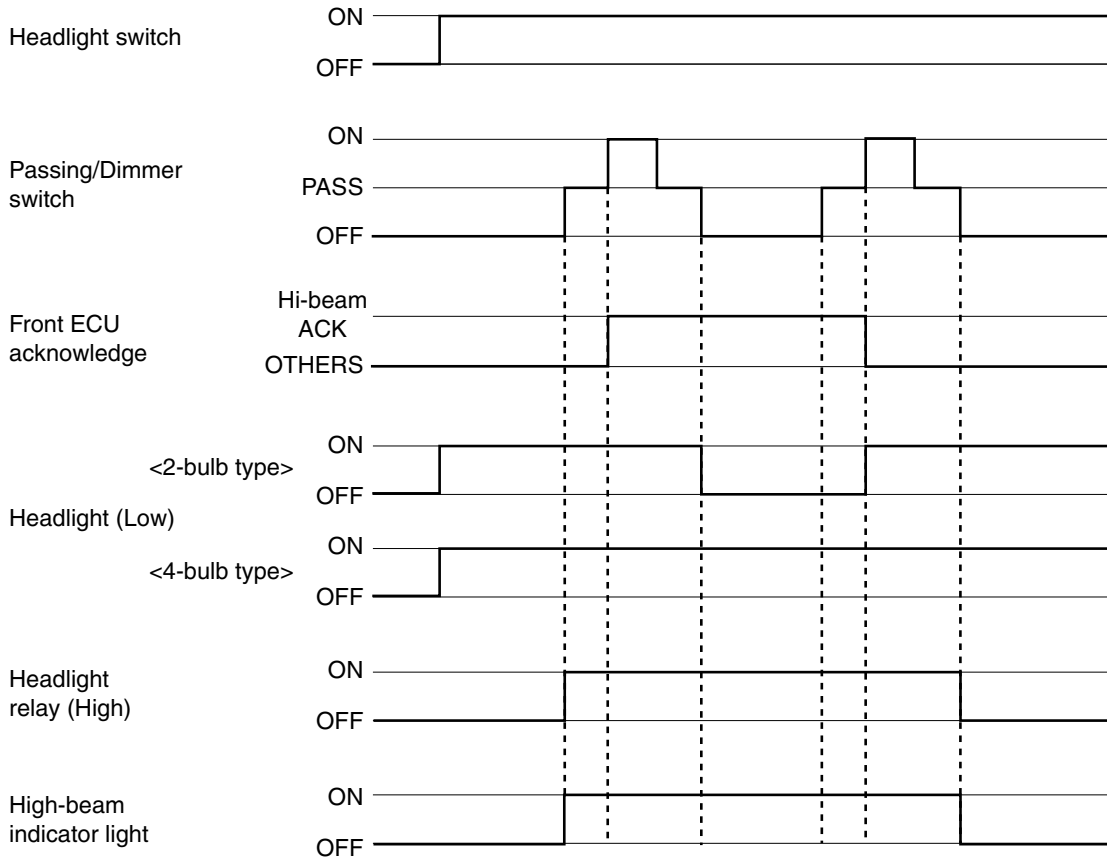
Taillights

If the column switch sends a taillight switch "ON" signal to the front-ECU, the front-ECU turns on its taillight relay, causing the taillights to illuminate.

*NOTE: This description covers the taillights only. In actual driving, the taillights may be turned off due to the headlight automatic shut-off function. For the details of the headlight automatic shut-off function, refer to .*



Headlights



If the column switch sends a headlight switch "ON" signal to the front-ECU, the front-ECU turns on its headlight relay (LOW), causing the low-beam headlights to illuminate. If the dimmer switch is turned on while the headlight relay (LOW) is on, the front-ECU turns on the headlight relay (HIGH), causing the high-beam headlights to illuminate.

*NOTE: This description covers the headlights only. In actual driving, the headlights may be turned off due to the headlight automatic shut-off function. For the details of the headlight automatic shut-off function, refer to .*

**High-beam indicator light**

At the same time that the high-beams are illuminated, the ETACS-ECU sends a signal to illuminate the high beam indicator via the CAN bus line. The combination meter receives the transmitted signal and turns the high-beam indicator on and off.

**Headlight automatic-shutdown function**

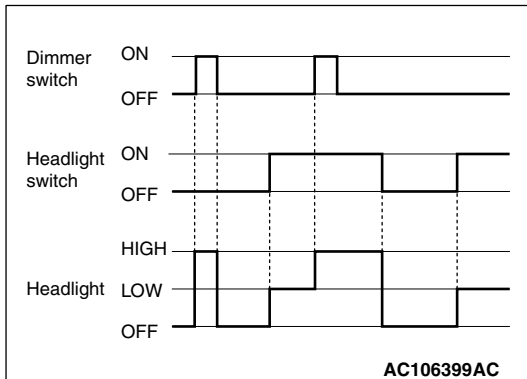
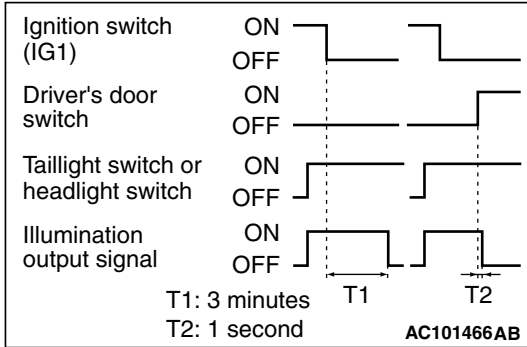
Even if the lighting switch (taillights switch or headlight switch) is ON, the headlights (including the taillights) will automatically go off in the following conditions to prevent the battery from discharging as a result of forgetting to turn off lights.

If the ignition key is turned from "ON" to "LOCK" (OFF) or "ACC" position with the lighting switch turned ON, and this state continues for three minutes, the light will automatically be turned off. If the driver's seat door is opened during these three minutes, the light will go off one second later.

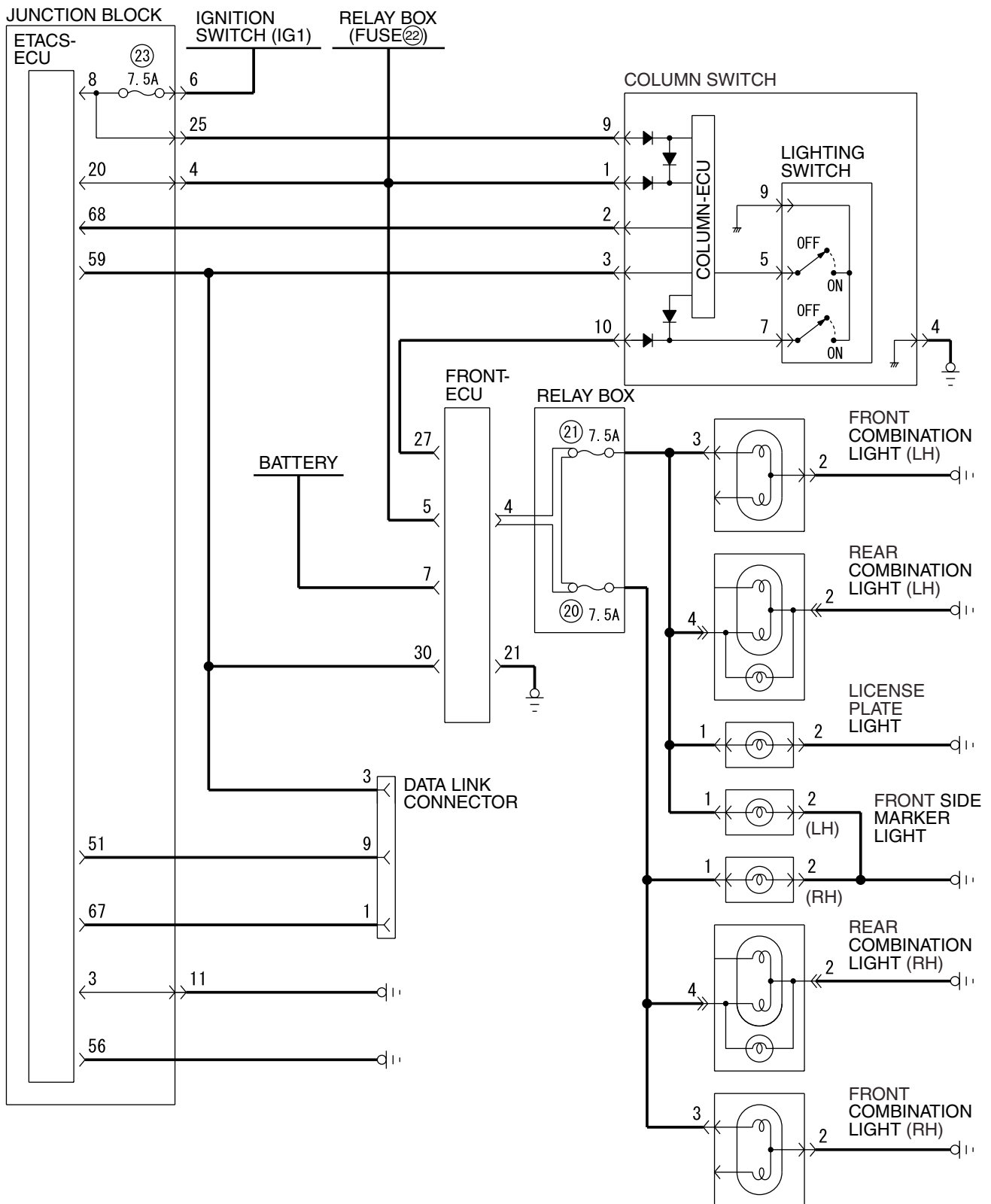
*NOTE: The headlight automatic-shutoff function can be customized on vehicles equipped with a multi center display (middle grade type). Refer to P. 54B-555.*

**Dimmer automatic reset function**

If the headlight switch is turned off while the high-beam headlights are on, the dimmer switch will be reset. Because of this, the headlights will illuminate at low beam the next time that they are turned on. The dimmer switch will be also reset if the dimmer switch is turned on unintentionally while the passing switch is operated.



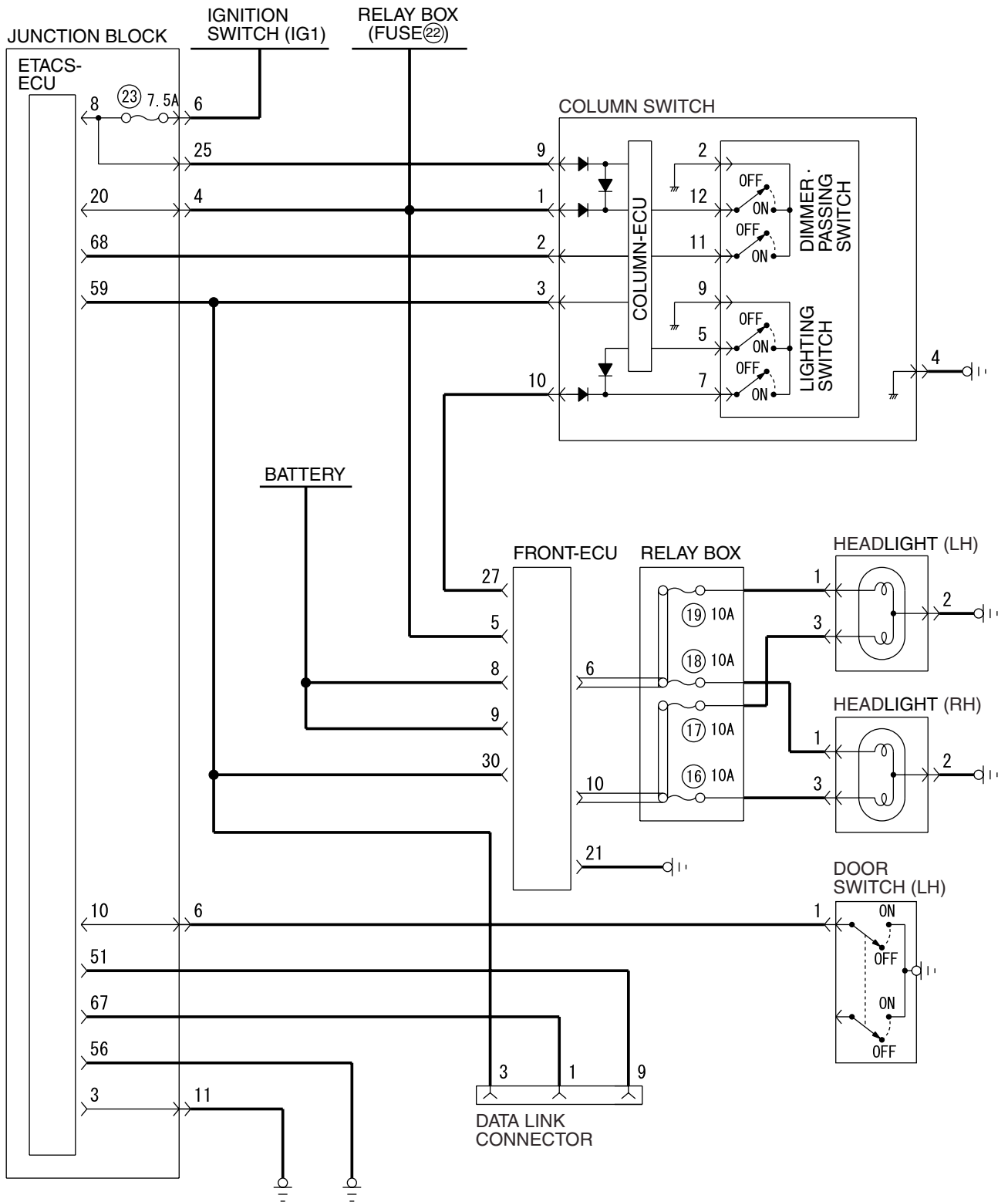
**General circuit diagram for the taillights**



W4P54M60AA

General circuit diagram for the headlights

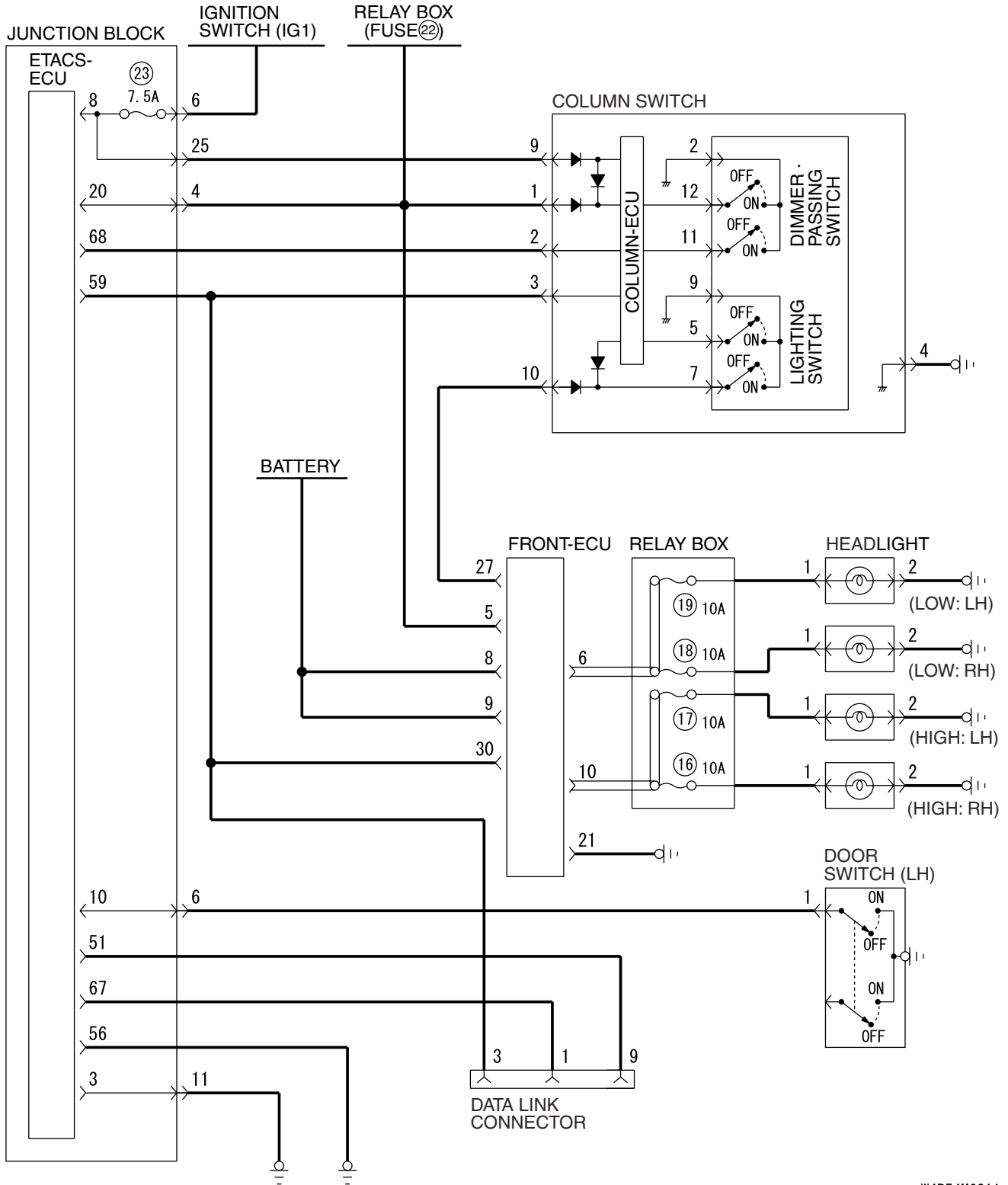
2-bulb type



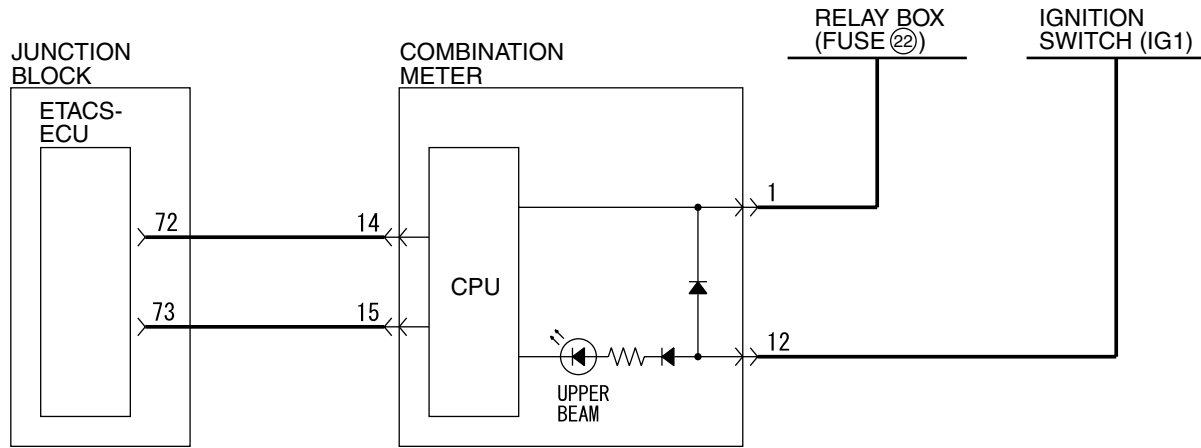
W4P54M61AA



**4-bulb type**



W4P54M62AA

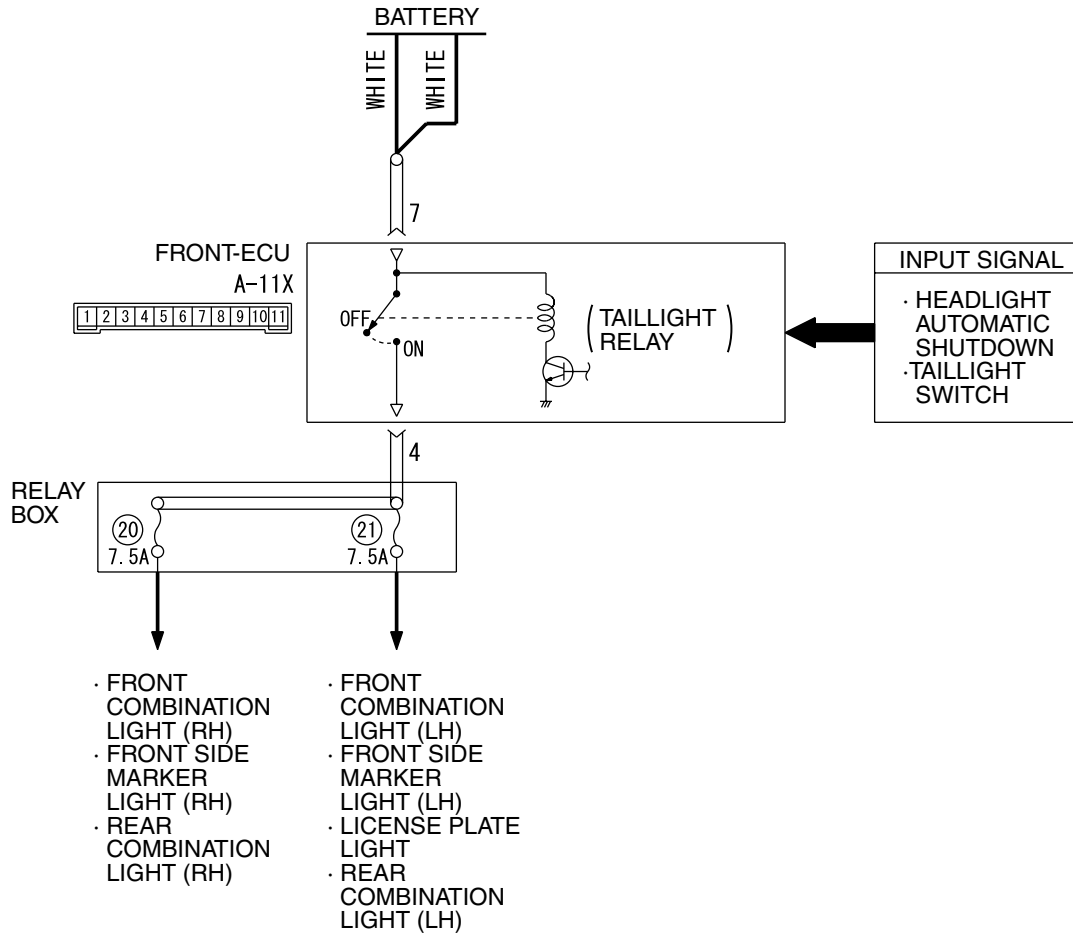


W4P54M63AA

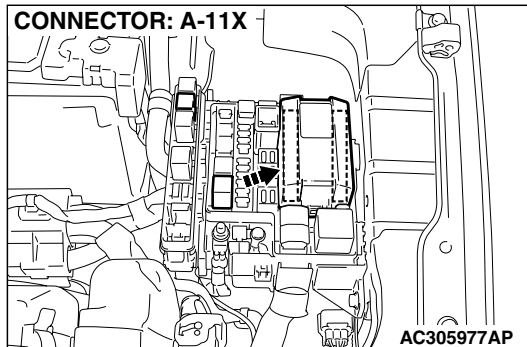
**INSPECTION PROCEDURE H-1: Headlight and Taillight: The taillights do not illuminate normally.**

*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Taillight Relay Circuit**



W4P54M64AA



**CIRCUIT OPERATION**

When the lighting switch is set to "TAIL" position, the "TAIL" signal is sent through the column-ECU (incorporated in the column switch) to the front-ECU. If the front-ECU receives the "TAIL" signal through the column-ECU, the front-ECU turns on the taillight relay (incorporated in the front-ECU), thus causing the taillights to illuminate.

**TECHNICAL DESCRIPTION (COMMENT)**

If the taillights do not illuminate normally, the column switch or the front-ECU may be defective.

**TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The front-ECU may be defective

**DIAGNOSIS****Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

**STEP 1. Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.**

Check the following ECUs:

- Column switch (column-ECU)
- Front-ECU

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

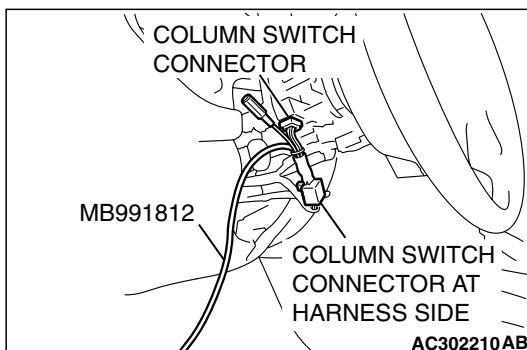
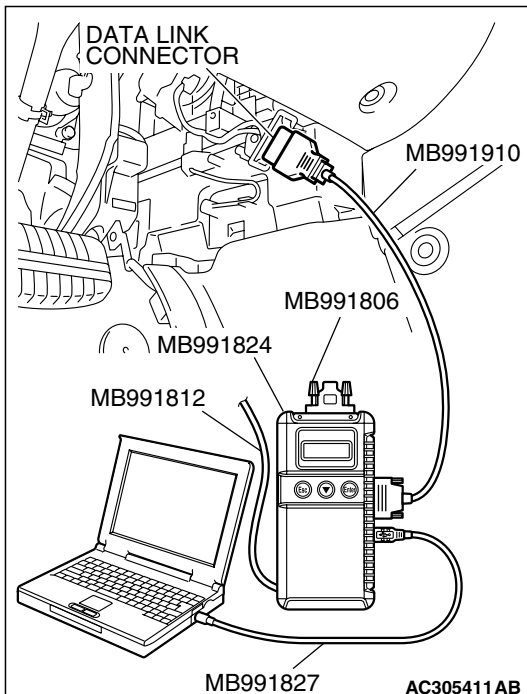
- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM Check."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "ECU COMM Check."
- (4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menus for both the "COLUMN ECU" and the "FRONT ECU" menus.

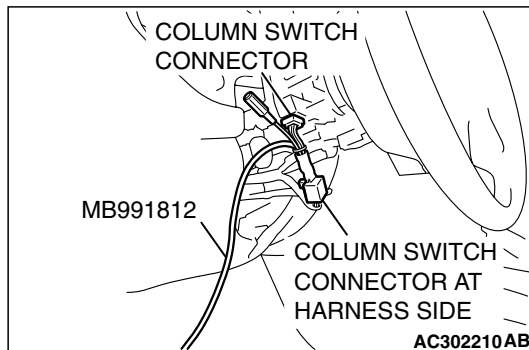
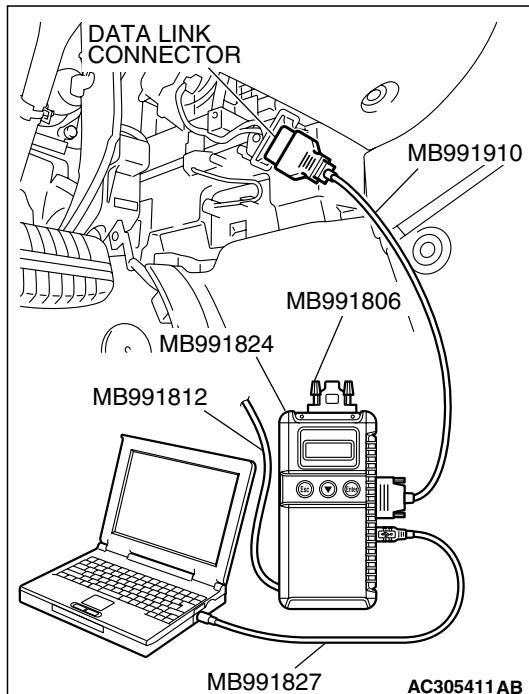
**Q: Is "OK" displayed for both the "COLUMN ECU" and "FRONT ECU" menu?**

**"OK" is displayed for all the items :** Go to Step 2.

**"NG" is displayed for the "COLUMN ECU" menu :** Refer to Inspection Procedure A-2 "Communication with the column switch (column-ECU) is not possible P.54B-71."

**"NG" is displayed for the "FRONT ECU" menu :** Refer to Inspection Procedure A-4 "Communication with the front-ECU is not possible P.54B-86."





**STEP 2. Check the input signal by using "FUNCTION DIAG." menu of the SWS monitor.**

Check the input signals from the following switches:

- Ignition switch: ON
- Lighting switch: TAIL

*NOTE: Turn the ignition switch to the "ON" position in order to disable the headlight automatic shutdown function.*

- (1) Operate scan tool MB991958 according to the procedure below to display "TAILLIGHT."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "LIGHTING."
  - g. Select "TAILLIGHT."
- (2) Check that normal conditions are displayed for the items described in the table below.

ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 01	TAILLIGHT SW	ON
ITEM 35	H/L AUTO-CUT	OFF
ITEM 70	FRONT ECU ACK	NORMAL ACK

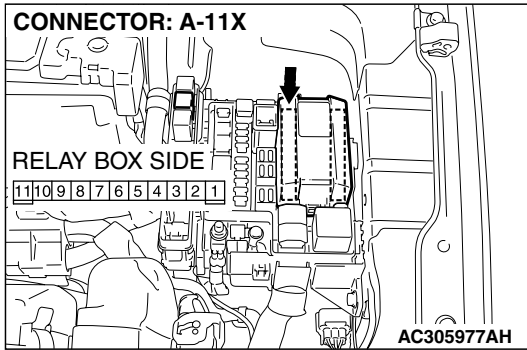
**Q: Does the scan tool MB991958 display the items "TAILLIGHT SW", "H/L AUTO-CUT" and "FRONT ECU ACK" as normal condition?**

**Normal conditions are displayed for all the items :** Go to Step 3.

**Normal condition is not displayed for "TAILLIGHT SW" :**  
Refer to Inspection Procedure M-5 "ETACS-ECU does not receive any signal from the taillight switch [P.54B-484.](#)"

**Normal condition is not displayed for "H/L AUTO-CUT" :**  
Refer to Inspection Procedure H-9 "Headlight automatic shutoff function does not work normally [P.54B-362.](#)"

**Normal condition is not displayed for "FRONT ECU ACK" :** Replace the front-ECU. Verify that the taillights illuminate normally.



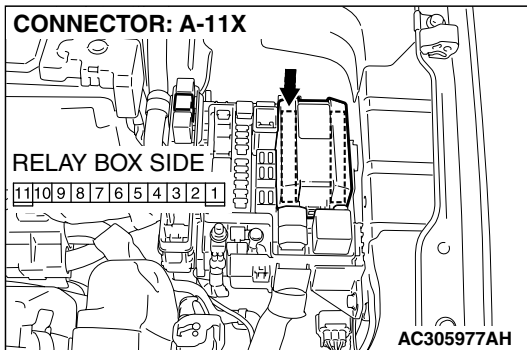
**STEP 3. Check front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-11X in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

**P.00E-2.** Verify that the taillights illuminate normally.



**STEP 4. Check the battery power supply circuit to the front-ECU. Measure the voltage at front-ECU connector A-11X.**

(1) Disconnect front-ECU connector A-11X and measure the voltage available at the relay box side of the connector.

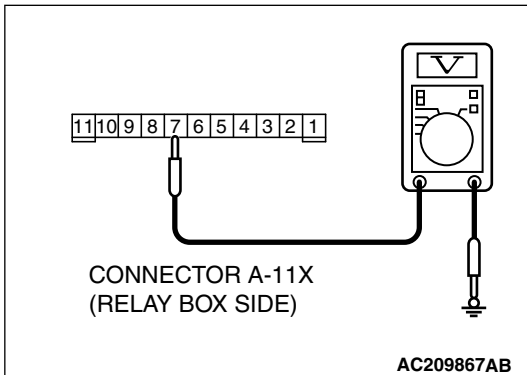
(2) Measure the voltage between terminal 7 and ground.

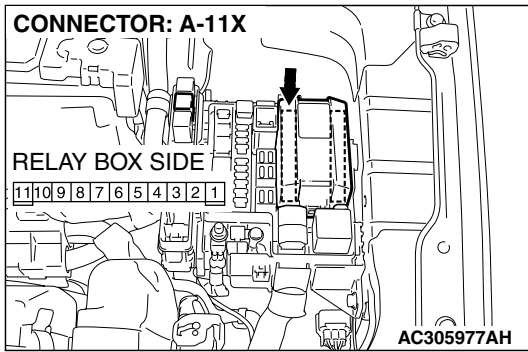
- The voltage should measure approximately 12 volts (battery positive voltage).

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

**YES :** Replace the front-ECU. Verify that the taillights illuminate normally.

**NO :** Go to Step 5.





**STEP 5. Check the wiring harness between front-ECU connector A-11X (terminal 7) and the battery.**

**Q: Is the wiring harness between front-ECU connector A-11X (terminal 7) and the battery in good condition?**

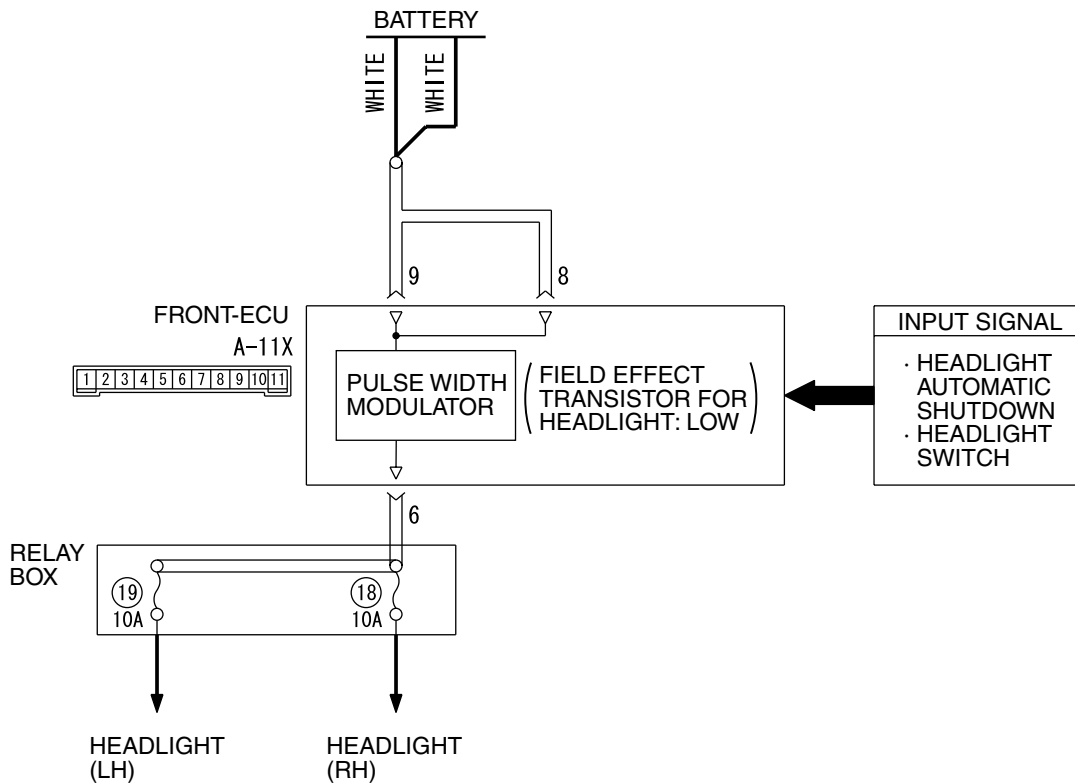
**YES :** No action is necessary and testing is complete.

**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. Verify that the taillights illuminate normally.

**INSPECTION PROCEDURE H-2: Headlight and Taillight: The headlights (low-beam) do not illuminate normally.**

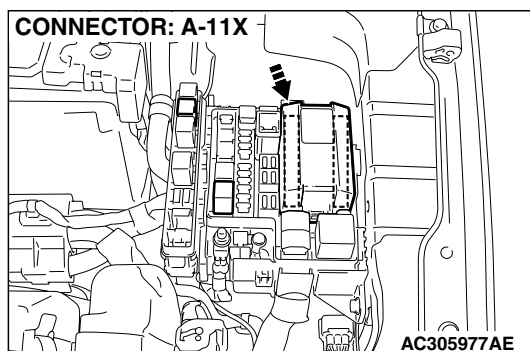
*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Headlight Relay (Low-Beam) Circuit**



W4P54M65AA





## **CIRCUIT OPERATION**

- When the lighting switch is set to "HEAD" position, the "HEAD" signal is sent through the column-ECU (incorporated in the column switch) to the front-ECU. If the front-ECU receives the "HEAD" signal through the column-ECU, the front-ECU turns on the headlight relay (incorporated in the front-ECU), thus causing the headlights to illuminate. The headlights always illuminate at low-beam by the headlight dimmer switch automatic resetting function.
- If the SWS communication line is defective, the front-ECU operates the headlights by using the other communication lines (headlight backup circuit) instead of that line.

## **TECHNICAL DESCRIPTION (COMMENT)**

If the headlights (low-beam) do not illuminate normally, the column switch or the front-ECU may be defective.

## **TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The front-ECU may be defective

## **DIAGNOSIS**

### **Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

**STEP 1. Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.**

Check the following ECUs:

- Column switch (column-ECU)
- Front-ECU

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

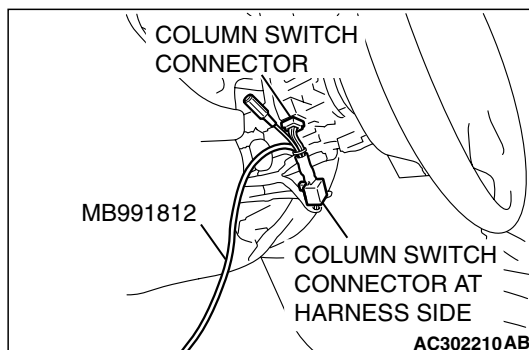
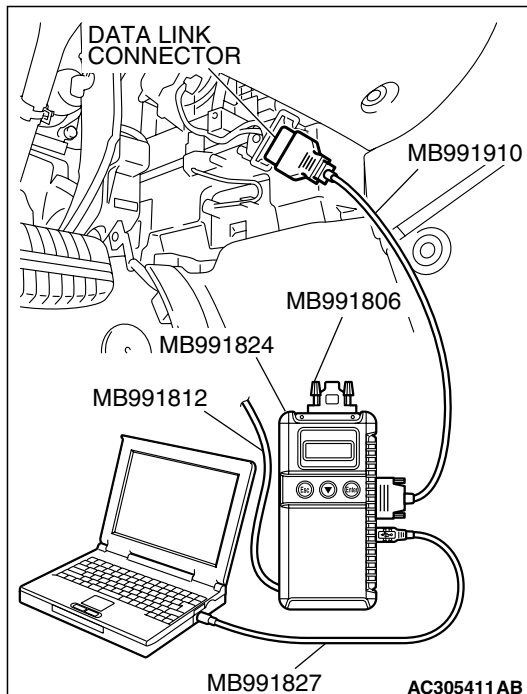
- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM Check."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "ECU COMM Check."
- (4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menus for both the "COLUMN ECU" and the "FRONT ECU" menus.

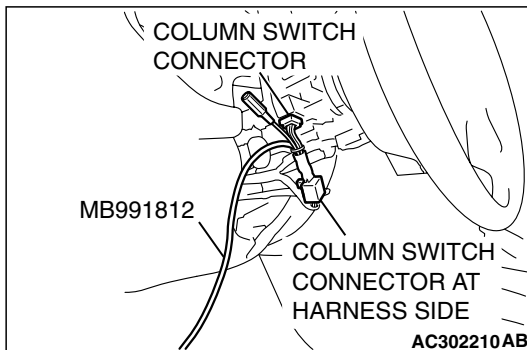
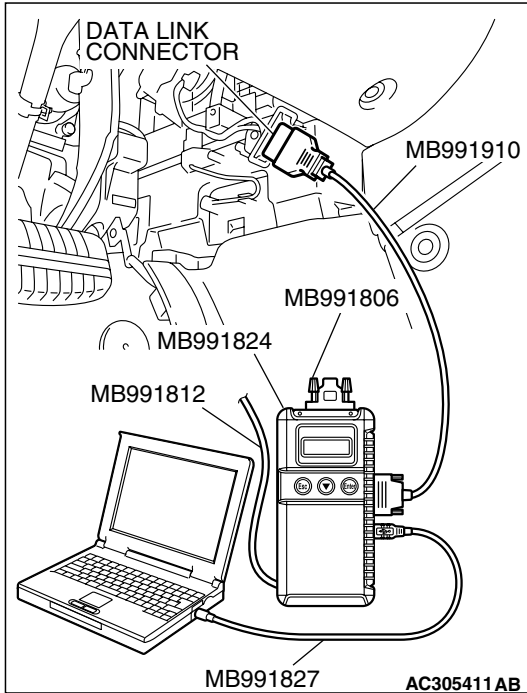
**Q: Is "OK" displayed for both the "COLUMN ECU" and "FRONT ECU" menus?**

**"OK" is displayed for all the items :** Go to Step 2.

**"NG" is displayed for the "COLUMN ECU" menu :** Refer to Inspection Procedure A-2 "Communication with the column switch (column-ECU) is not possible P.54B-71."

**"NG" is displayed for the "FRONT ECU" menu :** Refer to Inspection Procedure A-4 "Communication with the front-ECU is not possible P.54B-86."





**STEP 2. Check the input signal by using "FUNCTION DIAG." menu of the SWS monitor.**

Check the input signals from the following switches:

- Ignition switch: ON
- Lighting switch: HEAD

- (1) Operate scan tool MB991958 according to the procedure below to display "HEADLIGHT LO."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "LIGHTING."
  - g. Select "HEADLIGHT LO."
- (2) Check that normal conditions are displayed for the items described in the table below.

ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 00	HEADLIGHT SW	ON
ITEM 35	H/L AUTO-CUT	OFF
ITEM 70	FRONT ECU ACK	NORMAL ACK

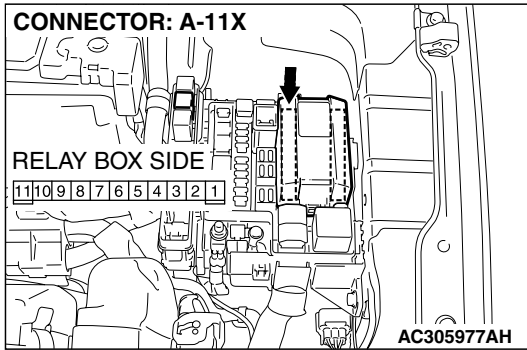
**Q: Does the scan tool MB991958 display the items "HEADLIGHT SW", "H/L AUTO-CUT" and "FRONT ECU ACK" as normal condition?**

**Normal conditions are displayed for all the items :** Go to Step 3.

**Normal condition is not displayed for "HEADLIGHT SW" :** Refer to Inspection Procedure M-5 "ETACS-ECU does not receive any signal from the headlight switch [P.54B-484.](#)"

**Normal condition is not displayed for "H/L AUTO-CUT" :** Refer to Inspection Procedure H-9 "Headlight automatic shutoff function does not work normally [P.54B-362.](#)"

**Normal condition is not displayed for "FRONT ECU ACK" :** Replace the front-ECU. Verify that the headlights (low-beam) illuminate normally.

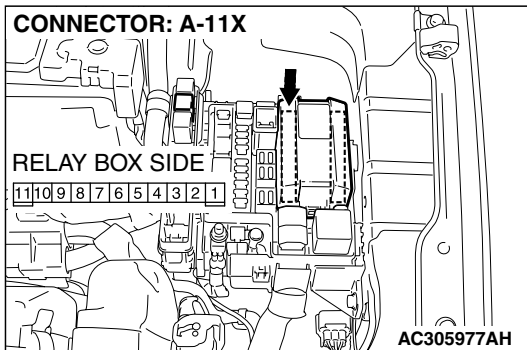


**STEP 3. Check front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-11X in good condition?**

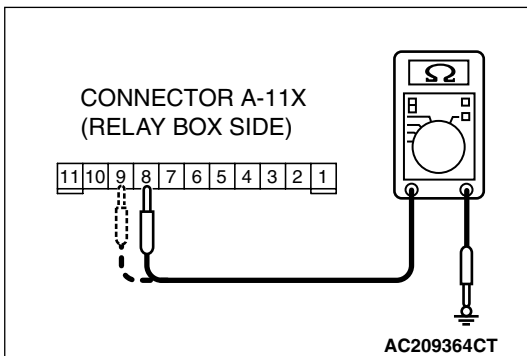
**YES :** Go to Step 4.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the headlights (low-beam) illuminate normally.



**STEP 4. Check the battery power supply circuit to the front-ECU. Measure the voltage at front-ECU connector A-11X.**

(1) Disconnect front-ECU connector A-11X and measure the voltage available at the relay box side of the connector.



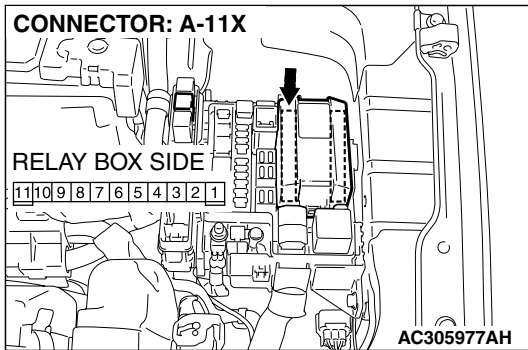
(2) Measure the voltage between terminal numbers 8 and ground, and also between terminal 9 and ground.

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

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

**YES :** Replace the front-ECU. Verify that the headlights (low-beam) illuminate normally.

**NO :** Go to Step 5.



**STEP 5.** Check the wiring harness between front-ECU connector A-11X (terminals 8 and 9) and the battery.

**Q:** Is the wiring harness between front-ECU connector A-11X (terminals 8 and 9) and the battery in good condition?

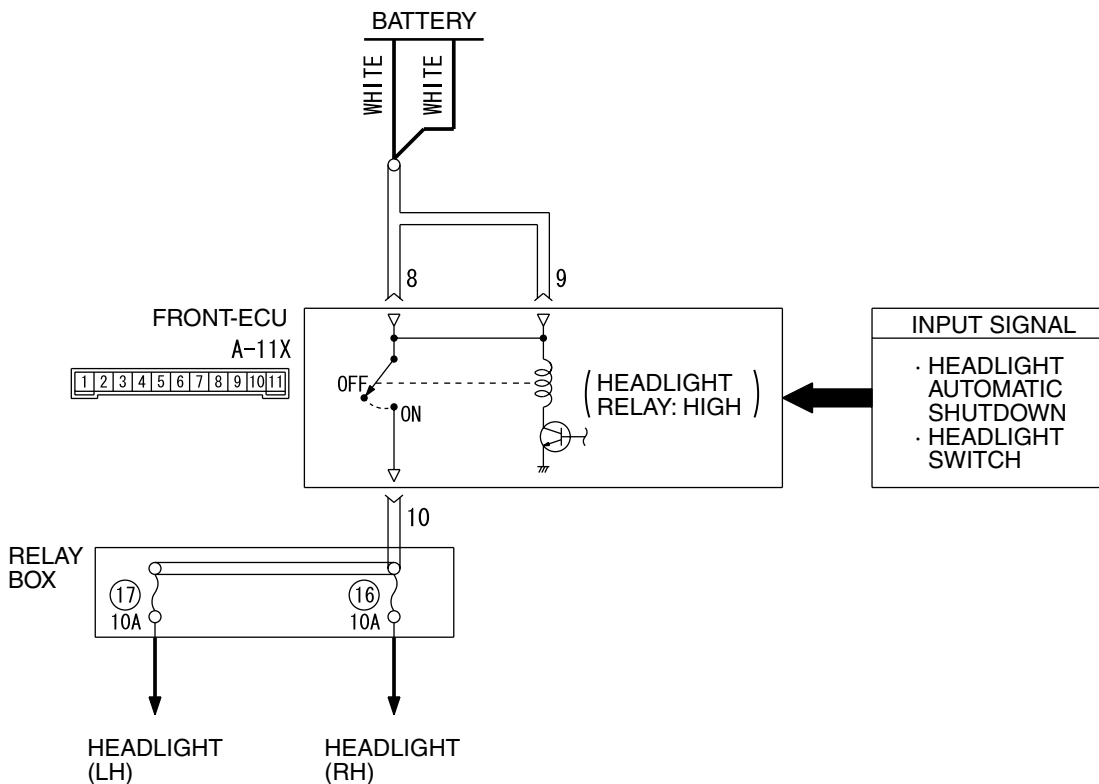
**YES :** No action is necessary and testing is complete.

**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. Verify that the headlights (low-beam) illuminate normally.

**INSPECTION PROCEDURE H-3: Headlight and Taillight: The headlights (high-beam) do not illuminate normally.**

*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Headlight Relay (High-Beam) Circuit**



W4P54M66AA

**CIRCUIT OPERATION**

When the dimmer switch is turned on, the column switch sends a signal to the front-ECU. Then the front-ECU switches the headlights from low-beam to high beam or vice versa.

**TECHNICAL DESCRIPTION (COMMENT)**

If the headlights (high beam) do not illuminate normally, the column switch or the front-ECU may be defective.

**TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The front-ECU may be defective

**DIAGNOSIS****Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

**STEP 1. Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.**

Check the following ECUs:

- Column switch (column-ECU)
- Front-ECU

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

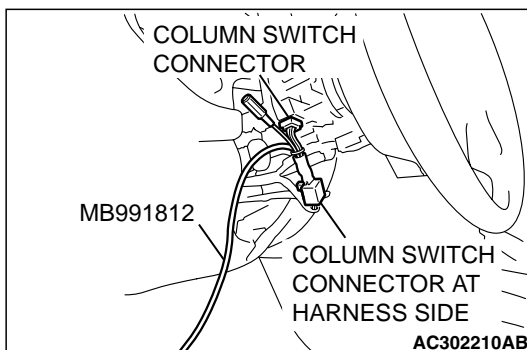
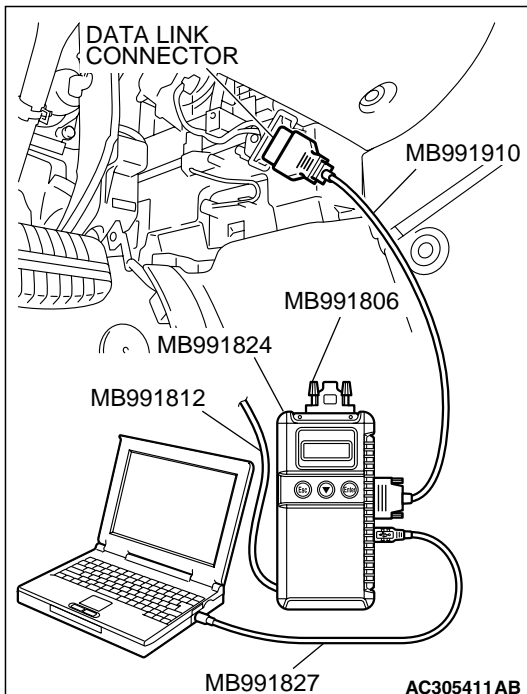
- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM Check."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "ECU COMM Check."
- (4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menus for both the "COLUMN ECU" and the "FRONT ECU" menus.

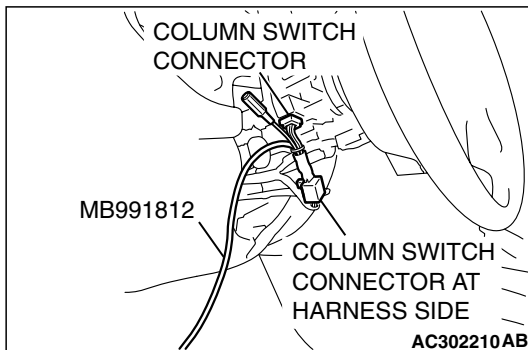
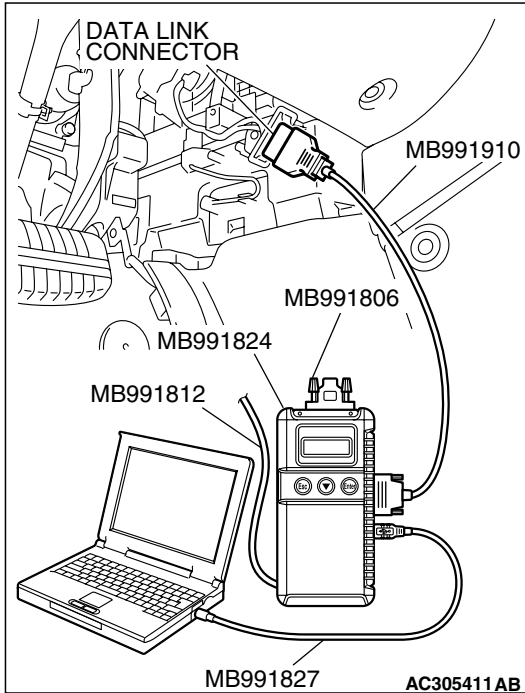
**Q: Is "OK" displayed for both the "COLUMN ECU" and "FRONT ECU" menus?**

**"OK" is displayed for all the items :** Go to Step 2.

**"NG" is displayed for the "COLUMN ECU" menu :** Refer to Inspection Procedure A-2 "Communication with the column switch (column-ECU) is not possible P.54B-71."

**"NG" is displayed for the "FRONT ECU" menu :** Refer to Inspection Procedure A-4 "Communication with the front-ECU is not possible P.54B-86."





## STEP 2. Check the input signal by using "FUNCTION DIAG." menu of the SWS monitor.

Check the input signals from the following switches:

- Ignition switch: ON
- Lighting switch: HEAD
- Dimmer switch: ON

- (1) Operate scan tool MB991958 according to the procedure below to display "HEADLIGHT HI."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "LIGHTING."
  - g. Select "HEADLIGHT HI."
- (2) Check that normal conditions are displayed for the items described in the table below.

ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 00	HEADLIGHT SW	ON
ITEM 02	DIMMER SW	OFF (should turn "ON" momentarily when the dimmer switch is operated)
ITEM 35	H/L AUTO-CUT	OFF
ITEM 70	FRONT ECU ACK	HI-BEAM ACK

**Q: Does the scan tool MB991958 display the items "HEADLIGHT SW", "DIMMER SW", "H/L AUTO-CUT" and "FRONT ECU ACK" as normal condition?**

**Normal conditions are displayed for all the items :**

Replace the front-ECU. Verify that the headlights (high-beam) illuminate normally.

**Normal condition is not displayed for "HEADLIGHT SW" :**

Refer to Inspection Procedure M-5 "ETACS-ECU does not receive any signal from the headlight switch [P.54B-484.](#)"

**Normal condition is not displayed for "DIMMER SW" :**

Refer to Inspection Procedure M-5 "ETACS-ECU does not receive any signal from the dimmer switch [P.54B-484.](#)"

**Normal condition is not displayed for "H/L AUTO-CUT" :**

Refer to Inspection Procedure H-9 "Headlight automatic shutoff function does not work normally [P.54B-362.](#)"

**Normal condition is not displayed for "FRONT ECU ACK" :**

Replace the front-ECU. Verify that the headlights (high-beam) illuminate normally.



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**INSPECTION PROCEDURE H-4: Headlight and Taillight: When the passing switch is turned "ON," the headlights (low-beam or high-beam) do not illuminate.**

---

*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

### **TECHNICAL DESCRIPTION (COMMENT)**

If both of the headlights (low-beam and high-beam) do not illuminate, the input circuit from the passing switch or the front-ECU may be defective.

### **TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The front-ECU may be defective

### **DIAGNOSIS**

#### **Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

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#### **STEP 1. Check the headlights.**

**Q: Do the headlights (low-beam and high-beam) illuminate normally?**

**The headlights illuminate normally. :** Go to Step 2.

**Headlights (low-beam) do not illuminate normally :**

Refer to Inspection Procedure H-2 "The headlights (low-beam) do not illuminate normally [P.54B-302](#).

**Headlights (high-beam) do not illuminate normally :**

Refer to Inspection Procedure H-3 "The headlights (high-beam) do not illuminate normally [P.54B-307](#)."

**STEP 2. Check the input signal by using "DATA LIST" menu of the SWS monitor.**

Turn the passing switch to the "ON" position before checking input signals from the passing switch.

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

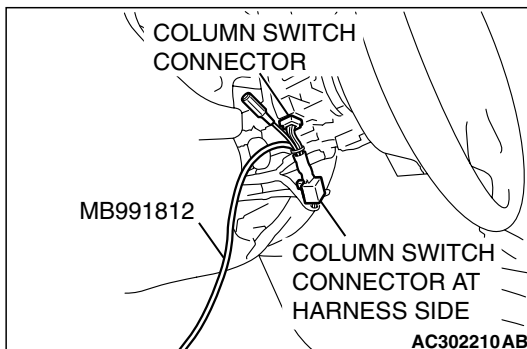
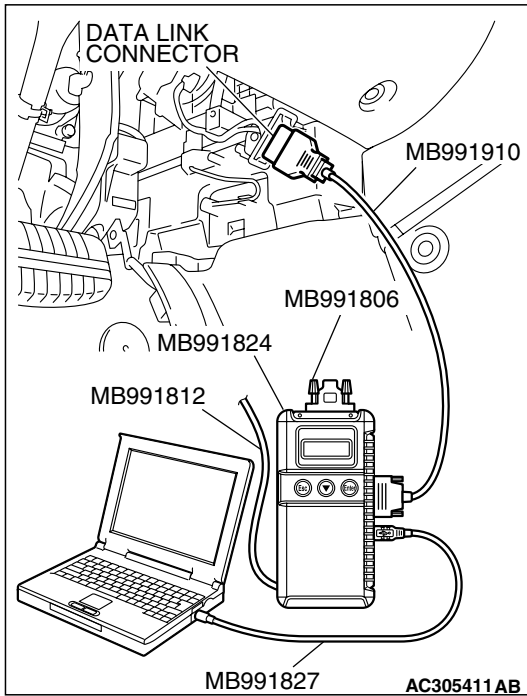
- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Operate scan tool MB991958 according to the procedure below to display "COLUMN ECU."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Data List."
  - f. Select "COLUMN ECU."
- (3) Check that normal conditions are displayed for the items described in the table below.

ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 03	PASSING SW	ON

**Q: Does the scan tool MB991958 display "PASSING SW" as normal condition?**

**YES :** Replace the front-ECU. When the passing switch is turned "ON", the headlights (low-beam and high-beam) should illuminate normally.

**NO :** Refer to Inspection Procedure M-5 "ETACS-ECU does not receive any signal from the passing switch P.54B-484."



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**INSPECTION PROCEDURE H-5: Headlight and Taillight: Headlights do not illuminate when the lighting switch is at "TAIL," and "PASSING" position, but illuminate at low-beam when the switch is at "HEAD" position. At this position, the headlights cannot be changed to high beam by operating the dimmer switch.**

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*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

### **TECHNICAL DESCRIPTION (COMMENT)**

If the headlights illuminate at low-beam regardless of the lighting switch positions, the headlight operation is in fail-safe mode.

### **TROUBLESHOOTING HINTS**

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The front-ECU may be defective

### **DIAGNOSIS**

#### **Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.

Check the following ECUs:

- ETACS-ECU
- Column-ECU
- Front-ECU

**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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

(1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."

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

(3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM Check."

- a. Select "System select."
- b. Select "SWS."
- c. Select "SWS MONITOR."
- d. Select "ECU COMM Check."

(4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menus for the "ETACS ECU", "COLUMN ECU" and "FRONT ECU" menus.

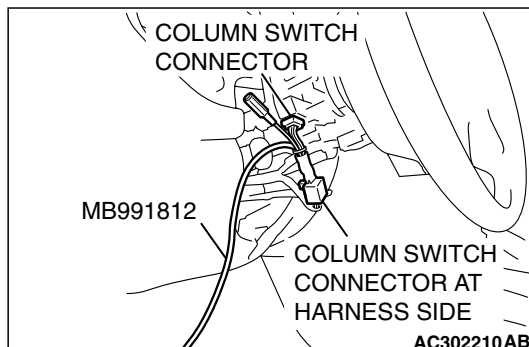
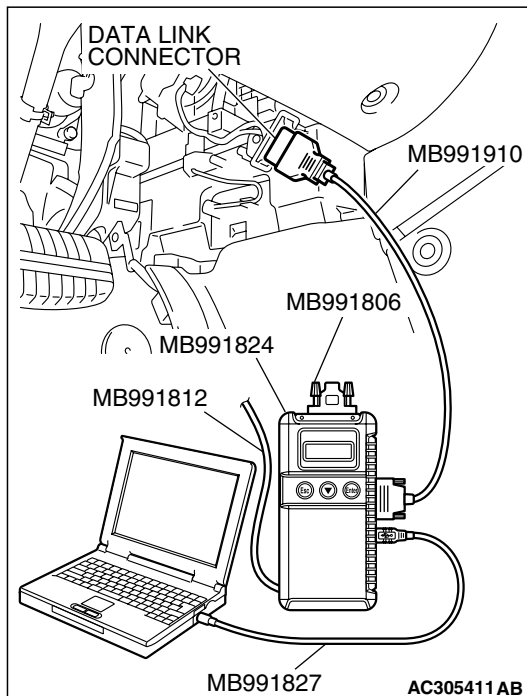
**Q: Is "OK" displayed for both the "ETACS ECU", "COLUMN ECU" and "FRONT ECU" menus?**

**"OK" is displayed for all the items :** Replace the front-ECU. Verify that the headlights and the taillights illuminate normally.

**"NG" is displayed for the "ETACS ECU" menu :** Refer to Inspection Procedure A-3 "Communication with the ETACS-ECU is not possible P.54B-78."

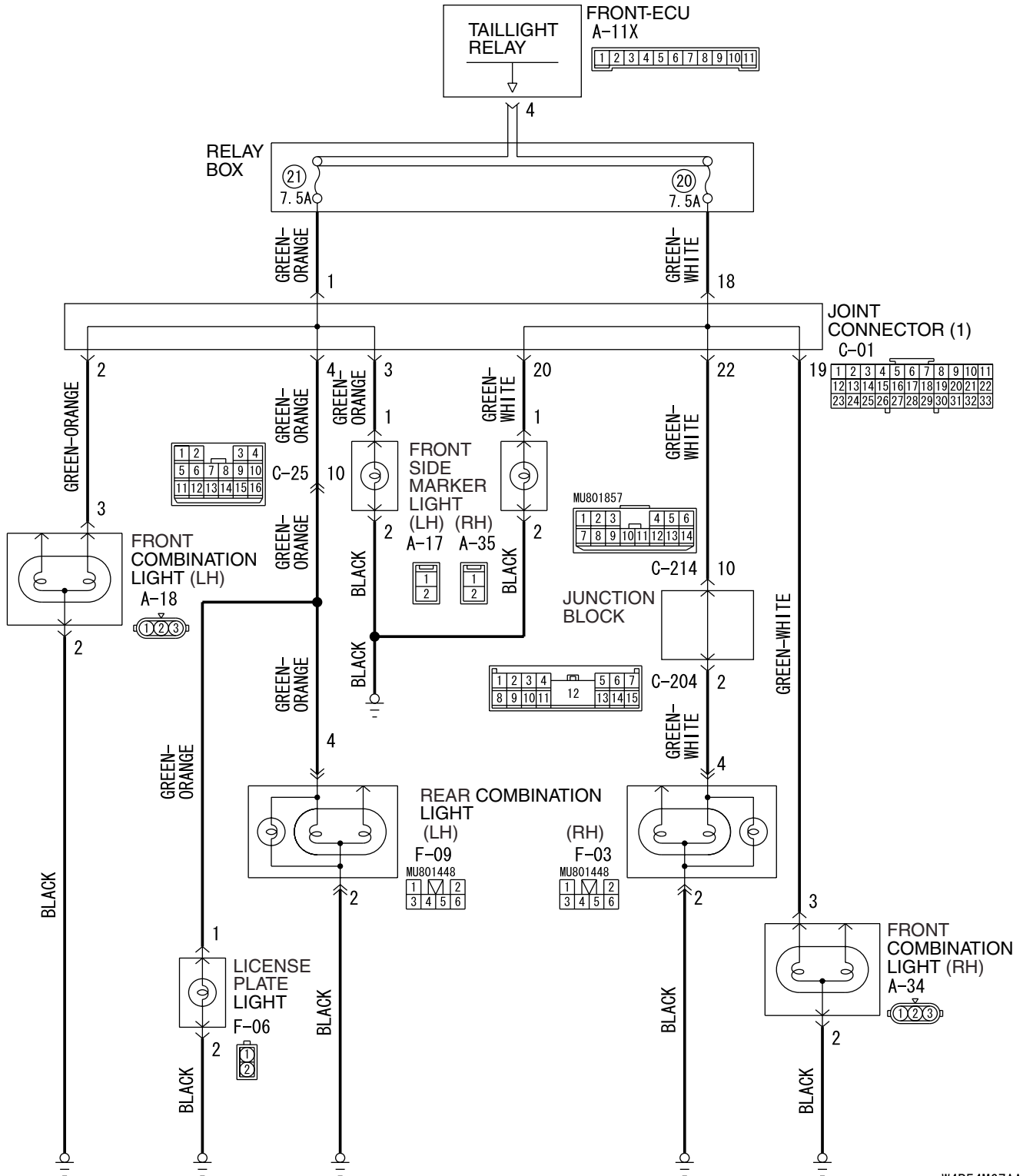
**"NG" is displayed for the "COLUMN ECU" menu :** Refer to Inspection Procedure A-2 "Communication with the column switch (column-ECU) is not possible P.54B-71."

**"NG" is displayed for the "FRONT ECU" menu :** Refer to Inspection Procedure A-4 "Communication with the front-ECU is not possible P.54B-86."

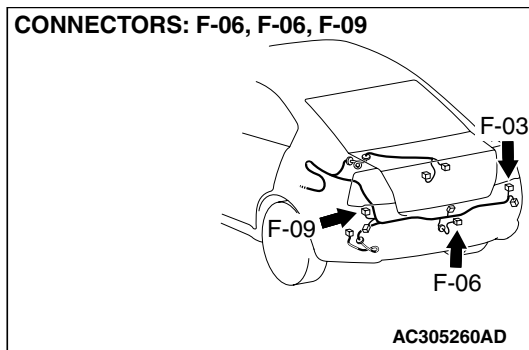
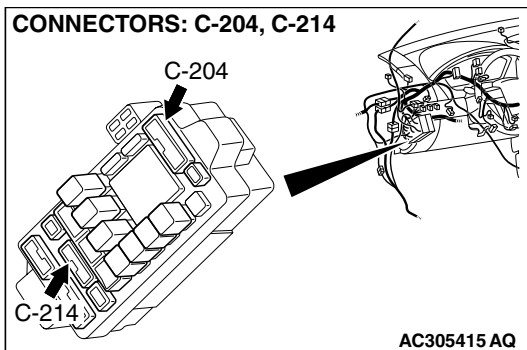
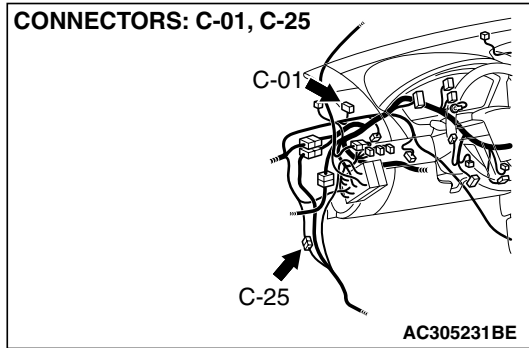
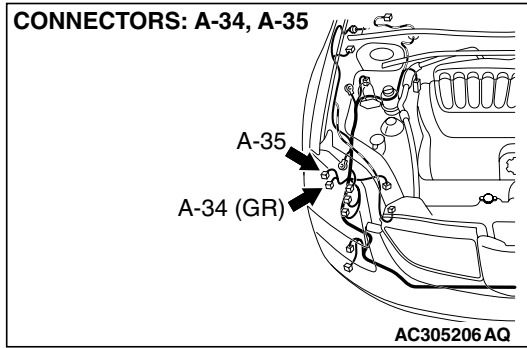
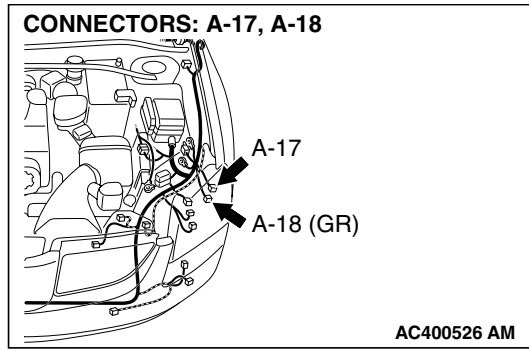
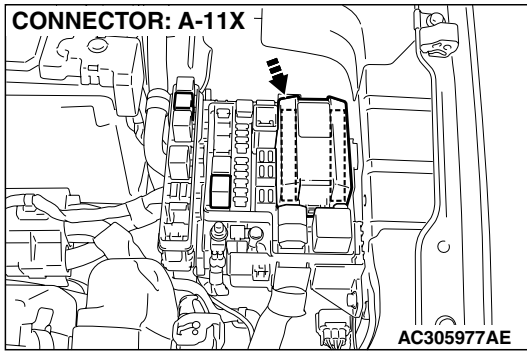


**INSPECTION PROCEDURE H-6: Headlight and Taillight: The taillights, the front parking lights, the front side marker lights or the license plate light do not illuminate.**

**Taillights, Front Parking Lights, Front Side Marker Lights and License Plate Light Circuit**



W4P54M67AA



**TECHNICAL DESCRIPTION (COMMENT)**

If the front parking lights, the front side marker lights, the taillights or the license plate light do not illuminate, their bulb may be defective.

**TROUBLESHOOTING HINTS**

- The front parking light bulb may be defective

- The front side marker light bulb may be defective
- The stop/taillight bulb may be defective
- The license plate light bulb may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

## DIAGNOSIS

### Required Special Tool:

- MB991223: Harness Set

### STEP 1. Check the operation of each light.

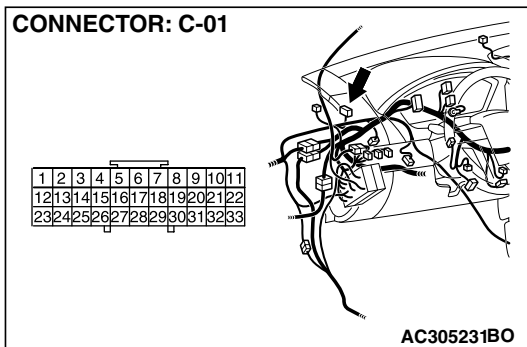
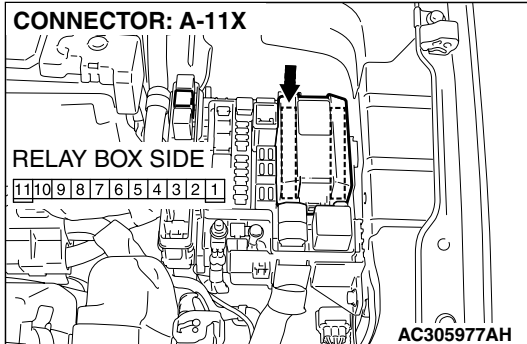
#### Q: Which light does not illuminate?

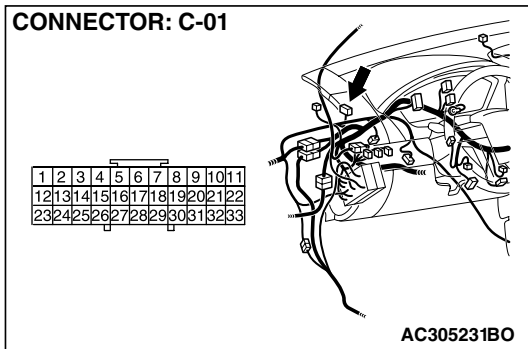
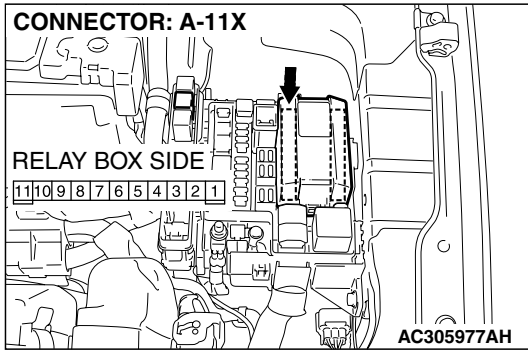
- front parking light (LH), taillight (LH), front side marker light (LH) and license plate light : Go to Step 2.
- front parking light (RH), taillight (RH) and front side marker light (RH) : Go to Step 4.
- taillight (LH) and license plate light : Go to Step 6.
- taillight (LH) : Go to Step 8.
- taillight (RH) : Go to Step 13.
- front parking light (LH) : Go to Step 19.
- front parking light (RH) : Go to Step 25.
- license plate light : Go to Step 31.
- front side marker lights : Go to Step 37.
- front side marker light (LH) : Go to Step 38.
- front side marker light (RH) : Go to Step 44.
- All lights** : Refer to Inspection Procedure H-1 "The taillights do not illuminate normally [P.54B-297](#)."

### STEP 2. Check joint connector C-01 and front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.

#### Q: Are joint connector C-01 and front-ECU connector A-11X 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](#). The front parking light (LH), taillight (LH), front side marker light (LH) and the license plate light should illuminate normally.



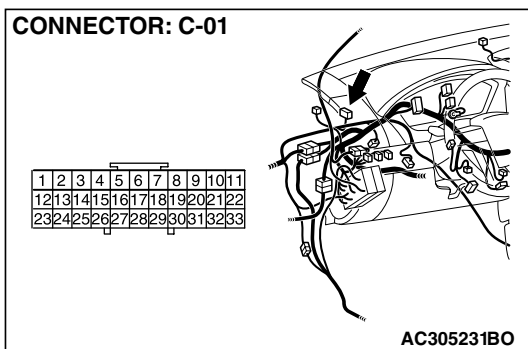
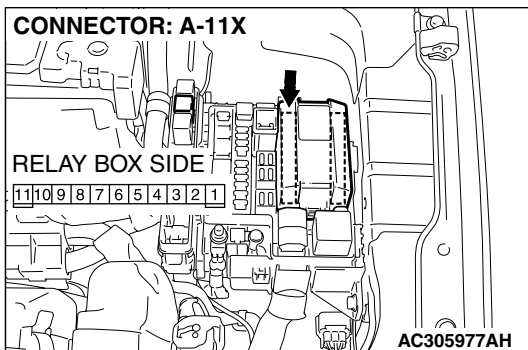


**STEP 3. Check the wiring harness between joint connector C-01 (terminal 1) and front-ECU connector A-11X (terminal 4).**

**Q: Is the wiring harness between joint connector C-01 (terminal 1) and front-ECU connector A-11X (terminal 4) 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. The front parking light (LH), taillight (LH), front side marker light (LH) and the license plate light should illuminate normally.



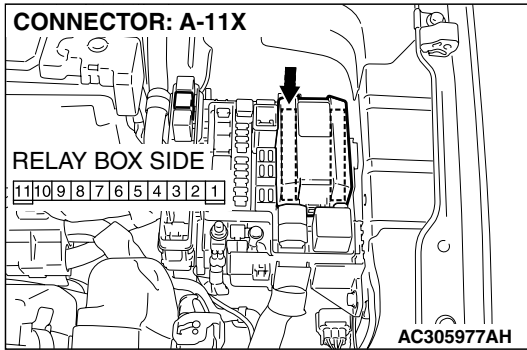
**STEP 4. Check joint connector C-01 and front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are joint connector C-01 and front-ECU connector A-11X 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](#). The front parking light (RH), the front side marker light (RH) and the taillight (RH) should illuminate normally.



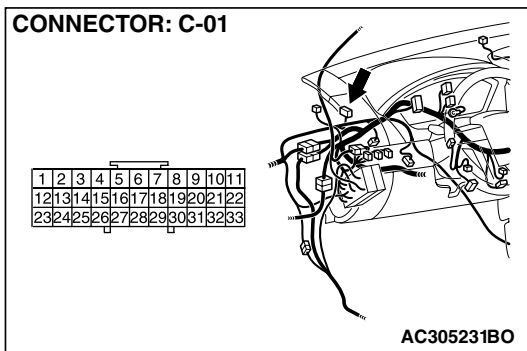


**STEP 5. Check the wiring harness between joint connector C-01 (terminal 18) and front-ECU connector A-11X (terminal 4).**

**Q: Is the wiring harness between joint connector C-01 (terminal 18) and front-ECU connector A-11X (terminal 4) 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. The front parking light (RH), the front side marker light (RH) and the taillight (RH) should illuminate normally.

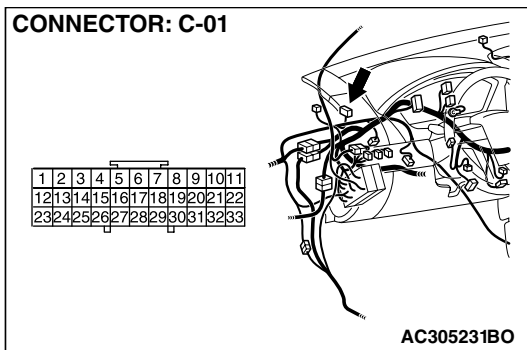


**STEP 6. Check joint connector C-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

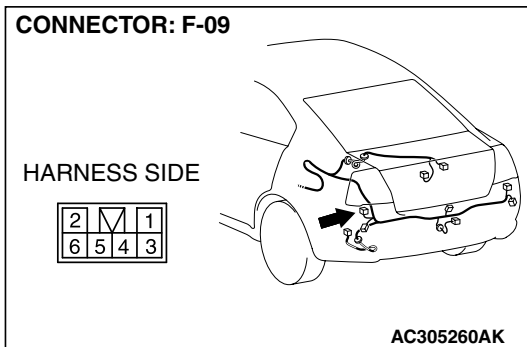
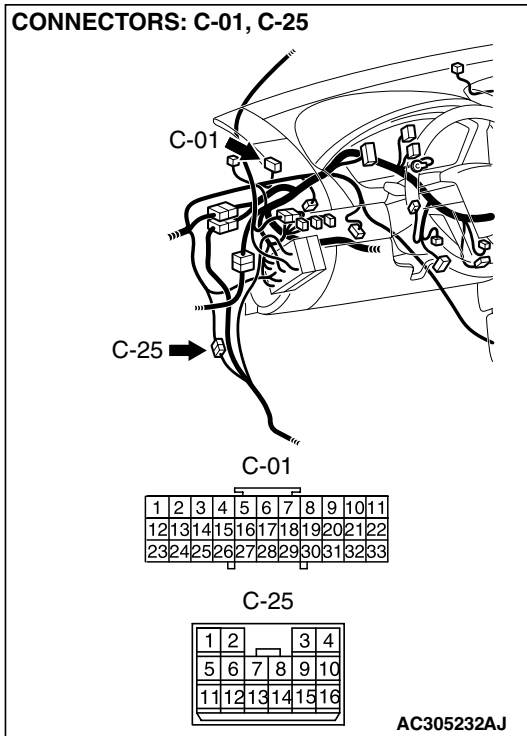
**Q: Is joint connector C-01 in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The taillight (LH) and the license plate light should illuminate normally.



**STEP 7.** Check the wiring harness between joint connector C-01 (terminal 4) and rear combination light (LH) connector F-09 (terminal 4).

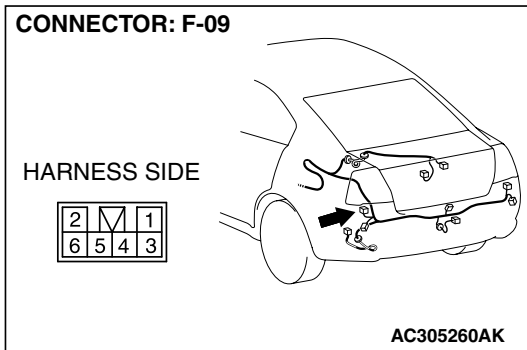


*NOTE: Also check intermediate connector C-25 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-25 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q:** Is the wiring harness between joint connector C-01 (terminal 4) and rear combination light (LH) connector F-09 (terminal 4) 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. The taillight (LH) and the license plate light should illuminate normally.



**STEP 8. Check rear combination light (LH) connector F-09 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is rear combination light (LH) connector F-09 in good condition?**

**YES :** Go to Step 9.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the taillight (LH) illuminates normally.

**STEP 9. Check the stop/taillight bulb (LH).**

- (1) Remove the stop/taillight bulb (LH).
- (2) Verify that the stop/taillight bulb (LH) is not damaged or burned out.

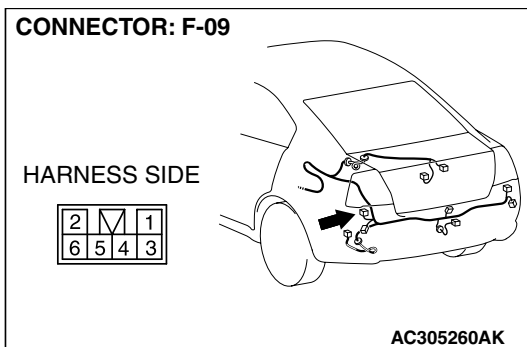
**Q: Is the stop/taillight bulb (LH) in good condition?**

**YES :** Go to Step 10.

**NO :** Replace the stop/taillight bulb (LH). Verify that the taillight (LH) illuminates normally.

**STEP 10. Check the ground circuit to the rear combination light (LH). Measure the resistance at rear combination light (LH) connector F-09.**

- (1) Disconnect rear combination light (LH) connector F-09 and measure the resistance available at the wiring harness side of the connector.



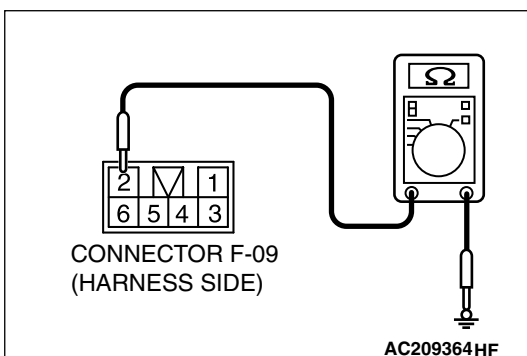
- (2) Measure the resistance value between terminal 2 and ground.

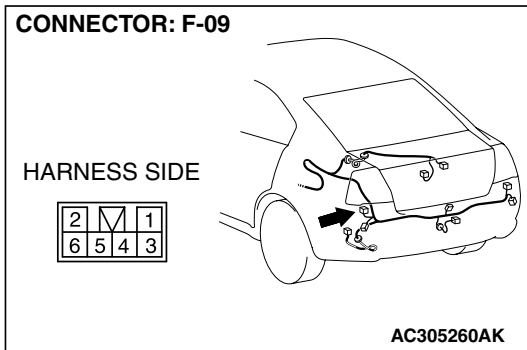
- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 12.

**NO :** Go to Step 11.



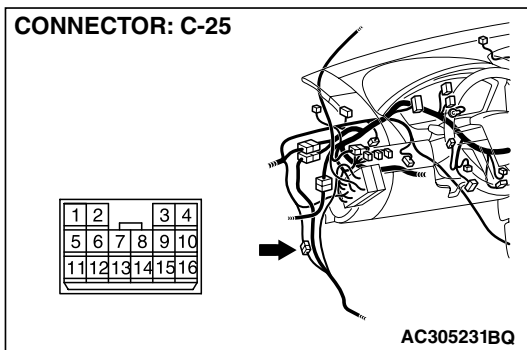


**STEP 11. Check the wiring harness between rear combination light (LH) connector F-09 (terminal 2) and ground.**

**Q: Is the wiring harness between rear combination light (LH) connector F-09 (terminal 2) and ground in good condition?**

**YES :** Replace the rear combination light socket (LH). Verify that the taillight (LH) illuminates normally.

**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. Verify that the taillight (LH) illuminates normally.

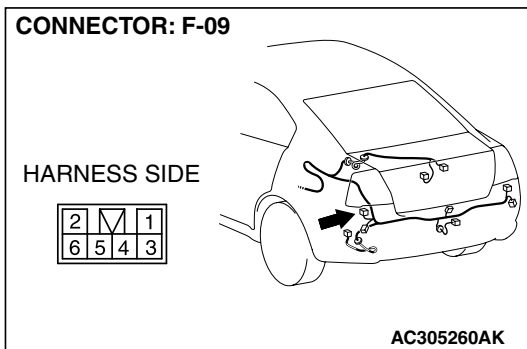


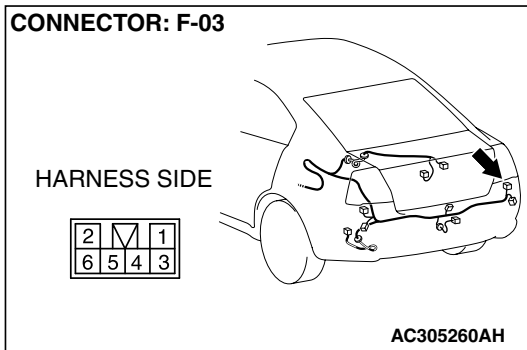
**STEP 12. Check the wiring harness between rear combination light (LH) connector F-09 (terminal 4) and intermediate connector C-25 (terminal 10).**

**Q: Is the wiring harness between rear combination light (LH) connector F-09 (terminal 4) and intermediate connector C-25 (terminal 10) in good condition?**

**YES :** Replace the rear combination light socket (LH). Verify that the taillight (LH) illuminates normally.

**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. Verify that the taillight (LH) illuminates normally.





**STEP 13. Check rear combination light (RH) connector F-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is rear combination light (RH) connector F-03 in good condition?**

**YES :** Go to Step 14.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the taillight (RH) illuminates normally.

**STEP 14. Check the stop/taillight bulb (RH).**

- (1) Remove the stop/taillight bulb (RH).
- (2) Verify that the stop/taillight bulb (RH) is not damaged or burned out.

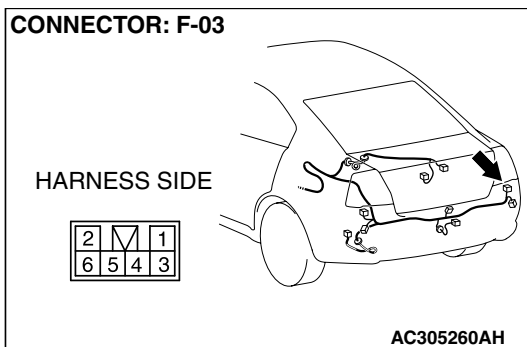
**Q: Is the stop/taillight bulb (RH) in good condition?**

**YES :** Go to Step 15.

**NO :** Replace the stop/taillight bulb (RH). Verify that the taillight (RH) illuminates normally.

**STEP 15. Check the ground circuit to the rear combination light (RH). Measure the resistance at rear combination light (RH) connector F-03.**

- (1) Disconnect rear light (RH) connector F-03 and measure the resistance available at the wiring harness side of the connector.



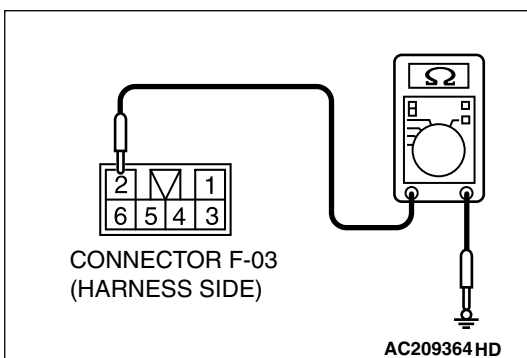
- (2) Measure the resistance value between terminal 2 and ground.

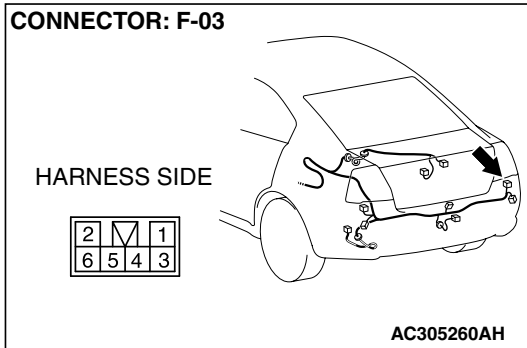
- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 17.

**NO :** Go to Step 16.



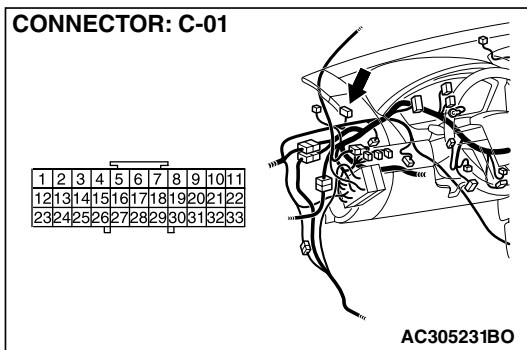


**STEP 16. Check the wiring harness between rear combination light (RH) connector F-03 (terminal 2) and ground.**

**Q: Is the wiring harness between rear combination light (RH) connector F-03 (terminal 2) and ground in good condition?**

**YES :** Replace the rear combination light socket (RH). Verify that the taillight (RH) illuminates normally.

**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. Verify that the taillight (RH) illuminates normally.



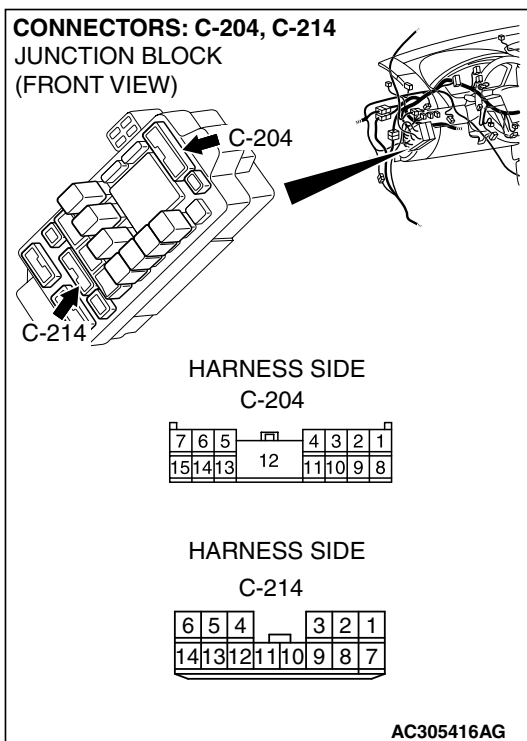
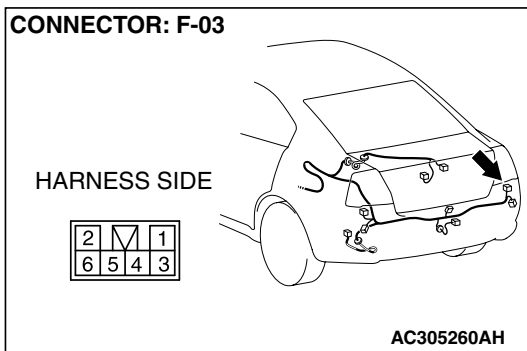
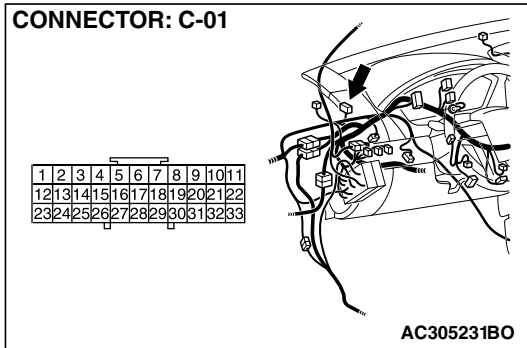
**STEP 17. Check joint connector C-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is joint connector C-01 in good condition?**

**YES :** Go to Step 18.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the taillight (RH) illuminates normally.

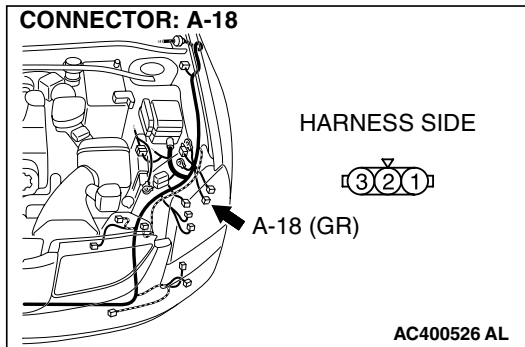
**STEP 18. Check the wiring harness between rear combination light (RH) connector F-03 (terminal 4) and joint connector C-01 (terminal 22).**



*NOTE: Also check junction block connectors C-214 and C-204 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-214 or C-204 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 rear combination light (RH) connector F-03 (terminal 4) and joint connector C-01 (terminal 22) in good condition?**

- YES :** Replace the rear combination light socket (RH). Verify that the taillight (RH) illuminates normally.
- 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. Verify that the taillight (RH) illuminates normally.



**STEP 19. Check front combination light (LH) connector A-18 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front combination light (LH) connector A-18 in good condition?**

**YES :** Go to Step 20.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the front parking light (LH) illuminates normally.

**STEP 20. Check the front parking light bulb (LH).**

- (1) Remove the front parking light bulb (LH).
- (2) Verify that the front parking light bulb (LH) is not damaged or burned out.

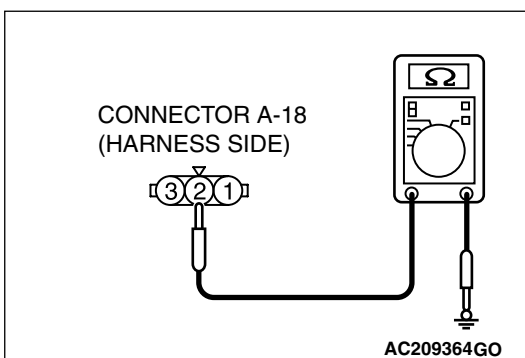
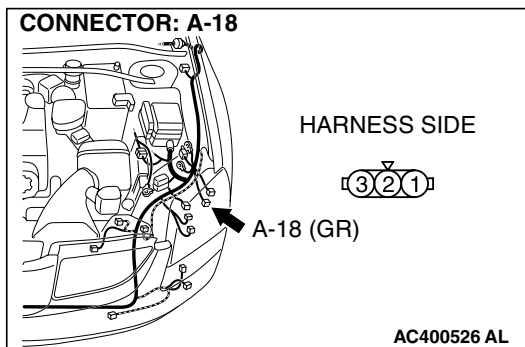
**Q: Is the front parking light bulb (LH) in good condition?**

**YES :** Go to Step 21.

**NO :** Replace the front parking light bulb (LH). Verify that the front parking light (LH) illuminates normally.

**STEP 21. Check the ground circuit to the front parking light (LH). Measure the resistance at front combination light (LH) connector A-18.**

- (1) Disconnect front combination light (LH) connector A-18 and measure the resistance available at the wiring harness side of the connector.



- (2) Measure the resistance value between terminal 2 and ground.

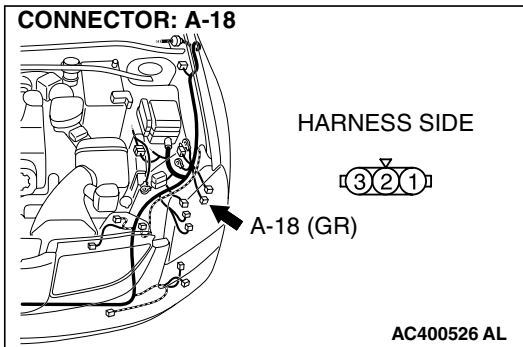
- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 23.

**NO :** Go to Step 22.



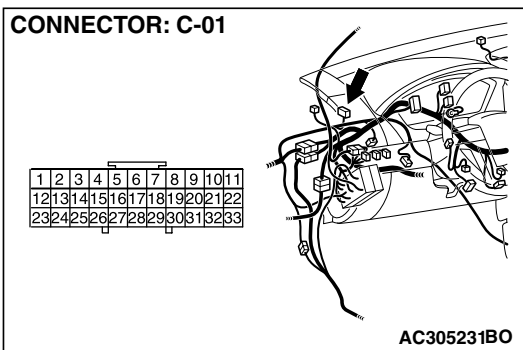


**STEP 22. Check the wiring harness between front combination light (LH) connector A-18 (terminal 2) and ground.**

**Q: Is the wiring harness between front combination light (LH) connector A-18 (terminal 2) and ground in good condition?**

**YES :** Replace the front combination light socket (LH). Verify that the front parking light (LH) illuminates normally.

**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. Verify that the front parking light (LH) illuminates normally.

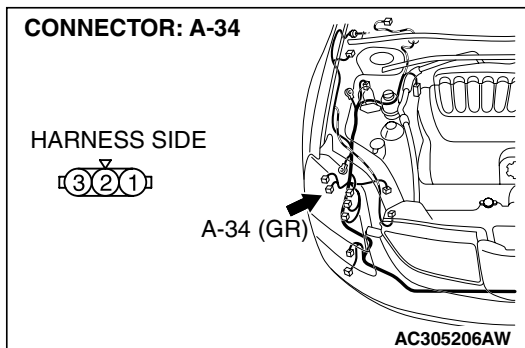
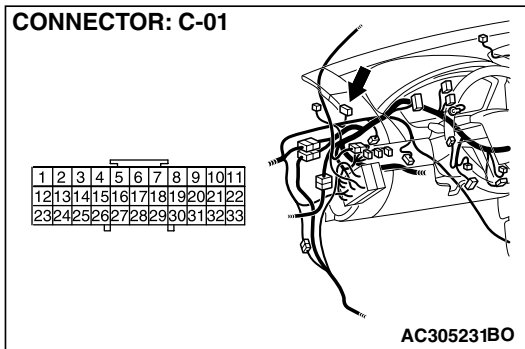
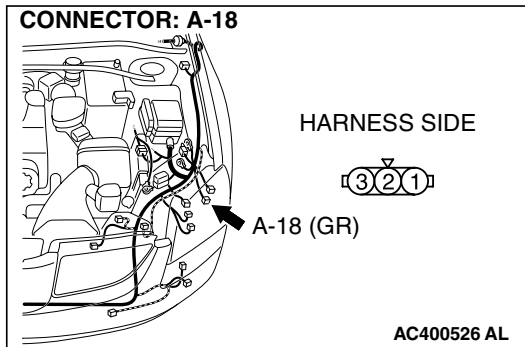


**STEP 23. Check joint connector C-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is joint connector C-01 in good condition?**

**YES :** Go to Step 24.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the front parking light (LH) illuminates normally.



**STEP 24. Check the wiring harness between front combination light (LH) connector A-18 (terminal 3) and joint connector C-01 (terminal 15).**

**Q: Is the wiring harness between front combination light (LH) connector A-18 (terminal 3) and joint connector C-01 (terminal 15) 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. Verify that the front parking light (LH) illuminates normally.

**STEP 25. Check front combination light (RH) connector A-34 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front combination light (RH) connector A-34 in good condition?**

**YES :** Go to Step 26.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the front parking light (RH) illuminates normally.

**STEP 26. Check the front parking light bulb (RH).**

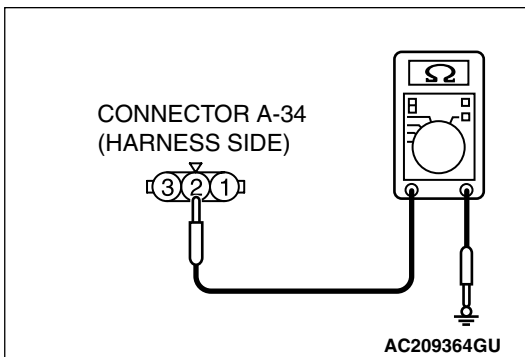
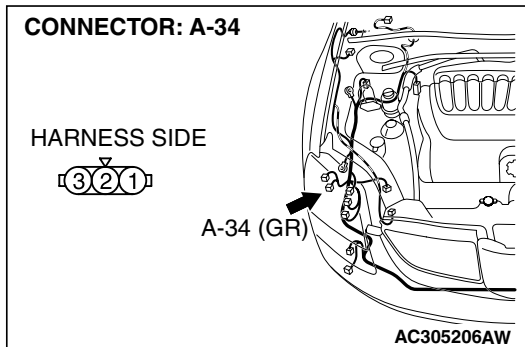
(1) Remove the front parking light bulb (RH).

(2) Verify that the front parking light bulb (RH) is not damaged or burned out.

**Q: Is the front parking light bulb (RH) in good condition?**

**YES :** Go to Step 27.

**NO :** Replace the front side marker light bulb (RH). Verify that the front parking light (RH) illuminates normally.



**STEP 27. Check the ground circuit to the front parking light (RH). Measure the resistance at front combination light (RH) connector A-34.**

(1) Disconnect front combination light (RH) connector A-34, and measure the resistance available at the harness side of the connector.

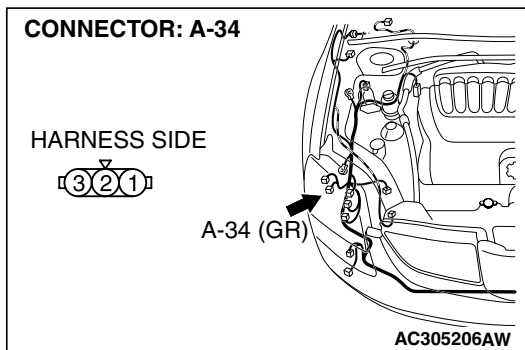
(2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 29.

**NO :** Go to Step 28.

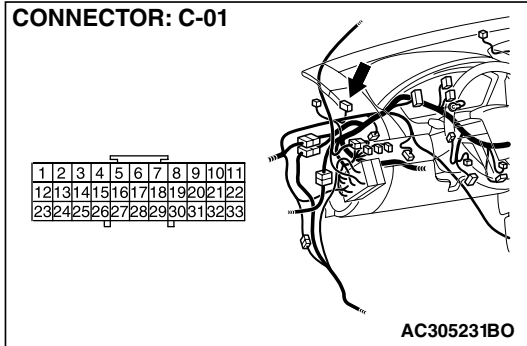


**STEP 28. Check the wiring harness between front combination light (RH) connector A-34 (terminal 2) and ground.**

**Q: Is the wiring harness between front combination light (RH) connector A-34 (terminal 2) and ground in good condition?**

**YES :** Replace the front combination light socket (RH). Verify that the front parking light (RH) illuminates normally.

**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. Verify that the front parking light (RH) illuminates normally.

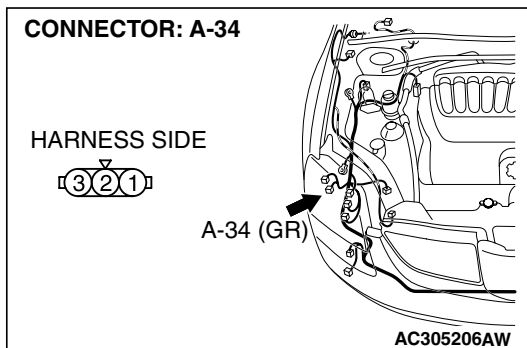


**STEP 29. Check joint connector C-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is joint connector C-01 in good condition?**

**YES :** Go to Step 30.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the front parking light (RH) illuminates normally.

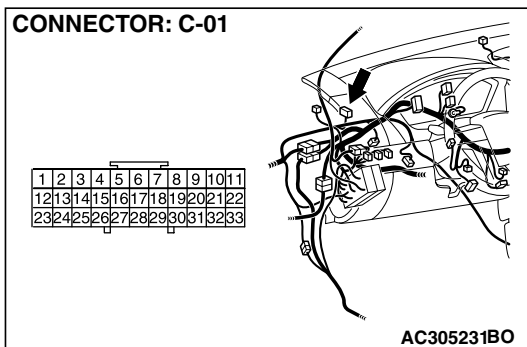


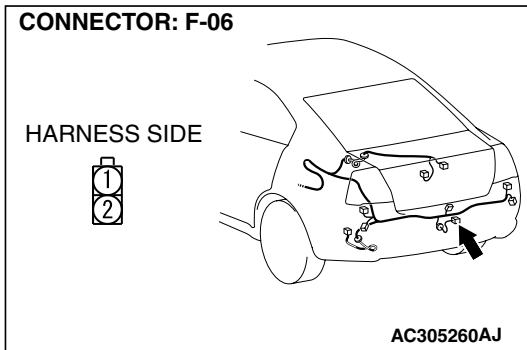
**STEP 30. Check the wiring harness between front combination light (RH) connector A-34 (terminal 3) and joint connector C-01 (terminal 19).**

**Q: Is the wiring harness between front combination light (RH) connector A-34 (terminal 3) and joint connector C-01 (terminal 19) 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. Verify that the front parking light (RH) illuminates normally.





**STEP 31. Check license plate light connector F-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is license plate light connector F-06 in good condition?**

**YES :** Go to Step 32.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the license plate light illuminate normally.

**STEP 32. Check the license plate light bulb.**

- (1) Remove the license plate light bulb.
- (2) Verify that the license plate light bulb is not damaged or burned out.

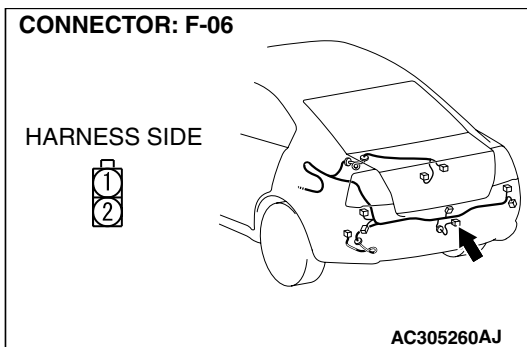
**Q: Is the license plate light bulb in good condition?**

**YES :** Go to Step 33.

**NO :** Replace the license plate light bulb. Verify that the license plate light illuminate normally.

**STEP 33. Check the ground circuit to the license plate light. Measure the resistance at license plate light connector F-06.**

- (1) Disconnect license plate light connector F-06 and measure the resistance available at the wiring harness side of the connector.



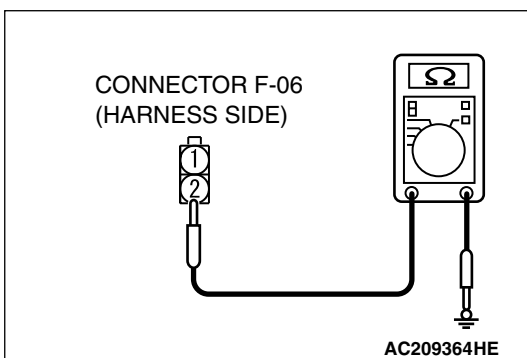
- (2) Measure the resistance value between terminal 2 and ground.

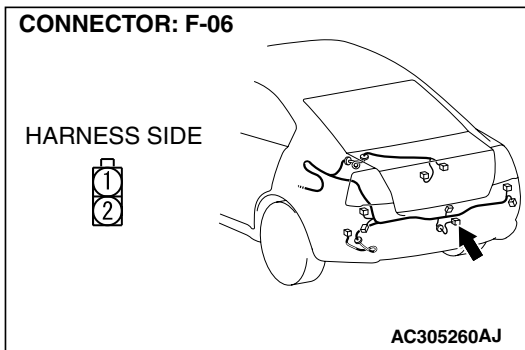
- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 35.

**NO :** Go to Step 34.

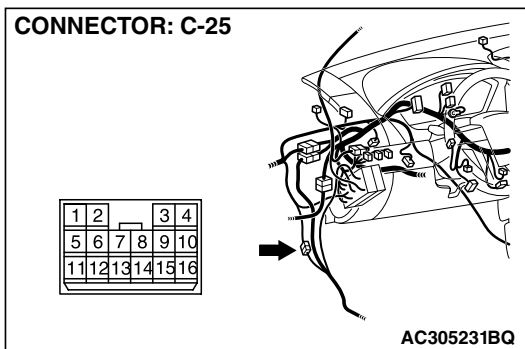




**STEP 34. Check the wiring harness between license plate light connector F-06 (terminal 2) and ground.**

**Q: Is the wiring harness between license plate light connector F-06 (terminal 2) and ground in good condition?**

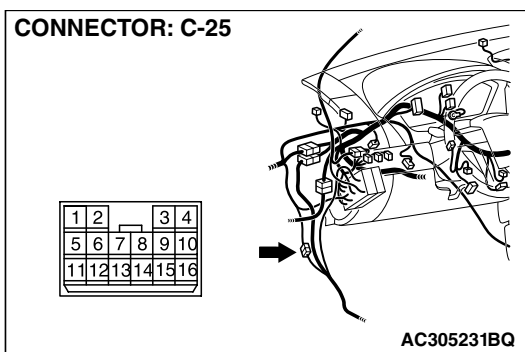
- YES :** Replace the license plate light socket. Verify that the license plate light illuminate normally.
- NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the license plate light illuminate normally.



**STEP 35. Check intermediate connector C-25 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is intermediate connector C-25 in good condition?**

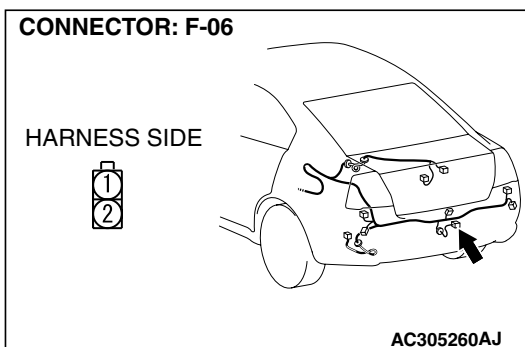
- YES :** Go to Step 36.
- NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the license plate light illuminate normally.

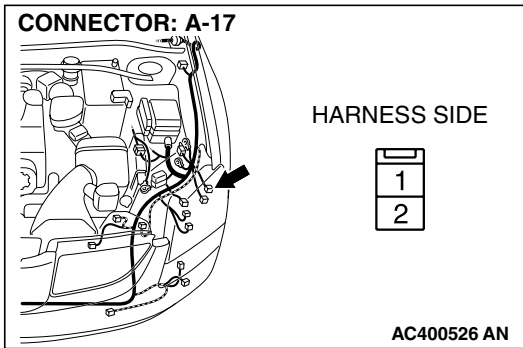


**STEP 36. Check the wiring harness between license plate light connector F-06 (terminal 1) and intermediate connector C-25 (terminal 10).**

**Q: Is the wiring harness between license plate light connector F-06 (terminal 1) and intermediate connector C-25 (terminal 10) in good condition?**

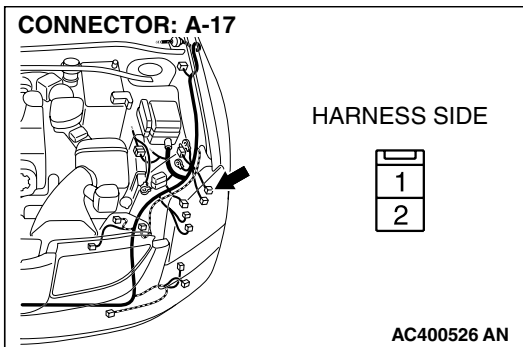
- YES :** Replace the license plate light socket. Verify that the license plate light illuminate normally.
- NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the license plate light illuminate normally.





**STEP 37. Check the wiring harness between front side marker light (LH) connector A-17 (terminal 2) and ground.**  
**Q: Is the wiring harness between front side marker light (LH) connector A-17 (terminal 2) and ground in good condition?**

- YES :** Replace the side marker light socket. Verify that the side marker light illuminate normally.
- 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. Verify that the side marker light illuminate normally.



**STEP 38. Check front side marker light (LH) connector A-17 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front side marker light (LH) connector A-17 in good condition?**

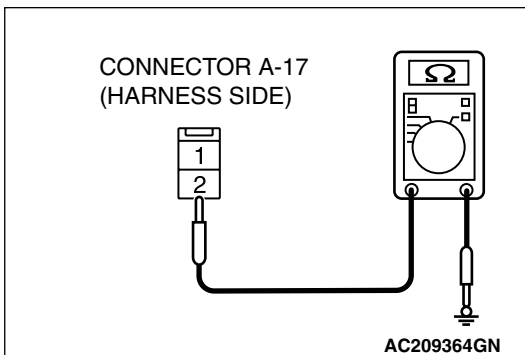
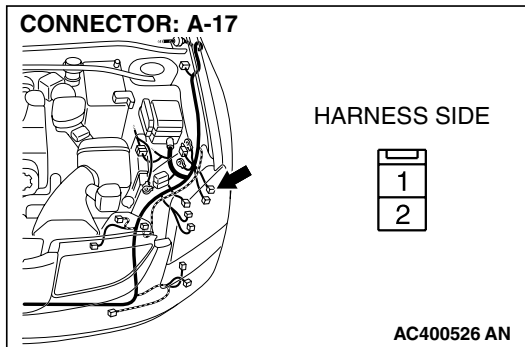
- YES :** Go to Step 39.
- NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the front side marker light (LH) illuminates normally.

**STEP 39. Check the front side marker light bulb (LH).**

- (1) Remove the front side marker light bulb (LH).
- (2) Verify that the front side marker light bulb (LH) is not damaged or burned out.

**Q: Is the front side marker light bulb (LH) in good condition?**

- YES :** Go to Step 40.
- NO :** Replace the front side marker light bulb (LH). Verify that the front side marker light (LH) illuminates normally.



**STEP 40. Check the ground circuit to the front side marker light (LH). Measure the resistance at front side marker light (LH) connector A-17.**

(1) Disconnect front side marker light (LH) connector A-17 and measure the resistance available at the wiring harness side of the connector.

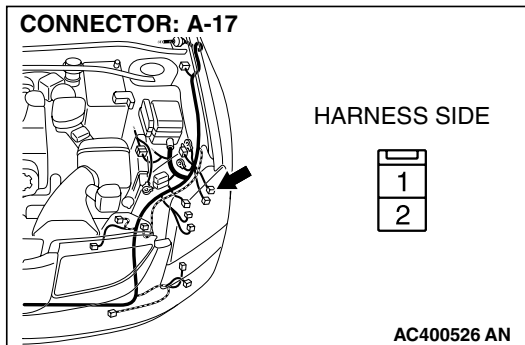
(2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 42.

**NO :** Go to Step 41.



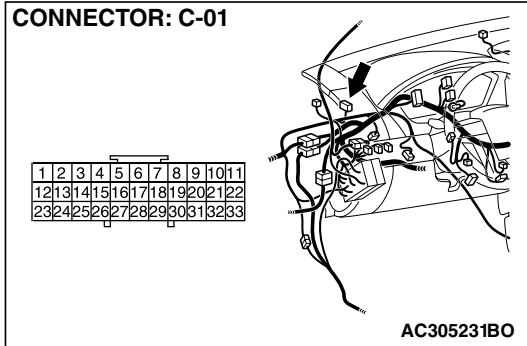
**STEP 41. Check the wiring harness between front side marker light (LH) connector A-17 (terminal 2) and ground.**

**Q: Is the wiring harness between front side marker light (LH) connector A-17 (terminal 2) and ground in good condition?**

**YES :** Replace the front combination light socket (LH). Verify that the front side marker light (LH) illuminates normally.

**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. Verify that the front side marker light (LH) illuminates normally.



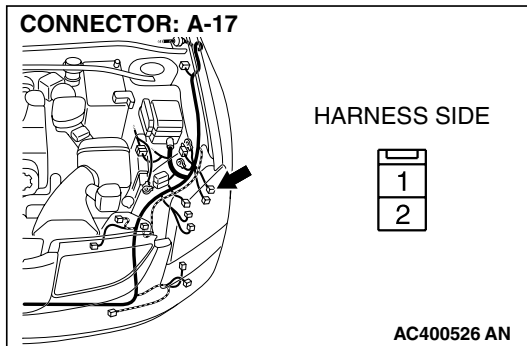


**STEP 42. Check joint connector C-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is joint connector C-01 in good condition?**

**YES :** Go to Step 43.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the front side marker light (LH) illuminates normally.

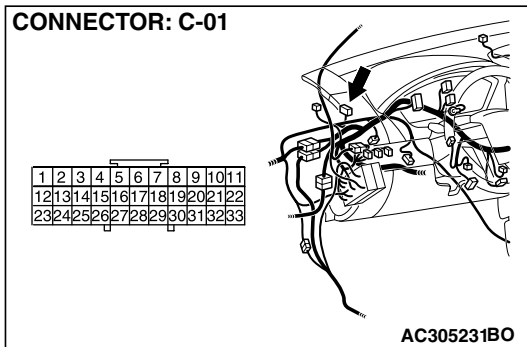


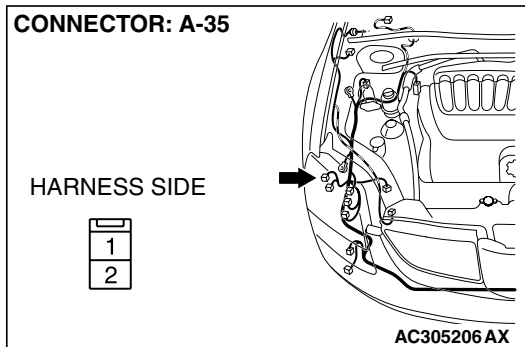
**STEP 43. Check the wiring harness between front side marker light (LH) connector A-17 (terminal 1) and joint connector C-01 (terminal 3).**

**Q: Is the wiring harness between front side marker light (LH) connector A-17 (terminal 1) and joint connector C-01 (terminal 3) 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. Verify that the front side marker light (LH) illuminates normally.





**STEP 44. Check front side marker light (RH) connector A-35 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front side marker light (RH) connector A-35 in good condition?**

**YES :** Go to Step 45.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the front side marker light (RH) illuminates normally.

**STEP 45. Check the front side marker light bulb (RH).**

- (1) Remove the front side marker light bulb (RH).
- (2) Verify that the front side marker light bulb (RH) is not damaged or burned out.

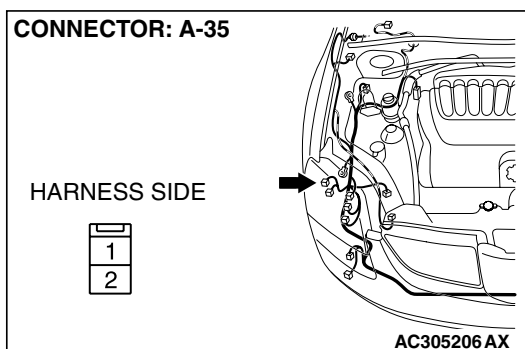
**Q: Is the front side marker light bulb (RH) in good condition?**

**YES :** Go to Step 46.

**NO :** Replace the front side marker light bulb (LH). Verify that the front side marker light (LH) illuminates normally.

**STEP 46. Check the ground circuit to the front side marker light (RH). Measure the resistance at front side marker light (RH) connector A-35.**

- (1) Disconnect front side marker light (RH) connector A-35 and measure the resistance available at the wiring harness side of the connector.



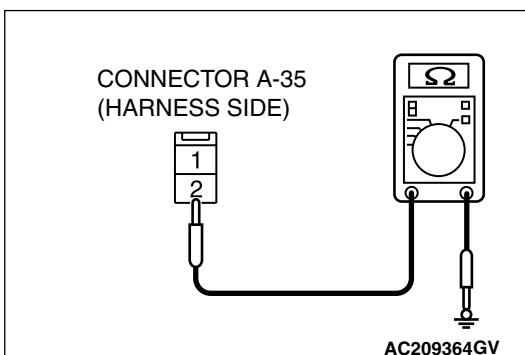
- (2) Measure the resistance value between terminal 2 and ground.

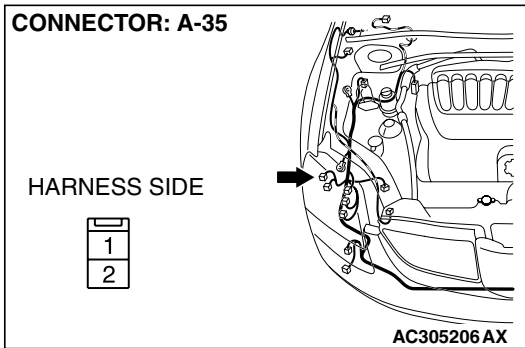
- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 48.

**NO :** Go to Step 47.



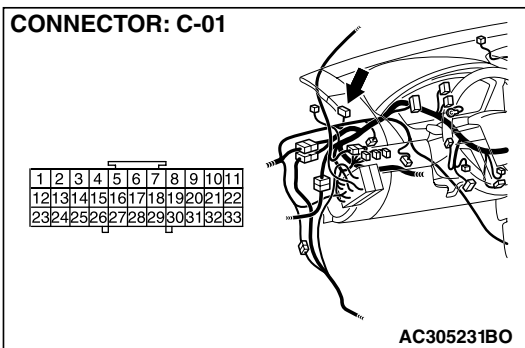


**STEP 47. Check the wiring harness between front side marker light (RH) connector A-35 (terminal 2) and ground.**

**Q: Is the wiring harness between front side marker light (RH) connector A-35 (terminal 2) and ground in good condition?**

**YES :** Replace the front combination light socket (RH).  
Verify that the front side marker light (RH) illuminates normally.

**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. Verify that the front side marker light (RH) illuminates normally.



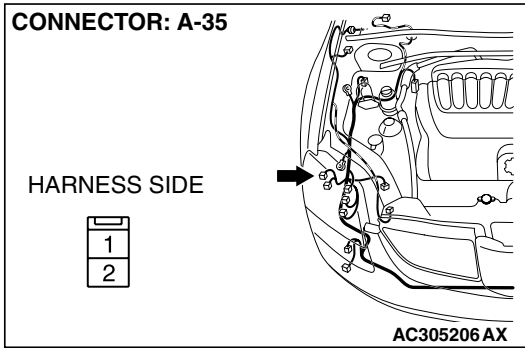
**STEP 48. Check joint connector C-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is joint connector C-01 in good condition?**

**YES :** Go to Step 49.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Check that the front side marker light (RH) illuminates normally.

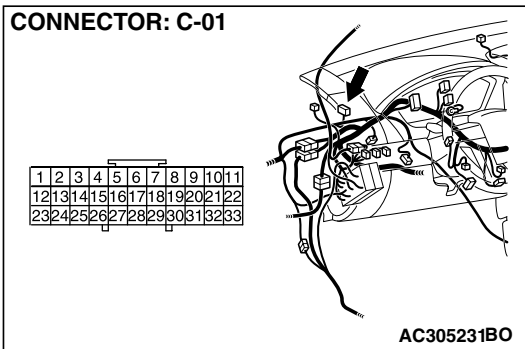


**STEP 49.** Check the wiring harness between front side marker light (RH) connector A-35 (terminal 1) and joint connector C-01 (terminal 3).

**Q:** Is the wiring harness between front side marker light (RH) connector A-35 (terminal 1) and joint connector C-01 (terminal 3) in good condition?

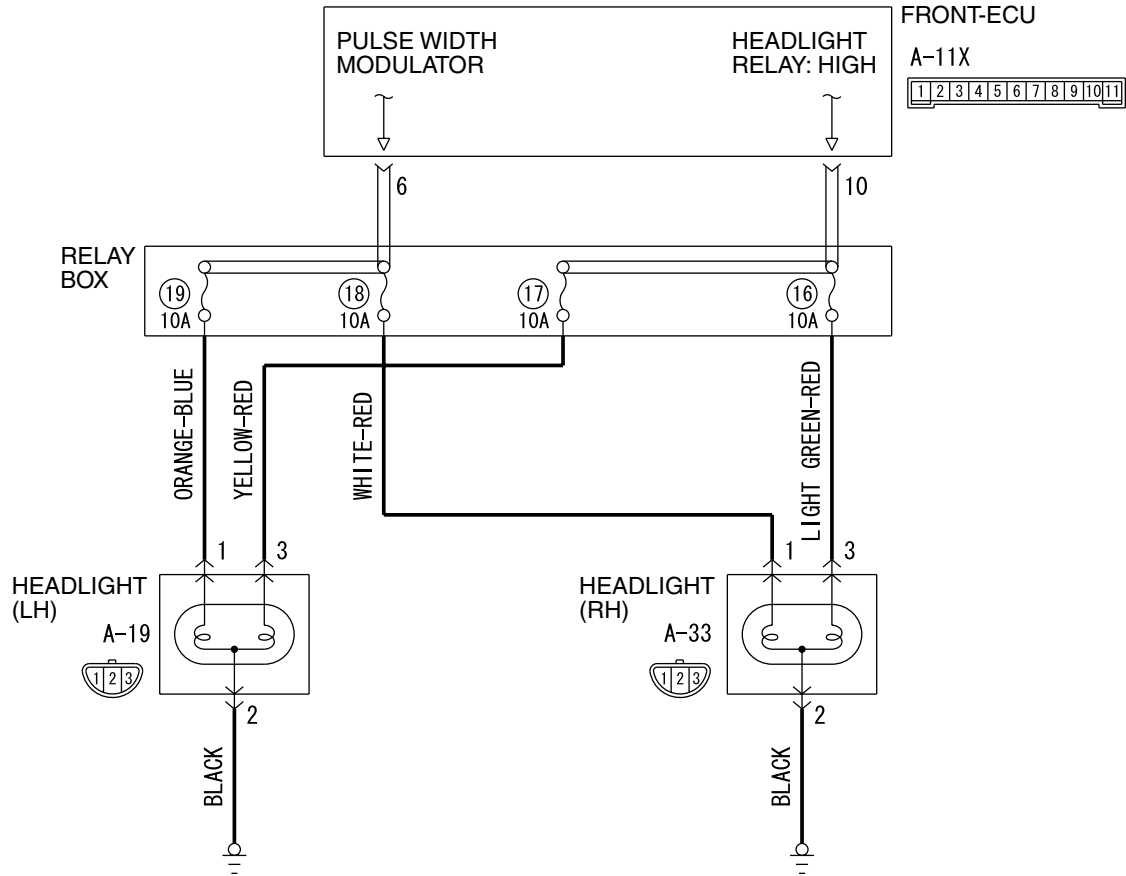
**YES :** No action is necessary and testing is complete.

**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. Verify that the front side marker light (RH) illuminates normally.

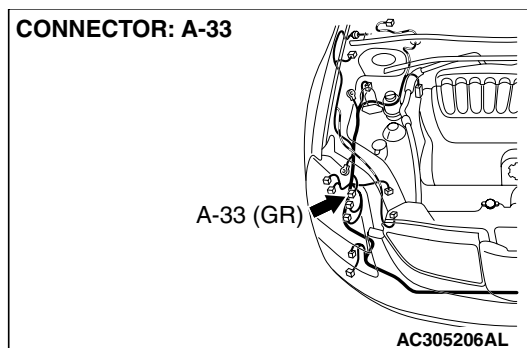
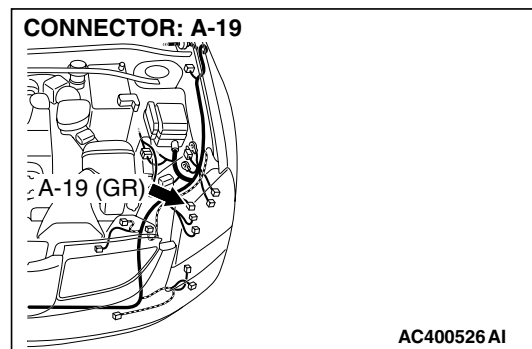
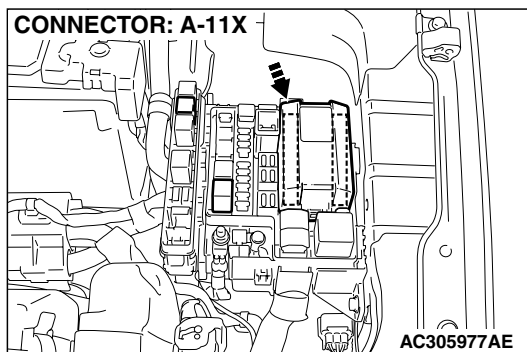


**INSPECTION PROCEDURE H-7: Headlight and Taillight: One of the headlights does not illuminate.  
<2-bulb type>**

**Headlights Circuit <2-bulb type>**



W4P54M68AA



**TECHNICAL DESCRIPTION (COMMENT)**

If one of the headlights does not illuminate, a headlight bulb may be defective.

**TROUBLESHOOTING HINTS**

- The headlight bulb may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

**DIAGNOSIS****Required Special Tool:**

- MB991223: Harness Set

**STEP 1. Check the headlight operation.****Q: Which of the headlights does not illuminate?**

**LH (low and high beam)** : Go to Step 2.

**RH (low and high beam)** : Go to Step 5.

**LH (only low-beam)** : Go to Step 8.

**RH (only low-beam)** : Go to Step 11.

**LH (only high beam)** : Go to Step 14.

**RH (only high beam)** : Go to Step 17.

**Low beam only (both RH and LH)** : Refer to Inspection Procedure H-2 "The headlights (low-beam) do not illuminate normally [P.54B-302](#)."

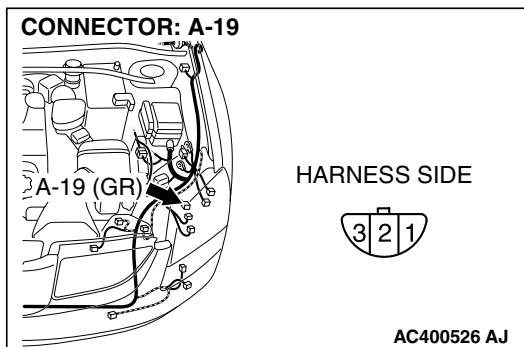
**High beam only (both RH and LH)** : Refer to Inspection Procedure H-3 "The headlights (high-beam) do not illuminate normally [P.54B-307](#)."

**High beam indicator light** : Refer to Inspection Procedure H-8 "The high-beam indicator light does not illuminate [P.54B-358](#)."

**STEP 2. Check headlight (LH) connector A-19 for loose, corroded or damaged terminals, or terminals pushed back in the connector.****Q: Is headlight (LH) connector A-19 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 headlights illuminate normally.

**STEP 3. Check headlight (LH) bulb.**

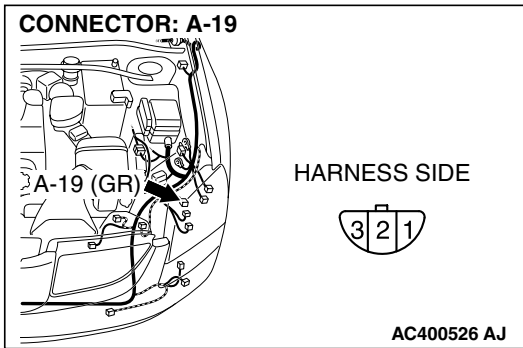
(1) Remove the headlight (LH) bulb.

(2) Verify that the headlight (LH) bulb is not damaged or burned out.

**Q: Is headlight (LH) bulb normal?**

**YES** : Go to Step 4.

**NO** : Replace the headlight (LH) bulb. Verify that the headlights illuminate normally.

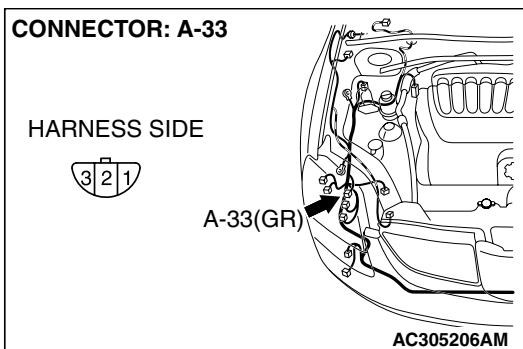


**STEP 4. Check the wiring harness between headlight (LH) connector A-19 (terminal 2) and ground.**

**Q: Is the wiring harness between headlight (LH) connector A-19 (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. Verify that the headlights illuminate normally.



**STEP 5. Check headlight (RH) connector A-33 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is headlight (RH) connector A-33 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 headlights illuminate normally.

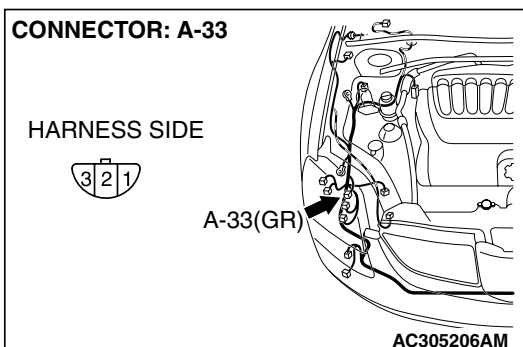
**STEP 6. Check the headlight (RH) bulb.**

- (1) Remove the headlight (RH) bulb.
- (2) Verify that the headlight (RH) bulb is not damaged or burned out.

**Q: Is headlight (RH) bulb normal?**

**YES :** Go to Step 7.

**NO :** Replace the headlight (RH) bulb. Verify that the headlights illuminate normally.

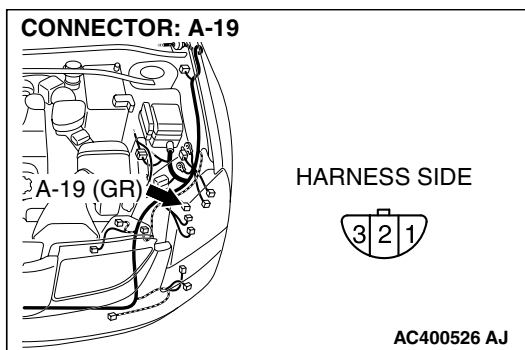
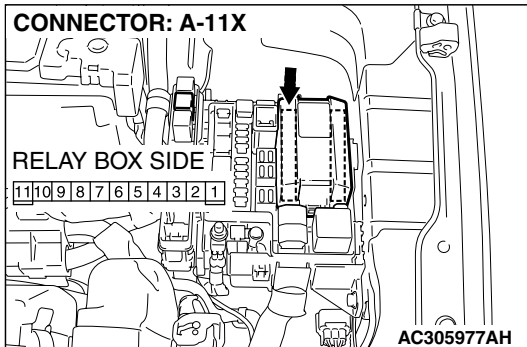


**STEP 7. Check the wiring harness between headlight (RH) connector A-33 (terminal 2) and ground.**

**Q: Is the wiring harness between headlight (RH) connector A-33 (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. Verify that the headlights illuminate normally.



**STEP 8. Check headlight (LH) connector A-19 and front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are headlight (LH) connector A-19 and front-ECU connector A-11X in good condition?**

**YES :** Go to Step 9.

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

**STEP 9. Check headlight (LH) bulb.**

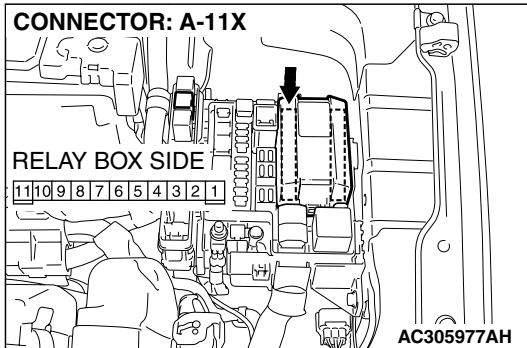
- (1) Remove the headlight (LH) bulb.
- (2) Verify that the headlight (LH) bulb is not damaged or burned out.

**Q: Is headlight (LH) bulb normal?**

**YES :** Go to Step 10.

**NO :** Replace the headlight (LH) bulb. Verify that the headlights illuminate normally.



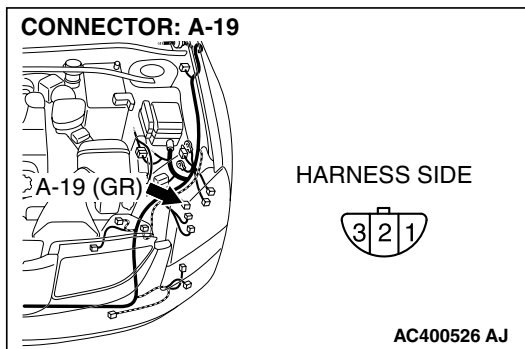


**STEP 10.** Check the wiring harness between headlight (LH) connector A-19 (terminal 1) and front-ECU connector A-11X (terminal 6).

**Q:** Is the wiring harness between headlight (LH) connector A-19 (terminal 1) and front-ECU connector A-11X (terminal 6) 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. Verify that the headlights illuminate normally.

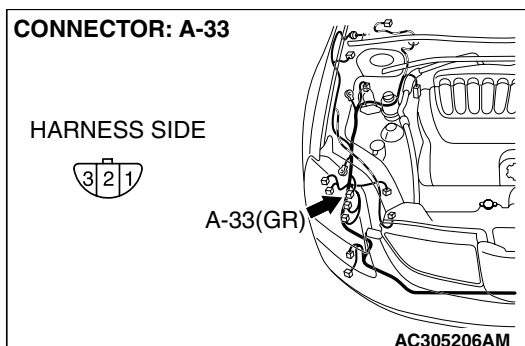
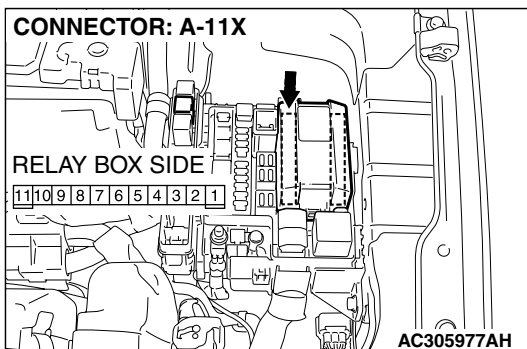


**STEP 11.** Check headlight (RH) connector A-33 and front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**Q:** Are headlight (RH) connector A-33 and front-ECU connector A-11X in good condition?

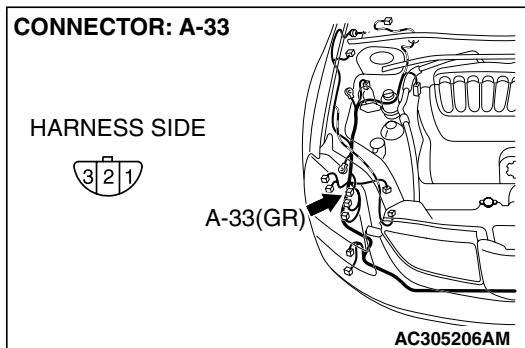
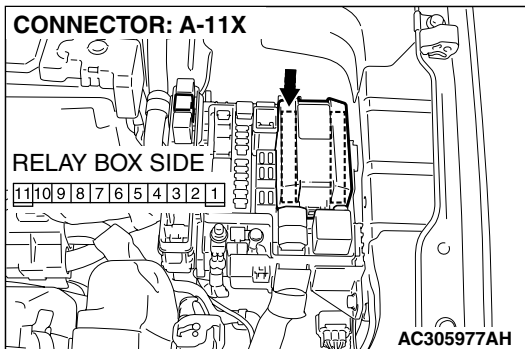
**YES :** Go to Step 12.

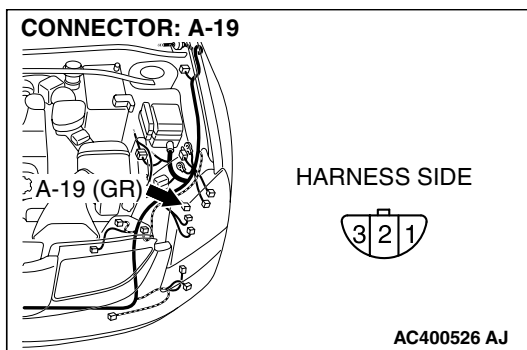
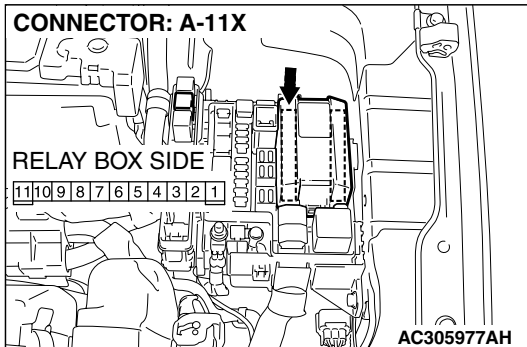
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the headlights illuminate normally.



**STEP 12. Check the headlight (RH) bulb.**

- (1) Remove the headlight (RH) bulb.
- (2) Verify that the headlight (RH) bulb is not damaged or burned out.

**Q: Is headlight (RH) bulb normal?****YES** : Go to Step 13.**NO** : Replace the headlight (RH) bulb. Verify that the headlights illuminate normally.**STEP 13. Check the wiring harness between headlight (RH) connector A-33 (terminal 1) and front-ECU connector A-11X (terminal 6).****Q: Is the wiring harness between headlight (RH) connector A-33 (terminal 1) and front-ECU connector A-11X (terminal 6) 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. Verify that the headlights illuminate normally.



**STEP 14. Check headlight (LH) connector A-19 and front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are headlight (LH) connector A-19 and front-ECU connector A-11X in good condition?**

**YES :** Go to Step 15.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

**P.00E-2.** Verify that the headlights illuminate normally.

**STEP 15. Check headlight (LH) bulb.**

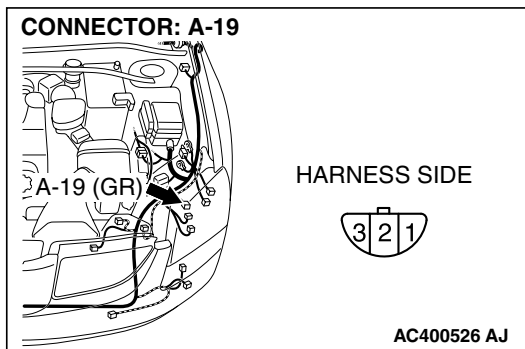
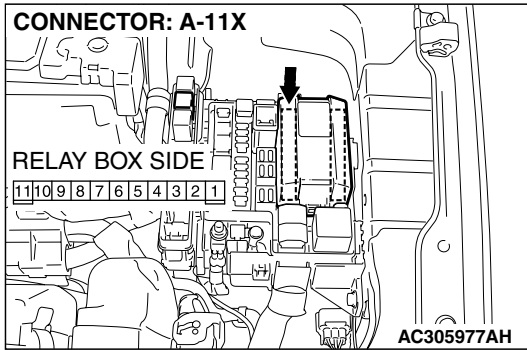
(1) Remove the headlight (LH) bulb.

(2) Verify that the headlight (LH) bulb is not damaged or burned out.

**Q: Is headlight (LH) bulb normal?**

**YES :** Go to Step 16.

**NO :** Replace the headlight (LH) bulb. Verify that the headlights illuminate normally.

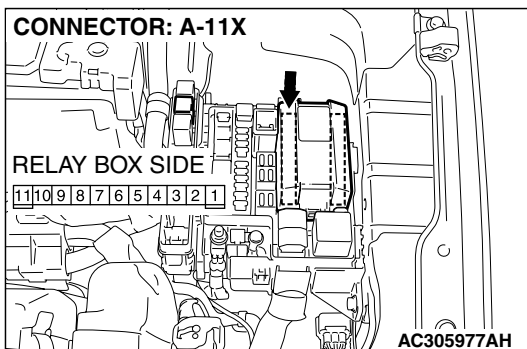


**STEP 16.** Check the wiring harness between headlight (LH) connector A-19 (terminal 3) and front-ECU connector A-11X (terminal 10).

**Q:** Is the wiring harness between headlight (LH) connector A-19 (terminal 3) and front-ECU connector A-11X (terminal 10) 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. Verify that the headlights illuminate normally.

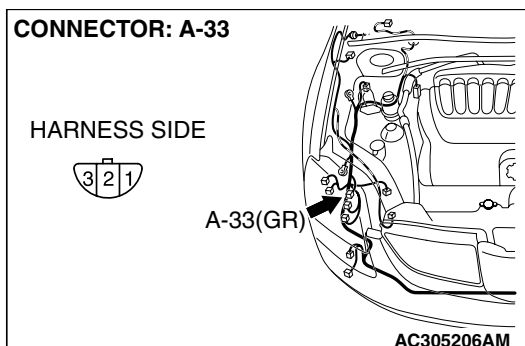


**STEP 17.** Check headlight (RH) connector A-33 and front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**Q:** Are headlight (RH) connector A-33 and front-ECU connector A-11X in good condition?

**YES :** Go to Step 18.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the headlights illuminate normally.



**STEP 18. Check the headlight (RH) bulb.**

- (1) Remove the headlight (RH) bulb.
- (2) Verify that the headlight (RH) bulb is not damaged or burned out.

**Q: Is headlight (RH) bulb normal?**

**YES** : Go to Step 19.

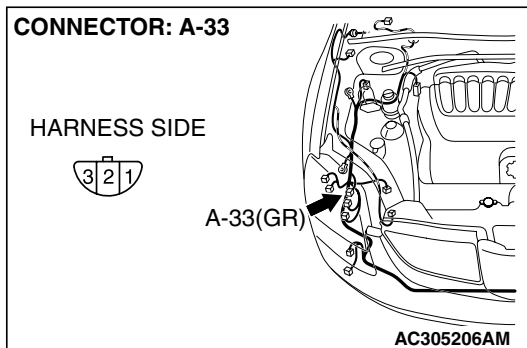
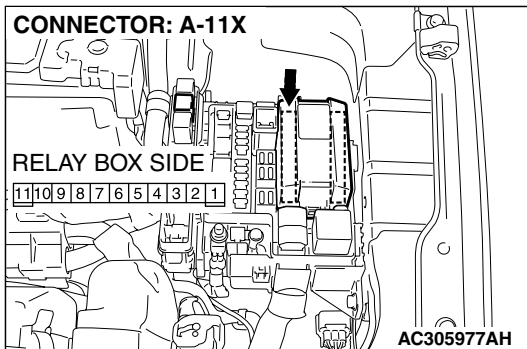
**NO** : Replace the headlight (RH) bulb. Verify that the headlights illuminate normally.

**STEP 19. Check the wiring harness between headlight (RH) connector A-33 (terminal 3) and front-ECU connector A-11X (terminal 10).**

**Q: Is the wiring harness between headlight (RH) connector A-33 (terminal 3) and front-ECU connector A-11X (terminal 10) in good condition?**

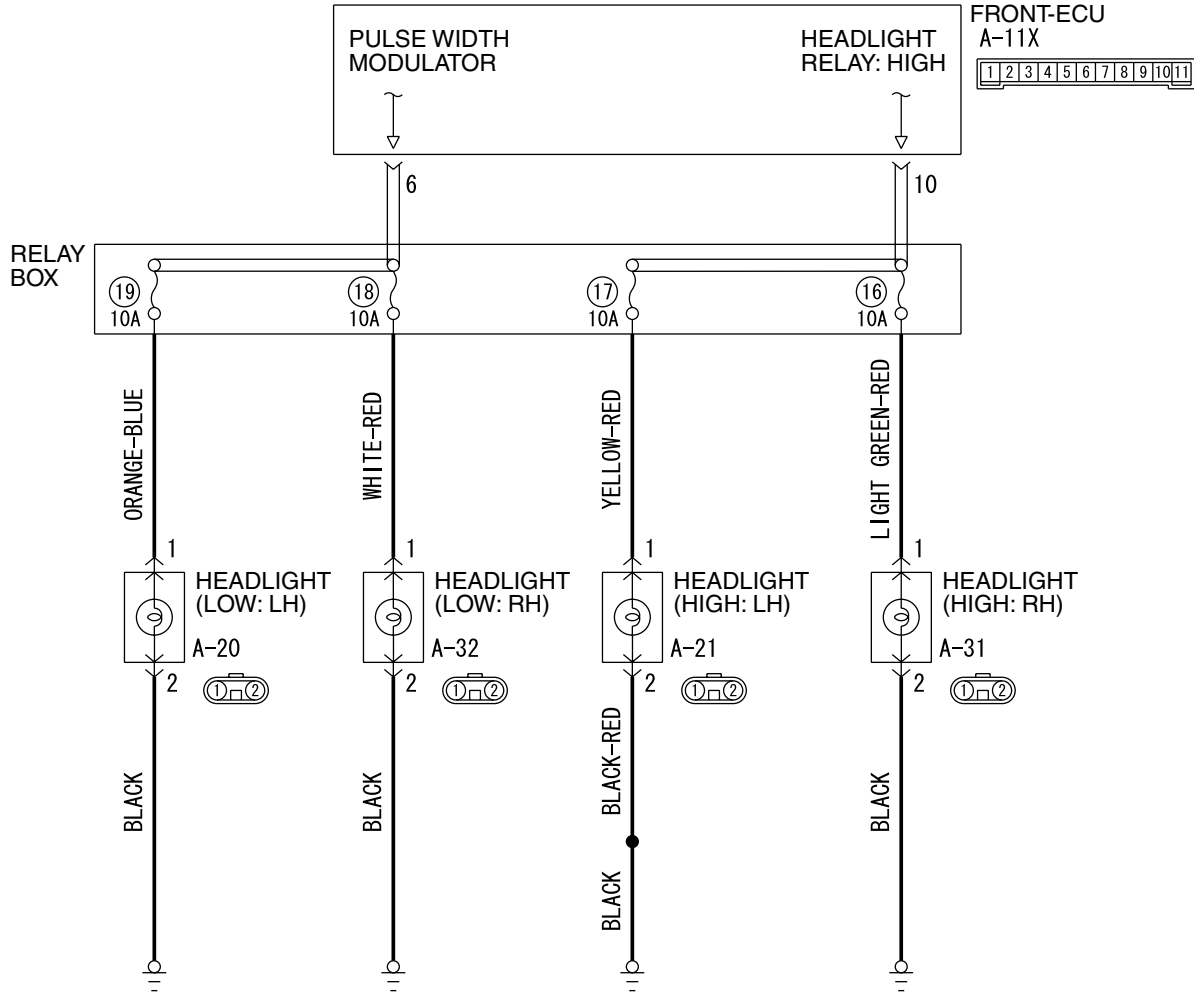
**YES** : No action is necessary and testing is complete.

**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. Verify that the headlights illuminate normally.

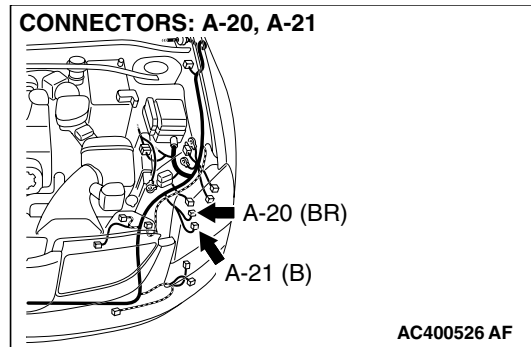
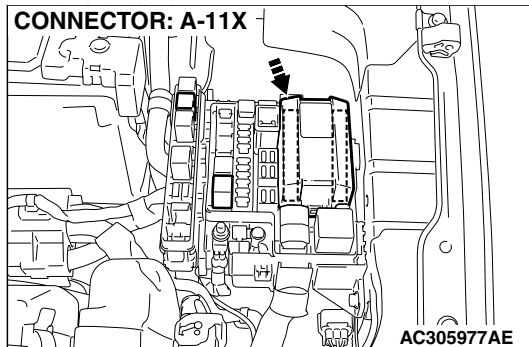


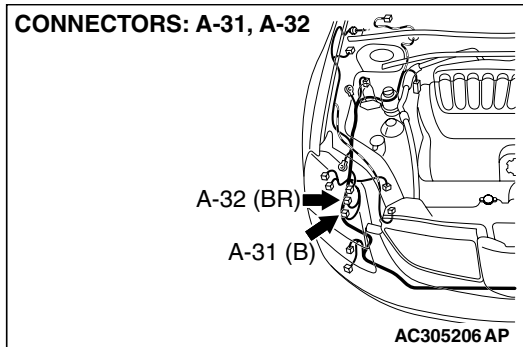
**INSPECTION PROCEDURE H-7: Headlight and Taillight: One of the headlights does not illuminate.  
<4-bulb type>**

Headlights Circuit <4-bulb type>



W4P54M69AA





### TECHNICAL DESCRIPTION (COMMENT)

If one of the headlights does not illuminate, a headlight bulb may be defective.

### TROUBLESHOOTING HINTS

- The headlight bulb may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

### DIAGNOSIS

#### Required Special Tool:

- MB991223: Harness Set

#### STEP 1. Check the headlight operation.

##### Q: Which of the headlights does not illuminate?

**Low (LH) :** Go to Step 2.

**Low (RH) :** Go to Step 8.

**High (LH) :** Go to Step 14.

**High (RH) :** Go to Step 20.

**Low beam only (both RH and LH) :** Refer to Inspection Procedure H-2 "The headlights (low-beam) do not illuminate normally [P.54B-302.](#)"

**High beam only (both RH and LH) :** Refer to Inspection Procedure H-3 "The headlights (high-beam) do not illuminate normally [P.54B-307.](#)"

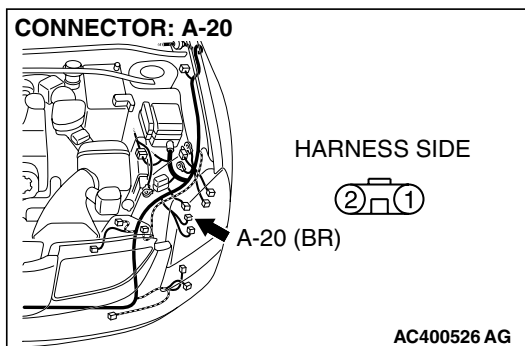
**High beam indicator light :** Refer to Inspection Procedure H-8 "The high-beam indicator light does not illuminate [P.54B-358.](#)"

#### STEP 2. Check headlight (LOW: LH) connector A-20 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

##### Q: Is headlight (LOW: LH) connector A-20 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 headlight (LOW: LH) illuminates normally.

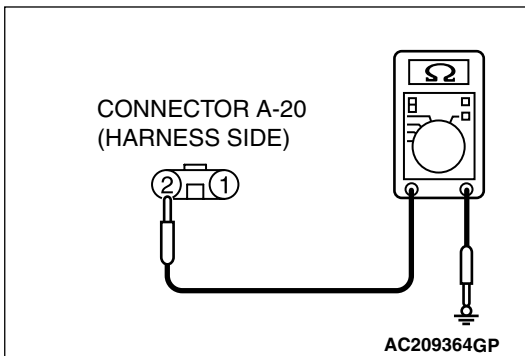
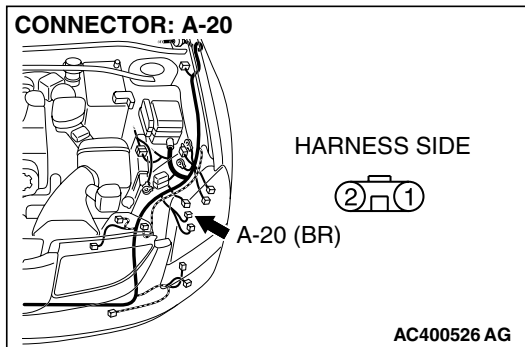


**STEP 3. Check the headlight bulb (LOW: LH).**

- (1) Remove the headlight bulb (LOW: LH).
- (2) Verify that the headlight bulb (LOW: LH) is not damaged or burned out.

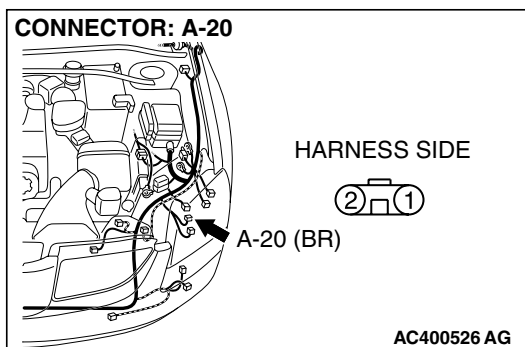
**Q: Is the headlight bulb (LOW: LH) in good condition?****YES** : Go to Step 4.**NO** : Replace the headlight bulb (LOW: LH). Verify that the headlight (LOW: LH) illuminates normally.**STEP 4. Check the ground circuit to the headlight (LOW: LH). Measure the resistance at headlight (LOW: LH) connector A-20.**

- (1) Disconnect headlight (LOW: LH) connector A-20 and measure the resistance available at the wiring harness side of the connector.

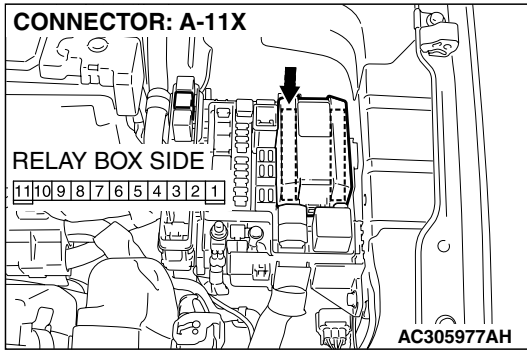


- (2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?****YES** : Go to Step 6.**NO** : Go to Step 5.**STEP 5. Check the wiring harness between headlight (LOW: LH) connector A-20 (terminal 2) and ground.****Q: Is the wiring harness between headlight (LOW: LH) connector A-20 (terminal 2) and ground in good condition?****YES** : Replace the headlight socket (LOW: LH). Verify that the headlight (LOW: LH) illuminates normally.**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. Verify that the headlight (LOW: LH) illuminates normally.



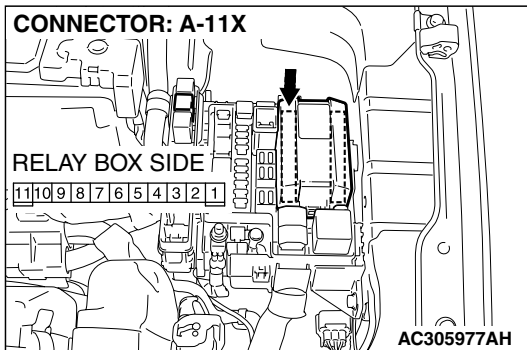


**STEP 6.** Check front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**Q:** Is front-ECU connector A-11X in good condition?

**YES :** Go to Step 7.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the headlight (LOW: LH) illuminates normally.

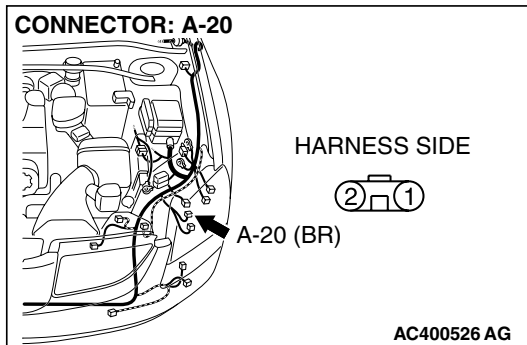


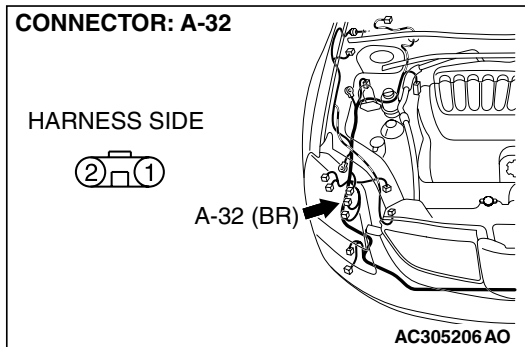
**STEP 7.** Check the wiring harness between headlight (LOW: LH) connector A-20 (terminal 1) and front-ECU connector A-11X (terminal 6).

**Q:** Is the wiring harness between headlight (LOW: LH) connector A-20 (terminal 1) and front-ECU connector A-11X (terminal 6) 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. Verify that the headlight (LOW: LH) illuminates normally.





**STEP 8. Check headlight (LOW: RH) connector A-32 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is headlight (LOW: RH) connector A-32 in good condition?**

**YES :** Go to Step 9.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the headlight (LOW: RH) illuminates normally.

**STEP 9. Check the headlight bulb (LOW: RH).**

- (1) Remove the headlight bulb (LOW: RH).
- (2) Verify that the headlight bulb (LOW: RH) is not damaged or burned out.

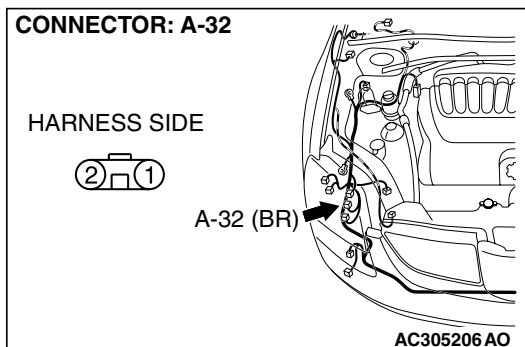
**Q: Is the headlight bulb (LOW: RH) in good condition?**

**YES :** Go to Step 10.

**NO :** Replace the headlight bulb (LOW: RH). Verify that the headlight (LOW: RH) illuminates normally.

**STEP 10. Check the ground circuit to the headlight (LOW: RH). Measure the resistance at headlight (LOW: RH) connector A-32.**

- (1) Disconnect headlight (LOW: RH) connector A-32 and measure the resistance available at the wiring harness side of the connector.



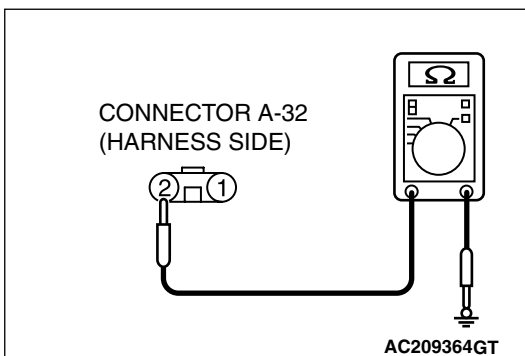
- (2) Measure the resistance value between terminal 2 and ground.

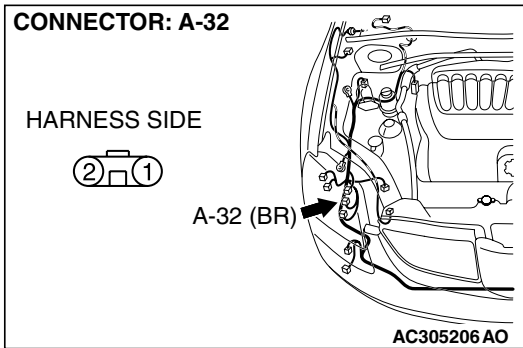
- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 12.

**NO :** Go to Step 11.

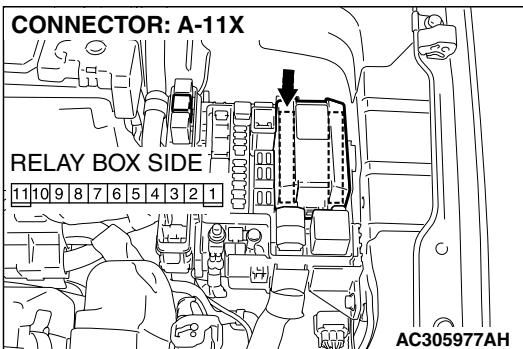




**STEP 11. Check the wiring harness between headlight (LOW: RH) connector A-32 (terminal 2) and ground.**

**Q: Is the wiring harness between headlight (LOW: RH) connector A-32 (terminal 2) and ground in good condition?**

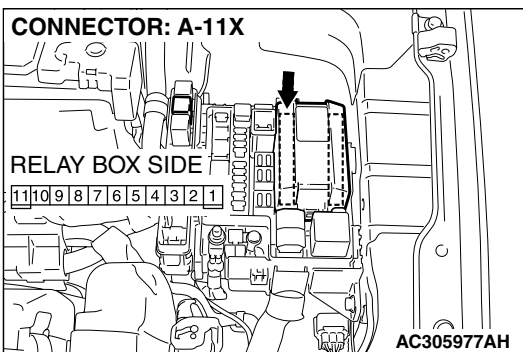
- YES :** Replace the headlight socket (LOW: RH). Verify that the headlight (LOW: RH) illuminates normally.
- NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the headlight (LOW: RH) illuminates normally.



**STEP 12. Check front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-11X in good condition?**

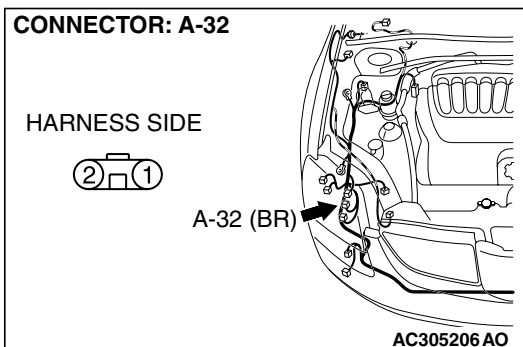
- YES :** Go to Step 13.
- NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the headlight (LOW: RH) illuminates normally.

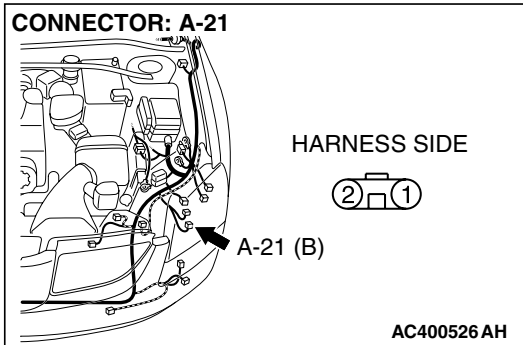


**STEP 13. Check the wiring harness between headlight (LOW: RH) connector A-32 (terminal 1) and front-ECU connector A-11X (terminal 6).**

**Q: Is the wiring harness between headlight (LOW: RH) connector A-32 (terminal 1) and front-ECU connector A-11X (terminal 6) 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. Verify that the headlight (LOW: RH) illuminates normally.





**STEP 14. Check headlight (HIGH: LH) connector A-21 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is headlight (HIGH: LH) connector A-21 in good condition?**

**YES :** Go to Step 15.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the headlight (HIGH: LH) illuminates normally.

**STEP 15. Check the headlight bulb (HIGH: LH).**

- (1) Remove the headlight bulb (HIGH: LH).
- (2) Verify that the headlight bulb (HIGH: LH) is not damaged or burned out.

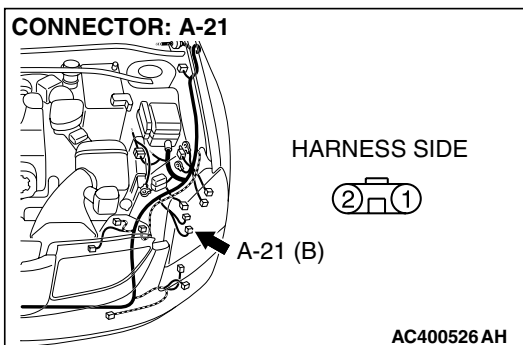
**Q: Is the headlight bulb (HIGH: LH) in good condition?**

**YES :** Go to Step 16.

**NO :** Replace the headlight bulb (HIGH: LH). Verify that the headlight (HIGH: LH) illuminates normally.

**STEP 16. Check the ground circuit to the headlight (HIGH: LH). Measure the resistance at headlight (HIGH: LH) connector A-21.**

- (1) Disconnect headlight (HIGH: LH) connector A-21 and measure the resistance available at the wiring harness side of the connector.



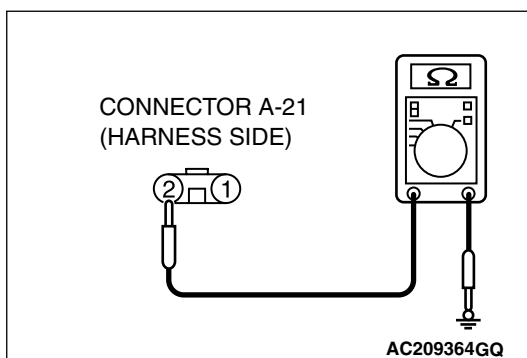
- (2) Measure the resistance value between terminal 2 and ground.

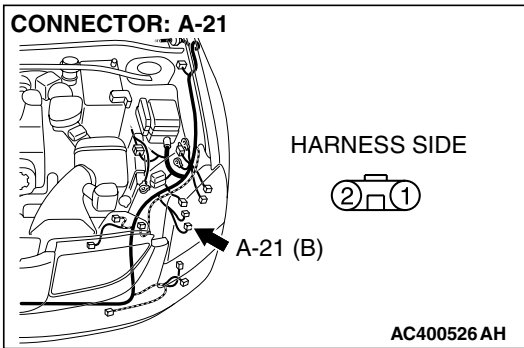
- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 18.

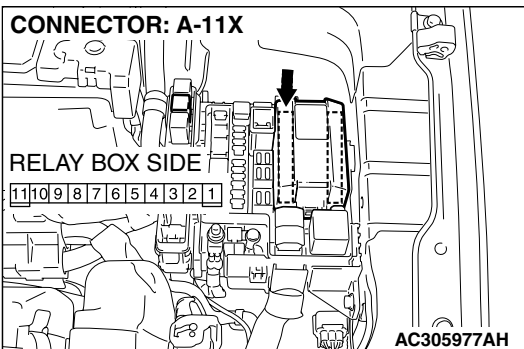
**NO :** Go to Step 17.





**STEP 17. Check the wiring harness between headlight (HIGH: LH) connector A-21 (terminal 2) and ground.**  
**Q: Is the wiring harness between headlight (HIGH: LH) connector A-21 (terminal 2) and ground in good condition?**

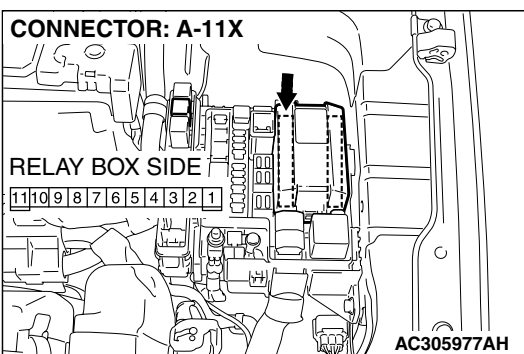
- YES :** Replace the headlight socket (HIGH: LH). Verify that the headlight (HIGH: LH) illuminates normally.
- NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the headlight (HIGH: LH) illuminates normally.



**STEP 18. Check front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-11X in good condition?**

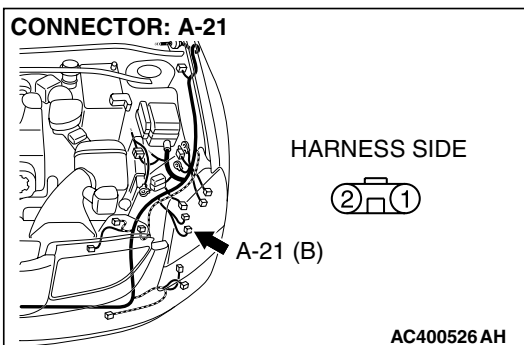
- YES :** Go to Step 19.
- NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the headlight (HIGH: LH) illuminates normally.

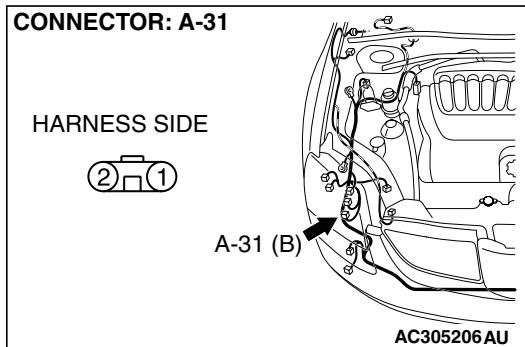


**STEP 19. Check the wiring harness between headlight (HIGH: LH) connector A-21 (terminal 1) and front-ECU connector A-11X (terminal 10).**

**Q: Is the wiring harness between headlight (HIGH: LH) connector A-21 (terminal 1) and front-ECU connector A-11X (terminal 10) 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. Verify that the headlight (HIGH: LH) illuminates normally.





**STEP 20. Check headlight (HIGH: RH) connector A-31 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is headlight (HIGH: RH) connector A-31 in good condition?**

**YES :** Go to Step 21.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the headlight (HIGH: RH) illuminates normally.

**STEP 21. Check the headlight bulb (HIGH: RH).**

- (1) Remove the headlight bulb (HIGH: RH).
- (2) Verify that the headlight bulb (HIGH: RH) is not damaged or burned out.

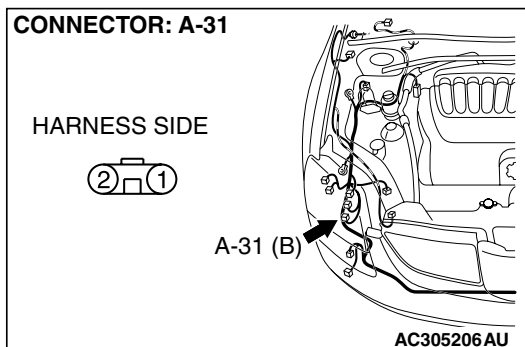
**Q: Is the headlight bulb (HIGH: RH) in good condition?**

**YES :** Go to Step 22.

**NO :** Replace the headlight bulb (HIGH: RH). Verify that the headlight (HIGH: RH) illuminates normally.

**STEP 22. Check the ground circuit to the headlight (HIGH: RH). Measure the resistance at headlight (HIGH: RH) connector A-31.**

- (1) Disconnect headlight (HIGH: RH) connector A-31 and measure the resistance available at the wiring harness side of the connector.



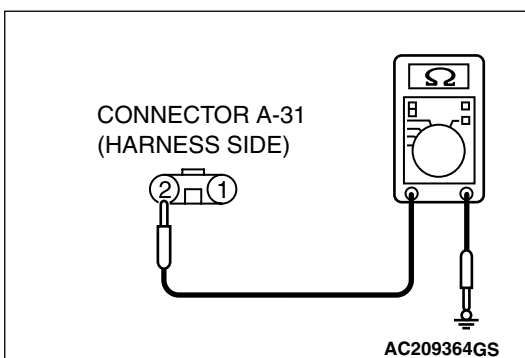
- (2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

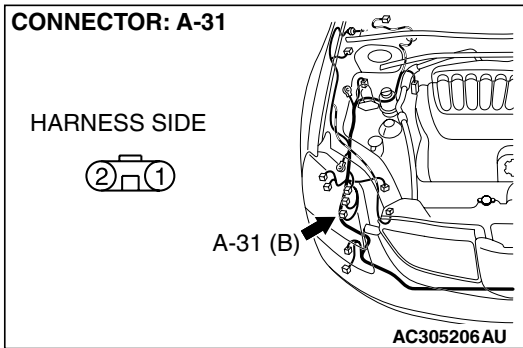
**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 24.

**NO :** Go to Step 23.





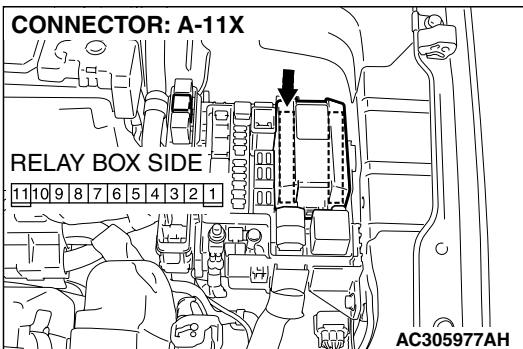


**STEP 23. Check the wiring harness between headlight (HIGH: RH) connector A-31 (terminal 2) and ground.**

**Q: Is the wiring harness between headlight (HIGH: RH) connector A-31 (terminal 2) and ground in good condition?**

**YES :** Replace the headlight socket (HIGH: RH). Verify that the headlight (HIGH: RH) illuminates normally.

**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. Verify that the headlight (HIGH: RH) illuminates normally.

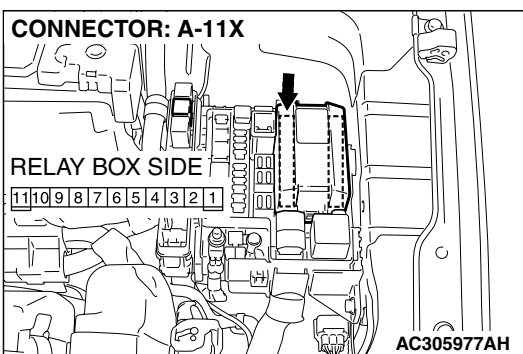


**STEP 24. Check front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-11X in good condition?**

**YES :** Go to Step 25.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the headlight (HIGH: RH) illuminates normally.

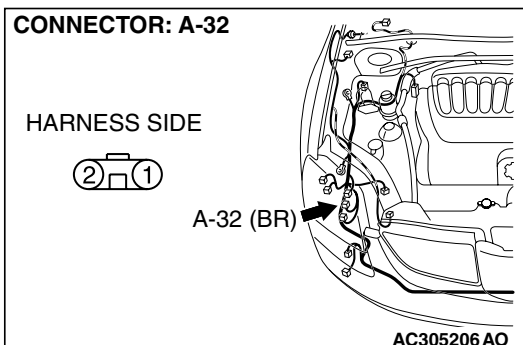


**STEP 25. Check the wiring harness between headlight (LOW: RH) connector A-32 (terminal 1) and front-ECU connector A-11X (terminal 10).**

**Q: Is the wiring harness between headlight (LOW: RH) connector A-32 (terminal 1) and front-ECU connector A-11X (terminal 10) in good condition?**

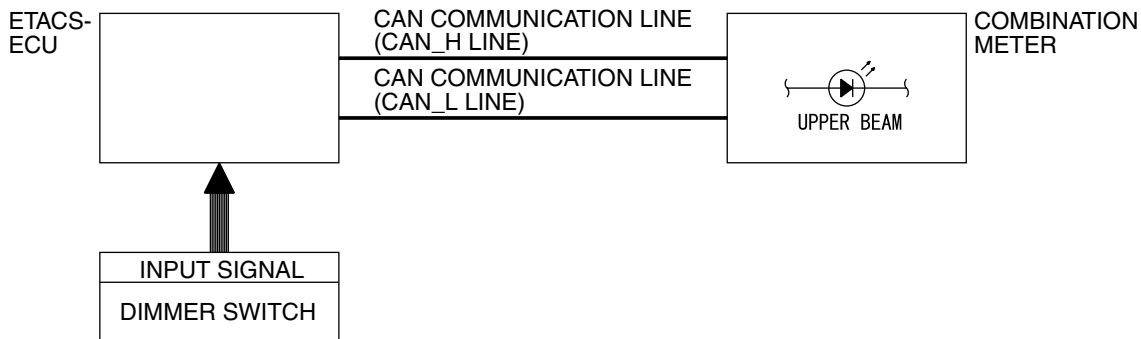
**YES :** No action is necessary and testing is complete.

**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. Verify that the headlight (HIGH: RH) illuminates normally.



**INSPECTION PROCEDURE H-8: Headlight and Taillight: The High-beam indicator light does not illuminate.**

*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**High-Beam Indicator Light Circuit**

W4P54M70AA

**CIRCUIT OPERATION**

At the same time that the high beams are illuminated, the ETACS-ECU sends a signal to illuminate the high beam indicator via the CAN bus line.

**TECHNICAL DESCRIPTION (COMMENT)**

If the high beam indicator does not illuminate normally, connector(s), wiring harness in the CAN bus lines, the ETACS-ECU or the combination meter may be defective.

**TROUBLESHOOTING HINTS**

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The combination meter may be defective
- The ETACS-ECU may be defective

**DIAGNOSIS****Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness



**STEP 1. Check the headlights.**

When the lighting switch is operated, check that the headlights illuminate/go off normally.

**Q: Are the headlights in good condition?**

**YES** : Go to Step 2.

**NO** : First, repair the headlights. Refer to Inspection Procedure H-7 "One of the headlights does not illuminate <2-bulb type> [P.54B-339](#) " or "One of the headlights does not illuminate <4-bulb type> [P.54B-348](#) ."

**STEP 2. Using scan tool MB991958, diagnose the CAN bus line.**

**⚠ CAUTION**

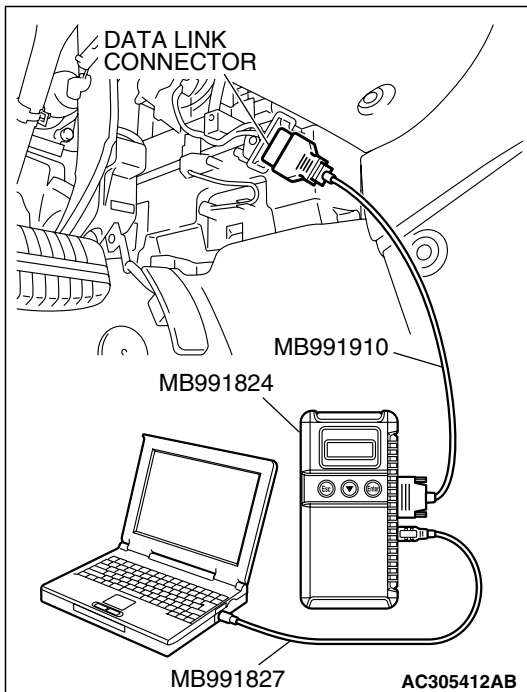
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

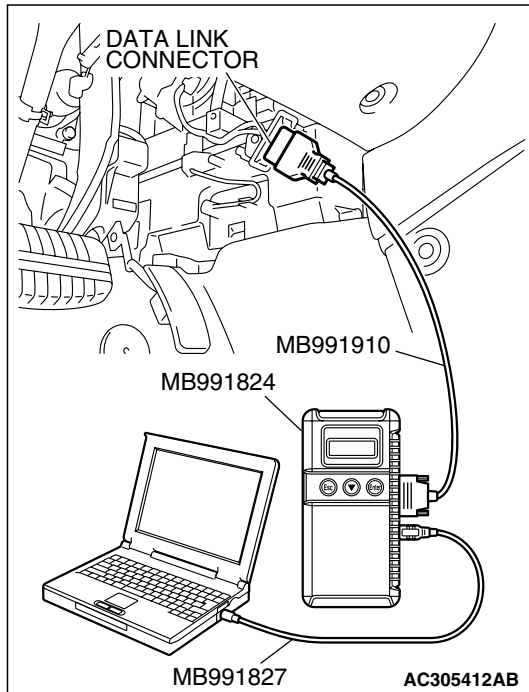
- (1) Connect scan tool MB991958. Refer to "How to connect SWS monitor [P.54B-13](#)."
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the CAN bus line found to be normal?**

**YES** : Go to Step 3.

**NO** : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis [P.54C-14](#)).



**STEP 3. Using scan tool MB991958, read the combination meter diagnostic trouble code.**

Check whether a combination meter-related DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check whether the combination meter-related DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the DTC set?**

**YES** : Diagnose the combination meter. Refer to [P.54A-52](#).

**NO** : Go to Step 4.

**STEP 4. Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.**

Check the ETACS-ECU.

**⚠ CAUTION**

**Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.**

(1) Connect the SWS monitor. Refer to "How to connect SWS monitor P.54B-13."

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

(3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM Check."

a. Select "Interactive Diagnosis."

b. Select "System select."

c. Select "SWS."

d. Select "SWS MONITOR."

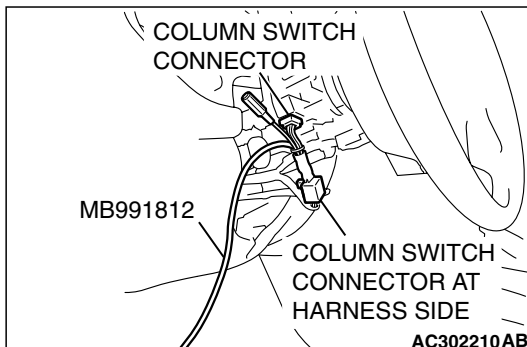
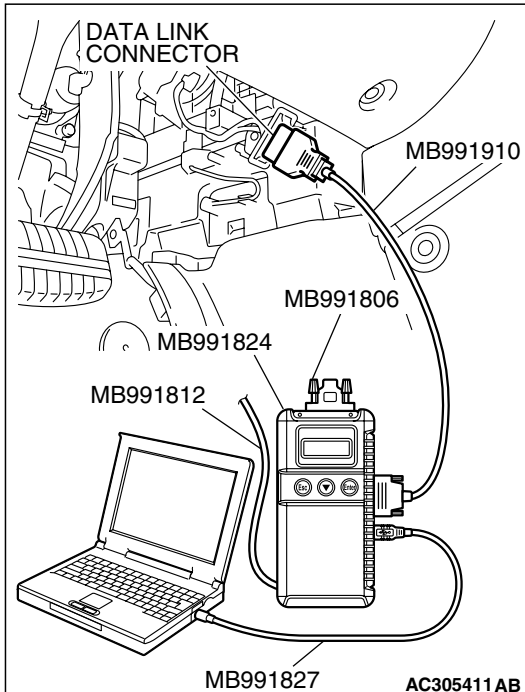
e. Select "ECU COMM Check."

(4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menu for the "ETACS ECU" menu.

**Q: Is "OK" displayed for the "ETACS ECU" menu?**

**YES :** Go to Step 5.

**NO :** Refer to Inspection Procedure A-3 "Communication with the ETACS-ECU is not possible P.54B-78."



**STEP 5. Replace the combination meter.**

(1) Replace the combination meter.

(2) Check that the high beam indicator light illuminates normally.

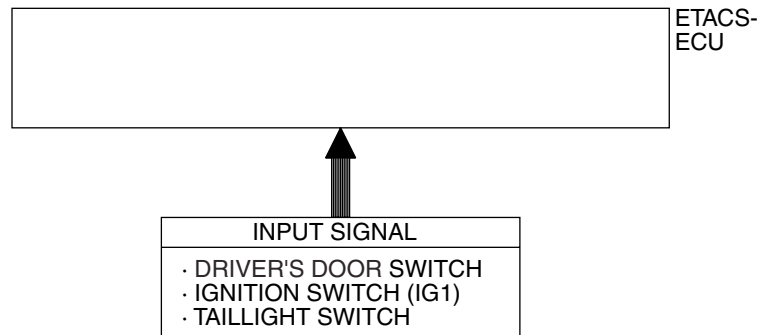
**Q: Does the high beam indicator light illuminate normally?**

**YES :** No action is necessary and testing is complete.

**NO :** Replace the ETACS-ECU. Check that the high beam indicator light illuminates normally.

**INSPECTION PROCEDURE H-9: Headlight and Taillight: Headlight automatic shutoff function does not work normally.**

*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Headlight Automatic Shutt-Down Function**

W4P54M71AA

**CIRCUIT OPERATION**

The ETACS-ECU operates the headlight automatic shutdown function according to the following signals:

- Ignition switch (IG1): OFF
- Driver's door switch: ON
- Taillight switch: ON
- Headlight switch: ON

The ETACS-ECU operates the headlight automatic shutdown function under the following conditions:

- Ignition key: Other than "ON" position
- Driver's door: open
- Taillights or headlights: on

**TECHNICAL DESCRIPTION (COMMENT)**

If the function does not work normally, the input circuit system from the switches, the ETACS-ECU or the front-ECU may be defective (refer to "CIRCUIT OPERATION").

**TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The front-ECU may be defective

## DIAGNOSIS

### Required Special Tools:

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

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### STEP 1. Check the adjustment function.

**Q: Has a setting other than "No auto-shutoff" been selected for the headlight automatic shutdown function?**

**YES :** Go to Step 2.

**NO :** Set the headlight automatic shutdown function to another setting other than "No auto-shutoff".

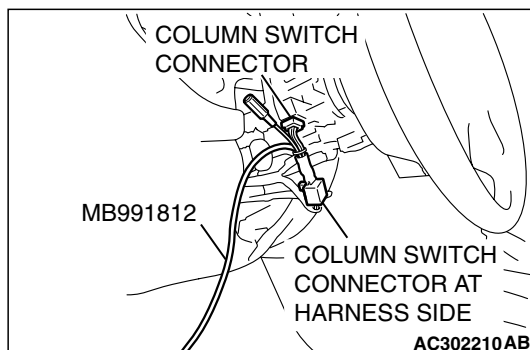
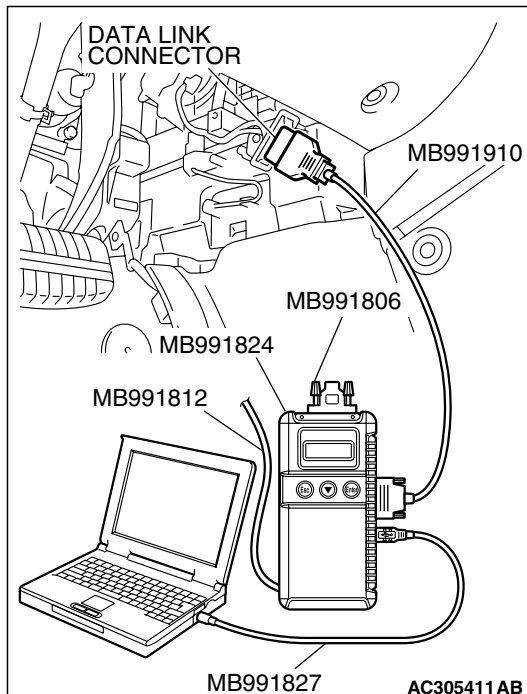
**STEP 2. Check the input signal by using "DATA LIST" menu of the SWS monitor.**

Check the input signals from the following switches:

- Ignition switch: "ON" to "OFF"
- Lighting switch: "TAIL" or "HEAD"

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.



- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Operate scan tool MB991958 according to the procedure below to display "H/L AUTO-CUT."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "LIGHTING."
  - g. Select "H/L AUTO-CUT."
- (4) Check that normal conditions are displayed for the items described in the table below.

ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 01	TAILLIGHT SW	ON
ITEM 30	IG SW (IG1)	OFF

- (5) When the driver's door is opened, check that normal conditions are displayed for the items described in the table below.

ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 32	FRONT DOOR SW	ON
ITEM 35	H/L AUTO-CUT	ON

**Q: Does the scan tool MB991958 display the items "TAILLIGHT SW", "IG SW IG1", "FRONT DOOR SW" and "H/L AUTO-CUT" as normal condition?**

**Normal conditions are displayed for all the items :**

Replace the front-ECU. Verify that the headlight automatic shutdown function works normally.

**Normal condition is not displayed for "TAILLIGHT SW" :**

Refer to Inspection Procedure M-5 "ETACS-ECU does not receive any signal from the taillight switch P.54B-484."

**Normal condition is not displayed for "IG SW (IG1)" :**

Refer to Inspection Procedure M-2 "ETACS-ECU does not receive any signal from the ignition switch

(IG1) P.54B-470."

**Normal condition is not displayed for "FRONT DOOR SW"** : Refer to Inspection Procedure M-4 "ETACS-ECU does not receive any signal from the front door switches P.54B-477."

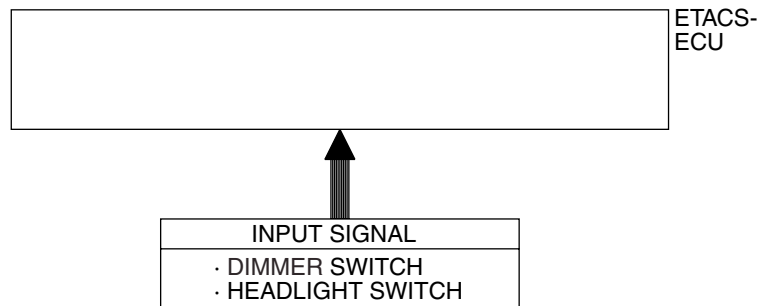
**Normal condition is not displayed for "H/L AUTO-CUT"** :  
Replace the front-ECU. Check that the headlight automatic shutdown function works normally.

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**INSPECTION PROCEDURE H-10: Headlight and Taillight: Headlight dimmer switch automatic resetting function does not work normally.**

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**Headlight (Dimmer/Passing) Input Signal**



W4P54M72AA

**CIRCUIT OPERATION**

The headlight dimmer switch automatic resetting function is controlled by the front-ECU.

**TECHNICAL DESCRIPTION (COMMENT)**

If the headlight dimmer switch automatic resetting function does not work normally, the front-ECU may be defective.

**TROUBLESHOOTING HINT**

The front-ECU may be defective

**DIAGNOSIS**

Replace the front-ECU.  
Check that the headlight dimmer switch automatic resetting function works normally.

## FLASHER TIMER

### GENERAL DESCRIPTION CONCERNING THE FLASHER TIMER

M1549023600238

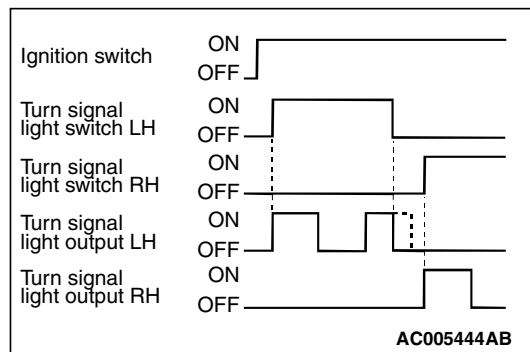
The following ECUs affect the functions and control of the flasher timer.

FUNCTION	CONTROL ECU
Turn-signal light	ETACS-ECU, column switch
Turn-signal indicators	ETACS-ECU, column switch
Hazard warning light	ETACS-ECU

### FLASHER TIMER FUNCTION

#### TURN-SIGNAL LIGHT

The turn-signal light output (flashing signal) is turned ON when the ignition switch is ON and the turn-signal light switch is ON (LH or RH). If the front turn-signal light or rear turn-signal light bulb has burned out, the flashing speed increases to indicate that the bulb has burned out.



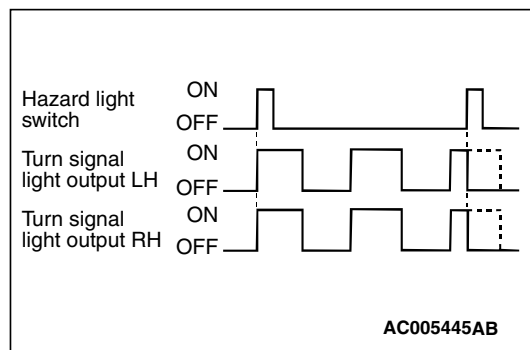
#### TURN-SIGNAL INDICATORS

At the same time that the turn-signal lights are illuminated, the ETACS-ECU sends a signal to illuminate the turn-signal light indicator via the CAN bus line. The combination meter receives the transmitted signal and turns the turn-signal light indicator on and off.

#### HAZARD WARNING LIGHT

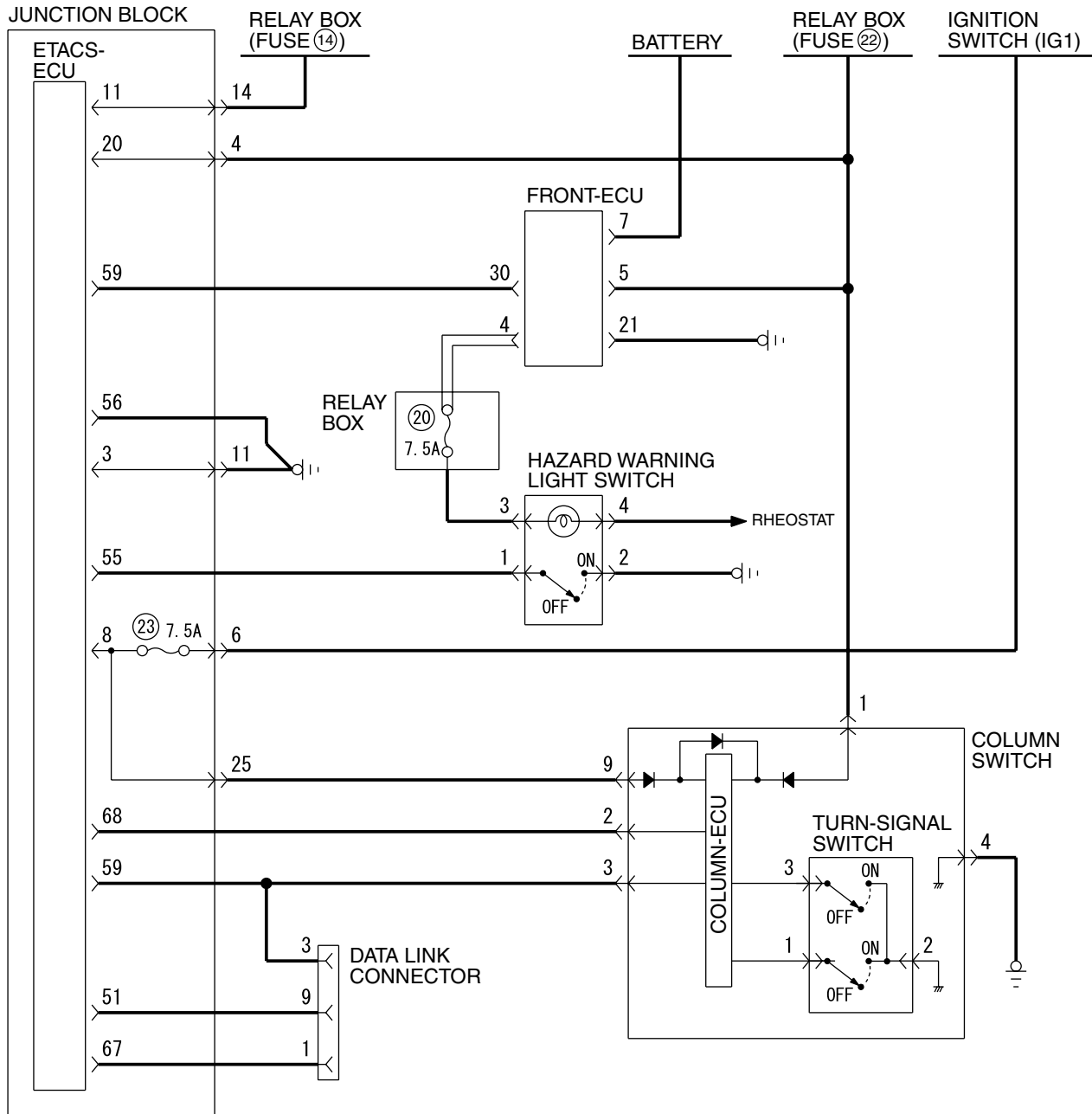
Detects the signal where the hazard warning light switch input changes from OFF to ON, and reverse the flashing state according to this signal. The hazard warning lights toggle on and off whenever the hazard warning light switch is operated.

*NOTE: The hazard warning light switch is a push-return type toggle switch.*

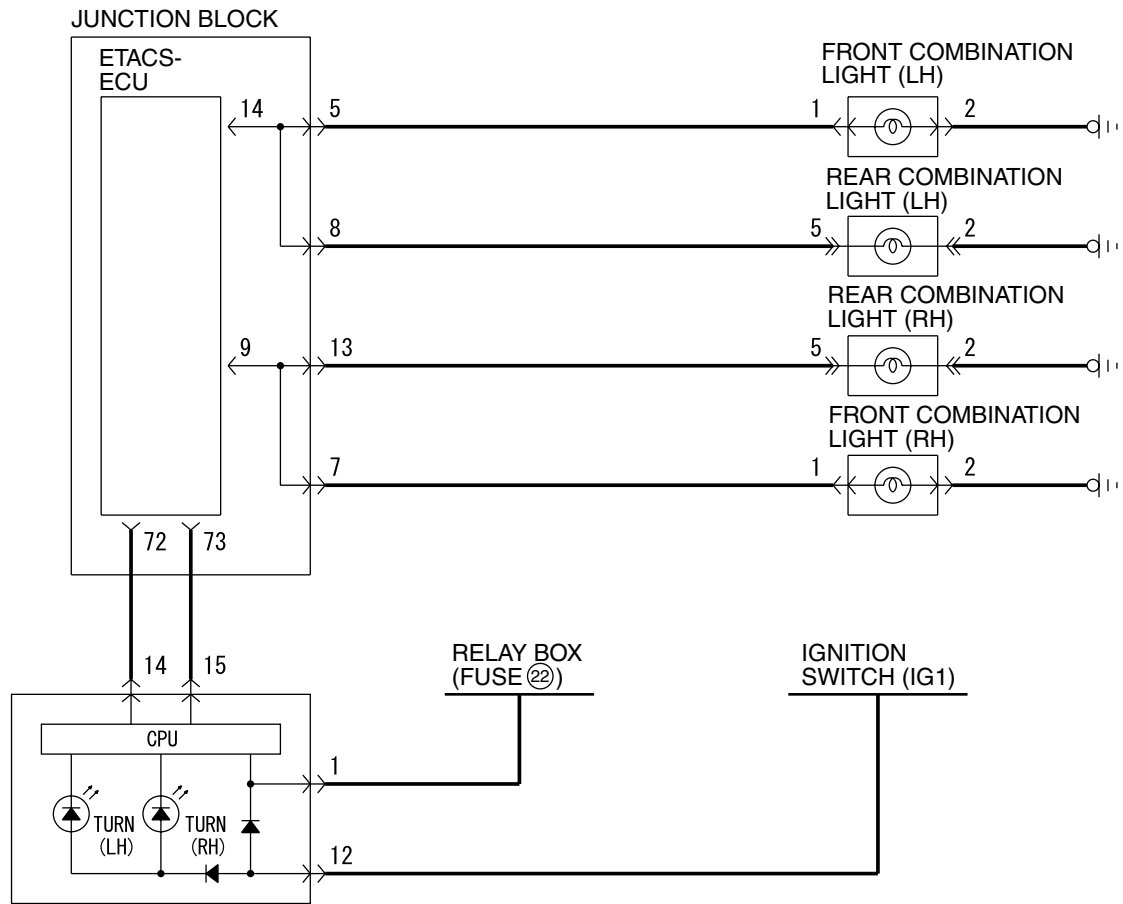




General circuit diagram for the turn-signal light and hazard light



W4P54M77AA

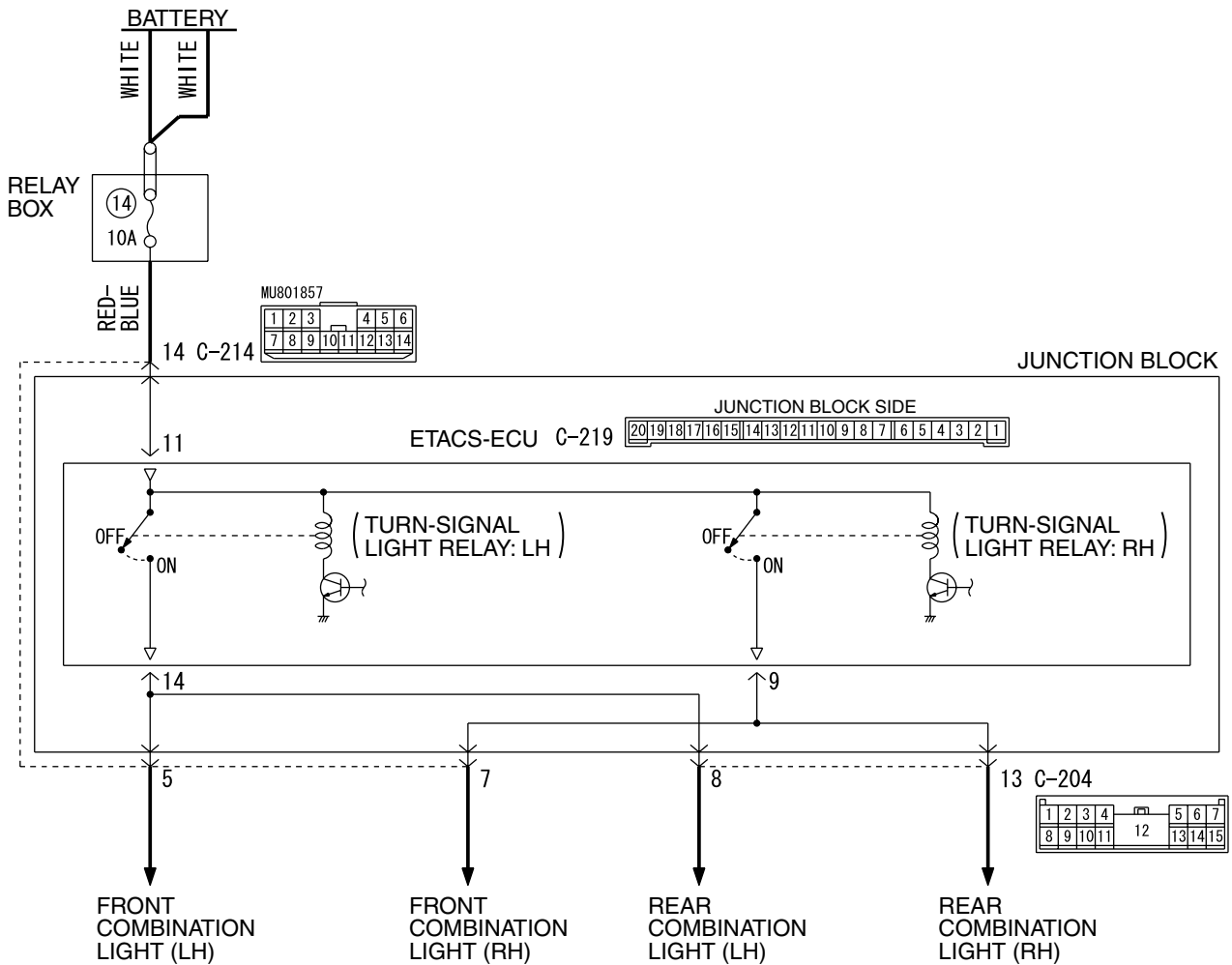


W4P54M78AA

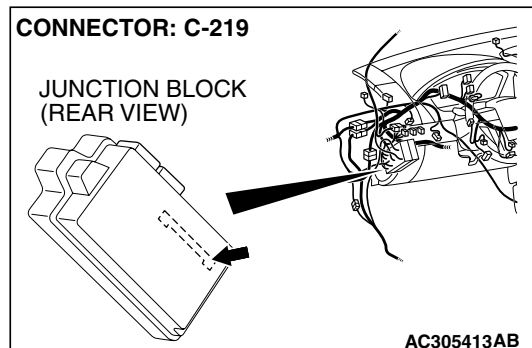
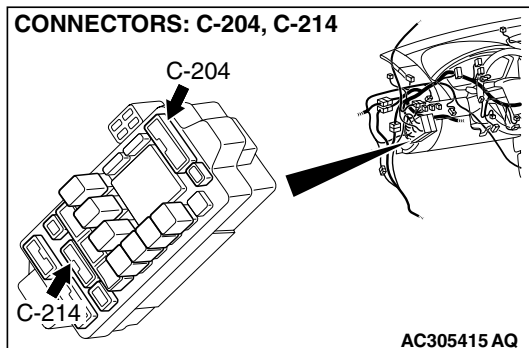
**INSPECTION PROCEDURE I-1: Flasher Timer: Turn-signal lights do not flash when the turn-signal light switch is turned on.**

*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Turn-Signal Light Power Supply Circuit**



W4P54M79AA



**CIRCUIT OPERATION**

- The turn-signal light switch sends a signal through the column-ECU (incorporated in the column switch) to the ETACS-ECU. If the column-ECU sends a turn-signal light switch "ON" signal to the ETACS-ECU, the ETACS-ECU turns on the flasher timer (incorporated in the ETACS-ECU), thus causing the turn-signal lights to flash.
- The ETACS-ECU operates the turn-signal lights according to the following signals:
  - Ignition switch (IG1): ON
  - Turn-signal light switch: ON
- The ETACS-ECU flashes the turn-signal lights under the following conditions:
  - Ignition key: "ON" position

- Turn-signal light switch: Left or right turn-signal position

**TECHNICAL DESCRIPTION (COMMENT)**

If the turn-signal lights do not flash normally, the input circuits from the switches described in "CIRCUIT OPERATION" or the ETACS-ECU may be defective. If the hazard warning lights do not flash, the power supply line to the ETACS-ECU (dedicated to the turn-signal lights) may be defective.

**TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The ETACS-ECU may be defective

**DIAGNOSIS****Required Special Tools:**

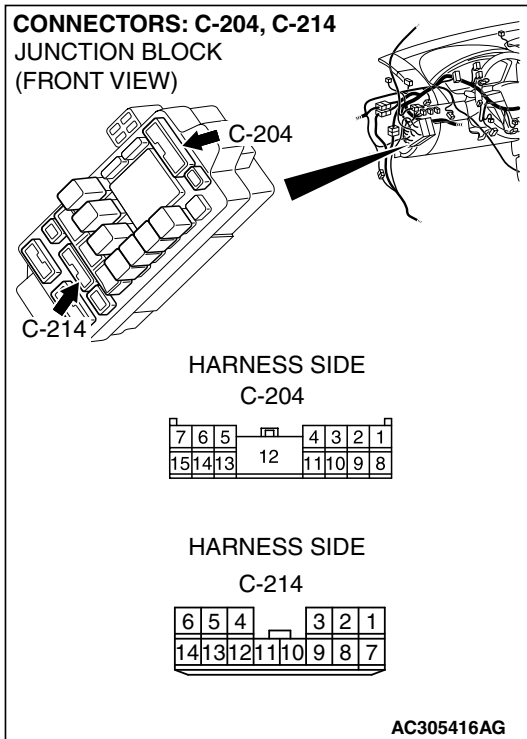
- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

**STEP 1. Check the hazard warning light.****Q: Do the hazard warning lights work normally?**

- YES** : Go to Step 7.  
**NO** : Go to Step 2.

**STEP 2. Check the turn-signal lights.****Q: Does either of the turn-signal lights illuminate?**

- Only right or left side light does not illuminate.** : Go to Step 3.  
**Turn-signal lights do not illuminate at all** : Go to Step 4.

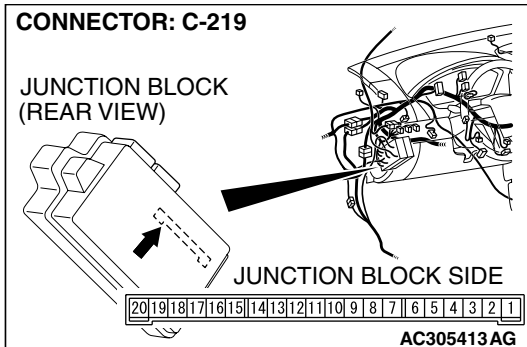


**STEP 3. Check ETACS-ECU connector C-219, junction block connectors C-214 and C-204 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Are ETACS-ECU connector C-219, junction block connectors C-214 and C-204 in good condition?**

**YES :** Replace the ETACS-ECU. Verify that the turn-signal lights illuminate normally.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the turn-signal lights illuminate normally.

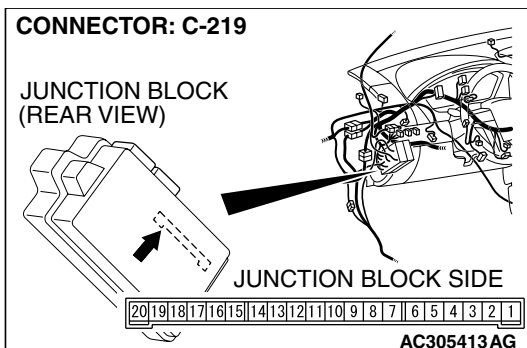


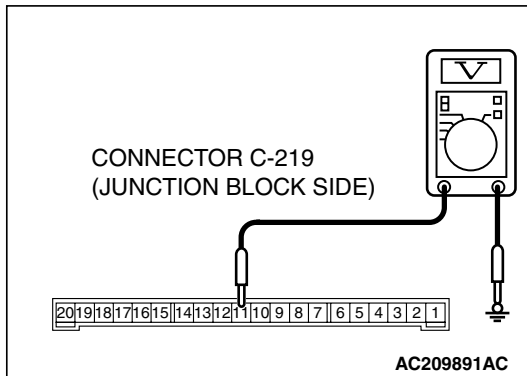
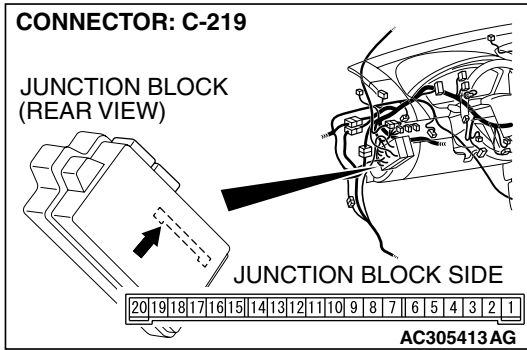
**STEP 4. Check ETACS-ECU connector C-219 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is ETACS-ECU connector C-219 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](#). Verify that the turn-signal lights illuminate normally.





**STEP 5. Check the battery power supply circuit to the ETACS-ECU. Measure the voltage at ETACS-ECU connector C-219.**

(1) Disconnect ETACS-ECU connector C-219, and measure the voltage available at the junction block side of the connector.

(2) Measure the voltage between terminal 11 and ground.

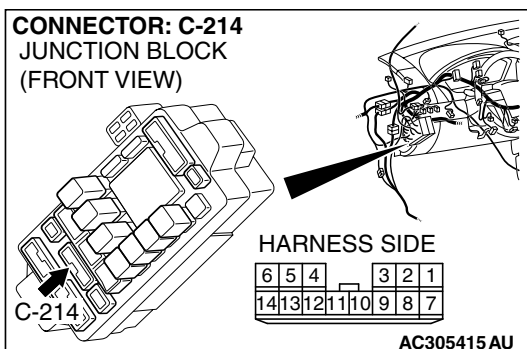
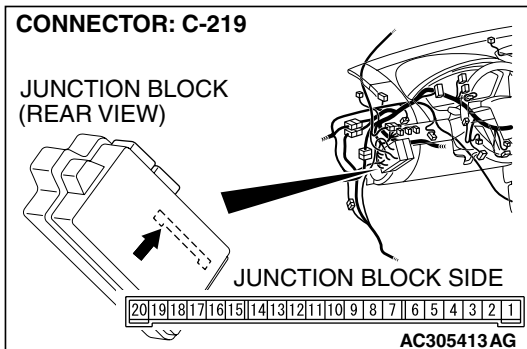
- The voltage should measure approximately 12 volts (battery positive voltage).

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

**YES :** Replace the ETACS-ECU. Verify that the turn-signal lights illuminate normally.

**NO :** Go to Step 6.

**STEP 6. Check the wiring harness between ETACS-ECU connector C-219 (terminal 11) and the battery.**



*NOTE: Also check junction block connector C-214 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-214 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 ETACS-ECU connector C-219 (terminal 11) and the battery 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. Verify that the turn-signal lights illuminate normally.

**STEP 7. Check the input signal by using "FUNCTION DIAG." menu of the SWS monitor.**

Check the input signals from the following switches:

- Ignition switch: ON
- Turn-signal light switch: RH

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "LOCK" (OFF) position.
- (3) Operate scan tool MB991958 according to the procedure below to display "TURN SIG.RH."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "TURN SIGNAL."
  - g. Select "TURN SIG.RH."
- (4) Check that normal conditions are displayed for the items described in the table below.

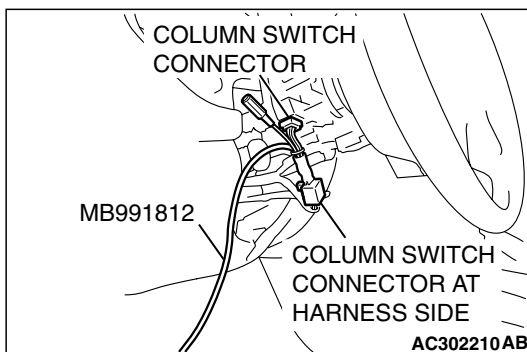
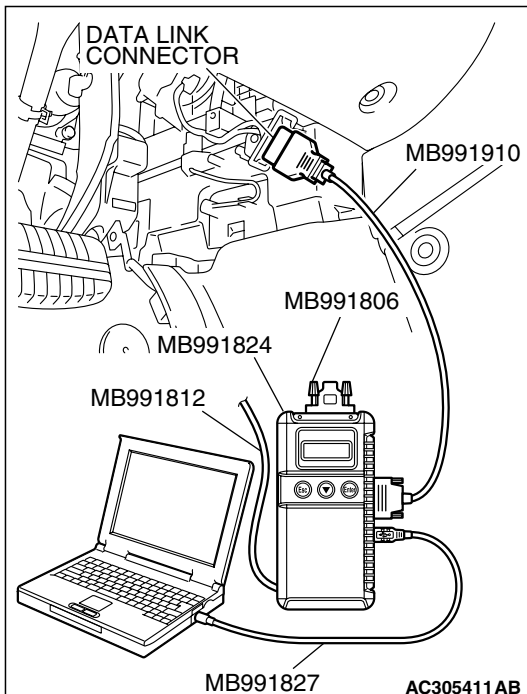
ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 10	T/S RH SW	ON
ITEM 30	IG SW (IG1)	ON

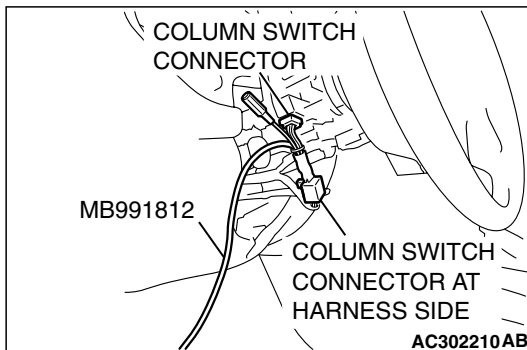
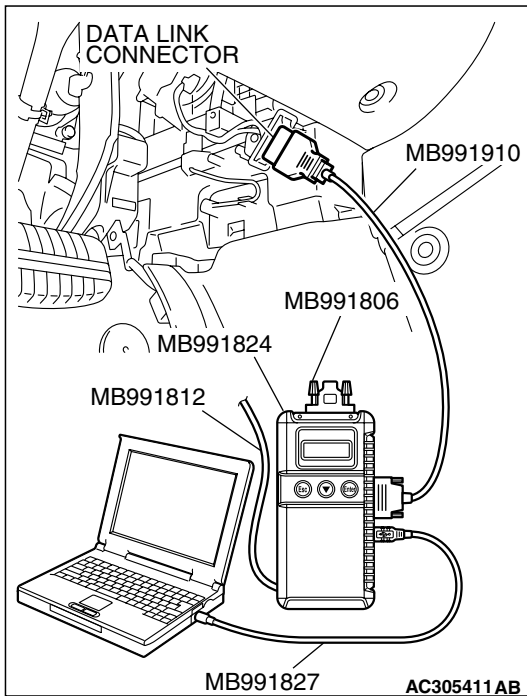
**Q: Does the scan tool MB991958 display the items "T/S RH SW" and "IG SW (IG1)" as normal condition?**

**Normal conditions are displayed for all the items :** Go to Step 8.

**Normal condition is not displayed for "T/S RH SW" :**  
Refer to Inspection Procedure M-5 "ETACS-ECU does not receive any signal from the turn-signal light switch P.54B-484."

**Normal condition is not displayed for "IG SW (IG1)" :**  
Refer to Inspection Procedure M-2 "ETACS-ECU does not receive any signal from the ignition switch (IG1) P.54B-470."





**STEP 8. Check the input signal by using "FUNCTION DIAG." menu of the SWS monitor.**

If the Ignition switch is turned to the "ON" position and the turn-signal light switch (LH) is turned on, normal conditions should be displayed for the items described in the table below.

- (1) Operate scan tool MB991958 according to the procedure below to display "TURN SIG.LH."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "TURN SIGNAL."
  - g. Select "TURN SIG.LH."
- (2) Check that normal conditions are displayed for the item described in the table below.

ITEM No.	ITEM NAME	NORMAL CONDITION
ITEM 11	T/S LH SW	ON

**Q: Do the scan tool display the item "T/S LH SW" as normal condition?**

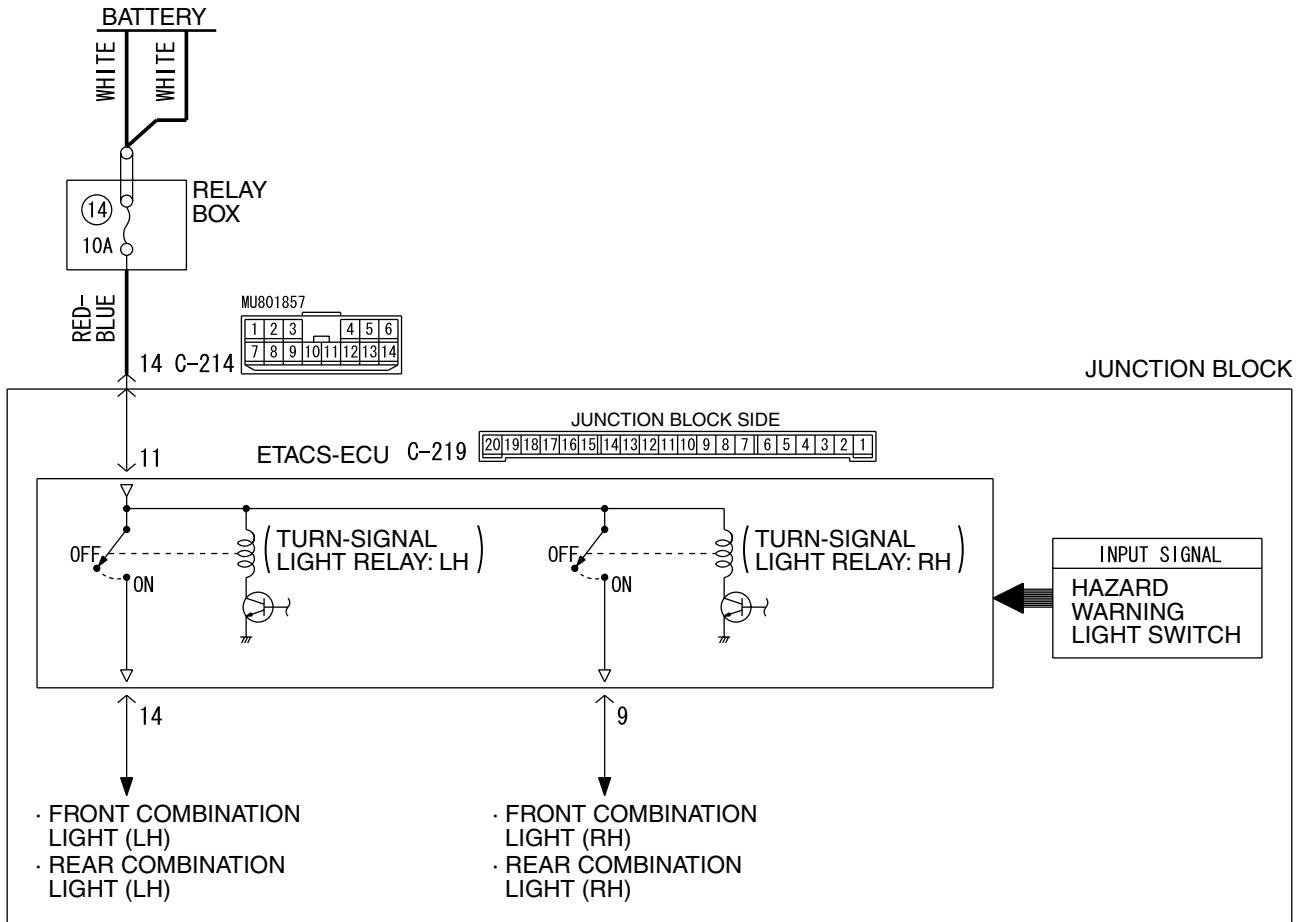
**YES :** Replace the ETACS-ECU. Verify that the turn-signal lights illuminate normally.

**NO :** Refer to Inspection Procedure M-5 "ETACS-ECU does not receive any signal from the turn-signal light switch [P.54B-484.](#)"



**INSPECTION PROCEDURE I-2: Flasher Timer: Hazard warning lights do not flash when the hazard warning light switch is turned on.**

**Hazard Warning Light Circuit**



W4P54M80AA

**CIRCUIT OPERATION**

If the ETACS-ECU receives "ON" signal from the hazard warning light switch, the ETACS-ECU turns on the flasher timer (incorporated in the ETACS-ECU), thus causing the turn-signal lights to flash.

**TECHNICAL DESCRIPTION (COMMENT)**

If the hazard warning lights do not flash, the power supply line to the ETACS-ECU (dedicated to the turn-signal lights) or the ETACS-ECU may be defective.

**TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The ETACS-ECU may be defective

**DIAGNOSIS****Required Special Tools:**

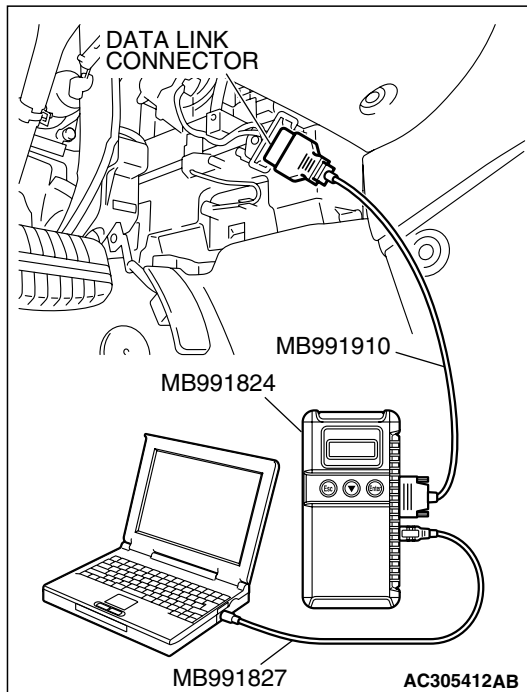
- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A

**STEP 1. Check the turn-signal lights.****Q: Do the turn-signal lights illuminate normally?****YES** : Go to Step 2.**NO** : Refer to Inspection Procedure I-1 "Turn-signal lights do not flash when the turn-signal light switch is turned on [P.54B-369](#)."**STEP 2. Check the input signal (by using the pulse check mode of the monitor).**

Check input signal from the hazard warning light switch.

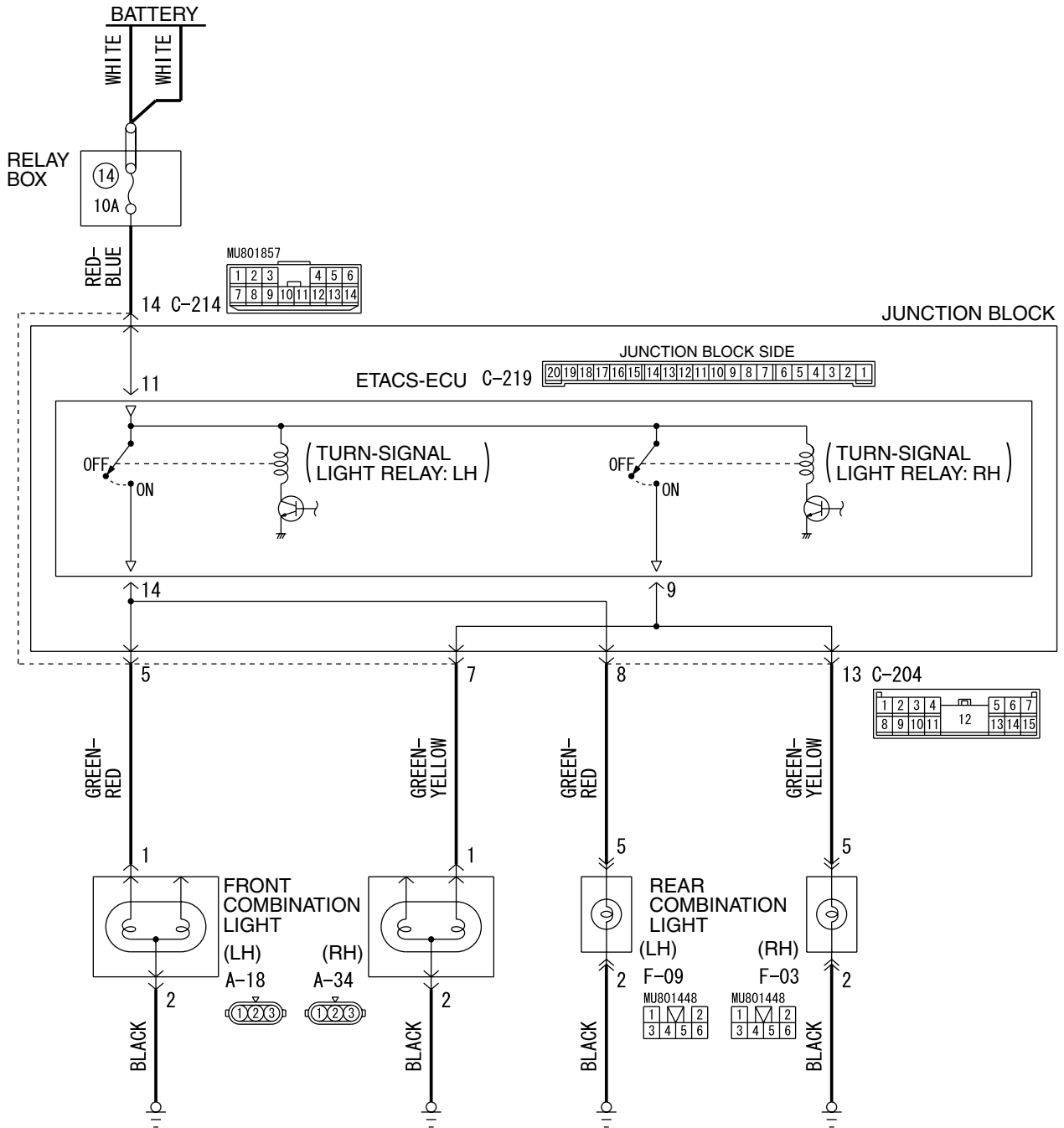
**⚠ CAUTION****To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.**

- (1) Connect the special tool. Refer to "How to connect SWS monitor [P.54B-13](#)."
- (2) Operate scan tool MB991958 according to the procedure below to display "Pulse check."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "Pulse Checking."
- (3) Check that scan tool MB991958 sounds when the hazard warning light switch is turned from "OFF" to "ON."

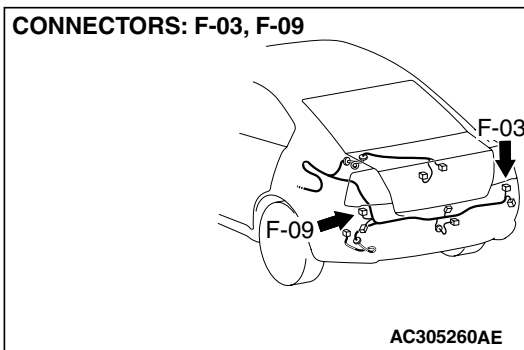
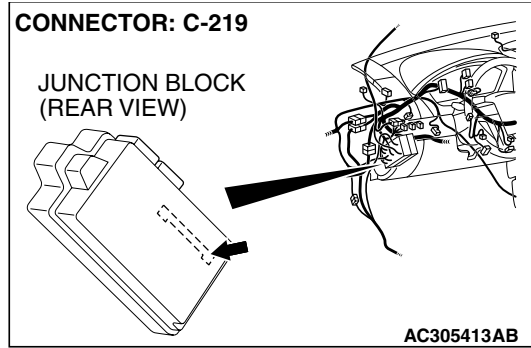
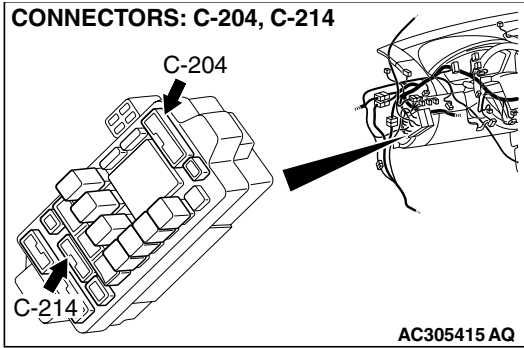
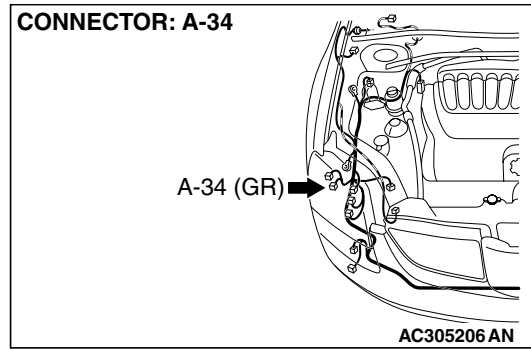
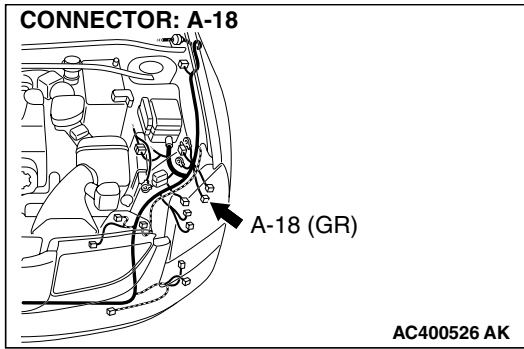
**Q: Does scan tool MB991958 sound when the hazard warning light switch is turned from "OFF" to "ON"?****YES** : Replace the ETACS-ECU. Verify that the hazard warning lights illuminate normally.**NO** : Refer to Inspection Procedure N-2 "ETACS-ECU does not receive any signal from the hazard warning light switch [P.54B-501](#)."

**INSPECTION PROCEDURE I-3: Flasher Timer: One of the turn-signal lights does not illuminate.**

**Turn-Signal Lights Circuit**



W4P54M81AA



**TECHNICAL DESCRIPTION (COMMENT)**

If the right or left turn-signal light does not illuminate, their bulb may be defective.

**TROUBLESHOOTING HINTS**

- The turn-signal light bulb may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

## DIAGNOSIS

### Required Special Tool:

- MB991223: Harness Set

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### STEP 1. Check the hazard warning light.

#### Q: Which turn-signal light does not illuminate?

**front turn-signal light (LH)** : Go to Step 2.

**front turn-signal light (RH)** : Go to Step 8.

**rear combination light (LH)** : Go to Step 14.

**rear combination light (RH)** : Go to Step 20.

**Turn-signal indicators** : Refer to Inspection Procedure I-4

"The turn-signal light indicator does not illuminate normally P.54B-391."

**LH side only** : Refer to Inspection Procedure I-1

"Turn-signal lights do not flash when the turn-signal light switch is turned on P.54B-369."

**RH side only** : Refer to Inspection Procedure I-1

"Turn-signal lights do not flash when the turn-signal light switch is turned on P.54B-369."

**Both LH and RH sides** : Refer to Inspection Procedure I-2

"Hazard warning lights do not flash when the hazard warning light switch is turned on P.54B-375."

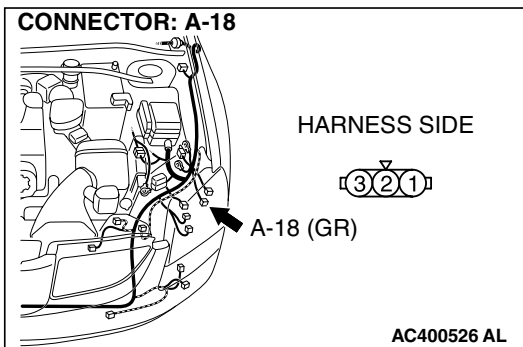
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### STEP 2. Check front combination light (LH) connector A-18 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

#### Q: Is front combination light (LH) connector A-18 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. Verify that the turn-signal lights illuminate normally.



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### STEP 3. Check the front turn-signal light bulb (LH).

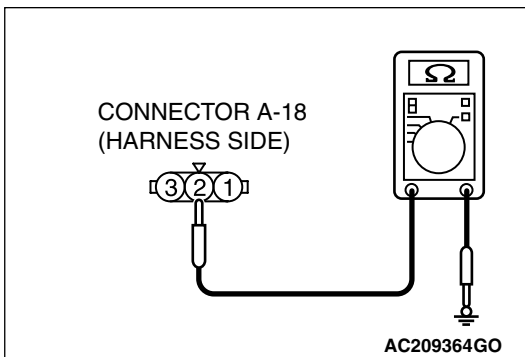
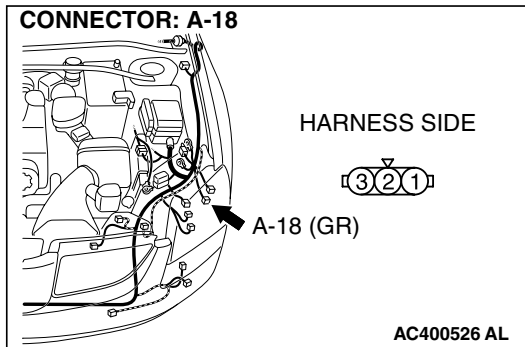
(1) Remove the front turn-signal (LH) light bulb.

(2) Verify that the front turn-signal light bulb (LH) is not damaged or burned out.

#### Q: Is the front turn-signal (LH) light bulb in good condition?

**YES** : Go to Step 4.

**NO** : Replace the front turn-signal (LH) light bulb. Verify that the turn-signal lights illuminate normally.



**STEP 4. Check the ground circuit to the ETACS-ECU. Measure the resistance at front combination light (LH) connector A-18.**

(1) Disconnect front combination light (LH) connector A-18 and measure the resistance available at the wiring harness side of the connector.

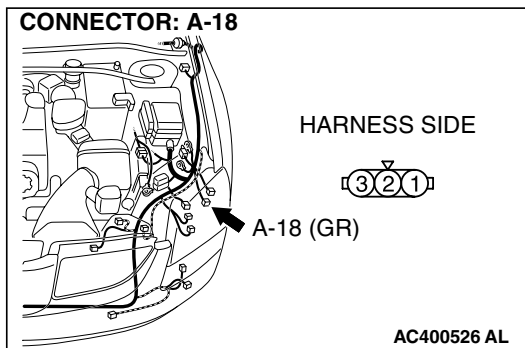
(2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 6.

**NO :** Go to Step 5.

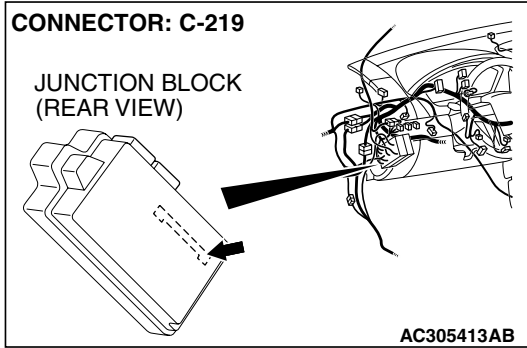


**STEP 5. Check the wiring harness between front combination light (LH) connector A-18 (terminal 2) and ground.**

**Q: Is the wiring harness between front combination light (LH) connector A-18 (terminal 2) and ground in good condition?**

**YES :** Replace the front combination light socket (LH). Verify that the turn-signal lights illuminate normally.

**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. Verify that the turn-signal lights illuminate normally.

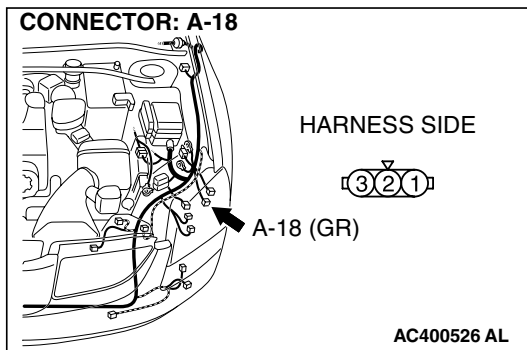


**STEP 6.** Check ETACS-ECU connector C-219 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

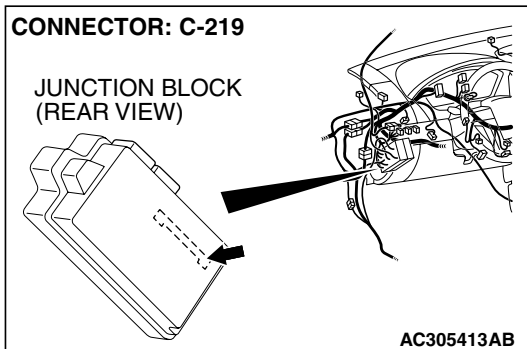
**Q:** Is ETACS-ECU connector C-219 in good condition?

**YES :** Go to Step 7.

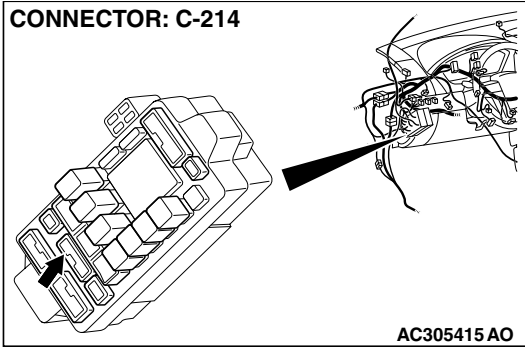
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the turn-signal lights illuminate normally.



**STEP 7.** Check the wiring harness between front combination light (LH) connector A-18 (terminal 1) and ETACS-ECU connector C-219 (terminal 14).



## CONNECTOR: C-214



*NOTE: Also check junction block connector C-214 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-214 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 front combination light (LH) connector A-18 (terminal 1) and ETACS-ECU connector C-219 (terminal 14) in good condition?**

**YES :** Replace the front combination light socket (LH). Verify that the turn-signal lights illuminate normally.

**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. Verify that the turn-signal lights illuminate normally.

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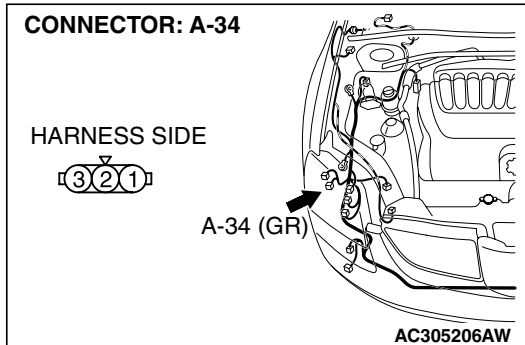
**STEP 8. Check front combination light (RH) connector A-34 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front combination light (RH) connector A-34 in good condition?**

**YES :** Go to Step 9.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the turn-signal lights illuminate normally.

## CONNECTOR: A-34




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**STEP 9. Check the front turn-signal light bulb (RH).**

(1) Remove the front turn-signal (RH) light bulb.

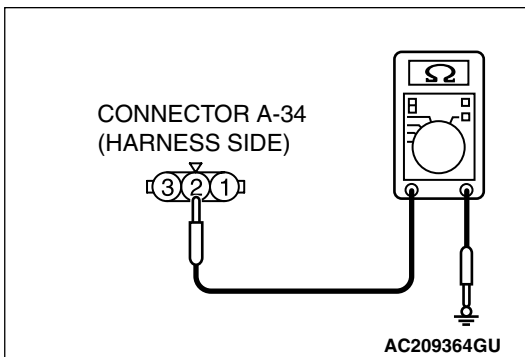
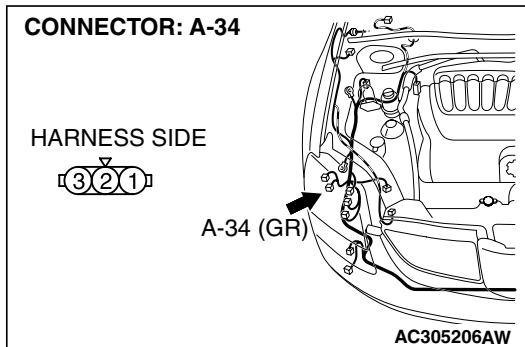
(2) Verify that the front turn-signal light bulb (RH) is not damaged or burned out.

**Q: Is the front turn-signal (RH) light bulb in good condition?**

**YES :** Go to Step 10.

**NO :** Replace the front turn-signal (RH) light bulb. Verify that the turn-signal lights illuminate normally.





**STEP 10. Check the ground circuit to the front combination light (RH). Measure the resistance at front combination light (RH) connector A-34.**

(1) Disconnect front combination light (RH) connector A-34 and measure the resistance available at the wiring harness side of the connector.

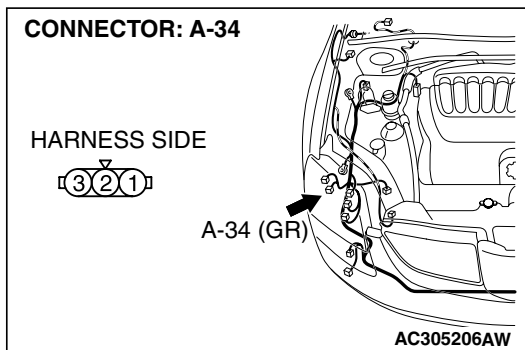
(2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 12.

**NO :** Go to Step 11.



**STEP 11. Check the wiring harness between front combination light (RH) connector A-34 (terminal 2) and ground.**

**Q: Is the wiring harness between front combination light (RH) connector A-34 (terminal 2) and ground in good condition?**

**YES :** Replace the front combination light socket (RH).  
Verify that the turn-signal lights illuminate normally.

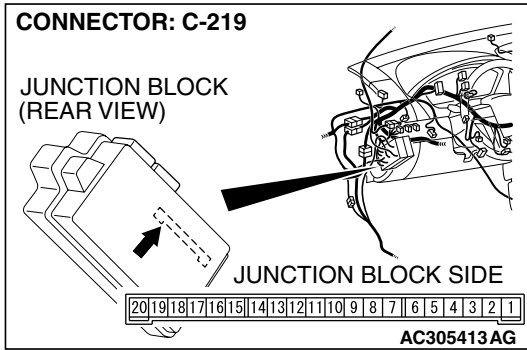
**NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the turn-signal lights illuminate normally.

**STEP 12.** Check ETACS-ECU connector C-219 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

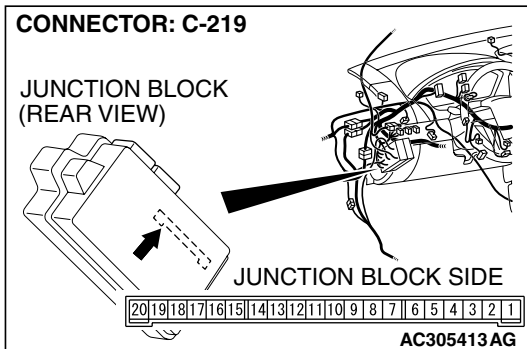
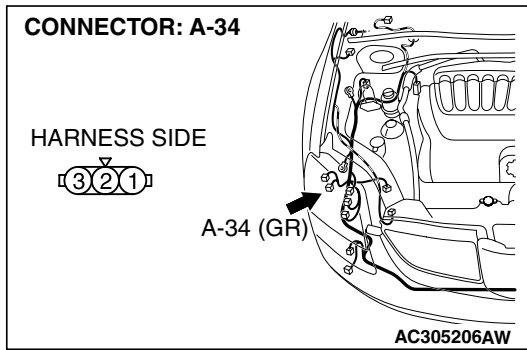
**Q:** Is ETACS-ECU connector C-219 in good condition?

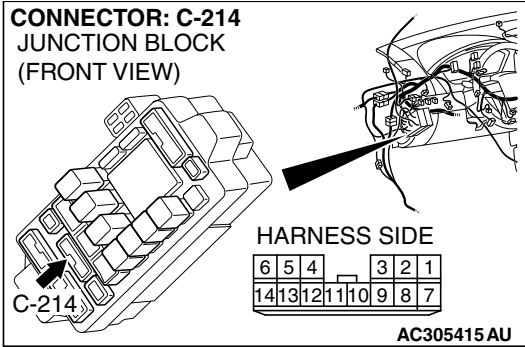
**YES :** Go to Step 13.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the turn-signal lights illuminate normally.



**STEP 13.** Check the wiring harness between front combination light (RH) connector A-34 (terminal 1) and ETACS-ECU connector C-219 (terminal 9).

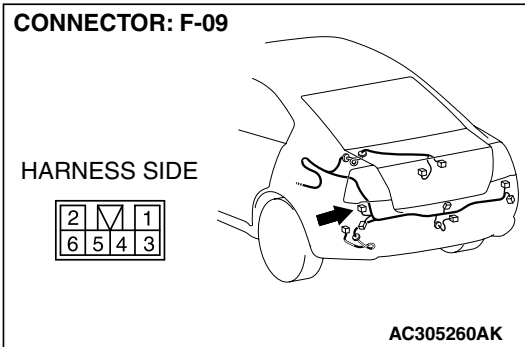




*NOTE: Also check junction block connector C-214 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-214 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Is the wiring harness between front combination light (RH) connector A-34 (terminal 1) and ETACS-ECU connector C-219 (terminal 9) in good condition?**

- YES :** Replace the front combination light socket (RH).  
Verify that the turn-signal lights illuminate normally.
- 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. Verify that the turn-signal lights illuminate normally.



**STEP 14. Check rear combination light (LH) connector F-09 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is rear combination light (LH) connector F-09 in good condition?**

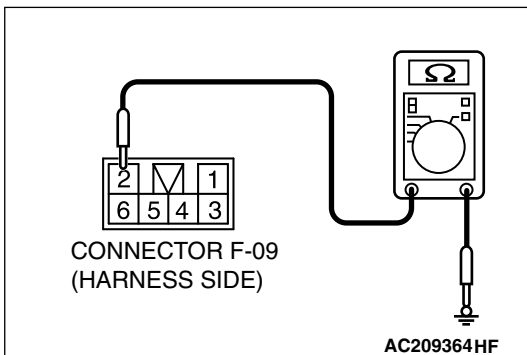
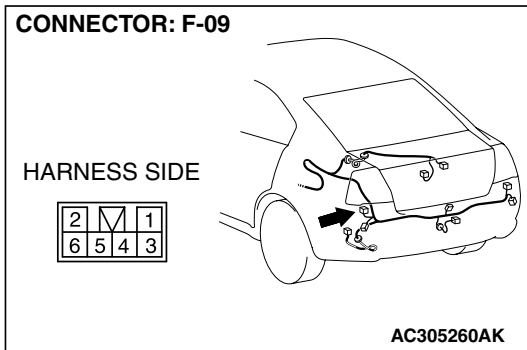
- YES :** Go to Step 15.
- NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the turn-signal lights illuminate normally.

**STEP 15. Check the rear turn-signal light bulb (LH).**

- (1) Remove the rear turn-signal (LH) light bulb.
- (2) Verify that the rear turn-signal light bulb (LH) is not damaged or burned out.

**Q: Is the rear turn-signal (LH) light bulb in good condition?**

- YES :** Go to Step 16.
- NO :** Replace the rear turn-signal (LH) light bulb. Verify that the turn-signal lights illuminate normally.



**STEP 16. Check the ground circuit to the rear combination light (LH). Measure the resistance at rear combination light (LH) connector F-09.**

(1) Disconnect rear combination light (LH) connector F-09 and measure the resistance available at the wiring harness side of the connector.

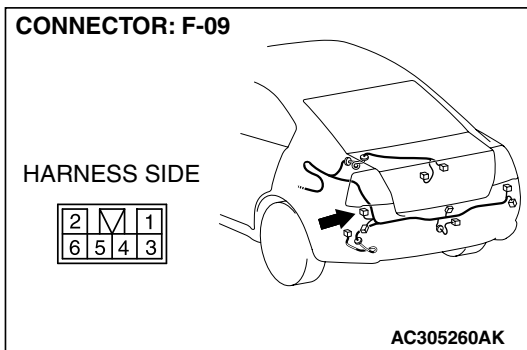
(2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 18.

**NO :** Go to Step 17.



**STEP 17. Check the wiring harness between rear combination light (LH) connector F-09 (terminal 2) and ground.**

**Q: Is the wiring harness between rear combination light (LH) connector F-09 (terminal 2) and ground in good condition?**

**YES :** Replace the rear combination light socket assembly (LH). Verify that the turn-signal lights illuminate normally.

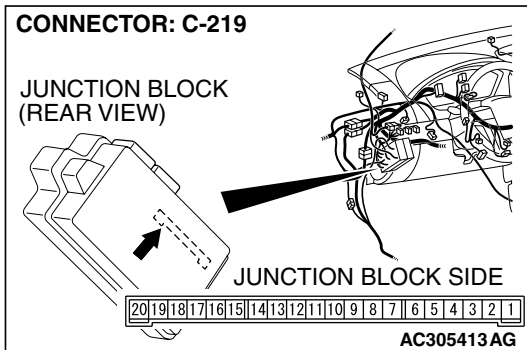
**NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the turn-signal lights illuminate normally.

**STEP 18. Check ETACS-ECU connector C-219 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

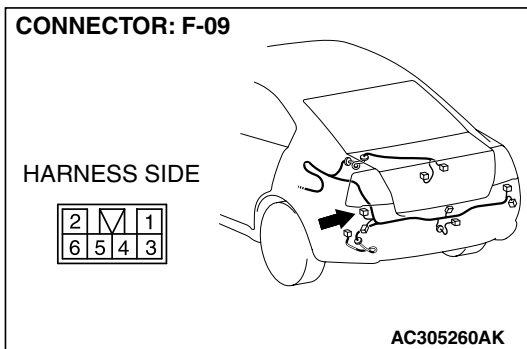
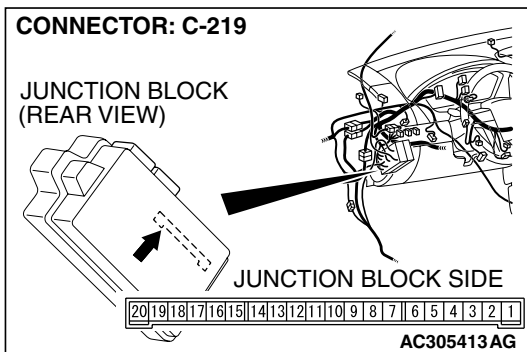
**Q: Is ETACS-ECU connector C-219 in good condition?**

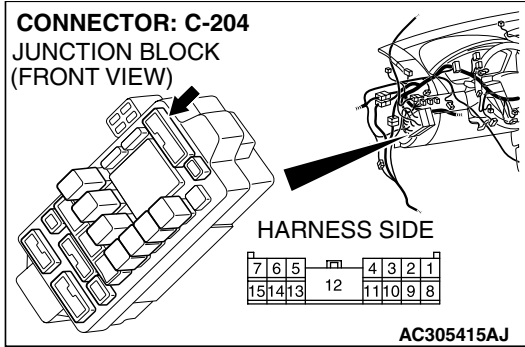
**YES :** Go to Step 19.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the turn-signal lights illuminate normally.



**STEP 19. Check the wiring harness between rear combination light (LH) connector F-09 (terminal 5) and ETACS-ECU connector C-219 (terminal 14).**



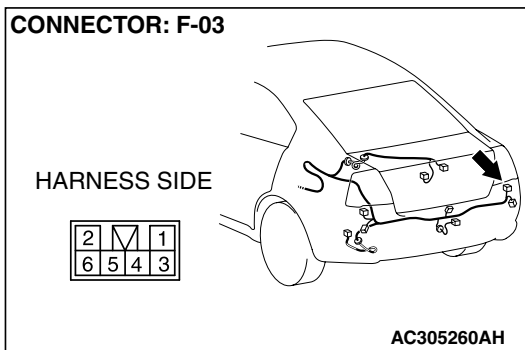


*NOTE: Also check junction block connector C-204 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-204 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Is the wiring harness between rear combination light (LH) connector F-09 (terminal 1) and ETACS-ECU connector C-219 (terminal 14) in good condition?**

**YES :** Replace the rear combination light socket assembly (LH). Verify that the turn-signal lights illuminate normally.

**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. Verify that the turn-signal lights illuminate normally.



**STEP 20. Check rear combination light (RH) connector F-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is rear combination light (RH) connector F-03 in good condition?**

**YES :** Go to Step 21.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the turn-signal lights illuminate normally.

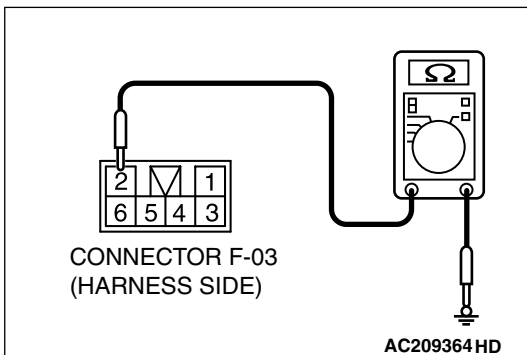
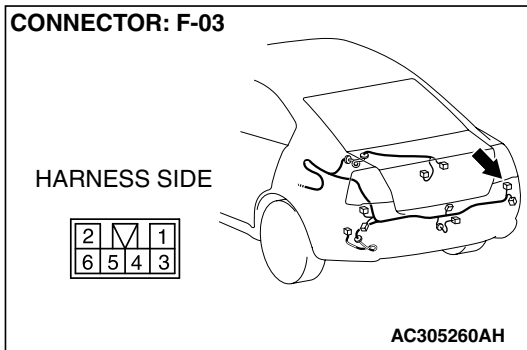
**STEP 21. Check the rear turn-signal light bulb (RH).**

- (1) Remove the rear turn-signal (RH) light bulb.
- (2) Verify that the rear turn-signal light bulb (RH) is not damaged or burned out.

**Q: Is the rear turn-signal (RH) light bulb in good condition?**

**YES :** Go to Step 22.

**NO :** Replace the rear turn-signal (RH) light bulb. Verify that the turn-signal lights illuminate normally.



**STEP 22. Check the ground circuit to the rear turn-signal light (RH). Measure the resistance at rear combination light (RH) connector F-03.**

(1) Disconnect rear combination light (RH) connector F-03 and measure the resistance available at the harness side of the connector.

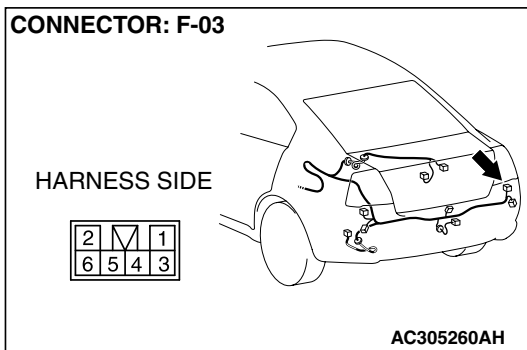
(2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 24.

**NO :** Go to Step 23.



**STEP 23. Check the wiring harness between rear combination light (RH) connector F-03 (terminal 2) and ground.**

**Q: Is the wiring harness between rear combination light (RH) connector F-03 (terminal 2) and ground in good condition?**

**YES :** Replace the rear combination light socket assembly (RH). Verify that the turn-signal lights illuminate normally.

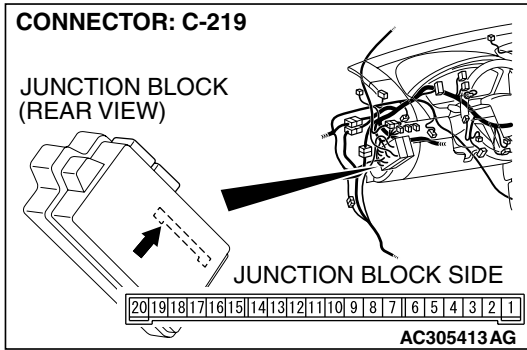
**NO :** The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the turn-signal lights illuminate normally.

**STEP 24. Check ETACS-ECU connector C-219 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

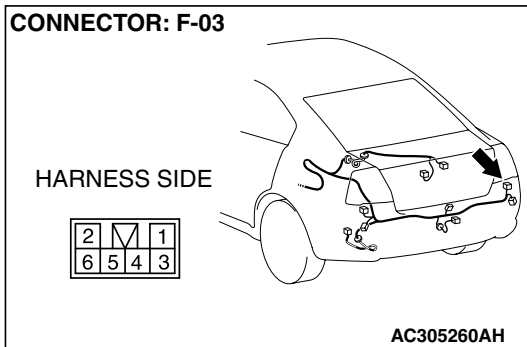
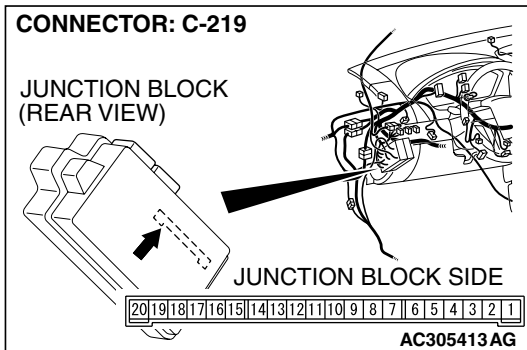
**Q: Is ETACS-ECU connector C-219 in good condition?**

**YES :** Go to Step 25.

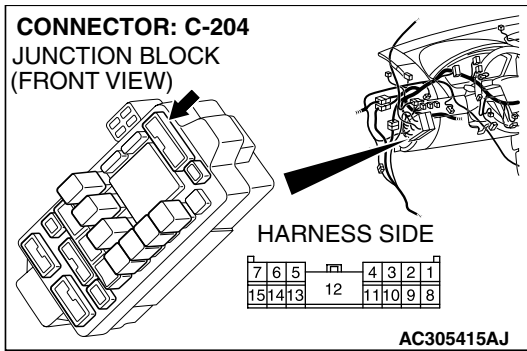
**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Verify that the turn-signal lights illuminate normally.



**STEP 25. Check the wiring harness between rear combination light (RH) connector F-03 (terminal 5) and ETACS-ECU connector C-219 (terminal 9).**







*NOTE: Also check junction block connector C-204 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-204 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 rear combination light (RH) connector F-03 (terminal 5) and ETACS-ECU connector C-219 (terminal 9) in good condition?**

**YES :** Replace the rear combination light socket assembly (RH). Verify that the turn-signal lights illuminate normally.

**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. Verify that the turn-signal lights illuminate normally.

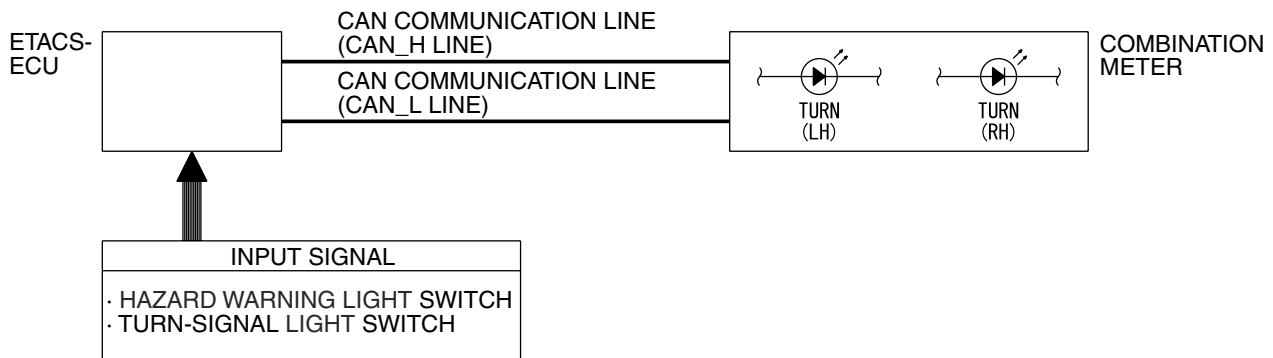
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**INSPECTION PROCEDURE I-4: The turn-signal light indicator does not illuminate normally.**

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*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

**Turn-signal Lights Indicator Light Circuit**



W4P54M82AA

**CIRCUIT OPERATION**

At the same time that the turn-signal lights are illuminated, the ETACS-ECU sends a signal to illuminate the turn-signal light indicator via the CAN bus line.

**TECHNICAL DESCRIPTION (COMMENT)**

If the turn-signal indicator does not illuminate normally, connector(s), wiring harness in the CAN bus lines, the ETACS-ECU or the combination meter may be defective.

**TROUBLESHOOTING HINTS**

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The combination meter may be defective
- The ETACS-ECU may be defective

**DIAGNOSIS****Required Special Tools:**

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

**STEP 1. Check the turn-signal lights.**

When the column switch or the hazard warning light switch are operated, check that the turn-signal lights illuminate and go off normally.

**Q: Are the turn-signal lights in good condition?**

**YES** : Go to Step 2.

**NO** : First, repair the turn-signal light(s). Refer to Inspection Procedure I-3 "One of the turn-signal lights does not illuminate P.54B-377."

**STEP 2. Using scan tool MB991958, diagnose the CAN bus line.****⚠ CAUTION**

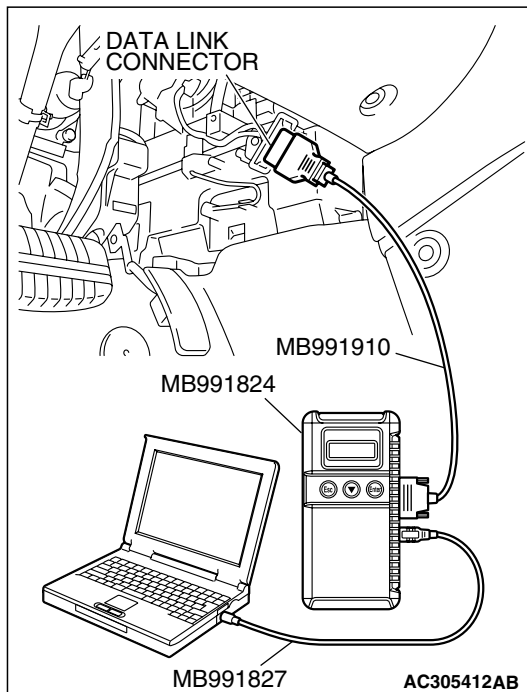
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

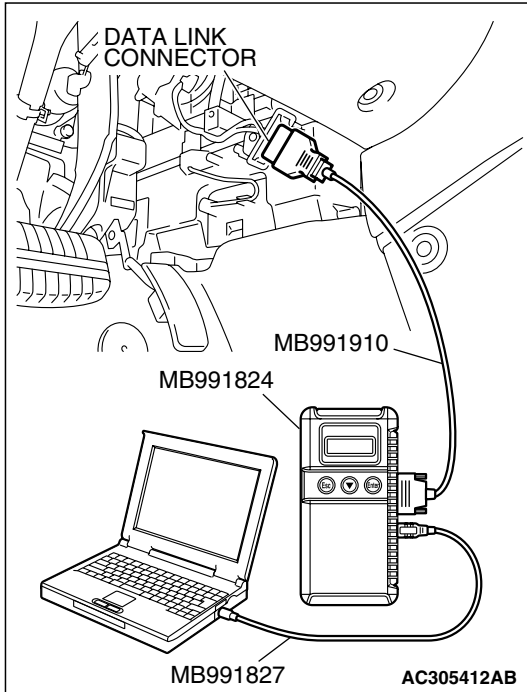
- (1) Connect scan tool MB991958. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the CAN bus line found to be normal?**

**YES** : Go to Step 3.

**NO** : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).





**STEP 3. Using scan tool MB991958, read the combination meter diagnostic trouble code.**

Check whether the combination meter-related DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check whether a combination meter-related DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the DTC set?**

**YES** : Diagnose the combination meter. Refer to [P.54A-52](#).

**NO** : Go to Step 4.

**STEP 4.** Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.

Check the ETACS-ECU.

**⚠ CAUTION**

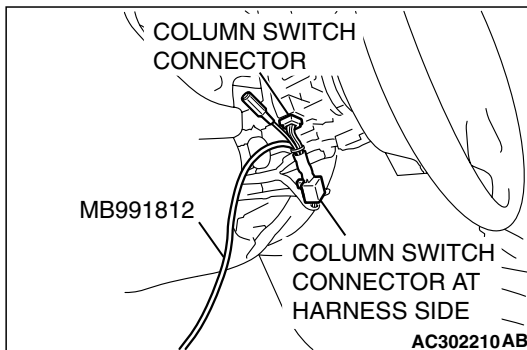
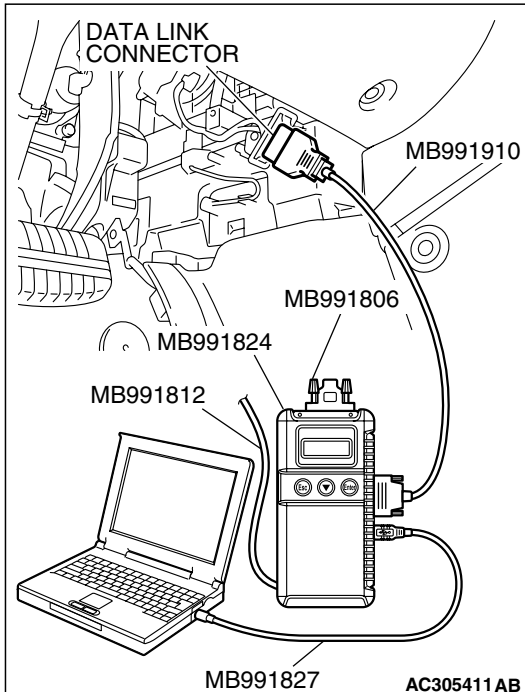
**Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.**

- (1) Connect the SWS monitor. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "ON" position.
- (3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM Check."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "ECU COMM Check."
- (4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menu for the "ETACS ECU" menu.

**Q: Is "OK" displayed for the "ETACS ECU" menu?**

**YES :** Go to Step 5.

**NO :** Refer to Inspection Procedure A-3 "Communication with the ETACS-ECU is not possible P.54B-78."



**STEP 5.** Replace the combination meter.

- (1) Replace the combination meter.
- (2) Check that the turn-signal light indicator lights illuminate normally.

**Q: Are the turn-signal indicator lights in good condition?**

**YES :** No action is necessary and testing is complete.

**NO :** Replace the ETACS-ECU. Check that the turn-signal light indicator lights illuminate normally.

## FOG LIGHT

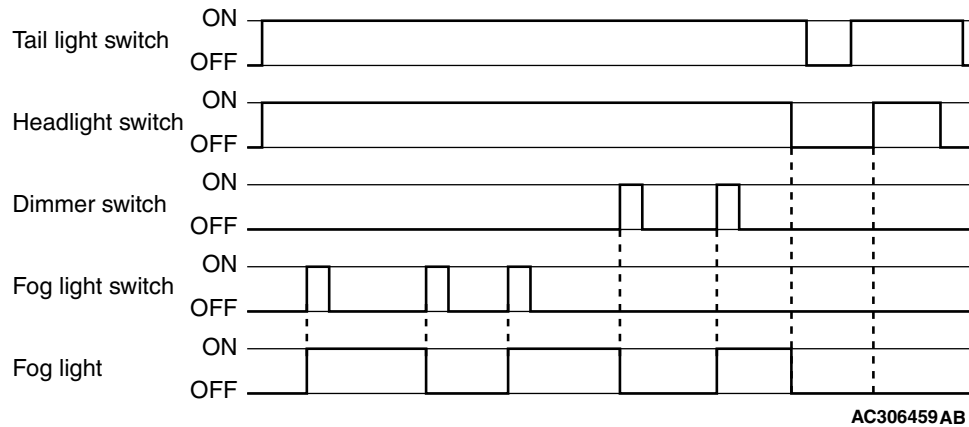
### GENERAL DESCRIPTION CONCERNING THE FOG LIGHTS

M1549021400216

The following ECUs affect the functions and control of the fog lights.

FUNCTION	CONTROL ECU
Fog light	ETACS-ECU, front-ECU, column switch
Fog light indicator	ETACS-ECU, column switch

#### Fog light



The fog lights will illuminate only when the fog light switch is operated while the low-beam headlights are on.

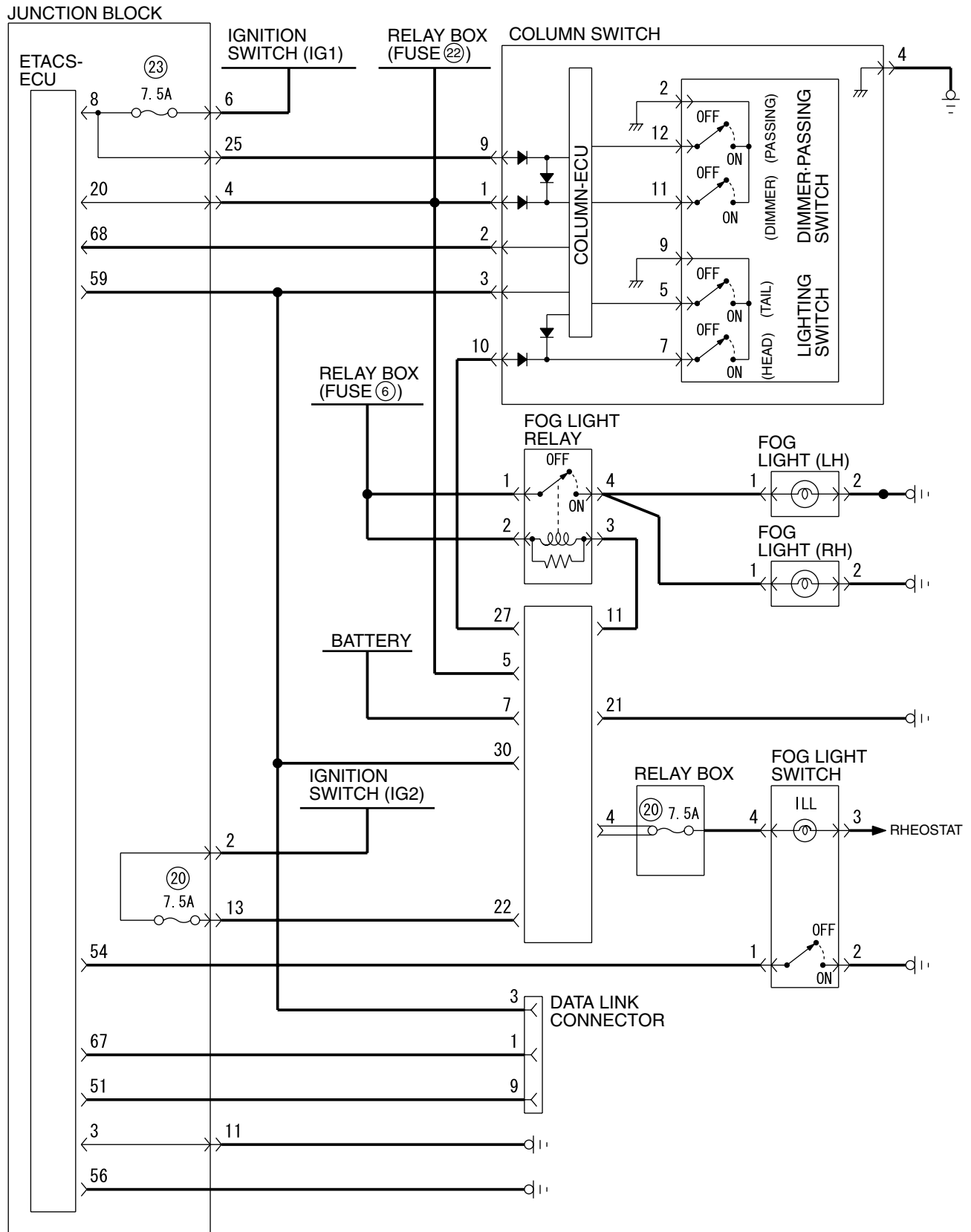
The fog lights will be switched off when any of the following conditions is met. The fog lights will also be switched off automatically by headlight automatic shutoff function.

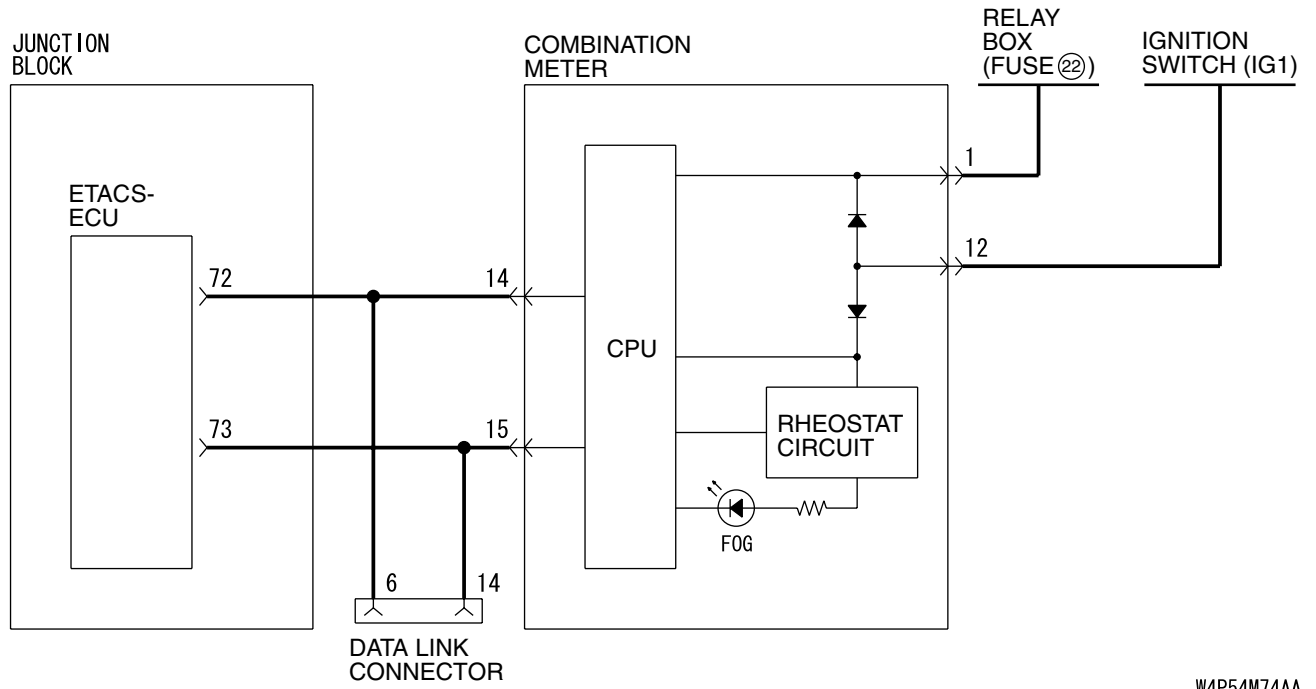
- When the high-beam headlights are switched on, the fog lights will be switched off. If the low-beam headlights are switched on again, the fog lights will illuminate again.
- When the headlight switch is turned off or the tail lights and headlights are off, the fog lights will be switched off. If the low-beam headlights are switched on again, the fog lights will not illuminate again.

#### Fog light indicator

At the same time that the fog lights are illuminated, the ETACS-ECU sends a signal to illuminate the fog light indicator via the CAN bus line. The combination meter receives the transmitted signal and turns the fog light indicator on and off.

General circuit diagram for the fog lights



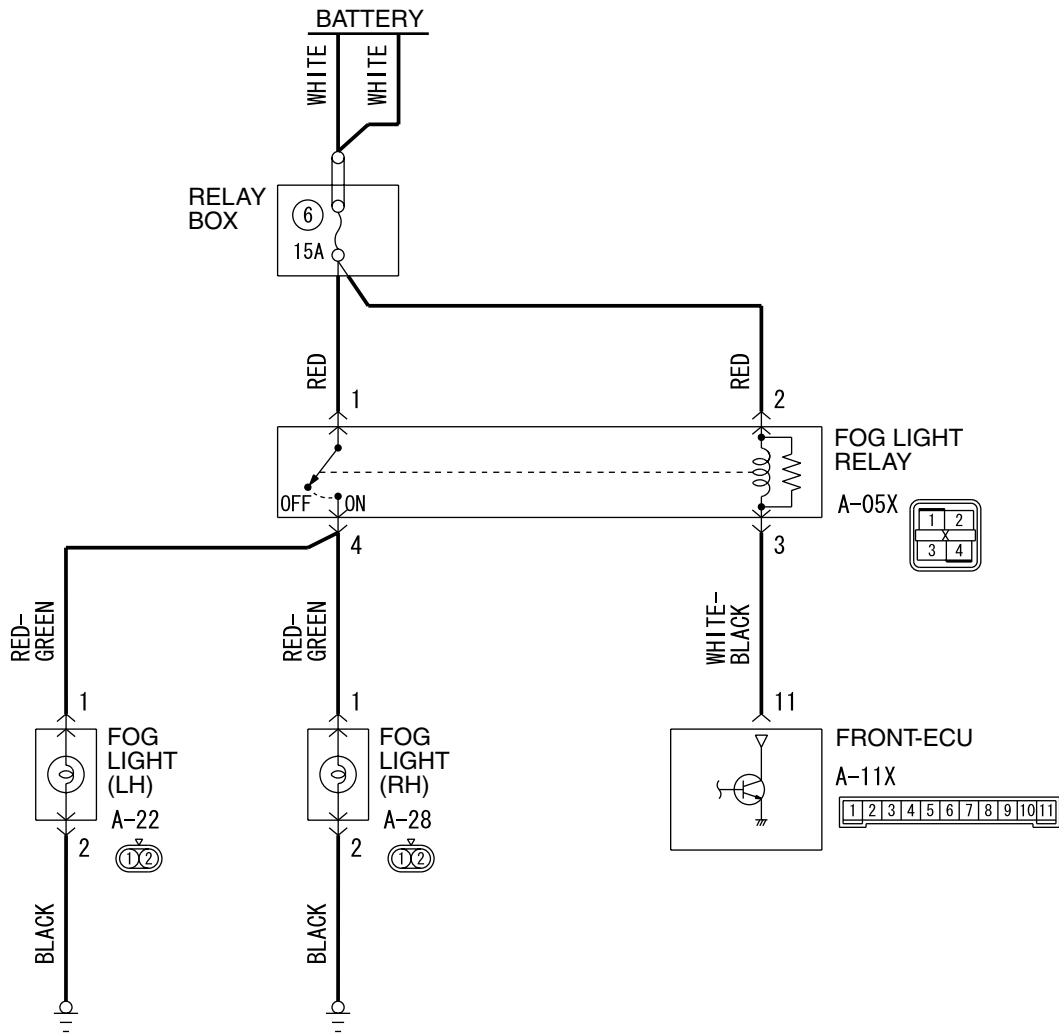


W4P54M74AA

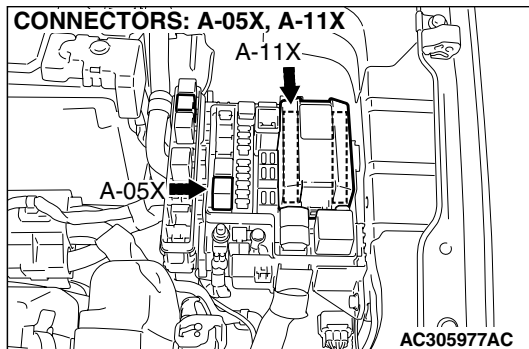
**INSPECTION PROCEDURE J-1 : Fog Light: Fog lights do not illuminate when the fog light switch is turned on.**

*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*

Fog Light Circuit



W4P54M75AA





## CIRCUIT OPERATION

- The ETACS-ECU sends a fog light illumination request signal ("LIGHT ON" signal) to the front-ECU when the fog light switch is turned on while the headlights are illuminating at low beam.
- Then the front-ECU switches on its relay to illuminate the fog lights.

## TECHNICAL DESCRIPTION (COMMENT)

If the headlights illuminate at low beam, the fog light relay, the fog light switch, the front-ECU or the ETACS-ECU may be defective.

## TROUBLESHOOTING HINTS

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The fog light relay may be defective
- The front-ECU may be defective
- The ETACS-ECU may be defective

## DIAGNOSIS

### Required Special Tools:

- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe Harness

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### STEP 1. Check the headlight (low-beam) operation.

#### Q: Do the headlights illuminate at low beam normally?

**YES** : Go to Step 2.

**NO** : Refer to Inspection Procedure H-2 "The headlights (low-beam) do not illuminate normally [P.54B-302](#)."

**STEP 2. Check the input signal by using "FUNCTION DIAG." menu of the SWS monitor.**

Set each switch to the following condition before checking input signal from the fog light switch:

- Ignition switch: ON
- Fog light switch: ON

*NOTE: Turn the ignition switch to the "ON" position in order to disable the headlight automatic shutdown function.*

**⚠ 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. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

- (1) Connect the special tool. Refer to "How to connect SWS monitor P.54B-13."
- (2) Operate scan tool MB991958 according to the procedure below to display "F.FOG."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "Function Diag."
  - f. Select "LIGHTING."
  - g. Select "F.FOG."
- (3) Check that normal conditions are displayed for the items described in the table below.

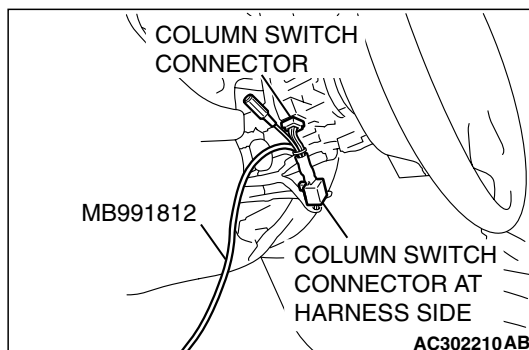
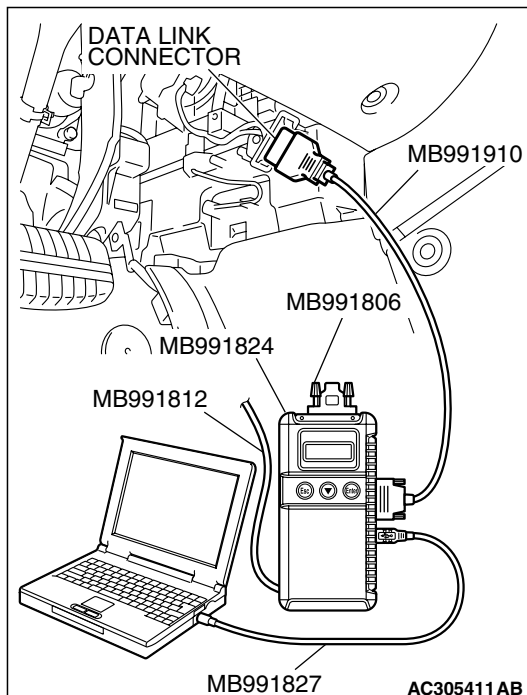
ITEM NO.	ITEM NAME	NORMAL CONDITION
ITEM 30	IG SW (IG1)	ON
ITEM 36	F.FOG LIGHT	ON

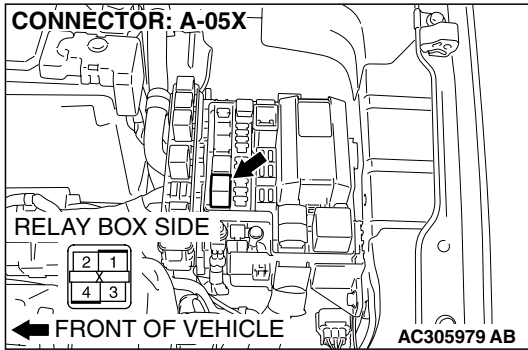
**Q: Does the scan tool MB991958 display the items "IG SW (IG1)" and "F.FOG LIGHT" as normal condition?**

**Normal conditions are displayed for all the items :** Go to Step 3.

**Normal condition is not displayed for "IG SW (IG1)" :**  
Refer to Inspection Procedure M-2 "ETACS-ECU does not receive any signal from the ignition switch (IG1) P.54B-470."

**Normal condition is not displayed for "F.FOG LIGHT" :**  
Refer to Inspection Procedure M-3 "ETACS-ECU does not receive any signal from the fog light switch P.54B-473."





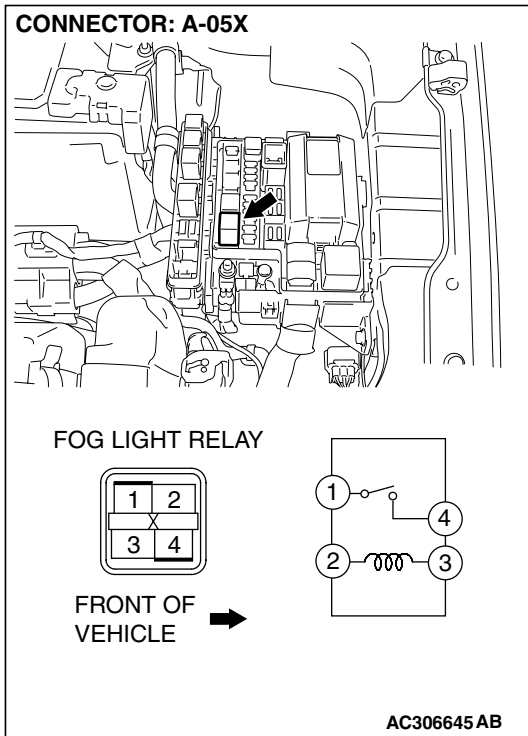
**STEP 3. Check fog light relay connector A-05X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is fog light relay connector A-05X in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Verify that the fog lights illuminate normally.



**STEP 4. Check the fog light relay.**

BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	1 – 4	Open circuit
<ul style="list-style-type: none"> <li>Connect terminal 2 to the positive battery terminal</li> <li>Connect terminal 3 to the negative battery terminal</li> </ul>	1 – 4	Less than 2 ohms

**Q: Is the fog light relay in good condition?**

**YES :** Go to Step 5.

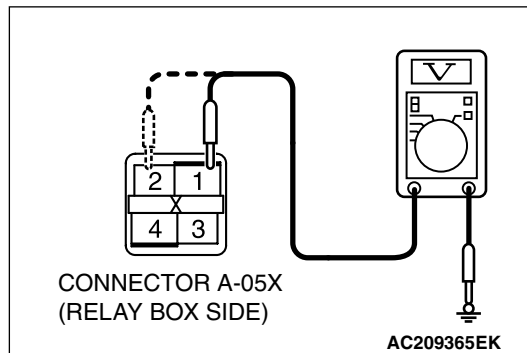
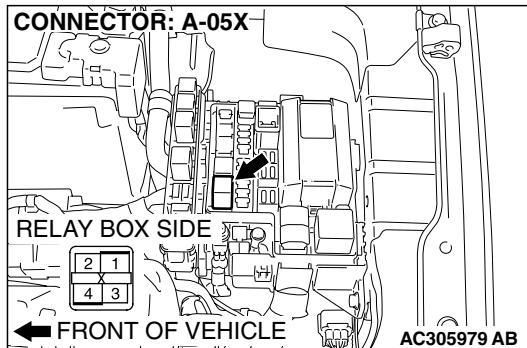
**NO :** Replace the fog light relay. Verify that the fog lights illuminate normally.

**STEP 5. Check the battery power supply circuit to the fog light relay. Measure the voltage at fog light relay connector A-05X.**

**⚠ CAUTION**

The top and bottom of the fog light relay are difficult to identify. Prior to inspection, confirm the triangle mark on the relay box.

(1) Disconnect fog light relay connector A-05X and measure the voltage available at the relay box side of the connector.



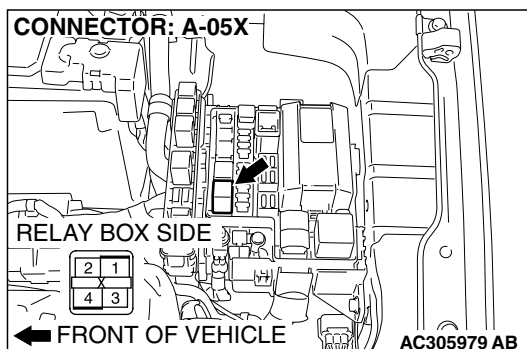
(2) Measure the voltage between terminal 1 and ground, and also between terminal 2 and ground.

- 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 7.

**NO :** Go to Step 6.

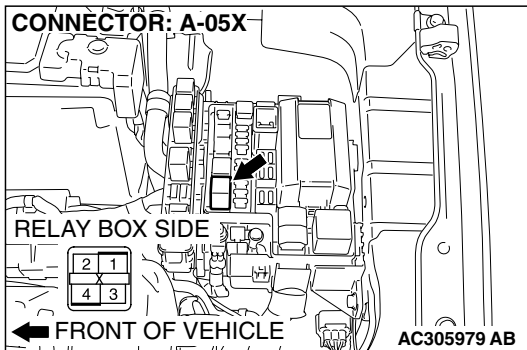


**STEP 6. Check the wiring harness between fog light relay connector A-05X (terminals 1 and 2) and the battery.**

**Q: Is the wiring harness between fog light relay connector A-05X (terminals 1 and 2) and the battery 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. Verify that the fog lights illuminate normally.

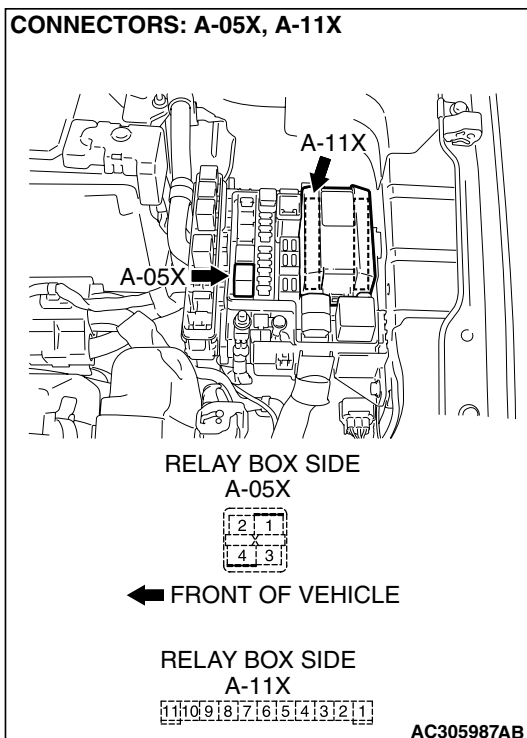


**STEP 7. Check front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is front-ECU connector A-11X 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. Verify that the fog lights illuminate normally.



**STEP 8. Check the wiring harness between fog light relay connector A-05X (terminal 3) and front-ECU connector A-11X (terminal 11).**

**Q: Is the wiring harness between fog light relay connector A-05X (terminal 3) and front-ECU connector A-11X (terminal 11) in good condition?**

**YES :** Go to Step 9.

**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. Verify that the fog lights illuminate normally.

**STEP 9. Replace the ECU.**

- (1) Replace the front-ECU.
- (2) The fog lights should illuminate normally.

**Q: Do the fog lights illuminate normally?**

**YES :** No action is necessary and testing is complete.

**NO :** Replace the ETACS-ECU. Verify that the fog lights illuminate normally.

**INSPECTION PROCEDURE J-2: Fog Light: Fog lights do not go out when the headlights (low-beam) are turned off while the fog lights are on.**

**TECHNICAL DESCRIPTION (COMMENT)**

If the trouble above occurs, the front-ECU may be defective.

**TROUBLESHOOTING HINT**

The front-ECU may be defective

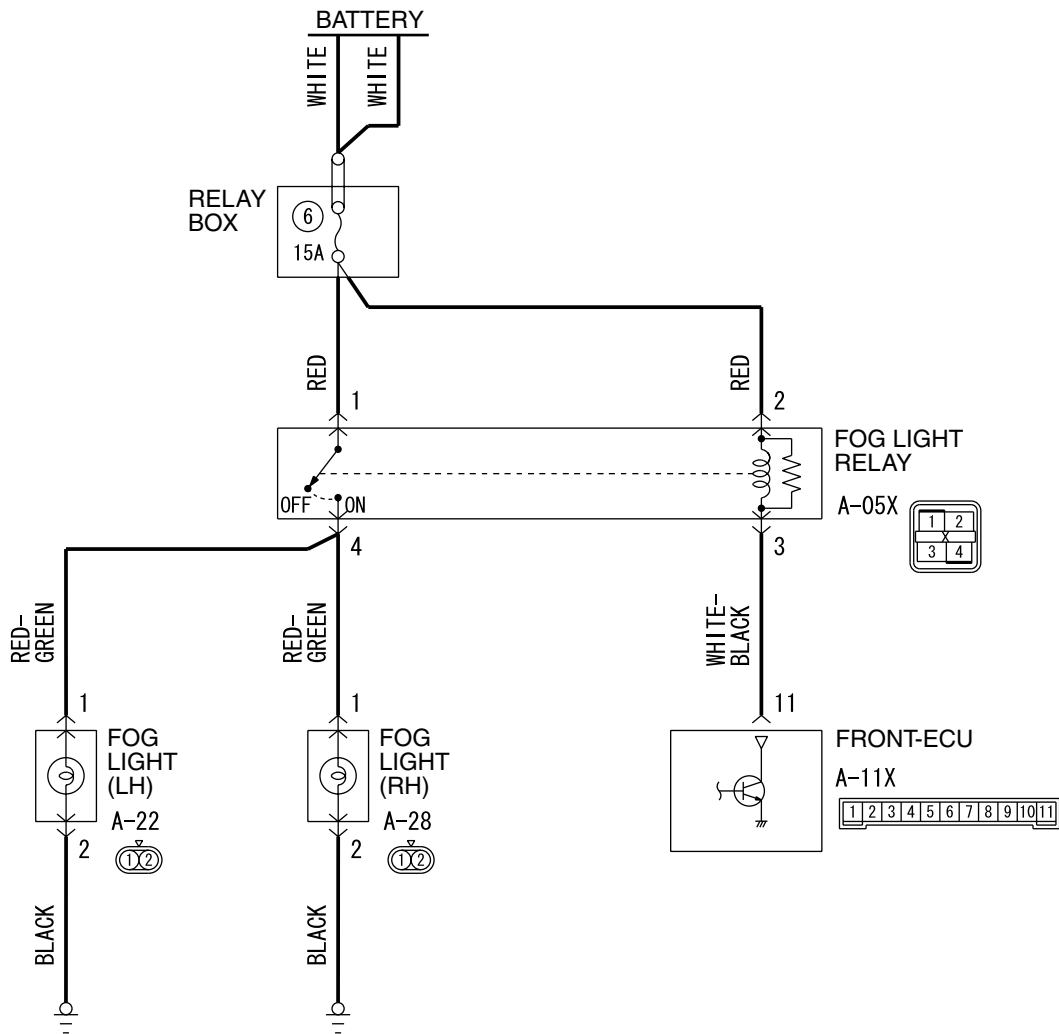
**DIAGNOSIS**

Replace the front-ECU.

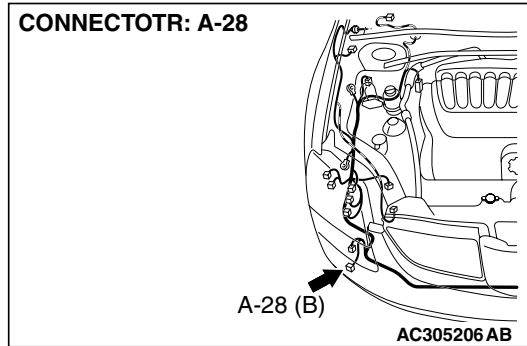
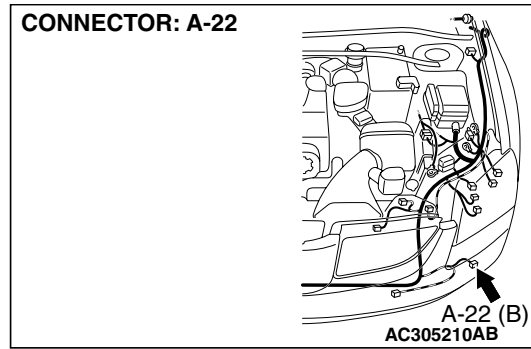
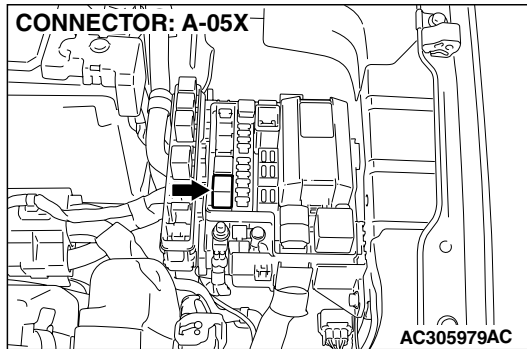
The fog lights should go out when the headlights (low-beam) are turned off while the fog lights are on.

**INSPECTION PROCEDURE J-3: Fog Light: One of the fog lights does not illuminate.**

Fog Light Circuit



W4P54M75AA



### TECHNICAL DESCRIPTION (COMMENT)

If one of the fog lights does not illuminate, the fog light relay or the fog light bulb may be defective. If the fog light indicator light does not illuminate, the combination meter may be defective.

### TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The fog light bulb may be defective

### DIAGNOSIS

#### Required Special Tool:

- MB991223: Harness Set

**STEP 1. Verify that the fog lights and the fog light indicator light illuminate.**

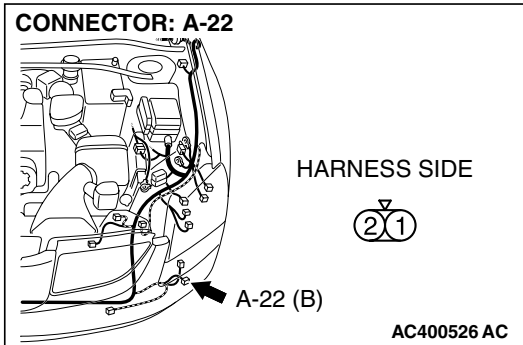
**Q: Do the fog lights and the fog light indicator light illuminate normally?**

**Only the fog light (LH) does not illuminate :** Go to Step 2.

**Only the fog light (RH) does not illuminate :** Go to Step 8.

**Only the fog light indicator does not illuminate :** Refer to Inspection Procedure J-4 "The fog light indicator does not illuminate normally [P. 54B-410.](#)"

**Both of the fog lights do not illuminate :** Refer to Inspection Procedure J-1 "Fog lights do not illuminate when the fog light switch is turned on [P. 54B-398.](#)"



**STEP 2. Check fog light (LH) connector A-22 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is fog light (LH) connector A-22 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 fog lights illuminate normally.

**STEP 3. Check the fog light bulb (LH).**

- (1) Remove the fog light bulb (LH).
- (2) Verify that the fog light bulb (LH) is not damaged or burned out.

**Q: Is the fog light bulb (LH) in good condition?**

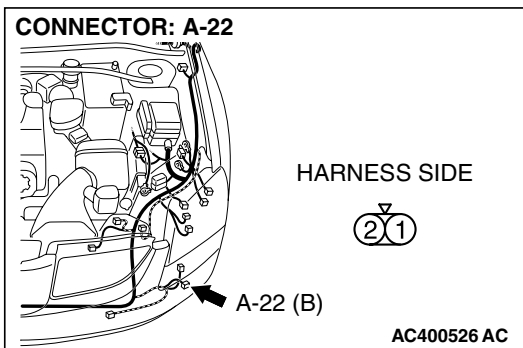
**YES :** Go to Step 4.

**NO :** Replace the fog light bulb (LH). Verify that the fog lights illuminate normally.

**STEP 4. Check the ground circuit to the fog light (LH).**

**Measure the resistance at fog light (LH) connector A-22.**

- (1) Disconnect fog light (LH) connector A-22 and measure the resistance available at the wiring harness side of the connector.



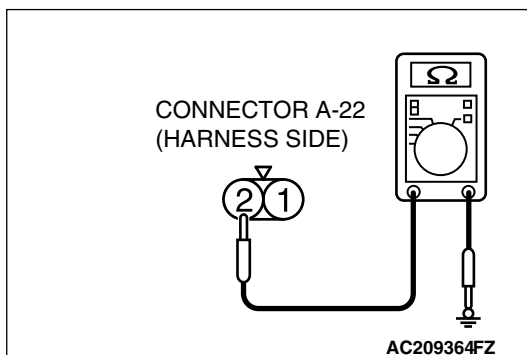
- (2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

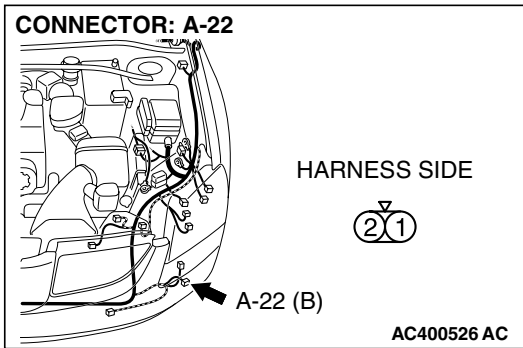
**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 6.

**NO :** Go to Step 5.





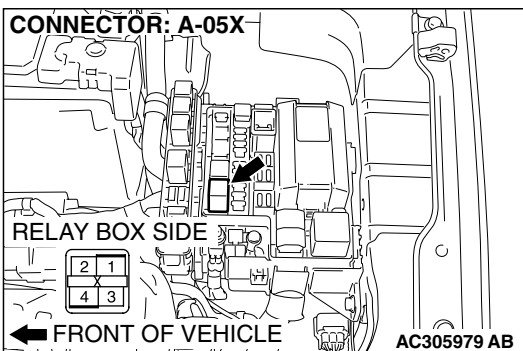


**STEP 5. Check the wiring harness between fog light (LH) connector A-22 (terminal 2) and ground.**

**Q: Is the wiring harness between fog light (LH) connector A-22 (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. Verify that the fog lights illuminate normally.

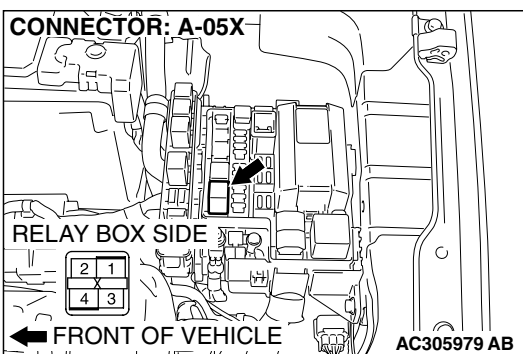


**STEP 6. Check fog light relay connector A-05X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is fog light relay connector A-05X in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the fog lights illuminate normally.

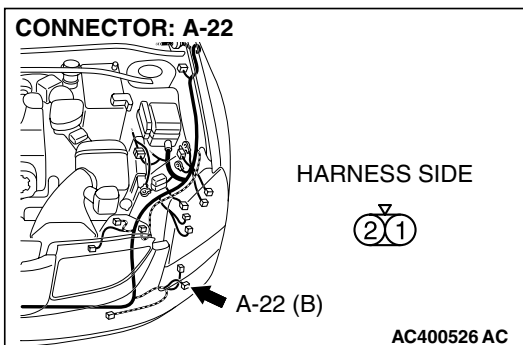


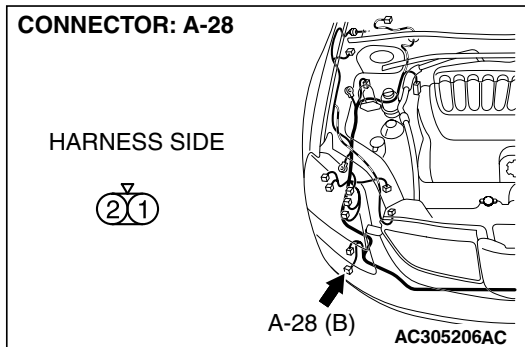
**STEP 7. Check the wiring harness between fog light relay connector A-05X (terminal 4) and fog light (LH) connector A-22 (terminal 1).**

**Q: Is the wiring harness between fog light relay connector A-05X (terminal 4) and fog light (LH) connector A-22 (terminal 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. Verify that the fog lights illuminate normally.





**STEP 8. Check fog light (RH) connector A-28 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is fog light (RH) connector A-28 in good condition?**

**YES :** Go to Step 9.

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

**STEP 9. Check the fog light bulb (RH).**

- (1) Remove the fog light bulb (RH).
- (2) Verify that the fog light bulb (RH) is not damaged or burned out.

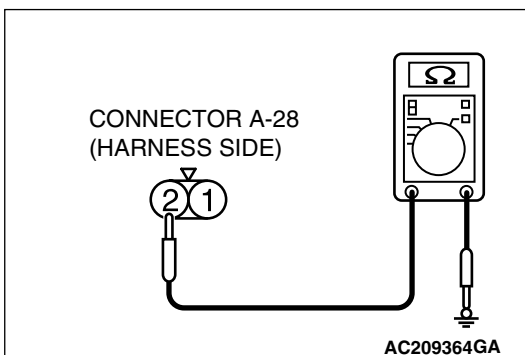
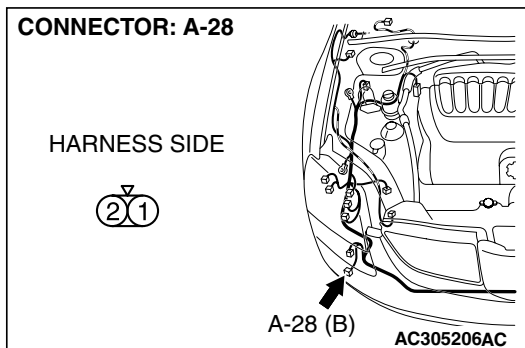
**Q: Is the fog light bulb (RH) in good condition?**

**YES :** Go to Step 10.

**NO :** Replace the fog light bulb (RH). Verify that the fog lights illuminate normally.

**STEP 10. Check the ground circuit to the fog light (RH). Measure the resistance at fog light (RH) connector A-28.**

- (1) Disconnect fog light (RH) connector A-28 and measure the resistance available at the wiring harness side of the connector.



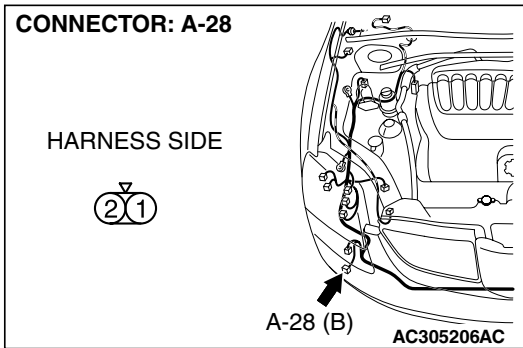
- (2) Measure the resistance value between terminal 2 and ground.

- The resistance should be 2 ohms or less.

**Q: Is the measured resistance 2 ohms or less?**

**YES :** Go to Step 12.

**NO :** Go to Step 11.

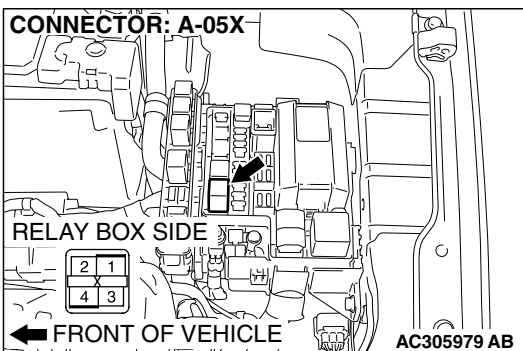


**STEP 11. Check the wiring harness between fog light (RH) connector A-28 (terminal 2) and ground.**

**Q: Is the wiring harness between fog light (RH) connector A-28 (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. Verify that the fog lights illuminate normally.

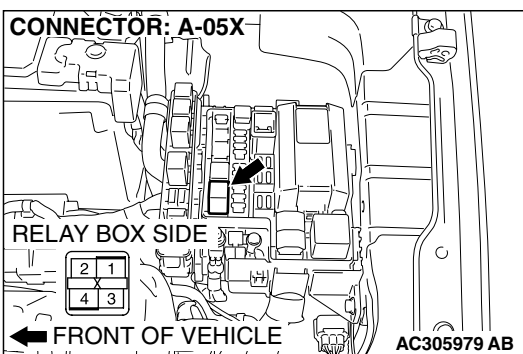


**STEP 12. Check fog light relay connector A-05X for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**Q: Is fog light relay connector A-05X in good condition?**

**YES :** Go to Step 13.

**NO :** Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the fog lights illuminate normally.

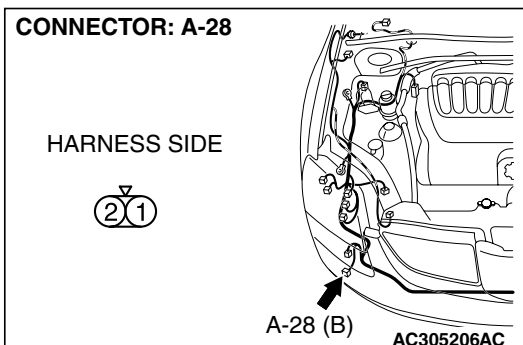


**STEP 13. Check the wiring harness between fog light relay connector A-05X (terminal 4) and fog light (RH) connector A-28 (terminal 1).**

**Q: Is the wiring harness between fog light relay connector A-05X (terminal 4) and fog light (RH) connector A-28 (terminal 1) in good condition?**

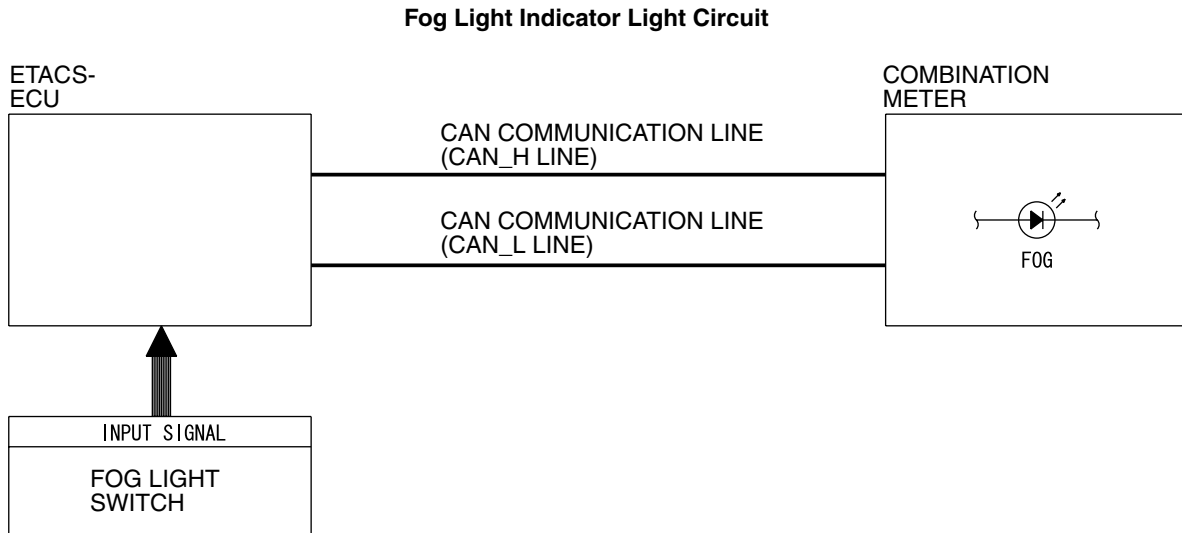
**YES :** No action is necessary and testing is complete.

**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. Verify that the fog lights illuminate normally.



**INSPECTION PROCEDURE J-4: The fog light indicator does not illuminate normally.**

*NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."*



W4P54M76AA

**CIRCUIT OPERATION**

At the same time that the fog lights are illuminated, the ETACS-ECU sends a signal to illuminate the fog light indicator via the CAN bus line.

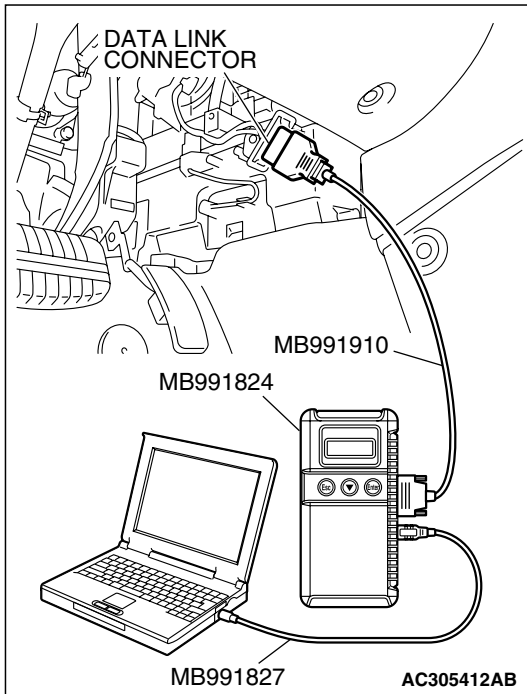
**TECHNICAL DESCRIPTION (COMMENT)**

If the fog light indicator does not illuminate normally, connector(s), wiring harness in the CAN bus lines, the ETACS-ECU or the combination meter may be defective.

**TROUBLESHOOTING HINTS**

- Trouble in input signal system
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The combination meter may be defective
- The ETACS-ECU may be defective



**STEP 3. Using scan tool MB991958, read the combination meter diagnostic trouble code.**

- (1) Check whether a combination meter-related DTC is set.
- (2) Turn the ignition switch to the "ON" position.  
Check whether the combination meter-related DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

**Q: Is the DTC set?**

**YES** : Diagnose the combination meter. Refer to [P.54A-52](#).

**NO** : Go to Step 4.

**STEP 4. Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.**

Check the ETACS-ECU.

**⚠ CAUTION**

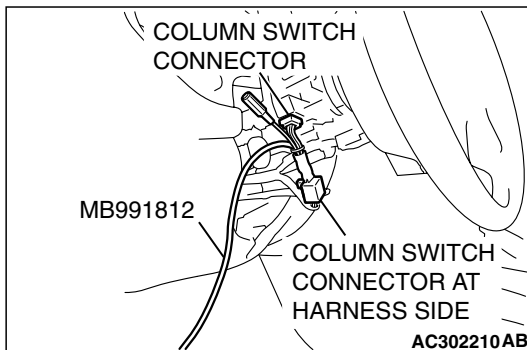
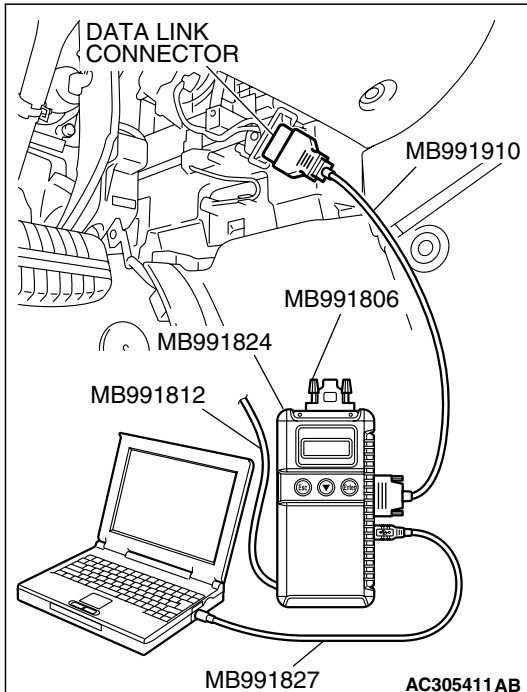
**Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.**

- (1) Connect the SWS monitor. Refer to "How to connect SWS monitor P.54B-13."
- (2) Turn the ignition switch to the "ON" position.
- (3) Operate scan tool MB991958 according to the procedure below to display "ECU COMM Check."
  - a. Select "Interactive Diagnosis."
  - b. Select "System select."
  - c. Select "SWS."
  - d. Select "SWS MONITOR."
  - e. Select "ECU COMM Check."
- (4) Scan tool MB991958 should show "OK" on the "ECU COMM Check" menu for the "ETACS ECU" menu.

**Q: Is "OK" displayed for the "ETACS ECU" menu?**

**YES :** Go to Step 5.

**NO :** Refer to Inspection Procedure A-3 "Communication with the ETACS-ECU is not possible P.54B-78."



**STEP 5. Replace the combination meter.**

- (1) Replace the combination meter.
- (2) Check that the fog light indicator light illuminates normally.

**Q: Is the fog light indicator light operating properly?**

**YES :** No action is necessary and testing is complete.

**NO :** Replace the ETACS-ECU. Check that the fog light indicator light illuminates normally.

**NEXT>>**