

SERVICE BULLETIN

DOMESTIC SALES & AFTER SALES SERVICE OFFICE, MITSUBISHI MOTORS CORPORATION

PURPOSE : INFORMATION	ISSUE NO. : MSB-09E54_80_90-001	DATE : 2009-10-20
SUBJECT : HANDS-FREE MODULE FOR 2010 OUTLANDER	<div> <div><MODEL></div> <div>(EUR/RUSSIA)</div> <div>OUTLANDER</div> <div>(GS45X)(CW0W)</div> </div> <div> <div><M/Y></div> <div>10</div> </div>	
GROUP : CHASSIS ELECTRICAL/CONFIGURATION DIAGRAMS/ CIRCUIT DIAGRAMS		

1. Description:

This Service Bulletin contains the information regarding the changes and additions due to the adoption of newly-developed hands-free module + USB for Russia.

2. Applicable Manuals:

<EUR>

Manual	Pub. No.	Title	Attached Sheet
2010 OUTLANDER Workshop Manual	CGXE10E1-CD CGXF10E1-CD CGXG10E1-CD CGXS10E1-CD CGXI10E1-CD	G.54A-Chassis Electrical	Attached sheet 227-254
		G.54C-Controller Area Network	Attached sheet 255-287
		G.80-Configuration Diagrams	Attached sheet 288-293
		G.90-Circuit Diagrams	Attached sheet 294-310

<RUSSIA>

Underneath Manual	Underneath Pub. No.	Title	Attached Sheet
2010 OUTLANDER Workshop Manual	N/A	G.54A-Chassis Electrical	Attached sheet 227-254
		G.54C-Controller Area Network	Attached sheet 255-287
		G.80-Configuration Diagrams	Attached sheet 288-293
		G.90-Circuit Diagrams	Attached sheet 294-310

There may be some attached sheets not included in this Service Bulletin because they are not applicable to your market. Their sheet numbers are not listed in the above table.

3. Effective Date:

From early October, 2009

4. Details:

See Attached sheets 227 to 310.

GROUP 54A

CHASSIS

ELECTRICAL

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CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>HANDS FREE ECU <VEHICLES WITH BLUETOOTH
FUNCTION/USB ADAPTER>

GENERAL INFORMATION

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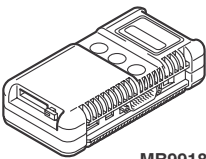

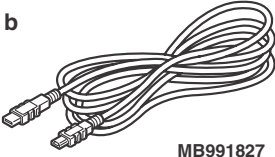
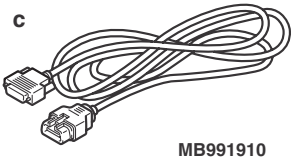
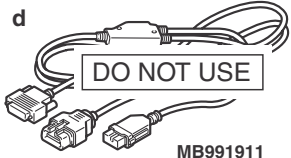
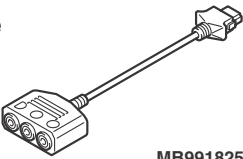
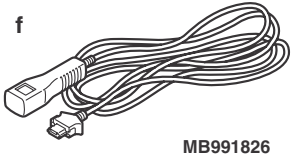
OUTLINE OF CHANGE

For vehicles with audio unit for Russia, due to the adoption of USB adapter-compatible hands free-ECU, the following service procedure has been established. The USB adapter-compatible hands free-ECU does not communicate in the CAN-B line

compared to the USB adapter not-supported hands free-ECU. Thus, the data cannot be retrieved by M.U.T.-III, but the error display and connection status of hands free-ECU can be displayed on the diagnosis mode by the communication with audio unit. The service procedures for vehicles with USB adapter not-supported hands free-ECU are the same as before.


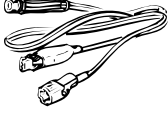
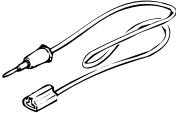
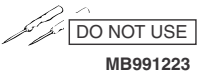
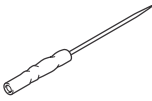
SPECIAL TOOLS

M1544403500124

Tool	Number	Name	Use
 MB991824	MB991955 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991825 f. MB991826	M.U.T.-III sub-assembly a. Vehicle Communication Interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III measure adapter f. M.U.T.-III trigger harness	<div>  CAUTION </div> <p>For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.</p> <p>CAN bus diagnostics, diagnosis code or service data check.</p>
 MB991827			
 MB991910			
 MB991911			
 MB991825			
 MB991826 MB991955			

CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

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Tool	Number	Name	Use
    MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222	Harness set a. Check harness b. LED harness c. LED harness adapter d. Probe	Continuity check and voltage measurement at harness wire or connector a. For checking connector pin contact pressure b. For checking power supply circuit c. For checking power supply circuit d. For connecting a locally sourced tester
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

TROUBLESHOOTING**INTRODUCTION TO DIAGNOSIS**

M1544404500053

Prior to the troubleshooting, check if the causes below can be the case. If any, take actions according to the solution method.

Pairing of the Bluetooth device (mobile phone or music player) and hands free ECU cannot be made.
The hands free ECU does not recognize the Bluetooth device (mobile phone or music player)

Cause	SOLUTION
The power of the device is off.	With the power of the cellular phone turned on, check the trouble symptom again.
In addition to the cellular phone to be recognized, two or more Bluetooth device (mobile phone or music player) exist in the vehicle.	With the voice operation, select the device to be connected.
Power supply abnormality in the hands free ECU, or communication error between the audio unit, and hands free ECU.	Turn the ignition switch to the "ON" position and check if iPod connected to the USB adapter or USB device can be played. If the music cannot be played, the power supply of hands free ECU or the communication between the audio unit, and Hands free ECU may have a problem. Perform the Inspection procedure 2: The USB adapter data cannot be replayed. (Refer to P.54A-12.) If the diagnosis mode of hands free ECU can be made an entry, the ECU status can be checked by the hands free ECU self-check, however, if the power supply of hands free ECU, or the communication with the audio unit may have a problem, the ECU status cannot be checked.(Refer to P.54A-5.)

54A-4**CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>**

Calling cannot be made using the hands free cellular phone function.

Bluetooth The music player cannot be replayed.

The music data received from the USB adapter cannot be replayed.

Cause	SOLUTION
The Bluetooth connection is not made between the hands free ECU and Bluetooth device.	Connect the Bluetooth device to the hands free ECU via Bluetooth .
The vehicle is not located in the communication area of the cellular phone.	Check the radio wave condition of the mobile phone shown on the display, or check the radio wave condition shown on the mobile phone itself.
AUDIO communication error between the hands free ECU and the audio unit.	Check if the data of music file sent to the hands free ECU can be replayed. If there are no problems, the communication between the hands free ECU and the audio unit may have a problem.

The voice recognition operation cannot be performed.

The communication voice cannot be heard by the other party.

Cause	SOLUTION
During the conversation, the microphone unit is set to mute.	During the conversation, press the speech switch and set to mute off by voice recognition. Perform Inspection Procedure 3: When the speech switch is pressed, the voice information is output, but the voice recognition is not performed. (Refer to P.54A-13.)
The hands free ECU cannot recognize the speech voice because of noise or others.	Minimize the noise by turning off the A/C, closing the window, and stopping the engine, and then clearly speak up near the microphone unit . Or, customize the voice recognition using the speaker enrolment function.
The microphone unit , or the connection has a problem.	The microphone unit may have a problem. Perform Inspection Procedure 3: "When the speech switch is pressed, the voice information is output, but the voice recognition is not performed." (Refer to P.54A-13.) The connection with the microphone unit can be checked by the microphone check result on the diagnosis mode. (Refer to P.54A-5.)
The speech switch, or the connection has a problem.	If the voice information is not output when the speech switch is operated, the steering wheel voice control switch has a problem. Perform the Inspection Procedure 4: When the speech switch is pressed, the voice information is not output. (Refer to P.54A-15.)

A call cannot be received when the pick-up switch (Steering wheel voice control switch) is pressed.

The voice information cannot be output from the speaker.

Cause	SOLUTION
The Bluetooth connection is not made between the hands free ECU and cellular phone.	Connect the cellular phone to the hands free ECU via Bluetooth .
The pick-up switch (Steering wheel voice control switch), or the connection has a problem.	If the voice information is not output when the speech switch is operated, the steering wheel voice control switch has a problem. Perform the Inspection Procedure 4: When the speech switch is pressed, the voice information is not output. (Refer to P.54A-15.)

CHASSIS ELECTRICAL

HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

54A-5

Voice guide "Unable to obtain vehicle speed. Please try again or contact your dealer for service" is sent from the speaker.

Cause	SOLUTION
The hands free-ECU cannot receive the vehicle speed signal from the audio unit.	If the vehicle speed signal the hands free-ECU receives has a problem, the vehicle speed signal of audio unit or the hands free-ECU may have a problem. Perform the Inspection Procedure 7: Voice guide "Unable to obtain vehicle speed. Please try again or contact your dealer for service" is sent from the speaker. (Refer to P.54A-21.)

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

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Refer to GROUP 00 – Contents of Troubleshooting.

DIAGNOSIS MODE <VEHICLES WITH AUDIO UNIT>

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Enter the diagnosis mode according to the following steps:

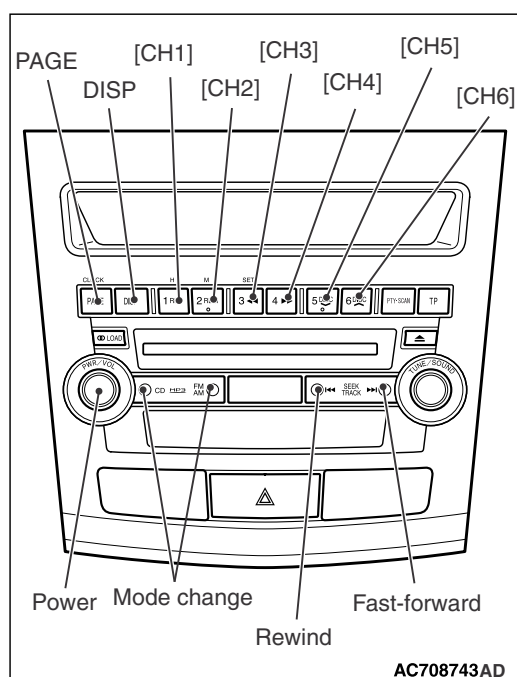
1. Turn the Ignition switch to the "ACC" or "ON" position and switch off the audio unit.

2. Press the following buttons in that order within sixty seconds from step (1).

- (1) [CH1] button.
- (2) Rewind button.
- (3) Fast-forward button.
- (4) [CH4] button.

NOTE:

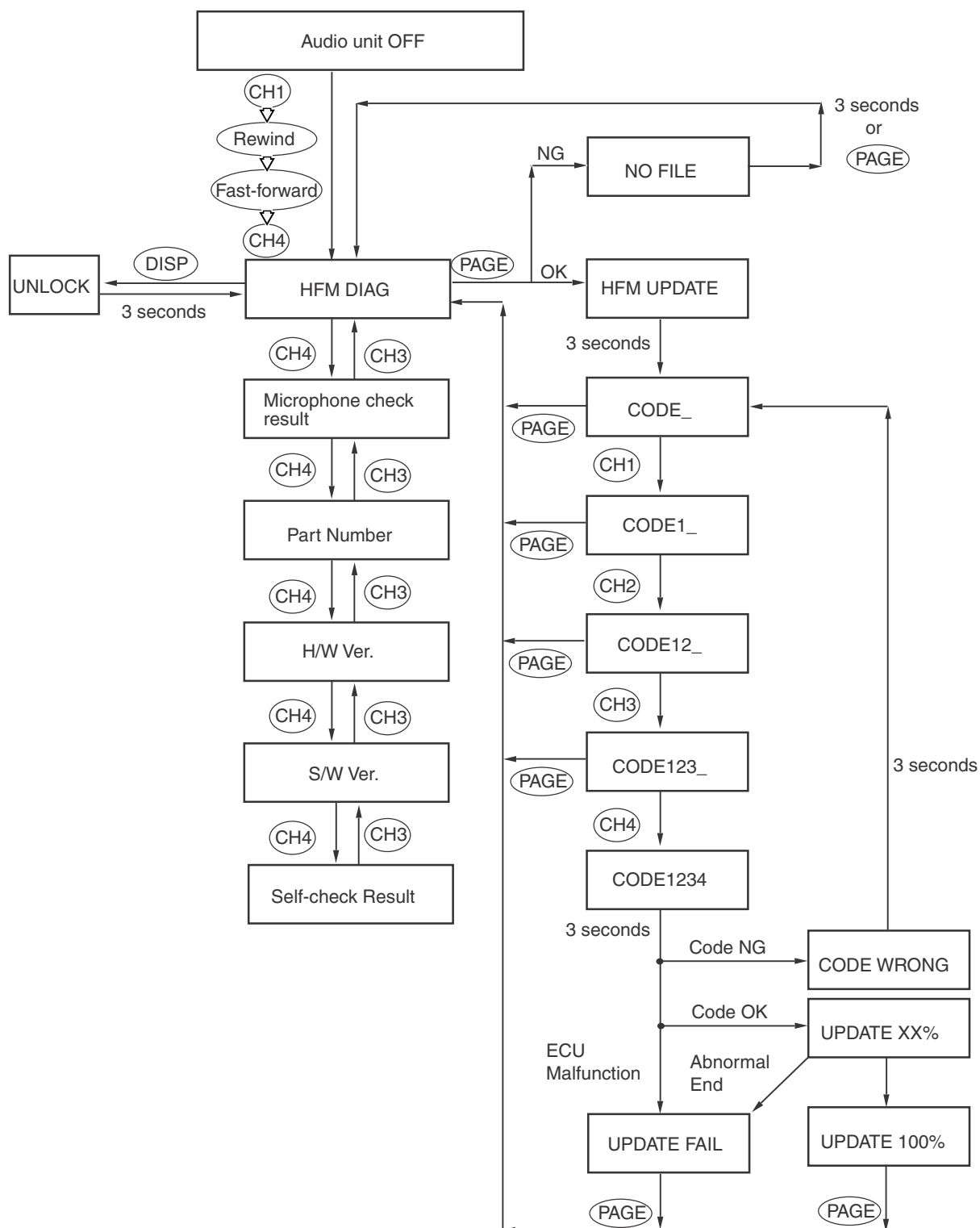
- When the "Power" button of the audio unit is pressed during the diagnosis mode, the diagnosis mode will be cancelled, thus switching off the audio unit. However, if the "Power" button is pressed while the hands free ECU is being updated, the update will not be cancelled.
- When the "Mode change" button (FM/AM, CD) is pressed during diagnosis mode except the hands free ECU update, the diagnosis mode will be cancelled and relevant operation will be carried out.
- When an invalid button is pressed during diagnosis mode except the hands free ECU update, the diagnosis mode will be cancelled, thus switching off the audio unit.
- During the diagnosis mode, voice which is input through the microphone unit is played through a relevant loudspeaker.



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CHASSIS ELECTRICAL

HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>



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CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

54A-7

Description in the illustrations	Actual display	Condition
UNLOCK	UNLOCK	Four-digit password, which has been set by the security function, will be erased.
HFM DIAG	HFM DIAG	Displayed when the diagnosis mode is being entered.
Result of microphone check	MIC SHORT	Displayed when the line between the microphone and the hands free ECU is short-circuited.
	MIC OPEN	Displayed when the line between the microphone and the hands free ECU is open-circuited.
	MIC OK	Normal status (the line between the microphone and the hands free ECU is not open/short-circuited)
Part number	PN XXXXXXXX	Eight-digit part number is displayed.
H/W Ver.	H/W XX	Two-digit hardware version is displayed.
S/W Ver.	S/W XXXXXXXX	Seven-digit software version is displayed.
Self-check result	HFM OK	Displayed when the hands free ECU is not defective.
	HFM ERROR	Displayed when the hands free ECU is suspected to be defective. <i>NOTE: Turn the ignition switch to the "OFF" position once when "ERROR" is displayed. Enter the diagnosis mode by turning the ignition switch to the "ON" position again. If the self-check result shows "ERROR" again, the hands free ECU is determined to be defective.</i>
NO FILE	NO FILE	A USB device stores no data.
HFM UPDATE	HFM UPDATE	Displayed when the hands-free ECU enters the update mode.
CODE_	CODE_	Input four-digit code for update. Use the "CH" button when a code is input.
CODE1_	CODE1_	When the "CH1" button is pressed once.
CODE12_	CODE12_	When the "CH1" and "CH2" buttons are pressed in that order.
CODE123_	CODE123_	When the "CH1", "CH2" and "CH3" buttons are pressed in that order.
CODE1234	CODE1234	When the "CH1", "CH2", "CH3" and "CH4" buttons are pressed in that order.
CODE WRONG	CODE WRONG	The code, which has been input, is wrong.
UPDATING XX%	UPDATING XX%	Displayed when updating is carried out.
UPDATING 100%	UPDATING 100%	The updating mode is complete.
UPDATE FAIL	UPDATE FAIL	Displayed when the update of the hands free ECU fails.

54A-8**CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>****TROUBLE SYMPTOM CHART**

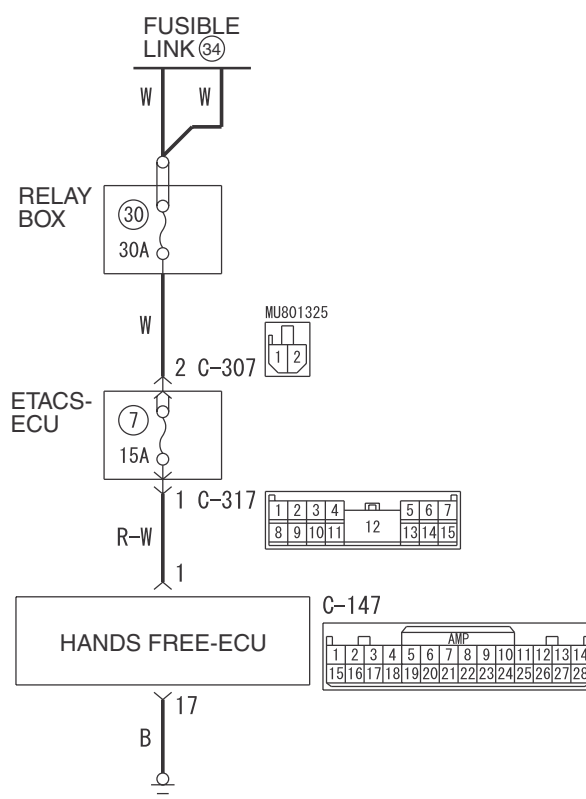
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NOTE: Some Bluetooth devices may not be compatible with the hands free ECU

Inspection Procedure No.	Trouble symptom	Reference page
1	Check the hands free-ECU power supply circuit.	P.54A-9
2	The USB adapter data cannot be replayed.	P.54A-12
3	When the speech switch is pressed, the voice information is output, but the voice recognition is not performed.	P.54A-13
4	When the speech switch is pressed, the voice information is not output.	P.54A-15
5	Diagnosis mode cannot be made an entry.	P.54A-17
6	Steering wheel voice control switch illumination does not come on.	P.54A-19
7	Voice guide "Unable to obtain vehicle speed. Please try again or contact your dealer for service" is sent from the speaker.	P.54A-21

SYMPTOM PROCEDURES**Inspection Procedure 1: Check the hands free ECU power supply circuit.****CAUTION**

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

Hands Free-ECU Power Source Circuit

Wire colour code

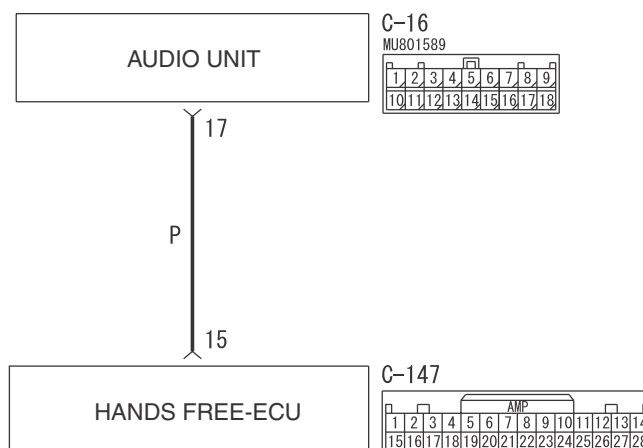
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver WAG54E110A

54A-10

CHASSIS ELECTRICAL

HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

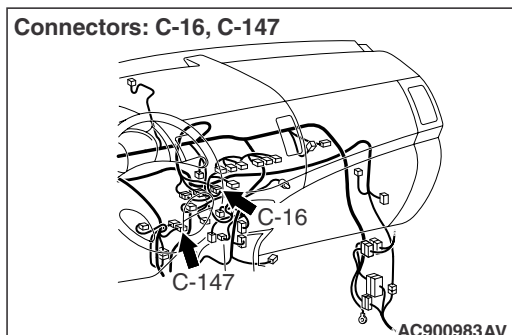
Hands Free-ECU Communication Circuit



Wire colour code

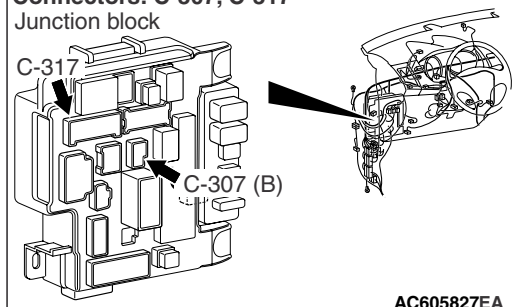
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver WAG54E111A

Connectors: C-16, C-147



Connectors: C-307, C-317

Junction block



CIRCUIT OPERATION

- The power supply to the hands free ECU is provided by the fusible link (34).
- The ACC signal is received C-147 hands free ECU connector terminal No.15 from C-16 audio unit connector terminal No.17.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of the hands free ECU
- Malfunction of the audio unit

DIAGNOSIS PROCEDURE

STEP 1. Connector check: C-147 hands free ECU connector

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the defective connector.

STEP 2. Resistance measurement at C-147 hands free ECU connector.

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Check the continuity between terminal 17 and earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to Step 3.

STEP 3. Check the wiring harness between C-147 hands free ECU connector terminal No.17 and body earth.

- Check the body earth wires for open circuit.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

NO : Repair the wiring harness.

CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

54A-11

STEP 4. Voltage measurement at C-147 hands free ECU connector.

- (1) Disconnect C-147 hands free ECU connector, and measure at the wiring harness side.
- (2) Measure the voltage between terminal No.1 and body earth.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 6.

NO : Go to Step 5.

STEP 5. Check the wiring harness between C-147 hands free ECU connector terminal No.1 and fusible link (34).

- Check the power supply line for open circuit and short circuit.

NOTE: Prior to the wiring harness inspection, check C-307, C-317 ETACS-ECU connector, and repair if necessary.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

NO : Repair the wiring harness.

STEP 6. Voltage measurement at C-147 hands free ECU connector.

- (1) Disconnect C-147 hands free ECU connector, and measure at the wiring harness side.
- (2) Turn the ignition switch to "ACC" position.
- (3) Measure the voltage between terminal No.15 and body earth.

OK: System voltage

Q: Is the check result normal?

YES : Replace the hands free ECU.

NO : Go to Step 7.

STEP 7. Check the harness wire between C-16 audio unit connector terminal No.17 and C-147 hands free ECU connector terminal No.15.

- Check the signal line for open circuit and short circuit.

Q: Is the check result normal?

YES : Replace the audio unit.

NO : Repair the wiring harness.

54A-12

CHASSIS ELECTRICAL

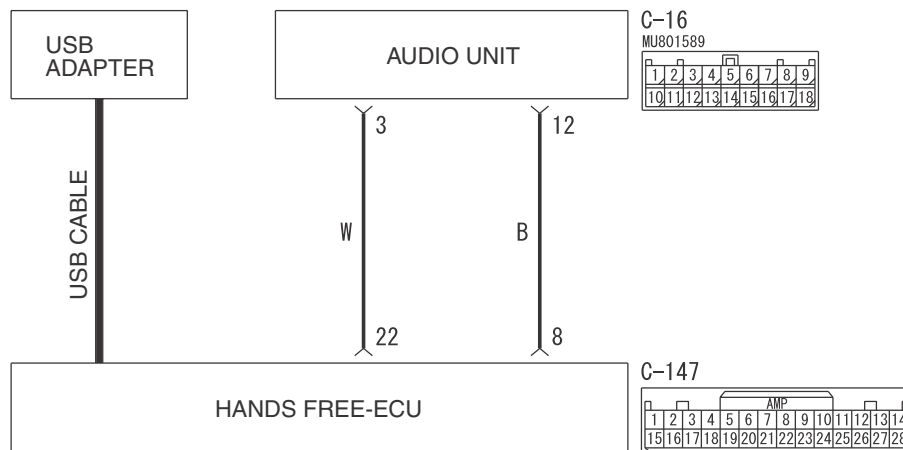
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

Inspection Procedure 2: The USB adapter data cannot be replayed.

CAUTION

Before replacing the hands free ECU, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

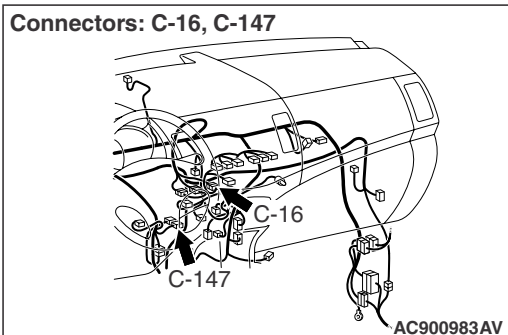
Hands Free-ECU Communication Circuit



Wire colour code

B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver WAG54E112A

Connectors: C-16, C-147



COMMENTS ON TROUBLE SYMPTOM

If the sound replay is impossible with the USB mode, the USB adapter, USB cable, hands free ECU, or audio unit may be defective, or a communication error between the audio unit and hands free ECU may have occurred.

NOTE: Before troubleshooting, check that the music file (the customer tried to replay) can be replayed.

PROBABLE CAUSES

- The audio unit may be defective.
- The hands free ECU may be defective.
- The USB adapter may be defective.
- The USB cable may be defective.
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check the audio unit operation.

Check if the audio unit normally and the sound is output.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Troubleshoot the audio unit.

STEP 2. Check the diagnosis mode

Check if the hands free-ECU can be switched to the diagnosis mode.(Refer to [P.54A-5.](#))

Q: Is the check result normal?

YES : Go to Step 3.

NO : Perform Inspection Procedure 5

"DIAGNOSIS MODE cannot be made an entry."(Refer to [P.54A-17.](#))

STEP 3. Check the USB adapter.

Check that the continuity exists between the front side terminals of USB adapter and rear side terminals of USB adapter. (Refer to [P.54A-28](#))

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the USB adapter.

CHASSIS ELECTRICAL

HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

54A-13

STEP 4. Check the USB cable.

Check that the USB cable is connected to the USB adapter or hands free-ECU normally. Or check the USB cable for damage such as bend.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace or repair the USB cable.

STEP 5. Connector check: C-147 hands free ECU connector, C-16 audio unit connector

Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair the defective connector.

STEP 6. Check the wiring harness between C-147 hands free ECU connector terminal No.22, 8 and C-16 audio unit connector terminal No. 3, 12.

- Check the signal lines for open circuit and short circuit.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Repair the wiring harness.

STEP 7. Replace the hands free ECU temporarily, and check the trouble symptom.

Replace the hands free ECU temporarily, and check that the sound is output from the speaker.

Q: Is the check result normal?

YES : Replace the hands free ECU.

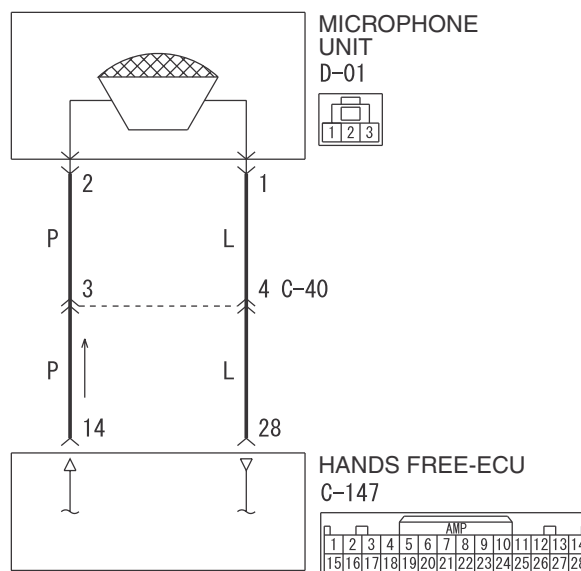
NO : Replace the audio unit.

Inspection Procedure 3: When the speech switch is pressed, the voice information is output, but the voice recognition is not performed.

CAUTION

Before replacing the hands free ECU, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

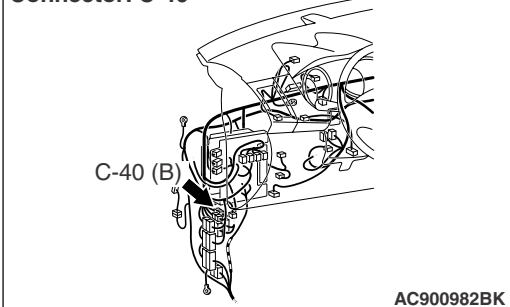
Microphone Unit Circuit



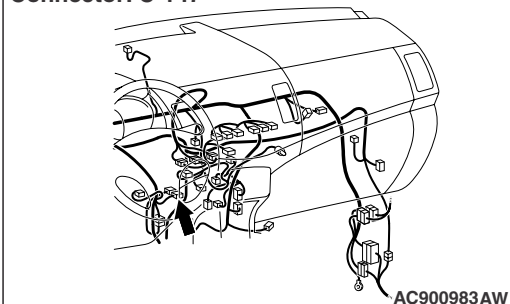
54A-14

CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

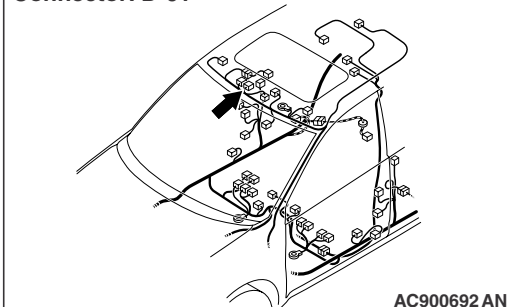
Connector: C-40



Connector: C-147



Connector: D-01

**COMMENTS ON TROUBLE SYMPTOM**

When the speech switch is pushed, if the voice information is sent but voice recognition is not executed, the microphone unit, hands free ECU or the communication between the microphone unit and hands free ECU may have a problem.

PROBABLE CAUSES

- The hands free ECU may be defective.
- The microphone unit may be defective.
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE**STEP 1. Check the diagnosis mode**

Check if the microphone check result "MIC OK" is displayed on the diagnosis mode of hands free ECU. (Refer to P.54A-5.)

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to Step 2.

STEP 2. Connector check: D-01 microphone unit connector, C-147 hands free ECU

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the defective connector.

STEP 3. Check the wiring harness between C-147 hands free ECU connector terminal No.14, 28 and D-01 microphone unit connector terminal No.2, 1.

- Check the signal lines for open circuit and short circuit.

NOTE: Prior to the wiring harness inspection, check intermediate connectors C-40 and repair if necessary.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the wiring harness.

STEP 4. Replace the microphone unit temporarily, and check the trouble symptom.

Q: Is the check result normal?

YES : Replace the microphone unit.

NO : Go to Step 5.

STEP 5. Replace the hands free ECU temporarily, and check the trouble symptom.

Q: Is the check result normal?

YES : Replace the hands free ECU.

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

CHASSIS ELECTRICAL

HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

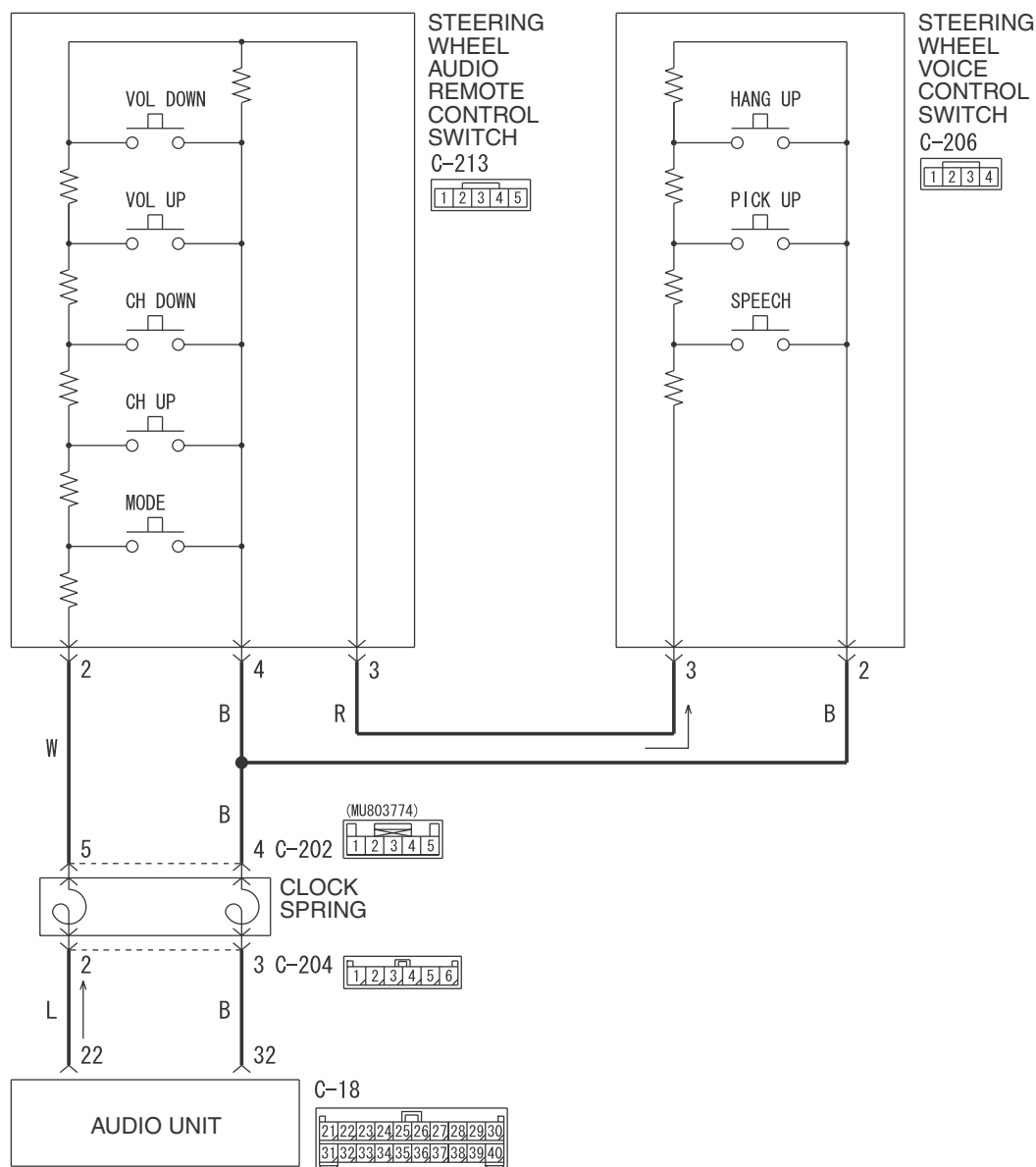
54A-15

Inspection Procedure 4: When the speech switch is pressed, the voice information is not output.

CAUTION

Before replacing the hands free ECU, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

Steering Wheel Voice Control Switch Circuit



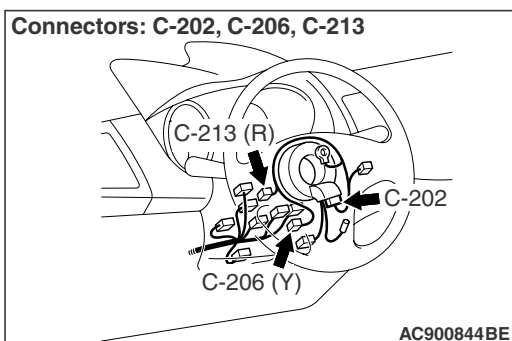
Wire colour code

B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver WAG54E114A

54A-16

CHASSIS ELECTRICAL

HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>



COMMENTS ON TROUBLE SYMPTOM

If the voice information is not sent when the speech switch is pushed, the communication between the audio unit, and the hands free ECU, or the communication between the audio unit, and the steering wheel voice control switch, the hands free ECU, or the steering wheel voice control switch may have a problem.

PROBABLE CAUSES

- The audio unit may be defective.
- The hands free ECU may be defective.
- The steering wheel audio remote control switch may be defective.
- The steering wheel voice control switch may be defective.
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check the diagnosis mode

Check if the hands free-ECU can be switched to the diagnosis mode.(Refer to [P.54A-5](#).)

Q: Is the check result normal?

YES : Go to Step 2.

NO : Perform Inspection Procedure 5
"DIAGNOSIS MODE cannot be made an entry."(Refer to [P.54A-17](#).)

STEP 2. Operation check of the steering wheel audio remote control switch

Check that the audio unit can be operated by the steering wheel audio remote control switch.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Troubleshoot the steering wheel audio remote control switch.

STEP 3. Check the steering wheel voice control switch.

Check the continuity of the steering wheel voice control switch. (Refer to steering wheel voice control switch inspection. [P.54A-27](#))

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the steering wheel voice control switch.

STEP 4. Check the steering wheel audio remote control switch.

Check the continuity of the steering wheel audio remote control switch. (Refer to steering wheel audio remote control switch inspection.)

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the steering wheel audio remote control switch.

STEP 5. Check the harness wire between C-213 steering wheel audio remote control switch connector terminal No. 3 and C-206 steering wheel voice control switch connector terminal No.3.

- Check the communication lines for open circuit and short circuit.

Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair the wiring harness.

STEP 6. Connector check: C-202 clock spring connector.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Repair the defective connector.

STEP 7. Check the harness wire between C-202 clock spring connector terminal No. 4 and C-206 steering wheel voice control switch connector terminal No.2.

- Check the communication lines for open circuit and short circuit.

Q: Is the check result normal?

YES : Go to Step 8.

NO : Repair the wiring harness.

CHASSIS ELECTRICAL

HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

54A-17

STEP 8. Temporarily replace the steering wheel voice control switch, and check the trouble symptom.

Q: Is the check result normal?

YES : Replace the steering wheel voice control switch.

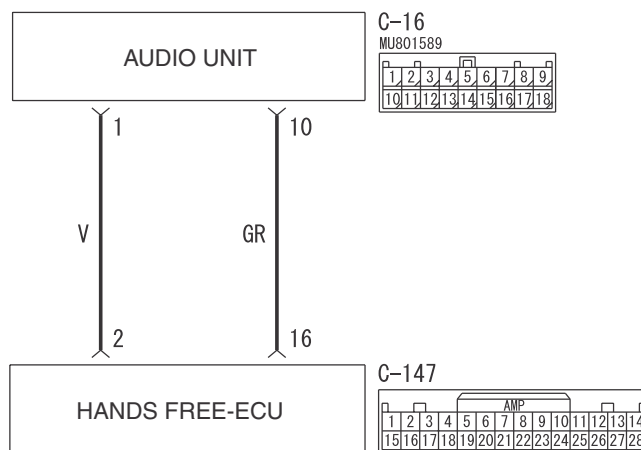
NO : Replace the audio unit.

Inspection Procedure 5: DIAGNOSIS MODE cannot be made an entry.

CAUTION

Before replacing the hands free ECU, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

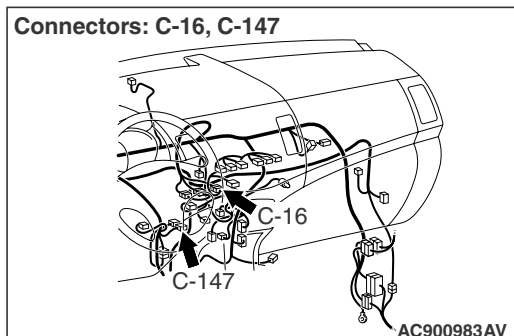
Hands Free-ECU Communication Circuit



Wire colour code

B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver WAG54E115A

Connectors: C-16, C-147



COMMENTS ON TROUBLE SYMPTOM

If the diagnosis mode cannot be made an entry, the hands free ECU, the communication between the hands free ECU, and the audio unit, or the power supply system of hands free ECU may have a problem.

PROBABLE CAUSES

- The hands free ECU may be defective.
- The audio unit may be defective.
- Damaged harness wires and connectors

54A-18**CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>****DIAGNOSIS PROCEDURE****STEP 1. Check the audio unit operation.**

Check if the audio unit work normally and the sound is output.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Troubleshoot the audio unit.

STEP 2. Connector check: C-147 hands free ECU connector, C-16 audio unit connector

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the defective connector.

STEP 3. Check the wiring harness between C-147 hands free ECU connector terminal No.2, 16 and C-16 audio unit connector terminal No.1, 10.

- Check the signal lines for open circuit and short circuit.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the wiring harness.

STEP 4. Check if the power supply circuit of hands free ECU have a problem.

Perform the Inspection procedure 1 "Check the hands free-ECU power supply circuit." of the troubleshooting. (Refer to [P.54A-9.](#))

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair according to the troubleshooting for reference.

STEP 5. Replace the hands free ECU temporarily, and check the trouble symptom.

Q: Is the check result normal?

YES : Replace the hands free ECU.

NO : Replace the audio unit.

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

Wire colour code

B : Black	LG : Light green
G : Green	L : Blue
W : White	Y : Yellow
SB : Sky blue	BR : Brown
O : Orange	GR : Grey
R : Red	P : Pink
V : Violet	PU : Purple
SI : Silver	

COMBINATION METER C-03

INTERFACE CIRCUIT


STEERING WHEEL VOICE CONTROL SWITCH C-206

CLOCK SPRING (MU803774) C-202

G-W

V

Connector: C-03



The diagram illustrates the connection of the C-03 connector to the vehicle's wiring harness. A black arrow points to the C-03 connector, which is a multi-pin connector. The connector is shown being plugged into a corresponding socket in the vehicle's wiring harness. The harness includes various wires, some of which are labeled with numbers (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100). The diagram also shows the C-03 connector being plugged into a socket in the vehicle's wiring harness.

AC900982BL

Connectors: C-202, C-204, C-206

The diagram shows the rear of a vehicle with the trunk open. Three connectors are labeled: C-204 is located near the top of the trunk, C-202 is located near the bottom right, and C-206 (Y) is located near the bottom left. Arrows point to each connector.

AC900844B

The power supply circuit to the steering wheel voice control switch, the steering wheel voice control switch, the combination meter, or the clock spring may be defective.

54A-20

CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>**PROBABLE CAUSES**

- Malfunction of steering wheel voice control switch
- Malfunctions of combination meter
- Malfunction of the clock spring
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE**STEP 1. Connector check: C-206 steering wheel voice-control switch connector****Q: Is the check result normal?****YES :** Go to Step 2.**NO :** Repair the defective connector.**STEP 2. Voltage measurement at C-206 steering wheel voice control switch connector.**

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Turn the ignition switch to the "ACC" position, and turn the tail lamp switch to the "ON" position.
- (3) Measure the voltage between terminal No.4 and body earth.

OK: System voltage**Q: Is the check result normal?****YES :** Go to Step 3.**NO :** Go to Step 5.**STEP 3. Check the wiring harness between C-206 steering wheel voice control switch connector terminal No.1 and body earth.**

- Check the earth wire for open circuit.

Q: Is the check result normal?**YES :** Go to Step 4.**NO :** Repair the wiring harness.**STEP 4. Check the steering wheel voice control switch.**

Check the illumination of the steering wheel voice control switch. (Refer to steering wheel voice control switch inspection. [P.54A-27](#))

Q: Is the check result normal?**YES :** Go to Step 10.**NO :** Replace the steering wheel voice control switch.**STEP 5. Connector check: C-202 and C-204 clock spring connectors****Q: Is the check result normal?****YES :** Go to Step 6.**NO :** Repair the defective connector.

MSB-09E54_80_90-001 (09RV015)

STEP 6. Check the clock spring.

Check whether the clock spring is in good condition.

NOTE: Before the operation, refer to GROUP 52B – Air bag module and clock spring.

- Check that continuity exists between C-202 clock spring connector terminal No.1 and C-204 clock spring connector terminal No.6.

Q: Is the check result normal?**YES :** Go to Step 7.**NO :** Replace the clock spring.**STEP 7. Check the wiring harness between C-206 steering wheel voice control switch connector terminal No.4 and C-202 clock spring connector terminal No.1.**

- Check the power supply lines open and short circuit.

Q: Is the check result normal?**YES :** Go to Step 8.**NO :** Repair the wiring harness.**STEP 8. Connector check: C-03 combination meter connector****Q: Is the check result normal?****YES :** Go to Step 9.**NO :** Repair the defective connector.**STEP 9. Check the wiring harness between C-03 combination meter connector terminal No.23 and C-204 clock spring connector terminal No.6.**

- Check the power supply line for open and short circuit.

Q: Is the check result normal?**YES :** Go to Step 10.**NO :** Repair the wiring harness.**STEP 10. Retest the system**

Check whether the illumination of the steering wheel voice control switch comes on normally.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

NO : Replace the steering wheel voice control switch.

CHASSIS ELECTRICAL

HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

54A-21

Inspection Procedure 7: Voice guide "Unable to obtain vehicle speed. Please try again or contact your dealer for service" is sent from the speaker.

CAUTION

Before replacing the hands free ECU, ensure that the power supply circuit, the earth circuit and the communication circuit are normal.

COMMENTS ON TROUBLE SYMPTOM

If the voice guide "Unable to obtain vehicle speed. Please try again or contact your dealer for service" is sent from the speaker, the vehicle speed signal of hands free ECU has a problem. At this time, the hands free ECU, and the vehicle speed signal of audio unit may have a problem.

PROBABLE CAUSES

- The hands free ECU may be defective.
- The audio unit may be defective.
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check the audio unit operation.

Check if the speed compensated volume function of audio unit works normally during driving.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Troubleshoot the audio unit.

STEP 2. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting).

STEP 3. M.U.T.-III other system diagnosis code

Check again if the diagnosis code is set to the audio unit.

Q: Is the diagnosis code set?

YES : Troubleshoot the audio unit (Refer to Diagnosis Code Chart).

NO : Go to Step 4.

STEP 4. Check the diagnosis mode

Check if the hands free ECU can be switched to the diagnosis mode. (Refer to [P.54A-5.](#))

Q: Is the check result normal?

YES : Go to Step 5.

NO : Perform Inspection Procedure 5: "DIAGNOSIS MODE cannot be made an entry." (Refer to [P.54A-17.](#))

STEP 5. Replace the hands free ECU temporarily, and check the trouble symptom.

Q: Is the check result normal?

YES : Replace the hands free ECU.

NO : Replace the audio unit.

54A-22

CHASSIS ELECTRICAL
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>

ON-VEHICLE SERVICE

PAIRING A DEVICE OR DELETING A DEVICE

M1544405500045

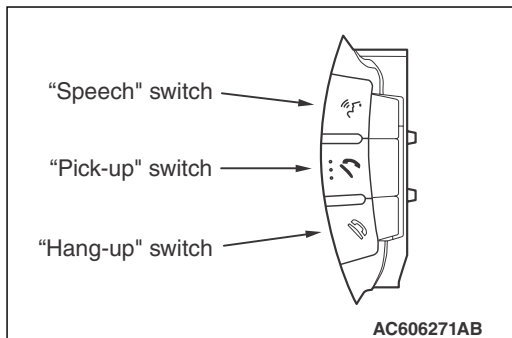
NOTE:

- Some Bluetooth devices (mobile phone or music player) may not be compatible with the hands free module.
- A maximum of seven Bluetooth devices can be registered.
- This system cannot be used when a battery of Bluetooth devices was exhausted.

PAIRING A DEVICE

Shift the selector lever to P (parking) position <A/T, CVT> or shift lever to N (neutral) position <M/T> and pull the parking brake lever.

1. Turn the ignition switch to "ACC" or "ON" position.



2. Press the "Speech" switch.
3. Say "Setup."
4. Say "Pairing options."
5. The voice guide will say "Select one of the following: pair, edit, delete, or list?"
6. Say "Pair."
7. The voice guide will say "Please say a 4-digit pairing code."
8. Say a 4 digit number. The 4 digit number will be registered as a pairing code for the device.
 - When the confirmation function is on, the system will confirm whether the number said is acceptable. Answer "Yes" to go Step 10. Say "No" to return to pairing code selection.

NOTE:

- The pairing code entered here is only used for the Bluetooth connection certification. It is any 4-digit number the user would like to select.
 - Remember the pairing code as it needs to be keyed into the device later in the pairing process.
 - Depending on the connection settings of the Bluetooth device, this code may have to be entered each time you connect the Bluetooth device to the hands free ECU. For the default connection settings, refer to the instructions for device.
9. The voice guide will say "Start pairing procedure on device. See device manual for instructions." Refer to the owner's manual for your device and enter into the device the pairing code that was registered in Step 9.
 10. When this system finds a Bluetooth device, the voice guide will say "Please say the name of the device after the beep."
 11. After you hear the beep, name the device by saying a name of your preference.

NOTE: When the confirmation function is on, after repeating the device tag you have said, the voice guide will ask "Is this correct?" Answer "Yes". To change the device tag, answer "No" and then say the device tag again.
 12. The voice guide will say "Pairing complete," after which a beep will be played and the pairing process will end.

DELETING A DEVICE

1. Turn the ignition switch to "ACC" or "ON" position.
2. Press the Speech switch.
3. Say "Setup."
4. Say "Pairing options"
5. The voice guide will say "Select one of the following: pair, edit, delete, or list"
6. Say "Delete."
7. After the voice guide says "Please say," the numbers of the devices and device tags of corresponding devices will be read out in order, starting with the device that has been most recently connected. After it completes reading all pairs, the voice guide will say "or all."
Say the number of the device that you want to delete from the system.
If you want to delete all paired devices from the system, say "All."
8. For confirmation purposes, the voice guide will say "Deleting (device tag) (number). Is this correct?" or "Deleting all devices, Is this correct?"
9. Answer "Yes" to delete the devices.
Answer "No" the system will return to Step 4.
10. The voice guide will say "Deleted", and then the system will end the device deletion process.
 - If the device deletion process fails for some reason, the voice guide will say "Delete failed." and then the system will cancel deleting the device.

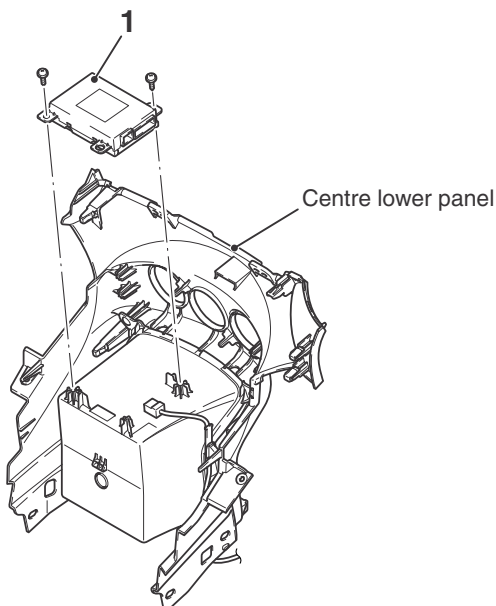
ERASE THE PASSWORD

M1544403800307

The 4-digit password set by security function can be erased by the diagnosis mode. Perform the "UNLOCK" operation of the diagnosis mode. (Refer to [P.54A-5](#).)

REMOVAL AND INSTALLATION

M1544405400037



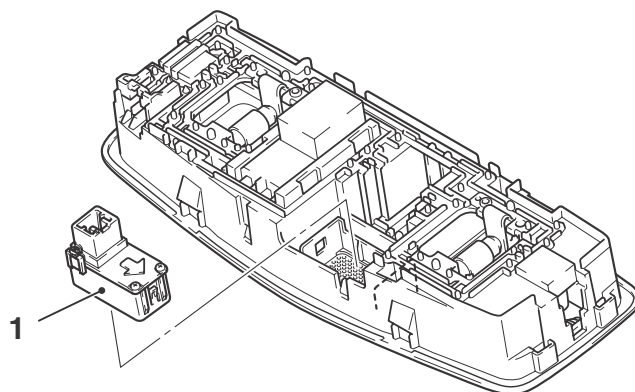
AC900436AB

Removal steps

- Audio unit
- 1. Hands free-ECU

54A-24**CHASSIS ELECTRICAL**
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>**REMOVAL AND INSTALLATION**

M1546023300089

<MICROPHONE UNIT>

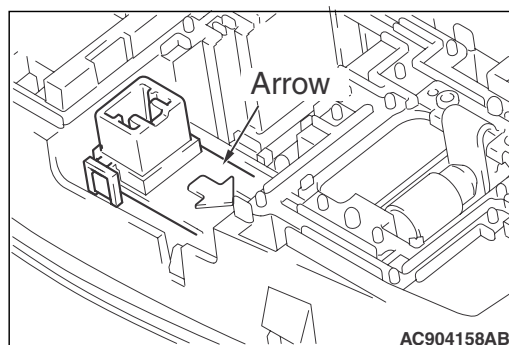
AC606269AD

Removal steps

- Front room lamp assembly (Refer to GROUP 52A, Headlining.)

>>A<<

1. Microphone unit

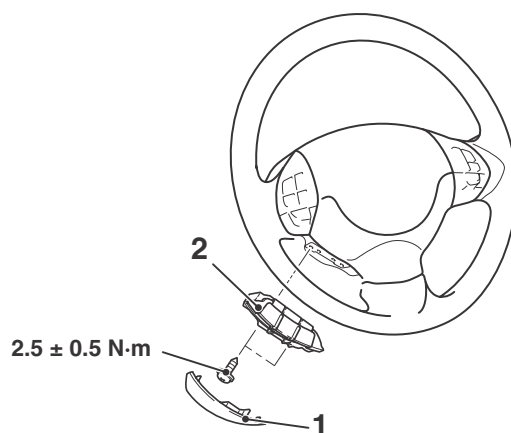
INSTALLATION SERVICE POINT**>>A<< MICROPHONE UNIT INSTALLATION**

AC904158AB

Install the microphone unit so that the arrow face toward the driver's seat.

REMOVAL AND INSTALLATION

M1546024200063



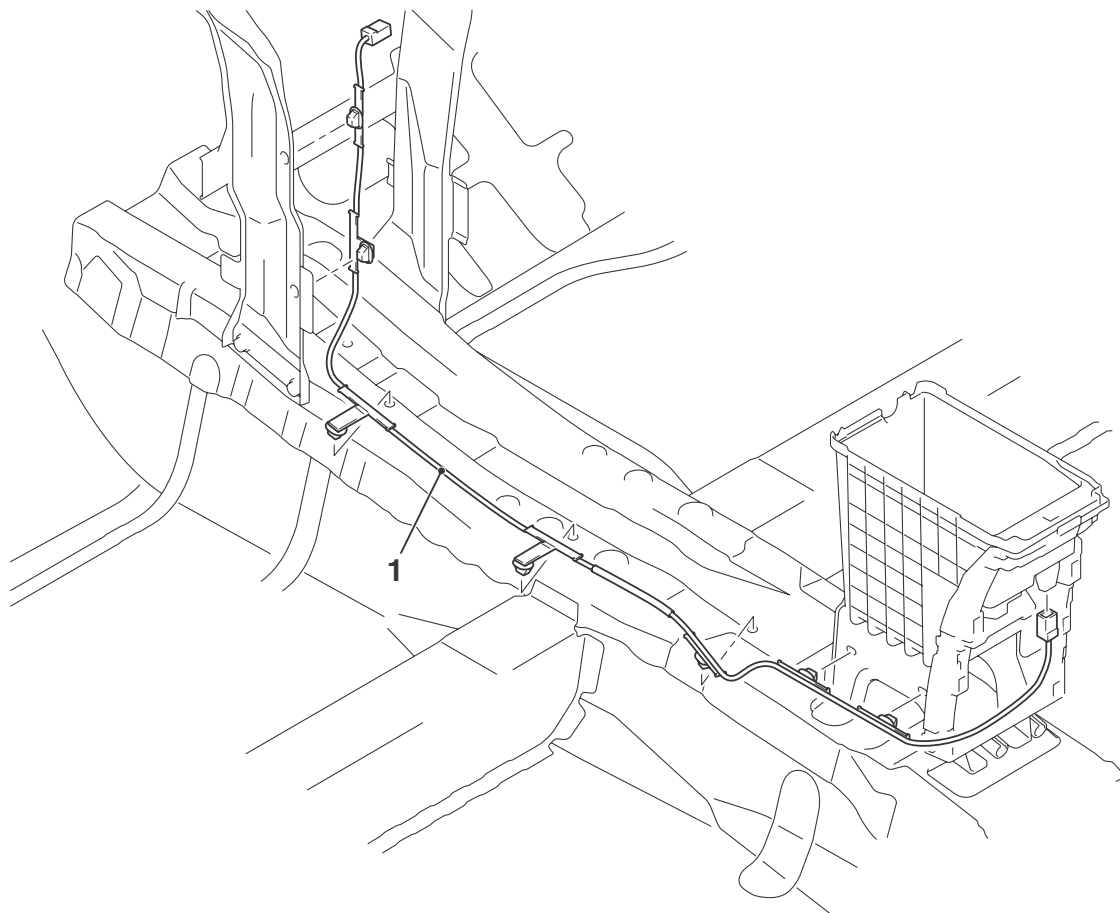
AC802108AB

Removal steps

1. Steering wheel voice control switch cover
2. Steering wheel voice control switch

54A-26**CHASSIS ELECTRICAL**
HANDS FREE ECU <VEHICLES WITH BLUETOOTH FUNCTION/USB ADAPTER>**REMOVAL AND INSTALLATION**

M1549101300098

<USB CABLE>

AC809507AB

Removal steps

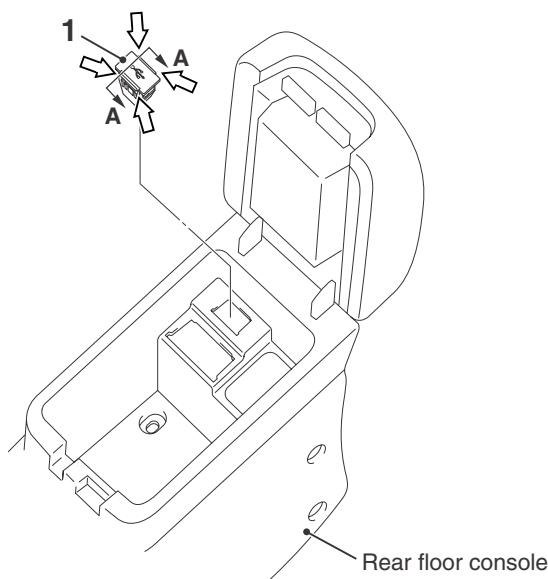
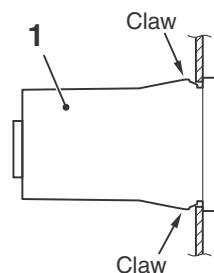
- Rear floor console assembly (Refer to GROUP 52A – Rear Floor Console Assembly.)

Removal steps (Continued)

- Centre lower panel (Refer to GROUP 52A – Instrument Panel Assembly.)
1. USB cable

REMOVAL AND INSTALLATION

M1549100800090

<USB ADAPTER>**Section A – A**

NOTE
 ⇐ :Claw positions

AC900459AB

Removal Steps

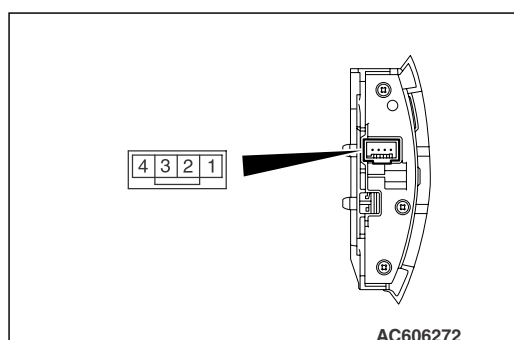
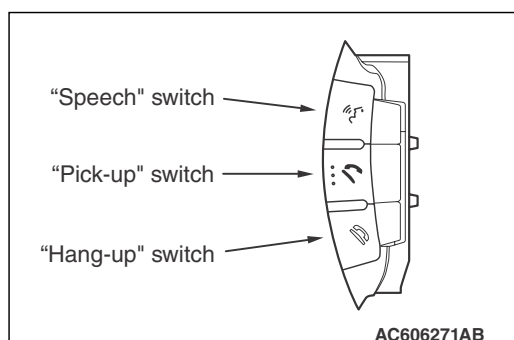
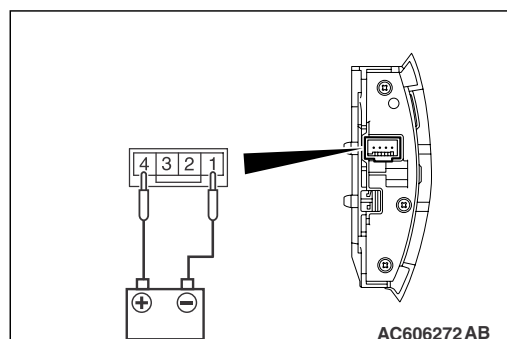
- Rear floor console assembly (Refer to GROUP 52A – Rear Floor Console assembly.)
- 1. USB adapter

Use an ohmmeter to measure the resistance value between the terminal.

Switch position	Tester connection	Measurement value
No push	2 – 3	Approximately 74 kΩ
"Speech" switch		Approximately 1.5 kΩ
"Pick-up" switch		Approximately 3.3 kΩ
"Hang-up" switch		Approximately 6.0 kΩ

INSPECTION**STEERING WHEEL VOICE-CONTROL SWITCH CONTINUITY CHECK**

M1544401100391

**ILLUMINATION CHECK**

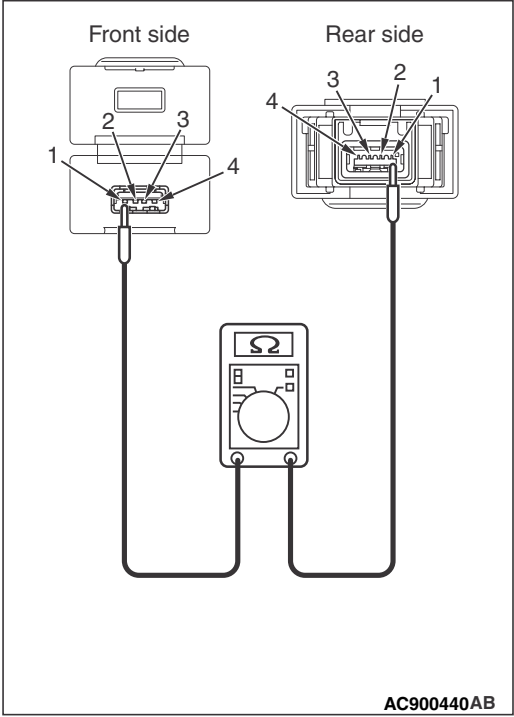
Apply the battery voltage of steering wheel voice control switch connector terminal No. 4 and 1, and check if the steering wheel audio remote control switch illuminates.

NOTE: Make sure that the polarity is correct.

USB ADAPTER INSPECTION

M1549101100072

1. Remove the USB adapter. (Refer to [P.54A-27](#))
2. Check that the continuity exists between the front side terminals of USB adapter and rear side terminals of USB adapter.



Front side terminal	Rear side terminal	Measurement value
1	1	Continuity exists (2 Ω or less)
2	2	
3	3	
4	4	

GROUP 54C

CONTROLLER AREA NETWORK (CAN)

CONTENTS

GENERAL INFORMATION	54C-2	TROUBLESHOOTING	54C-2
		CAN BUS DIAGNOSTICS TABLE	54C-2
		CAN BUS DIAGNOSIS	54C-4

54C-2

CONTROLLER AREA NETWORK (CAN)
GENERAL INFORMATION

GENERAL INFORMATION

M1548310001390

OUTLINE OF CHANGE

For vehicles with audio for Russia, due to the separation of USB adapter-compatible hands free-ECU from the CAN line, the following service procedure has been established. The items other than below are the same as before.

TROUBLESHOOTING

CAN BUS DIAGNOSTICS TABLE

M1548300201995

CAUTION

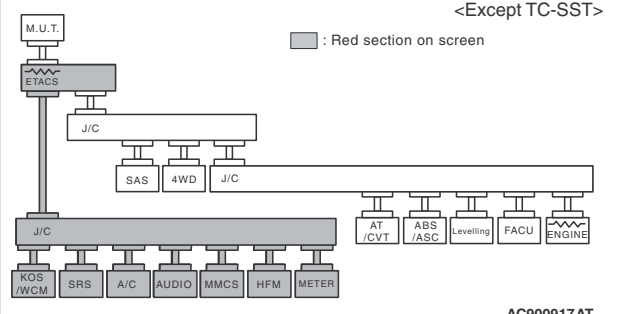
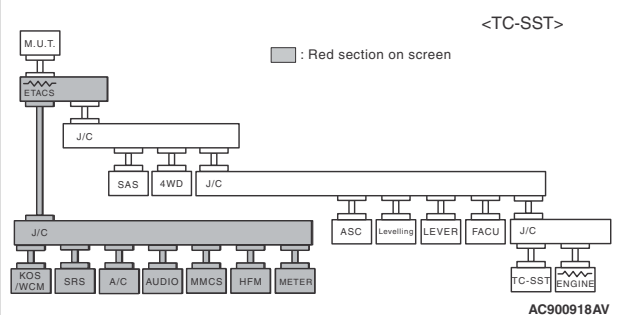
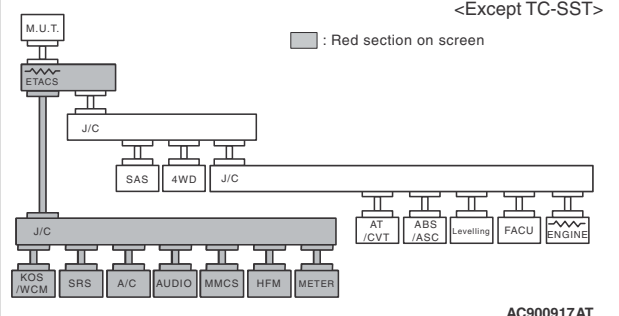
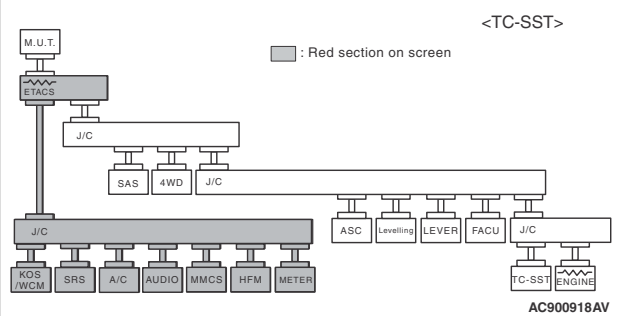
During diagnosis, a diagnosis code associated with another system may be set when the ignition switch is turned on with connector(s) disconnected. After completing the repair, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

This diagnosis applies only to the CAN bus lines. If a different system is defective, proceed to the applicable diagnosis section for each system. Observe the diagnosis procedure below only when the CAN bus line is defective.

M.U.T.-III screen (The ECUs that are not adopted are not displayed).	Comment	Diagnosis detail	Reference page
<p><Except TC-SST> ■ : Red section on screen</p> <p>AC900917AS</p> <p><TC-SST> ■ : Red section on screen</p> <p>AC900918AU</p>	<p>CAN-B: Disconnection in red displayed area is estimated.</p>	<p>Diagnosis Item 25 Diagnose when the M.U.T.-III cannot receive the data sent by hands free-ECU <vehicles with hands free cellular phone system (except vehicles for Russia (vehicles with audio))></p>	<p>P.54C-4</p>

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

54C-3

M.U.T.-III screen (The ECUs that are not adopted are not displayed).	Comment	Diagnosis detail	Reference page
<p><Except TC-SST></p> <p>■ : Red section on screen</p>  <p>AC900917AT</p> <p><TC-SST></p> <p>■ : Red section on screen</p>  <p>AC900918AV</p>	<p>CAN-B: A failure in the red section, or a bus-off failure is present in the gateway ECU.</p>	<p>Diagnosis Item 26 Short to power supply or earth in both CAN_H and CAN_L lines of the CAN-B bus lines.</p>	<p>P.54C-6</p>
<p><Except TC-SST></p> <p>■ : Red section on screen</p>  <p>AC900917AT</p> <p><TC-SST></p> <p>■ : Red section on screen</p>  <p>AC900918AV</p>	<p>CAN-B: Disconnection in red displayed area is estimated.</p>	<p>Diagnosis Item 28 Short to power supply or earth, open circuit or line-to-line short in the CAN-B bus lines</p>	<p>P.54C-18</p>

54C-4

CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

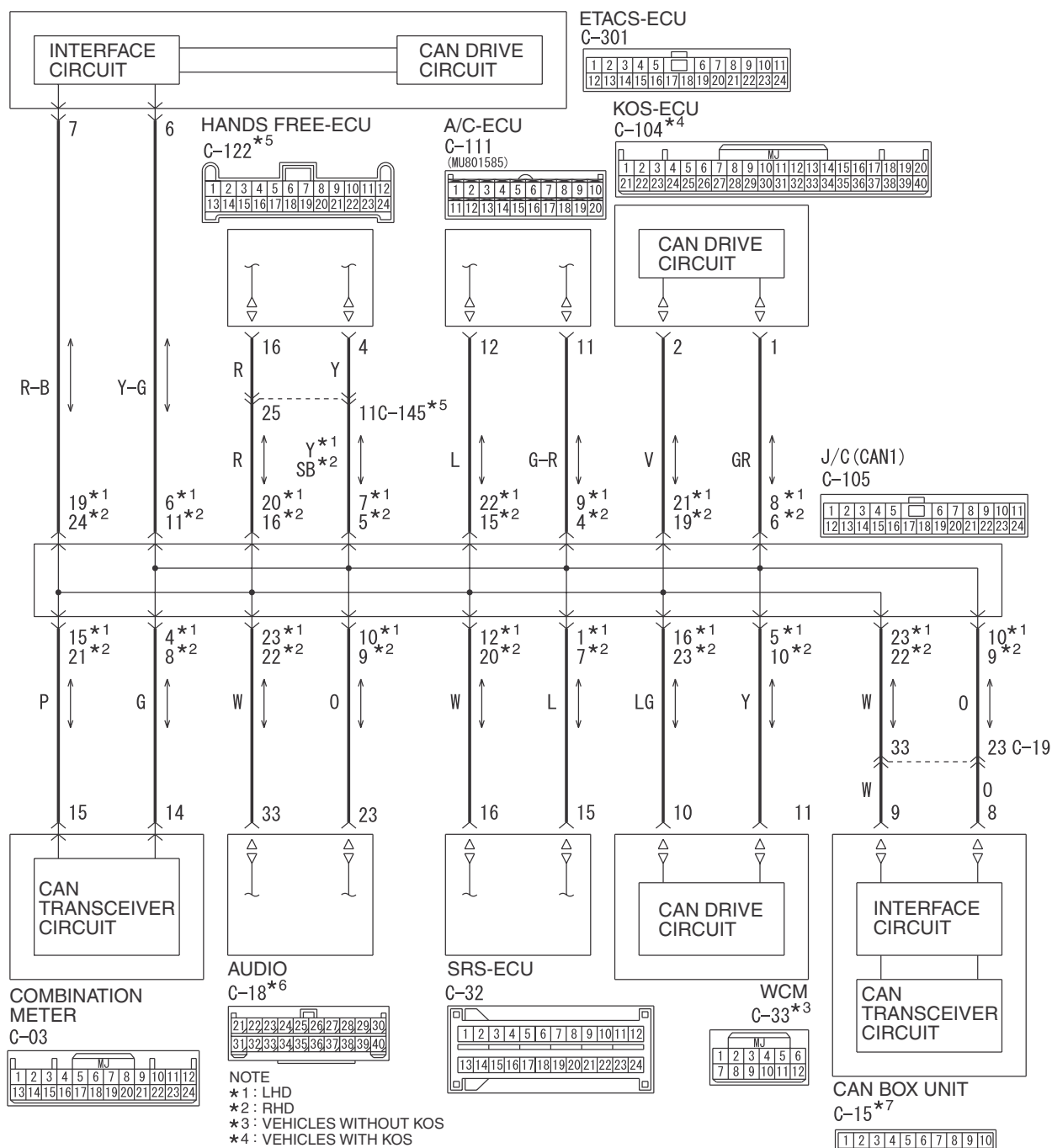
CAN BUS DIAGNOSIS

Diagnosis Item 25: Diagnose when the M.U.T.-III cannot receive the data sent by hands free-ECU
<vehicles with hands free cellular phone system (except vehicles for Russia (vehicles with audio))>

CAUTION

When servicing a CAN bus line, earth yourself by touching a metal object such as an unpainted water pipe. If you fail to do, a component connected to the CAN bus line may be broken.

CAN-B Communication Circuit



NOTE

- *1: LHD
- *2: RHD
- *3: VEHICLES WITHOUT KOS
- *4: VEHICLES WITH KOS
- *5: VEHICLES WITH HANDS FREE SYSTEM
<EXCEPT VEHICLES FOR RUSSIA (VEHICLES WITH AUDIO)>
- *6: VEHICLES WITH AUDIO
- *7: VEHICLES WITH MMCS

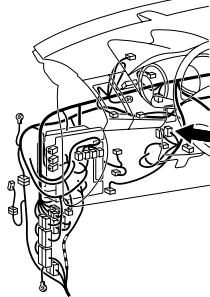
Wire colour code

B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver
MSB-09E54_80_90-001 (09RV015)

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

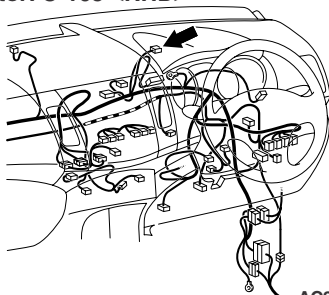
54C-5

Connector: C-105 <LHD>



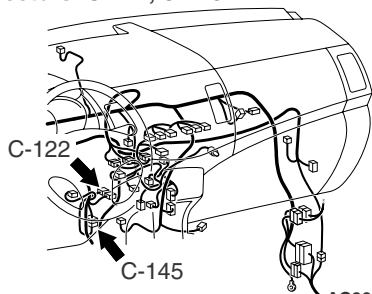
AC900982AZ

Connector: C-105 <RHD>



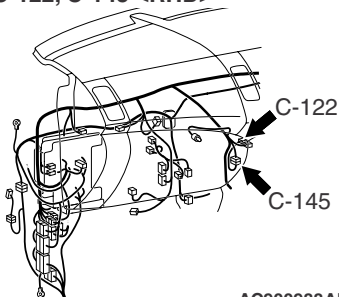
AC900989AY

Connectors: C-122, C-145 <LHD>



AC900983AH

Connectors: C-122, C-145 <RHD>



AC900988AM

FUNCTION

If the M.U.T.-III can not communicate with the hands free-ECU, this diagnosis result will be set.

TROUBLE JUDGEMENT CONDITIONS

If a communication flag is not set for the hands free-ECU, the ETACS-ECU determines that there is a failure.

TROUBLESHOOTING HINTS

Malfunction of the connector [joint connector (CAN1), hands free-ECU connector improperly connected]

Malfunction of the wiring harness [open circuit between the hands free-ECU connector and the joint connector (CAN1), power supply circuit to the hands free-ECU]

Malfunction of the hands free-ECU

DIAGNOSIS PROCEDURE

STEP 1. Connector check: C-105 joint connector (CAN1) and C-122 hands free-ECU connector

⚠ CAUTION

The strand end of the twist wire should be within 10 cm from the connector.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the defective connector.

STEP 2. Check the wiring harness between C-122 hands free-ECU connector and C-105 joint connector (CAN1)

⚠ CAUTION

Strictly observe the specified wiring harness repair procedure.

- (1) Disconnect hands free-ECU connector and joint connector (CAN1), and check the following wiring harness.
- (2) Check that there is continuity between C-122 hands free-ECU connector terminal No.4 and C-105 joint connector (CAN1) terminal No.7 <LHD> or 5 <RHD> <CAN_H>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-122 hands free-ECU connector terminal No.16 and C-105 joint connector (CAN1) terminal No.20 <LHD> or 16 <RHD> <CAN_L>

OK: Continuity exists (2 or less)

NOTE: Check C-145 intermediate connector, and repair if necessary.

Q: Is the check result normal?

YES : Check the power supply circuit of the hands free-ECU. Refer to Group 54A Hands free system Troubleshooting.

NO : Repair the wiring harness.

54C-6

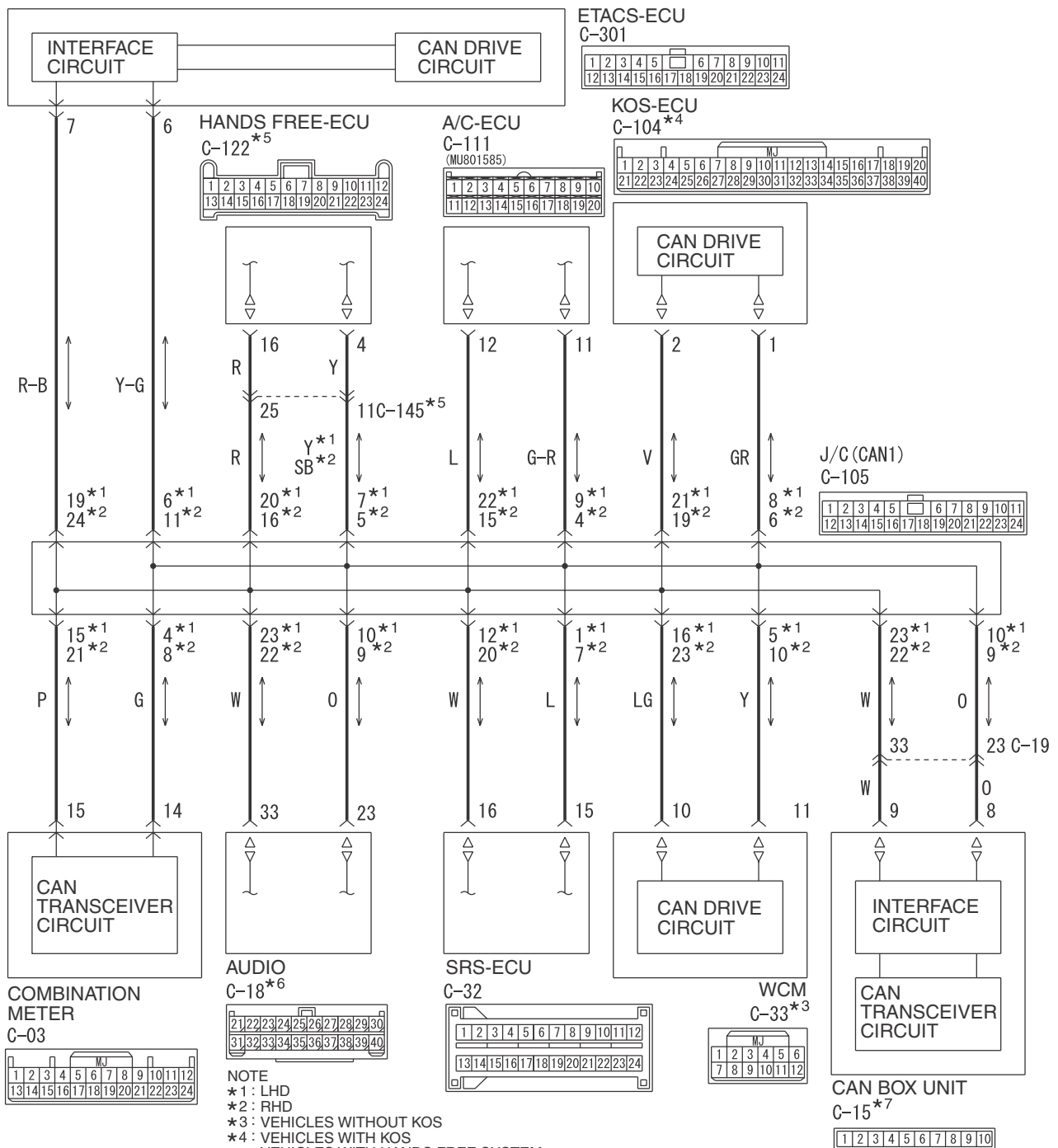
CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

Diagnosis Item 26: Short to power supply or earth in both CAN_H and CAN_L lines.

CAUTION

When servicing a CAN bus line, earth yourself by touching a metal object such as an unpainted water pipe. If you fail to do, a component connected to the CAN bus line may be broken.

CAN-B Communication Circuit



Wire colour code

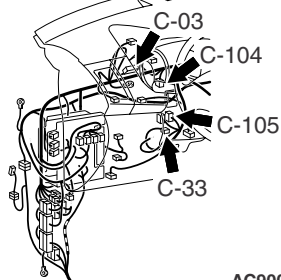
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver

WAG54E116A

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

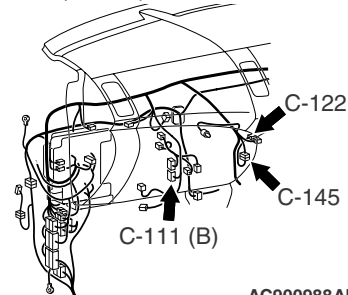
54C-7

Connectors: C-03, C-33, C-104, C-105 <LHD>



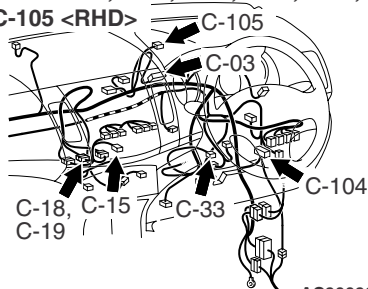
AC900982AW

Connectors: C-111, C-122, C-145 <RHD>



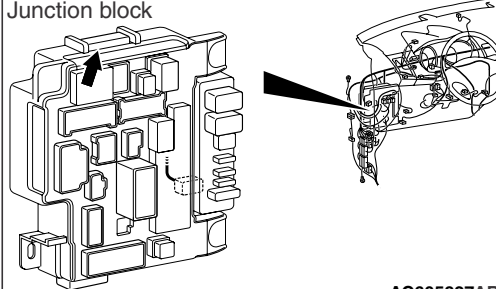
AC900988AU

Connectors: C-03, C-15, C-18, C-19, C-33, C-104, C-105 <RHD>



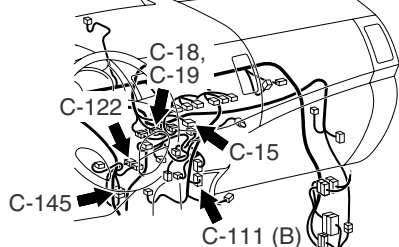
AC900989AV

Connector: C-301 <LHD>
Junction block



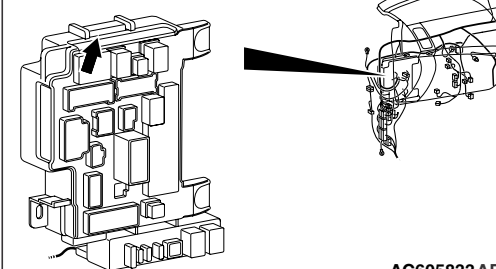
AC605827AB

Connectors: C-15, C-18, C-19, C-111, C-122, C-145 <LHD>



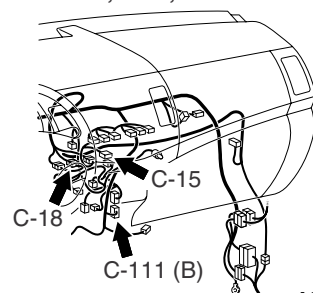
AC900983AN

Connector: C-301 <RHD>
Junction block



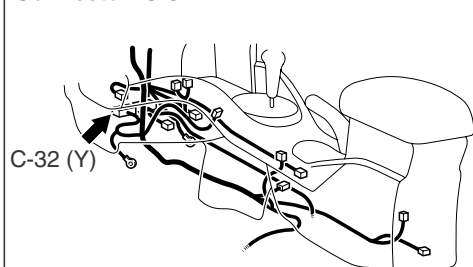
AC605833AB

Connectors: C-15, C-18, C-111 <LHD>



AC605820AE

Connector: C-32



AC901014 AD

FUNCTION

If a short to power supply or earth is present in both CAN_H and CAN_L lines, this diagnosis result will be set.

TROUBLE JUDGEMENT CONDITIONS

If a communication flag is set for ETACS-ECU and no communication is present through the CAN-B line, or diagnosis code U0019 is set in the ETACS-ECU, ETACS-ECU determines that there is a failure.

TROUBLESHOOTING HINTS

Malfunction of the connector (ETACS-ECU connector improperly connected)

Malfunction of the wiring harness (CAN_H and CAN_L lines are short to power supply or earth on the CAN-B line.)

Malfunction of ECUs

54C-8

CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

DIAGNOSIS PROCEDURE

STEP 1. Checking short to power supply (voltage measurement)**⚠ CAUTION**

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect C-301 ETACS-ECU connector, and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-301 ETACS-ECU connector terminal No.6 and body earth.

OK: 5 V or less

- (4) Measure the voltage between C-301 ETACS-ECU connector terminal No.7 and body earth.

OK: 5 V or less

Q: Is the check result normal?

YES : Go to Step 2.

NO : Go to Step 11.

STEP 2. Check the wiring harness between C-32 SRS connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).**⚠ CAUTION**

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.1 <LHD> or 7 <RHD> and body earth.

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.12 <LHD> or 20 <RHD> and body earth.

OK: 1 k or more

Q: Is the check result normal?

YES : Go to Step 3.

NO : Go to Step 20.

STEP 3. Check the wiring harness between C-111 A/C-ECU connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).**⚠ CAUTION**

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.9 <LHD> or 4 <RHD> and body earth.

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.22 <LHD> or 15 <RHD> and body earth.

OK: 1 k or more

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to Step 21.

STEP 4. Check the wiring harness between C-03 combination meter connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).**⚠ CAUTION**

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.4 <LHD> or 8 <RHD> and body earth.

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.15 <LHD> or 21 <RHD> and body earth.

OK: 1 k or more

Q: Is the check result normal?

YES <vehicles with WCM> : Go to Step 5.

YES <vehicles with KOS> : Go to Step 6.

NO (the check result is not normal.) : Go to Step 22.

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

54C-9

STEP 5. Check the wiring harness between C-33 WCM connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.5 <LHD> or 10 <RHD> and body earth.

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.16 <LHD> or 23 <RHD> and body earth.

OK: 1 k or more

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 10.

YES <vehicles with audio unit> : Go to Step 7.

YES <vehicles with MMCS> : Go to Step 8.

NO (the check result is not normal.) : Go to Step 23.

STEP 6. Check the wiring harness between C-104 KOS-ECU connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.8 <LHD> or 6 <RHD> and body earth.

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.21 <LHD> or 19 <RHD> and body earth.

OK: 1 k or more

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 10.

YES <vehicles with audio unit> : Go to Step 7.

YES <vehicles with MMCS> : Go to Step 8.

NO (the check result is not normal.) : Go to Step 24.

STEP 7. Check the wiring harness between C-18 audio unit connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD> and body earth. <CAN_H>

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD> and body earth. <CAN_L>

OK: 1 k or more

Q: Is the check result normal?

YES <vehicles without hands free cellular phone system> : Go to Step 10.

YES <vehicles with hands free cellular phone system (for Russia)> : Go to Step 10.

YES <vehicles with hands free cellular phone system (except for Russia)> : Go to Step 9.

NO (the check result is not normal.) : Go to Step 25.

STEP 8. Check the wiring harness between C-15 CAN box unit connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD> and body earth.

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD> and body earth.

OK: 1 k or more

54C-10

CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

Q: Is the check result normal?

YES <vehicles without hands free cellular phone system (with MMCS)> : Go to Step 10.

YES <vehicles with hands free cellular phone system (with MMCS)> : Go to Step 9.

NO (the check result is not normal.) : Go to Step 26.

STEP 9. Check the wiring harness between C-122 hands free-ECU connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.7 <LHD> or 5 <RHD> and body earth.

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.20 <LHD> or 16 <RHD> and body earth.

OK: 1 k or more

Q: Is the check result normal?

YES : Go to Step 10.

NO : Go to Step 27.

STEP 10. Check the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

Strictly observe the specified wiring harness repair procedure.

- (1) Disconnect ETACS-ECU connector and joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.6 and body earth.

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.19 and body earth.

OK: 1 k or more

Q: Is the check result normal?

YES : Go to Step 28.

NO : Repair the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1).

STEP 11. Check the wiring harness between C-32 SRS connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.1 <LHD> or 7 <RHD> and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.12 <LHD> or 20 <RHD> and body earth. <CAN_L>

OK: 5 V or less

Q: Is the check result normal?

YES : Go to Step 12.

NO : Go to Step 20.

STEP 12. Check the wiring harness between C-111 A/C-ECU connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.9 <LHD> or 4 <RHD> and body earth.

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.22 <LHD> or 15 <RHD> and body earth.

OK: 5 V or less

Q: Is the check result normal?

YES : Go to Step 13.

NO : Go to Step 21.

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

54C-11

STEP 13. Check the wiring harness between C-03 combination meter connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.4 <LHD> or 8 <RHD> and body earth.

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.15 <LHD> or 21 <RHD> and body earth.

OK: 5 V or less

Q: Is the check result normal?

YES <vehicles with WCM> : Go to Step 14.

YES <vehicles with KOS> : Go to Step 15.

NO (the check result is not normal.) : Go to Step 22.

STEP 14. Check the wiring harness between C-33 WCM connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.5 <LHD> or 10 <RHD> and body earth.

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.16 <LHD> or 23 <RHD> and body earth.

OK: 5 V or less

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 19.

YES <vehicles with audio unit> : Go to Step 16.

YES <vehicles with MMCS> : Go to Step 17.

NO (the check result is not normal.) : Go to Step 23.

STEP 15. Check the wiring harness between C-104 KOS-ECU connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.8 <LHD> or 6 <RHD> and body earth.

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.21 <LHD> or 19 <RHD> and body earth.

OK: 5 V or less

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 19.

YES <vehicles with audio unit> : Go to Step 16.

YES <vehicles with MMCS> : Go to Step 17.

NO (the check result is not normal.) : Go to Step 24.

STEP 16. Check the wiring harness between C-18 audio unit connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD> and body earth.

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD> and body earth.

OK: 5 V or less

54C-12

CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

Q: Is the check result normal?

YES <vehicles without hands free cellular phone system> : Go to Step 19.

YES <vehicles with hands free cellular phone system (for Russia)> : Go to Step 19.

YES <vehicles with hands free cellular phone system (except for Russia)> : Go to Step 18.

NO (the check is not result normal.) : Go to Step 25.

STEP 17. Check the wiring harness between C-15 CAN box unit connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

⚠ CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD> and body earth.

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD> and body earth.

OK: 5 V or less

Q: Is the check result normal?

YES <vehicles without hands free cellular phone system (with MMCS)> : Go to Step 19.

YES <vehicles with hands free cellular phone system (with MMCS)> : Go to Step 18.

NO (the check result is not normal.) : Go to Step 26.

STEP 18. Check the wiring harness between C-122 hands free-ECU connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

⚠ CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.7 <LHD> or 5 <RHD> and body earth.

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.20 <LHD> or 16 <RHD> and body earth.

OK: 5 V or less

Q: Is the check result normal?

YES : Go to Step 19.

NO : Go to Step 27.

STEP 19. Check the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

⚠ CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

Strictly observe the specified wiring harness repair procedure.

- (1) Disconnect ETACS-ECU connector and joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.6 <LHD> or 11 <RHD> and body earth.

OK: 1 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.19 <LHD> or 24 <RHD> and body earth.

OK: 1 V or less

Q: Is the check result normal?

YES : Go to Step 28.

NO : Repair the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1).

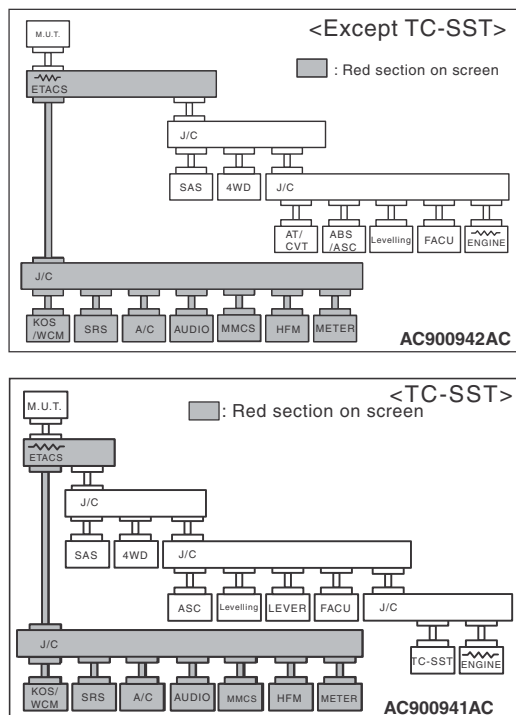
CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

54C-13

STEP 20. M.U.T.-III CAN bus diagnostics (checking the SRS-ECU for internal failure)

⚠ CAUTION

Strictly observe the specified wiring harness repair procedure.



Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-32 SRS-ECU connector and C-105 joint connector (CAN1).

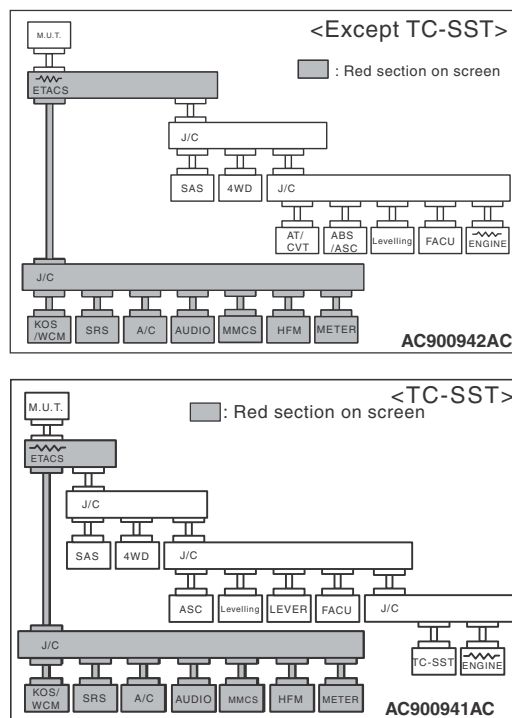
NO : Check the SRS-ECU connector, and repair if necessary. If the SRS-ECU connector is in good condition, replace the SRS-ECU.

STEP 21. M.U.T.-III CAN bus diagnostics (checking the A/C-ECU for internal failure)

⚠ CAUTION

Strictly observe the specified wiring harness repair procedure.

Disconnect C-111 A/C-ECU connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-111 A/C-ECU connector and C-105 joint connector (CAN1).

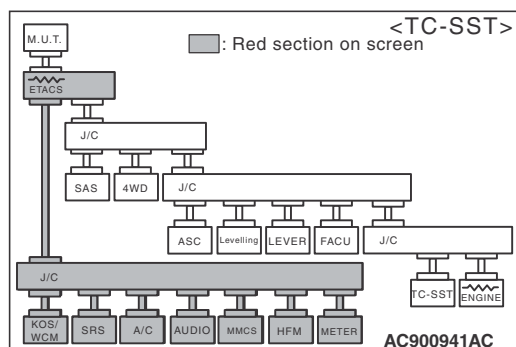
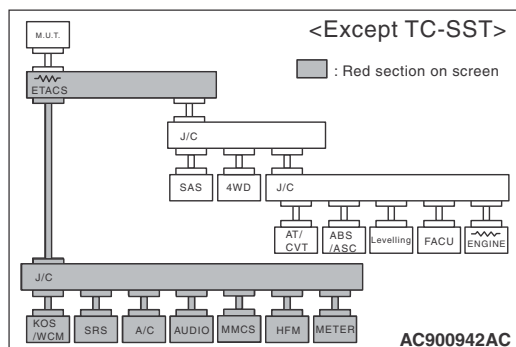
NO : Check the A/C-ECU connector, and repair if necessary. If the A/C-ECU connector is in good condition, replace the A/C-ECU.

54C-14

CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING**STEP 22. M.U.T.-III CAN bus diagnostics
(checking the combination meter for internal failure)****CAUTION**

Strictly observe the specified wiring harness repair procedure.

Disconnect C-03 combination meter connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

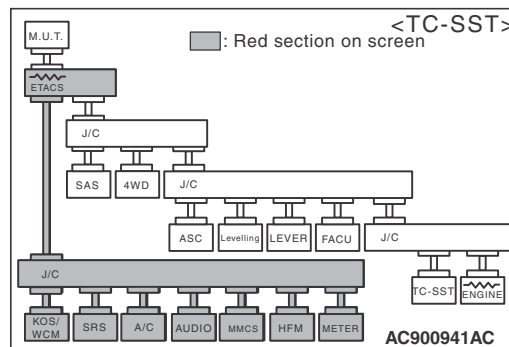
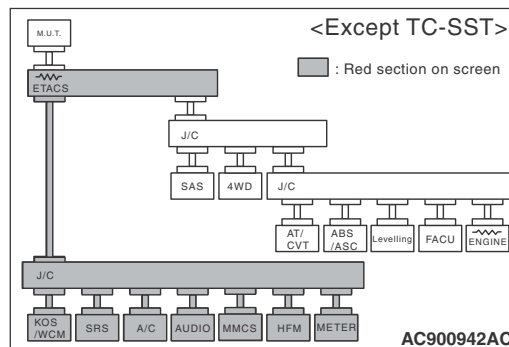
YES : Repair the wiring harness between C-03 combination meter connector and C-105 joint connector (CAN1).

NO : Check the combination meter connector, and repair if necessary. If the combination meter connector is in good condition, replace the combination meter.

**STEP 23. M.U.T.-III CAN bus diagnostics
(checking the WCM for internal failure)****CAUTION**

Strictly observe the specified wiring harness repair procedure.

Disconnect C-33 WCM connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-33 WCM connector and C-105 joint connector (CAN1).

NO : Check the WCM connector, and repair if necessary. If the WCM connector is in good condition, replace the WCM.

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

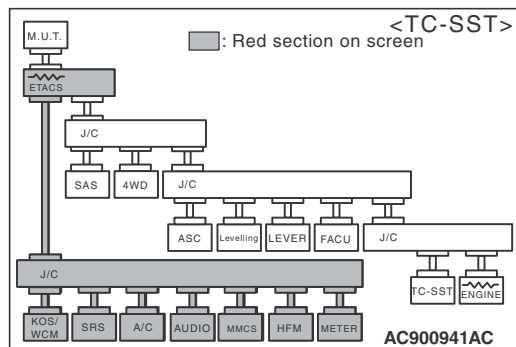
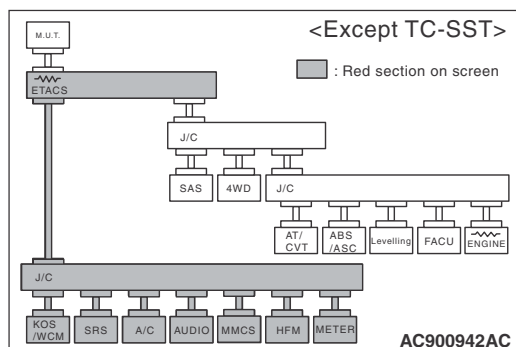
54C-15

STEP 24. M.U.T.-III CAN bus diagnostics (checking the KOS-ECU for internal failure)

⚠ CAUTION

Strictly observe the specified wiring harness repair procedure.

Disconnect C-104 KOS-ECU connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-104 KOS-ECU connector and C-105 joint connector (CAN1).

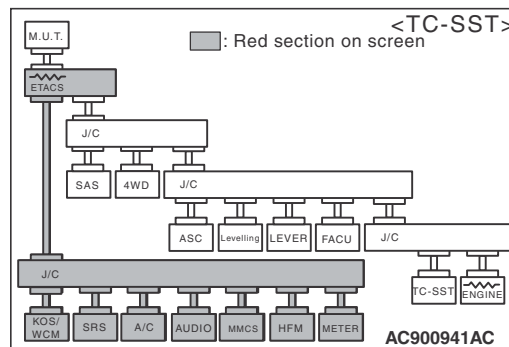
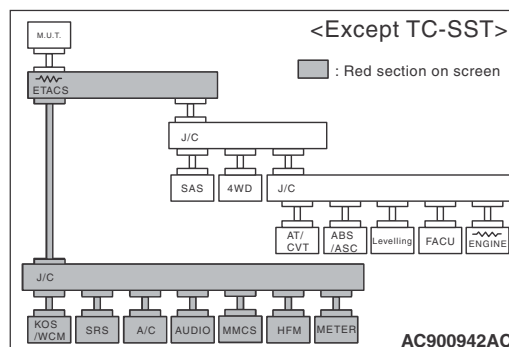
NO : Check the KOS-ECU connector, and repair if necessary. If the KOS-ECU connector is in good condition, replace the KOS-ECU.

STEP 25. M.U.T.-III CAN bus diagnostics (checking the audio unit for internal failure)

⚠ CAUTION

Strictly observe the specified wiring harness repair procedure.

Disconnect C-18 audio unit connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-18 audio unit connector and C-105 joint connector (CAN1).

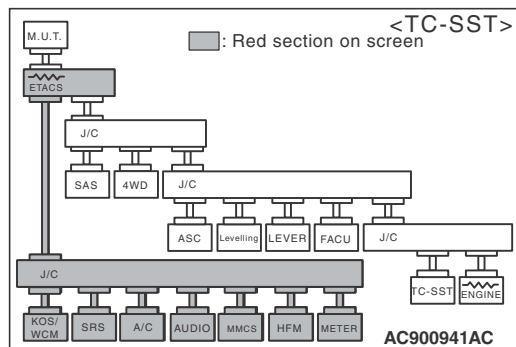
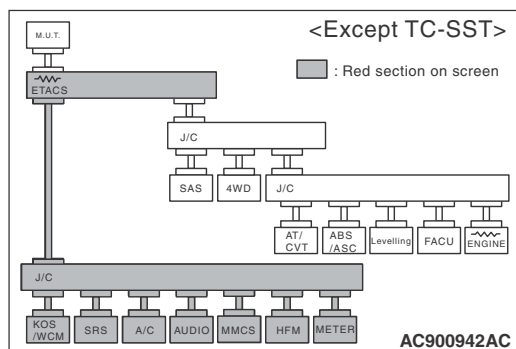
NO : Check the audio unit connector, and repair if necessary. If the audio unit connector is in good condition, replace the audio unit.

54C-16

CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING**STEP 26. M.U.T.-III CAN bus diagnostics
(checking the CAN box unit for internal failure)****CAUTION**

Strictly observe the specified wiring harness repair procedure.

Disconnect C-15 CAN box unit connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

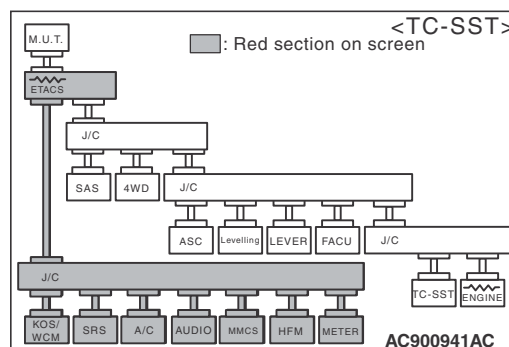
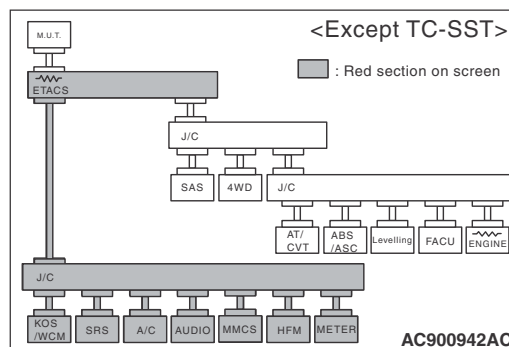
YES : Check C-19 intermediate connector, and repair if necessary. If the intermediate connector is in good condition, repair the wiring harness between C-15 CAN box unit connector and C-105 joint connector (CAN1).

NO : Check the CAN box unit connector, and repair if necessary. If the CAN box unit connector is in good condition, replace the CAN box unit.

**STEP 27. M.U.T.-III CAN bus diagnostics
(checking the hands free ECU unit for internal failure)****CAUTION**

Strictly observe the specified wiring harness repair procedure.

Disconnect C-122 hands free-ECU connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Check C-145 intermediate connector, and repair if necessary. If the intermediate connector is in good condition, repair the wiring harness between C-122 hands free-ECU connector and C-105 joint connector (CAN1).

NO : Check the hands free-ECU connector, and repair if necessary. If the hands free-ECU connector is in good condition, replace the hands free-ECU.

**CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING****54C-17**

STEP 28. Trouble symptom check

Diagnose the CAN bus line, and check that normal condition is displayed.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 How to use Troubleshooting/inspection Service Points How to Cope with Intermittent Malfunction).

NO : Check the ETACS-ECU connector, and repair if necessary. If the ETACS-ECU connector is in good condition, replace the ETACS-ECU.

54C-18

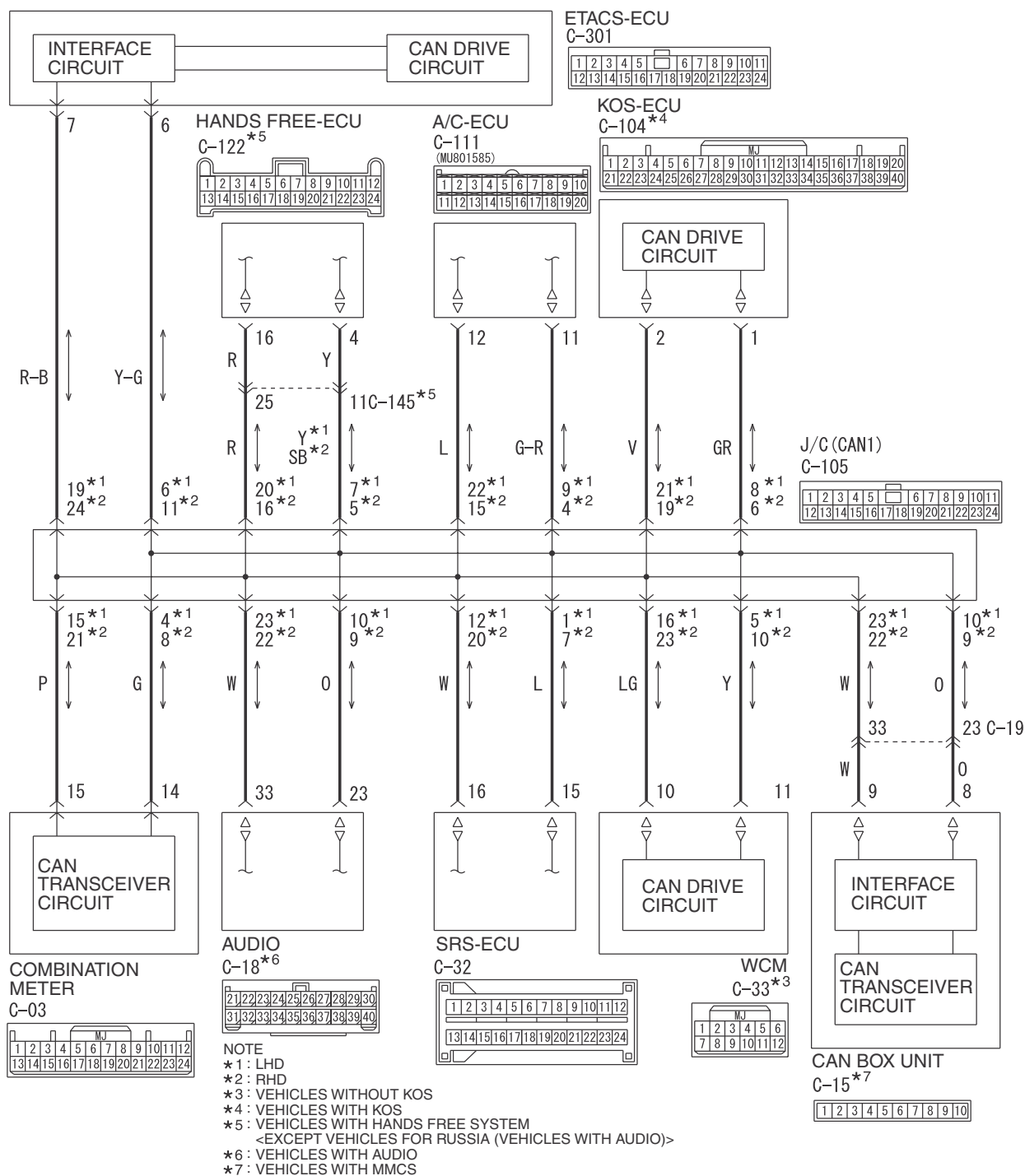
CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

Diagnosis Item 28: Short to power supply or earth, open circuit or line-to-line short in the CAN-B bus lines

CAUTION

When servicing a CAN bus line, earth yourself by touching a metal object such as an unpainted water pipe. If you fail to do, a component connected to the CAN bus line may be broken.

CAN-B Communication Circuit



Wire colour code

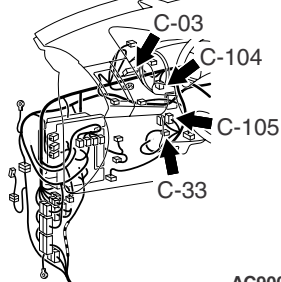
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver

MSB-09E54_80_90-001 (09RV015)

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

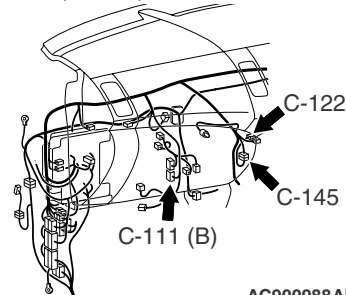
54C-19

Connectors: C-03, C-33, C-104, C-105 <LHD>



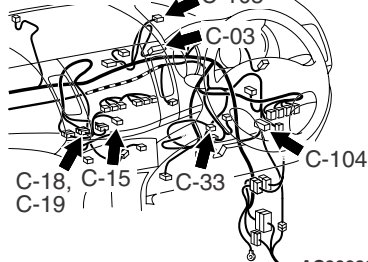
AC900982AW

Connectors: C-111, C-122, C-145 <RHD>

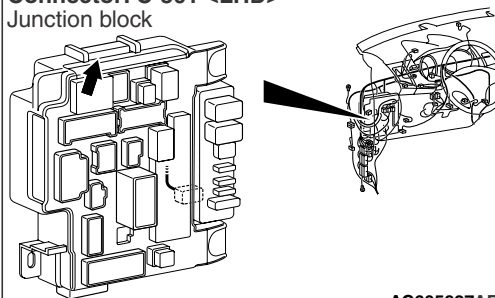


AC900988AU

Connectors: C-03, C-15, C-18, C-19, C-33, C-104, C-105 <RHD>

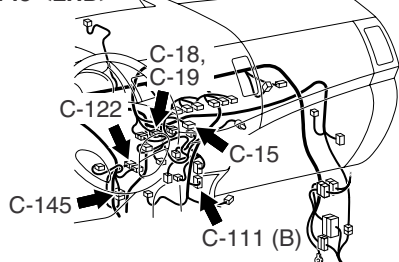


AC900989AV

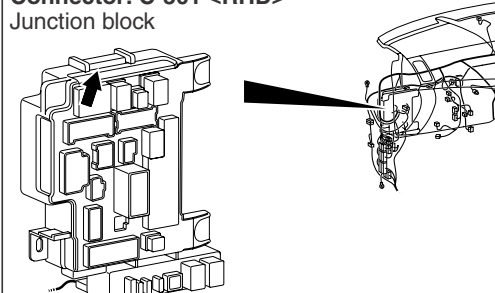
Connector: C-301 <LHD>
Junction block

AC605827AB

Connectors: C-15, C-18, C-19, C-111, C-122, C-145 <LHD>

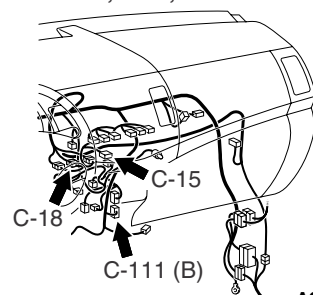


AC900983AN

Connector: C-301 <RHD>
Junction block

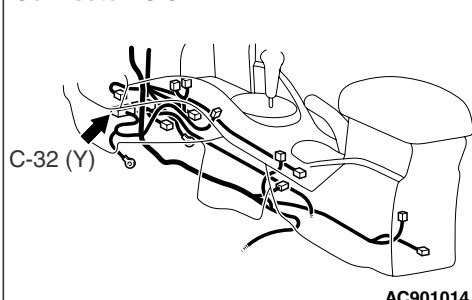
AC605833AB

Connectors: C-15, C-18, C-111 <LHD>



AC605820AE

Connector: C-32



AC901014 AD

FUNCTION

If a short to power supply or earth, open circuit or line-to-line short is present at either CAN_H or CAN_L side on the CAN-B lines, this diagnosis result will be set.

TROUBLE JUDGEMENT CONDITIONS

When CAN-B lines communication is normal, and diagnosis code U0019 is set in one or more of the ECUs, the ETACS-ECU determines that there is a failure.

TROUBLESHOOTING HINTS

Malfunction of the connector (short to power supply or earth in connector or improperly connected)

Malfunction of the wiring harness (short to power supply or earth, open circuit or line-to-line short in CAN bus lines)

Faulty ECU(s) (internal short to power supply or earth)

54C-20

CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

DIAGNOSIS PROCEDURE

STEP 1. Checking short to earth (resistance measurement)

NOTE: This check determines whether there is a short to earth in the CAN-B bus line. If a short to earth is present in either the CAN_H or CAN_L line, check the appropriate line only.

⚠ CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect C-301 ETACS-ECU connector, and measure at the wiring harness side.
- (2) Measure the resistance between C-301 ETACS-ECU connector terminal No.6 and body earth. <CAN_H>
OK: 1 k or more
- (3) Measure the resistance between C-301 ETACS-ECU connector terminal No.7 and body earth. <CAN_L>
OK: 1 k or more

Q: Is the check result normal?

YES : Go to Step 11.

NO : Go to Step 2.

STEP 2. Check the wiring harness between C-32 SRS connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).**⚠ CAUTION**

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.1 <LHD> or 7 <RHD> and body earth. <CAN_H>
OK: 1 k or more
- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.12 <LHD> or 20 <RHD> and body earth. <CAN_L>
OK: 1 k or more

Q: Is the check result normal?

YES : Go to Step 3.

NO : Go to Step 40.

STEP 3. Check the wiring harness between C-111 A/C-ECU connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).**⚠ CAUTION**

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.9 <LHD> or 4 <RHD> and body earth. <CAN_H>
OK: 1 k or more
- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.22 <LHD> or 15 <RHD> and body earth. <CAN_L>
OK: 1 k or more

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to Step 41.

STEP 4. Check the wiring harness between C-03 combination meter connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).**⚠ CAUTION**

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.4 <LHD> or 8 <RHD> and body earth. <CAN_H>
OK: 1 k or more
- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.15 <LHD> or 21 <RHD> and body earth. <CAN_L>
OK: 1 k or more

Q: Is the check result normal?

YES <vehicles with WCM> : Go to Step 5.

YES <vehicles with KOS> : Go to Step 6.

NO (the check result is not normal.) : Go to Step 42.

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

54C-21

STEP 5. Check the wiring harness between C-33 WCM connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.5 <LHD> or 10 <RHD> and body earth. <CAN_H>

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.16 <LHD> or 23 <RHD> and body earth. <CAN_L>

OK: 1 k or more

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 10.

YES <vehicles with audio unit> : Go to Step 7.

YES <vehicles with MMCS> : Go to Step 8.

NO (the check result is not normal.) : Go to Step 43.

STEP 6. Check the wiring harness between C-104 KOS-ECU connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.8 <LHD> or 6 <RHD> and body earth. <CAN_H>

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.21 <LHD> or 19 <RHD> and body earth. <CAN_L>

OK: 1 k or more

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 10.

YES <vehicles with audio unit> : Go to Step 7.

YES <vehicles with MMCS> : Go to Step 8.

NO (the check result is not normal.) : Go to Step 44.

STEP 7. Check the wiring harness between C-18 audio unit connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD> and body earth. <CAN_H>

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD> and body earth. <CAN_L>

OK: 1 k or more

Q: Is the check result normal?

YES <vehicles without hands-free system (with MMCS)> : Go to Step 10.

YES <vehicles with hands free cellular phone system (for Russia)> : Go to Step 10.

YES <vehicles with hands free cellular phone system (except for Russia)> : Go to Step 9.

NO (the check result is not normal.) : Go to Step 45.

STEP 8. Check the wiring harness between C-15 CAN box unit connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD> and body earth. <CAN_H>

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD> and body earth. <CAN_L>

OK: 1 k or more

54C-22

CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

Q: Is the check result normal?

YES <vehicles without hands-free system (with MMCS)> : Go to Step 10.

YES <vehicles with hands-free system (with MMCS)> : Go to Step 9.

NO (the check result is not normal.) : Go to Step 46.

STEP 9. Check the wiring harness between C-122 hands free-ECU connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

⚠ CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.7 <LHD> or 5 <RHD> and body earth. <CAN_H>

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.20 <LHD> or 15 <RHD> and body earth. <CAN_L>

OK: 1 k or more

Q: Is the check result normal?

YES : Go to Step 10.

NO : Go to Step 47.

STEP 10. Check the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1) for short to earth (resistance measurement).

⚠ CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

Strictly observe the specified wiring harness repair procedure.

- (1) Disconnect ETACS-ECU connector and joint connector (CAN1), and measure at the wiring harness side.
- (2) Measure the resistance between C-105 joint connector (CAN1) terminal No.6 <LHD> or 11 <RHD> and body earth. <CAN_H>

OK: 1 k or more

- (3) Measure the resistance between C-105 joint connector (CAN1) terminal No.19 <LHD> or 24

<RHD> and body earth. <CAN_L>

OK: 1 k or more

Q: Is the check result normal?

YES : Go to Step 48.

NO : Repair the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1).

STEP 11. Checking short to power supply (voltage measurement)

NOTE: This check determines whether there is a short to power supply in the CAN-B bus line. If a failure is present in either the CAN_H or CAN_L line, check the appropriate line only.

⚠ CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect C-301 ETACS-ECU connector, and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-301 ETACS-ECU connector terminal No.6 and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-301 ETACS-ECU connector terminal No.7 and body earth. <CAN_L>

OK: 5 V or less

Q: Is the check result normal?

YES : Go to Step 21.

NO : Go to Step 12.

STEP 12. Check the wiring harness between C-32 SRS connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

⚠ CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.1 <LHD> or 7 <RHD> and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.12 <LHD> or 20 <RHD> and body earth. <CAN_L>

OK: 5 V or less

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

54C-23

Q: Is the check result normal?

YES : Go to Step 13.

NO : Go to Step 40.

STEP 13. Check the wiring harness between C-111 A/C-ECU connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.9 <LHD> or 4 <RHD> and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.22 <LHD> or 15 <RHD> and body earth. <CAN_L>

OK: 5 V or less

Q: Is the check result normal?

YES : Go to Step 14.

NO : Go to Step 41.

STEP 14. Check the wiring harness between C-03 combination meter connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.4 <LHD> or 8 <RHD> and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.15 <LHD> or 21 <RHD> and body earth. <CAN_L>

OK: 5 V or less

Q: Is the check result normal?

YES <vehicles with WCM> : Go to Step 15.

YES <vehicles with KOS> : Go to Step 16.

NO (the check result is not normal.) : Go to Step 42.

STEP 15. Check the wiring harness between C-33 WCM connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.5 <LHD> or 10 <RHD> and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.16 <LHD> or 23 <RHD> and body earth. <CAN_L>

OK: 5 V or less

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 20.

YES <vehicles with audio unit> : Go to Step 17.

YES <vehicles with MMCS> : Go to Step 18.

NO (the check result is not normal.) : Go to Step 43.

STEP 16. Check the wiring harness between C-104 KOS-ECU connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.8 <LHD> or 6 <RHD> and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.21 <LHD> or 19 <RHD> and body earth. <CAN_L>

OK: 5 V or less

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 20.

YES <vehicles with audio unit> : Go to Step 17.

YES <vehicles with MMCS> : Go to Step 18.

NO (the check result is not normal.) : Go to Step 44.

54C-24

CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

STEP 17. Check the wiring harness between C-18 audio unit connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

⚠ CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD> and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD> and body earth. <CAN_L>

OK: 5 V or less

Q: Is the check result normal?

YES <vehicles without hands free cellular phone system> : Go to Step 20.

YES <vehicles with hands free cellular phone system (for Russia)> : Go to Step 20.

YES <vehicles with hands free cellular phone system (except for Russia)> : Go to Step 19.

YES <vehicles with hands-free system (with MMCS)> : Go to Step 19.

NO (the check result is not normal.) : Go to Step 45.

STEP 18. Check the wiring harness between C-15 CAN box unit connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

⚠ CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD> and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD> and body earth. <CAN_L>

OK: 5 V or less

Q: Is the check result normal?

YES <vehicles without hands-free system (with MMCS)> : Go to Step 20.

YES <vehicles with hands-free system (with MMCS)> : Go to Step 19.

NO (the check result is not normal.) : Go to Step 46.

STEP 19. Check the wiring harness between C-122 hands free-ECU connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

⚠ CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.7 <LHD> or 7 <RHD> and body earth. <CAN_H>

OK: 5 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.20 <LHD> or 16 <RHD> and body earth. <CAN_L>

OK: 5 V or less

Q: Is the check result normal?

YES : Go to Step 20.

NO : Go to Step 47.

STEP 20. Check the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1) for short to power supply (voltage measurement).

⚠ CAUTION

A digital multimeter should be used.

The test wiring harness should be used.

Strictly observe the specified wiring harness repair procedure.

- (1) Disconnect ETACS-ECU connector and joint connector (CAN1), and measure at the wiring harness side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between C-105 joint connector (CAN1) terminal No.6 <LHD> or 11 <RHD> and body earth. <CAN_H>

OK: 1 V or less

- (4) Measure the voltage between C-105 joint connector (CAN1) terminal No.19 <LHD> or 24 <RHD> and body earth. <CAN_L>

OK: 1 V or less

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Q: Is the check result normal?

YES : Go to Step 48.

NO : Repair the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1).

STEP 21. Checking line-to-line short

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect C-301 ETACS-ECU connector, and check that there is continuity at the harness side.
- (2) Check that there is continuity between C-301 ETACS-ECU connector terminal Nos.6 and 7.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 31.

NO : Go to Step 22.

STEP 22. Check the wiring harness between C-32 SRS connector and C-105 joint connector (CAN1) for line-to-line short.

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and check that there is continuity at the harness side.
- (2) Check that there is continuity between C-105 joint connector terminal Nos.1 and 12 <LHD> or 7 and 20 <RHD>.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 23.

NO : Go to Step 40.

STEP 23. Check the wiring harness between C-111 A/C-ECU connector and C-105 joint connector (CAN1) for line-to-line short.

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and check that there is continuity at the harness side.

- (2) Check that there is continuity between C-105 joint connector terminal Nos.9 and 22 <LHD> or 4 and 15 <RHD>.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 24.

NO : Go to Step 41.

STEP 24. Check the wiring harness between C-03 combination meter connector and C-105 joint connector (CAN1) for line-to-line short.

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and check that there is continuity at the harness side.
- (2) Check that there is continuity between C-105 joint connector terminal Nos.4 and 15 <LHD> or 8 and 21 <RHD>.

OK: No continuity

Q: Is the check result normal?

YES <vehicles with WCM> : Go to Step 25.

YES <vehicles with KOS> : Go to Step 26.

NO (the check result is not normal.) : Go to Step 42.

STEP 25. Check the wiring harness between C-33 WCM connector and C-105 joint connector (CAN1) for line-to-line short.

CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and check that there is continuity at the harness side.
- (2) Check that there is continuity between C-105 joint connector terminal Nos.5 and 16 <LHD> or 10 and 23 <RHD>.

OK: No continuity

Q: Is the check result normal?

YES <vehicles without audio unit or MMCS> : Go to Step 30.

YES <vehicles with audio unit> : Go to Step 27.

YES <vehicles with MMCS> : Go to Step 28.

NO (the check result is not normal.) : Go to Step 43.

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STEP 26. Check the wiring harness between C-104 KOS-ECU connector and C-105 joint connector (CAN1) for line-to-line short.

⚠ CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and check that there is continuity at the harness side.
- (2) Check that there is continuity between C-105 joint connector terminal Nos.8 and 21 <LHD> or 6 and 19 <RHD>.

OK: No continuity

Q: Is the check result normal?

YES <vehicles without audio unit or MMCS> : Go to Step 30.

YES <vehicles with audio unit> : Go to Step 27.

YES <vehicles with MMCS> : Go to Step 28.

NO (the check result is not normal.) : Go to Step 44.

STEP 27. Check the wiring harness between C-18 audio unit connector and C-105 joint connector (CAN1) for line-to-line short.

⚠ CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and check that there is continuity at the harness side.
- (2) Check that there is continuity between C-105 joint connector terminal Nos.10 and 23 <LHD> or 9 and 22 <RHD>.

OK: No continuity

Q: Is the check result normal?

YES <vehicles without hands-free system (with MMCS)> : Go to Step 29.

YES <vehicles without hands-free system (with MMCS)> : Go to Step 30.

NO (the check result is not normal.) : Go to Step 45.

STEP 28. Check the wiring harness between C-15 CAN box unit connector and C-105 joint connector (CAN1) for line-to-line short.

⚠ CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and check that there is continuity at the harness side.
- (2) Check that there is continuity between C-105 joint connector terminal Nos.10 and 23 <LHD> or 9 and 22 <RHD>.

OK: No continuity

Q: Is the check result normal?

YES <vehicles without hands-free system (with MMCS)> : Go to Step 29.

YES <vehicles without hands-free system (with MMCS)> : Go to Step 30.

NO (the check result is not normal.) : Go to Step 46.

STEP 29. Check the wiring harness between C-122 hands free-ECU connector and C-105 joint connector (CAN1) for line-to-line short.

⚠ CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

- (1) Disconnect joint connector (CAN1), and check that there is continuity at the harness side.
- (2) Check that there is continuity between C-105 joint connector terminal Nos.7 and 20 <LHD> or 5 and 16 <RHD>.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 30.

NO : Go to Step 47.

STEP 30. Check the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1) for line-to-line short.

⚠ CAUTION

Disconnect the negative battery terminal.

A digital multimeter should be used.

The test wiring harness should be used.

Strictly observe the specified wiring harness repair procedure.

- (1) Disconnect joint connector (CAN1), and check that there is continuity at the harness side.
- (2) Check that there is continuity between C-105 joint connector terminal Nos.6 and 19 <LHD> or 11 and 24 <RHD>.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 48.

NO : Repair the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1).

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

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STEP 31. Check the wiring harness between C-32 SRS-ECU connector and C-105 joint connector (CAN1) for open circuit.

- (1) Disconnect SRS-ECU connector and joint connector (CAN1), and check the following wiring harness.
- (2) Check that there is continuity between C-32 SRS-ECU connector terminal No.15 and C-105 joint connector (CAN1) terminal No.1 <LHD> or 7 <RHD>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-32 SRS-ECU connector terminal No.16 and C-105 joint connector (CAN1) terminal No.12 <LHD> or 20 <RHD>

OK: Continuity exists (2 or less)

Q: Is the check result normal?

YES : Go to Step 32.

NO : Repair the wiring harness between C-32 SRS-ECU connector and C-105 joint connector (CAN1).

STEP 32. Check the wiring harness between C-111 A/C-ECU connector and C-105 joint connector (CAN1) for open circuit.

- (1) Disconnect A/C-ECU connector and joint connector (CAN1), and check the following wiring harness.
- (2) Check that there is continuity between C-111 A/C-ECU connector terminal No.11 and C-105 joint connector (CAN1) terminal No.9 <LHD> or 4 <RHD>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-111 A/C-ECU connector terminal No.12 and C-105 joint connector (CAN1) terminal No.22 <LHD> or 15 <RHD>

OK: Continuity exists (2 or less)

Q: Is the check result normal?

YES : Go to Step 33.

NO : Repair the wiring harness between C-111 A/C-ECU connector and C-105 joint connector (CAN1).

STEP 33. Check the wiring harness between C-03 combination meter connector and C-105 joint connector (CAN1) for open circuit.

- (1) Disconnect combination meter connector and joint connector (CAN1), and check the wiring

harness.

- (2) Check that there is continuity between C-03 combination meter connector terminal No.14 and C-105 joint connector (CAN1) terminal No.4 <LHD> or 8 <RHD>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-03 combination meter connector terminal No.15 and C-105 joint connector (CAN1) terminal No.15 <LHD> or 21 <RHD>

OK: Continuity exists (2 or less)

Q: Is the check result normal?

YES <vehicles with WCM> : Go to Step 34.

YES <vehicles with KOS> : Go to Step 35.

NO (the check result is not normal.) : Repair the wiring harness between C-03 combination meter connector and C-105 joint connector (CAN1).

STEP 34. Check the wiring harness between C-33 WCM connector and C-105 joint connector (CAN1) for open circuit.

- (1) Disconnect WCM connector and joint connector (CAN1), and check the following wiring harness.
- (2) Check that there is continuity between C-33 WCM connector terminal No.11 and C-105 joint connector (CAN1) terminal No.5 <LHD> or 10 <RHD>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-33 WCM connector terminal No.10 and C-105 joint connector (CAN1) terminal No.16 <LHD> or 23 <RHD>

OK: Continuity exists (2 or less)

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 39.

YES <vehicles with audio unit> : Go to Step 36.

YES <vehicles with MMCS> : Go to Step 37.

NO (the check result is not normal.) : Repair the wiring harness between C-33 WCM connector and C-105 joint connector (CAN1).

STEP 35. Check the wiring harness between C-104 KOS-ECU connector and C-105 joint connector (CAN1) for open circuit.

- (1) Disconnect KOS-ECU connector and joint connector (CAN1), and check the following wiring harness.

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CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING

- (2) Check that there is continuity between C-104 KOS-ECU connector terminal No.1 and C-105 joint connector (CAN1) terminal No.8 <LHD> or 6 <RHD>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-104 KOS-ECU connector terminal No.2 and C-105 joint connector (CAN1) terminal No.21 <LHD> or 19 <RHD>

OK: Continuity exists (2 or less)

Q: Is the check result normal?

YES <vehicles without audio unit and MMCS> : Go to Step 39.

YES <vehicles with audio unit> : Go to Step 36.

YES <vehicles with MMCS> : Go to Step 37.

NO (the check result is not normal.) : Repair the wiring harness between C-104 KOS-ECU connector and C-105 joint connector (CAN1).

STEP 36. Check the wiring harness between C-18 audio unit connector and C-105 joint connector (CAN1) for open circuit.

- (1) Disconnect audio unit connector and joint connector (CAN1), and check the following wiring harness.
- (2) Check that there is continuity between C-18 audio unit connector terminal No.23 and C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-18 audio unit connector terminal No.33 and C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD>

OK: Continuity exists (2 or less)

Q: Is the check result normal?

YES <vehicles without hands-free system (with MMCS)> : Go to Step 39.

YES <vehicles with hands free cellular phone system (for Russia)> : Go to Step 39.

YES <vehicles with hands free cellular phone system (except for Russia)> : Go to Step 38.

NO (the check result is not normal.) : Repair the wiring harness between C-18 audio unit connector and C-105 joint connector (CAN1).

STEP 37. Check the wiring harness between C-15 CAN box unit connector and C-105 joint connector (CAN1) for open circuit.

- (1) Disconnect CAN box unit connector and joint connector (CAN1), and check the following wiring harness.
- (2) Check that there is continuity between C-15 CAN box unit connector terminal No.8 and C-105 joint connector (CAN1) terminal No.10 <LHD> or 9 <RHD>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-15 CAN box unit connector terminal No.9 and C-105 joint connector (CAN1) terminal No.23 <LHD> or 22 <RHD>

OK: Continuity exists (2 or less)

NOTE: Check C-19 intermediate connector, and repair if necessary.

Q: Is the check result normal?

YES <vehicles without hands-free system (with MMCS)> : Go to Step 39.

YES <vehicles with hands-free system (with MMCS)> : Go to Step 38.

NO (the check result is not normal.) : Repair the wiring harness between C-15 CAN box unit connector and C-105 joint connector (CAN1).

STEP 38. Check the wiring harness between C-122 hands free-ECU connector and C-105 joint connector (CAN1) for open circuit.

- (1) Disconnect hands free-ECU connector and joint connector (CAN1), and check the following wiring harness.
- (2) Check that there is continuity between C-122 hands free-ECU connector terminal No.4 and C-105 joint connector (CAN1) terminal No.7 <LHD> or 5 <RHD>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-122 hands free-ECU connector terminal No.16 and C-105 joint connector (CAN1) terminal No.20 <LHD> or 16 <RHD>

OK: Continuity exists (2 or less)

NOTE: Check C-145 intermediate connector, and repair if necessary.

Q: Is the check result normal?

YES : Go to Step 39.

NO : Repair the wiring harness between C-105 hands free-ECU connector and C-105 joint connector (CAN1).

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

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STEP 39 Check the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1) for open circuit.

⚠ CAUTION

Strictly observe the specified wiring harness repair procedure.

- (1) Disconnect ETACS-ECU connector and joint connector (CAN1), and check the following wiring harness.
- (2) Check that there is continuity between C-301 ETACS-ECU connector terminal No.6 and C-105 joint connector (CAN1) terminal No.6 <LHD> or 11 <RHD>

OK: Continuity exists (2 or less)

- (3) Check that there is continuity between C-301 ETACS-ECU connector terminal No.7 and C-105 joint connector (CAN1) terminal No.19 <LHD> or 24 <RHD>

OK: Continuity exists (2 or less)

Q: Is the check result normal?

YES : Go to Step 48.

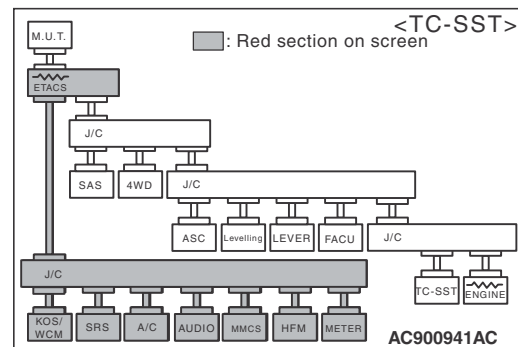
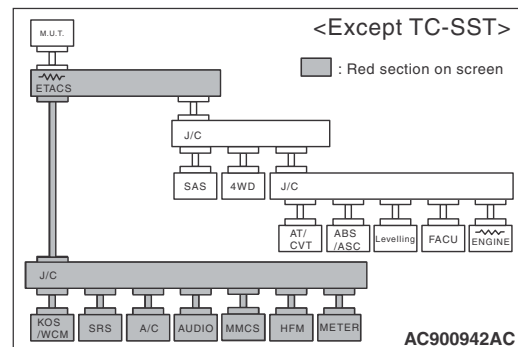
NO : Repair the wiring harness between C-301 ETACS-ECU connector and C-105 joint connector (CAN1).

STEP 40. M.U.T.-III CAN bus diagnostics (checking the SRS-ECU for internal short)

⚠ CAUTION

Strictly observe the specified wiring harness repair procedure.

Disconnect C-32 SRS-ECU connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-32 SRS-ECU connector and C-105 joint connector (CAN1).

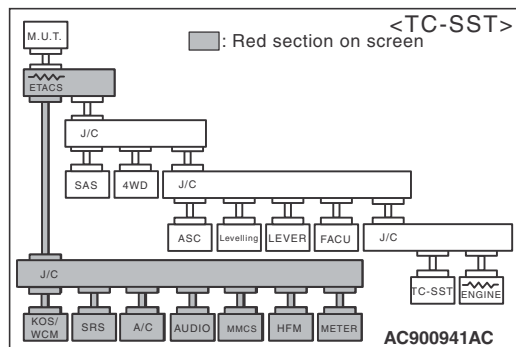
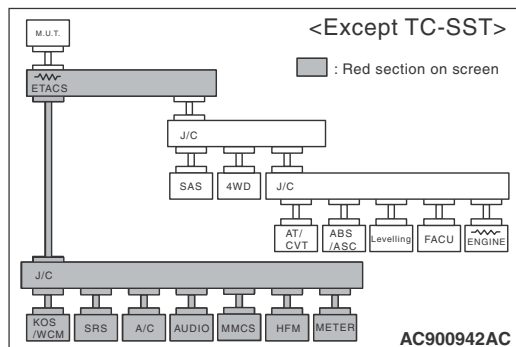
NO : Check the SRS-ECU connector, and repair if necessary. If the SRS-ECU connector is in good condition, replace the SRS-ECU.

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CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING**STEP 41. M.U.T.-III CAN bus diagnostics
(checking the A/C-ECU for internal short)****CAUTION**

Strictly observe the specified wiring harness repair procedure.

Disconnect C-111 A/C-ECU connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

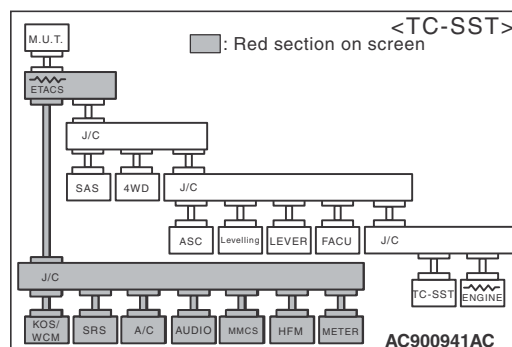
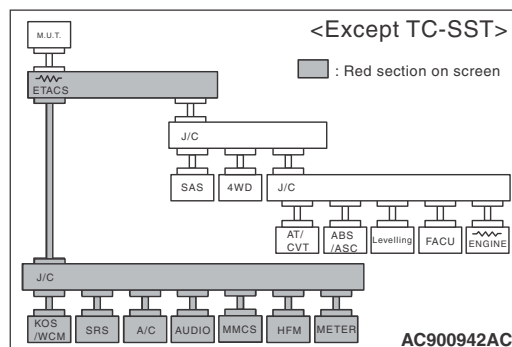
YES : Repair the wiring harness between C-111 A/C-ECU connector and C-105 joint connector (CAN1).

NO : Check the A/C-ECU connector, and repair if necessary. If the A/C-ECU connector is in good condition, replace the A/C-ECU.

**STEP 42. M.U.T.-III CAN bus diagnostics
(checking the combination meter for internal short)****CAUTION**

Strictly observe the specified wiring harness repair procedure.

Disconnect C-03 combination meter connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-03 combination meter connector and C-105 joint connector (CAN1).

NO : Check the combination meter connector, and repair if necessary. If the combination meter connector is in good condition, replace the combination meter.

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

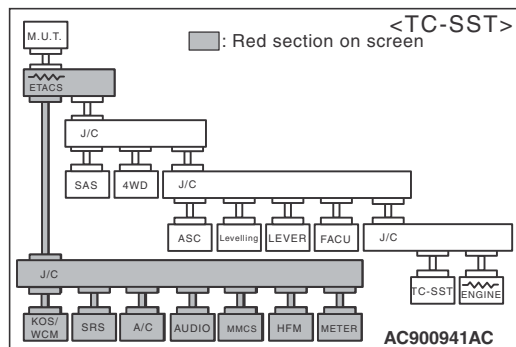
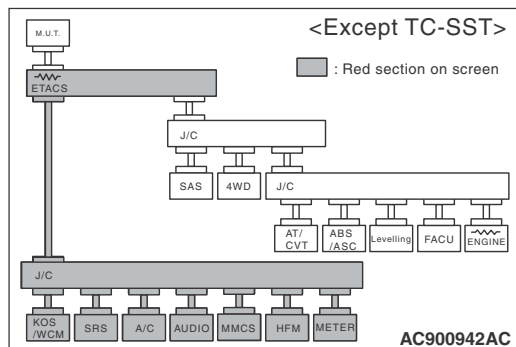
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STEP 43. M.U.T.-III CAN bus diagnostics (checking the WCM for internal short)

⚠ CAUTION

Strictly observe the specified wiring harness repair procedure.

Disconnect C-33 WCM connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-33 WCM connector and C-105 joint connector (CAN1).

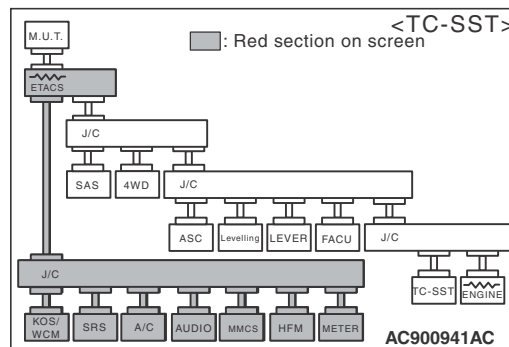
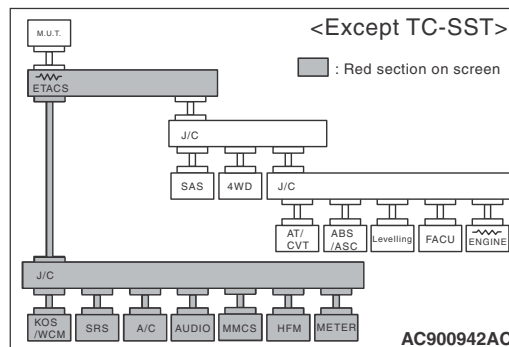
NO : Check the WCM connector, and repair if necessary. If the WCM connector is in good condition, replace the WCM.

STEP 44. M.U.T.-III CAN bus diagnostics (checking the KOS-ECU for internal short)

⚠ CAUTION

Strictly observe the specified wiring harness repair procedure.

Disconnect C-104 KOS-ECU connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-104 KOS-ECU connector and C-105 joint connector (CAN1).

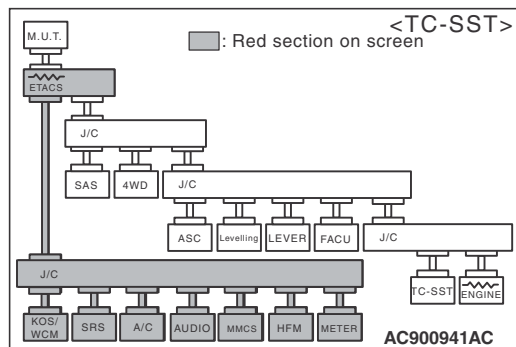
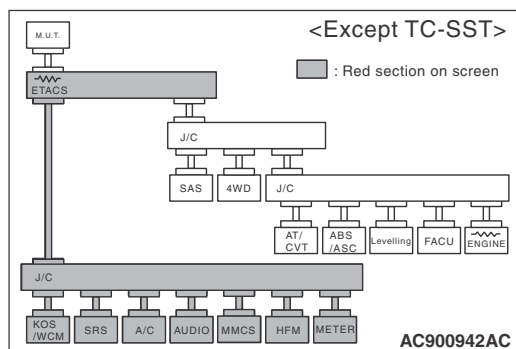
NO : Check the KOS-ECU connector, and repair if necessary. If the KOS-ECU connector is in good condition, replace the KOS-ECU.

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CONTROLLER AREA NETWORK (CAN)
TROUBLESHOOTING**STEP 45. M.U.T.-III CAN bus diagnostics
(checking the audio unit for internal short)****CAUTION**

Strictly observe the specified wiring harness repair procedure.

Disconnect C-18 audio unit connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

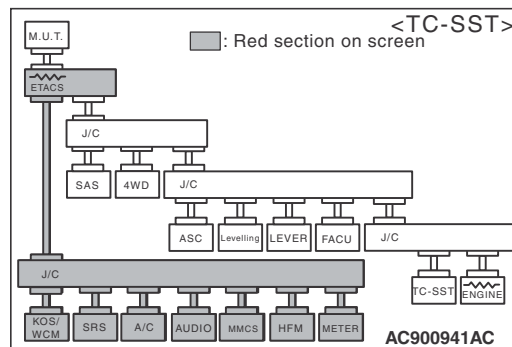
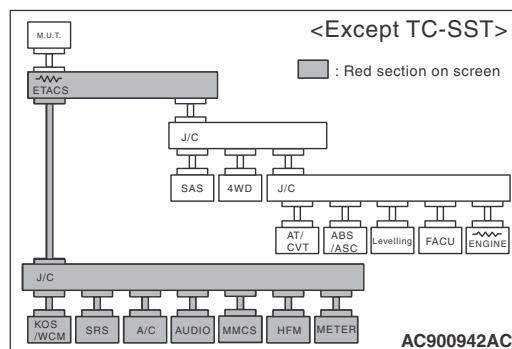
YES : Repair the wiring harness between C-18 audio unit connector and C-105 joint connector (CAN1).

NO : Check the audio unit connector, and repair if necessary. If the audio unit connector is in good condition, replace the audio unit.

**STEP 46. M.U.T.-III CAN bus diagnostics
(checking the CAN box unit for internal short)****CAUTION**

Strictly observe the specified wiring harness repair procedure.

Disconnect C-15 CAN box unit connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-15 CAN box unit connector and C-105 joint connector (CAN1).

NO : Check the CAN box unit connector, and repair if necessary. If the CAN box unit connector is in good condition, replace the CAN box unit.

CONTROLLER AREA NETWORK (CAN) TROUBLESHOOTING

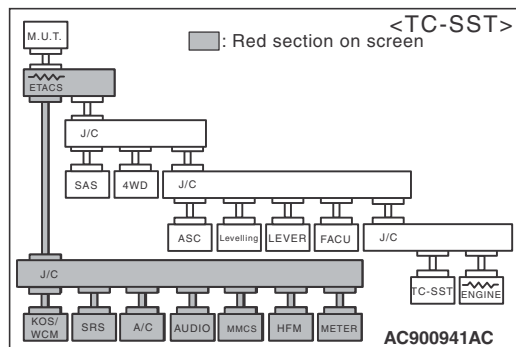
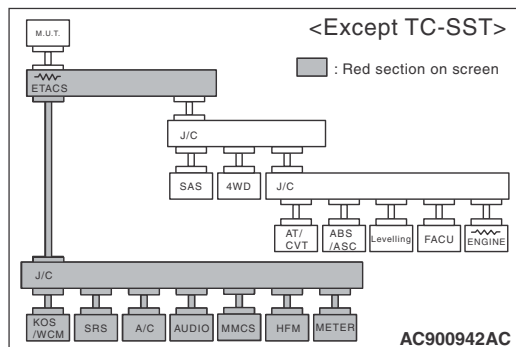
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STEP 47. M.U.T.-III CAN bus diagnostics (checking the hands free-ECU for internal short)

CAUTION

Strictly observe the specified wiring harness repair procedure.

Disconnect C-122 hands free-ECU connector, and diagnose the CAN bus line.



OK: The display of the M.U.T.-III is as shown in the figure.

Q: Does M.U.T.-III screen correspond to the illustration?

YES : Repair the wiring harness between C-122 hands free-ECU connector and C-105 joint connector (CAN1).

NO : Check the hands free-ECU connector, and repair if necessary. If the hands free-ECU connector is in good condition, replace the hands free-ECU.

STEP 48. Trouble symptom check

Diagnose the CAN bus line, and check that normal condition is displayed.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 How to use Troubleshooting/inspection Service Points How to Cope with Intermittent Malfunction).

NO : Check the ETACS-ECU connector, and repair if necessary. If the ETACS-ECU connector is in good condition, replace the ETACS-ECU.

GROUP 80

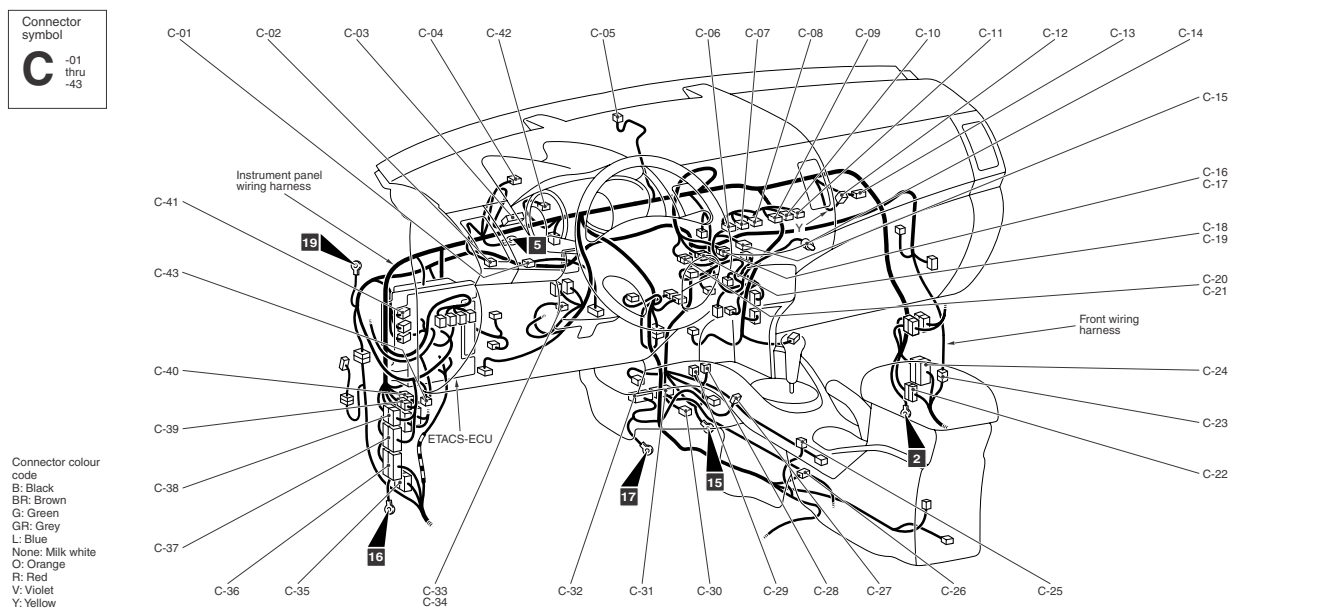
**CONFIGURATION
DIAGRAMS**

CONTENTS

INSTRUMENT PANEL <LHD> 80-2

INSTRUMENT PANEL <LHD>

M1801000701724



AC900146AB

C-01	(24)	J/C (CAN3)	C-20	(24)	Spare connector (for navigation unit) <Vehicles without MMCS>
C-02	(4)	Meter information switch	C-21	(24)	Instrument panel wiring harness and audio navigation display wiring harness combination <Vehicles with MMCS>
C-03	(24)	Combination meter	C-22	(24)	Instrument panel wiring harness and floor wiring harness combination
C-04	(24)	J/C (CAN2)	C-23	(4)	Front wiring harness and floor wiring harness combination
C-05	(5)	Photo sensor <Vehicles without rain sensitive AUTO wiper>	C-24	(20)	Instrument panel wiring harness and floor wiring harness combination
C-06	(12-GR)	Multivision display <Vehicles with MMCS>	C-25	(5)	Drive mode selector <4WD>
C-07	(7)	Multivision display <Vehicles with MMCS>	C-26	(10)	Shift switch assembly <A/T, CVT> or shift lever <TC-SST>
C-08	(32-GR)	Multivision display <Vehicles with MMCS>	C-27	(2)	Accessory socket (Front floor console)
C-09	(3-GR)	Multivision display <Vehicles with MMCS>	C-28	(2)	PTC heater <BSY, 4HN>
C-10	(5-GR)	Multivision display <Vehicles with MMCS>	C-29	(3)	PTC heater <BSY, 4HN>
C-11	(17-GR)	Multivision display <Vehicles with MMCS>	C-30	(6-B)	G and yaw rate sensor <Vehicles with ASC>
C-12	(4-Y)	Passenger's (Front) air bag module (squib)	C-31	(32-Y)	SRS-ECU
C-13	(4)	Passenger's air bag cut off switch	C-32	(24-Y)	SRS-ECU
C-14	(2-B)	Glove box lamp	C-33	(12)	Wireless control module <Vehicles without KOS>
C-15	(10)	CAN box unit <Vehicles with MMCS>	C-34	(12)	Receiver antenna module <Vehicles with KOS>
C-16	(18)	Audio or spare connector (for audio) <Vehicles without MMCS>	C-35	(24)	Instrument panel wiring harness and floor wiring harness combination
C-17	(18)	Instrument panel wiring harness and audio navigation display wiring harness combination <Vehicles with MMCS>	C-36	(20)	Instrument panel wiring harness and floor wiring harness combination
C-18	(20)	Audio or spare connector (for audio) <Vehicles without MMCS>	C-37	(22)	Instrument panel wiring harness and front wiring harness combination
C-19	(20)	Instrument panel wiring harness and audio navigation display wiring harness combination <Vehicles with MMCS>	C-38	(16-BR)	Instrument panel wiring harness and front wiring harness combination

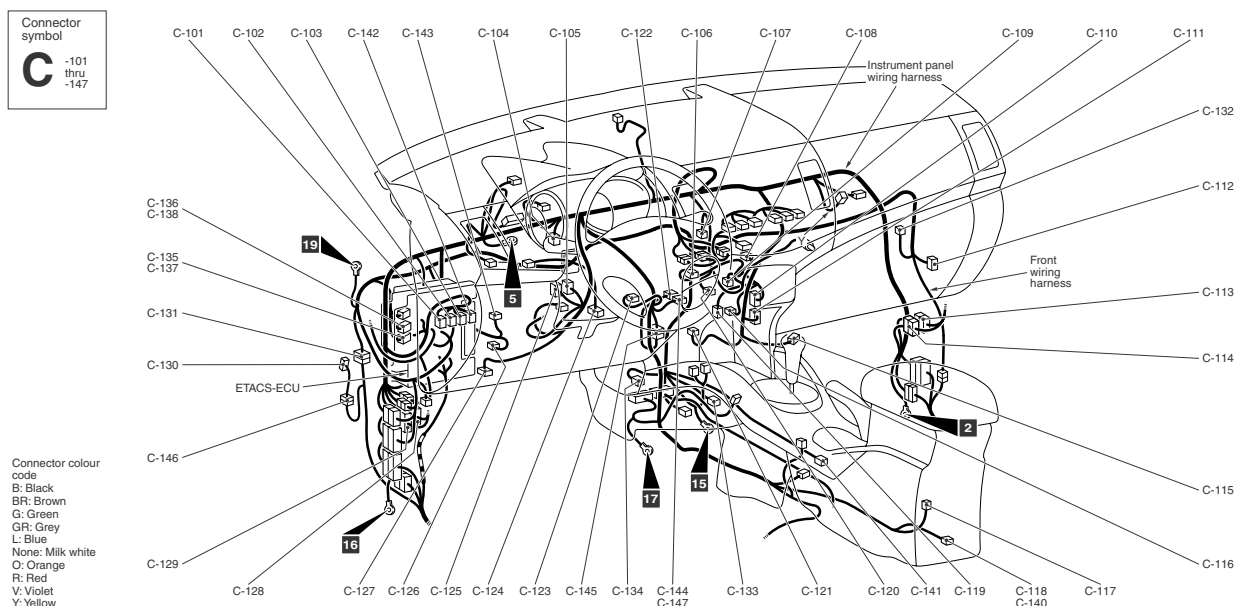
CONFIGURATION DIAGRAMS

INSTRUMENT PANEL <LHD>

80-3

- C-39 (2) Instrument panel wiring harness and front wiring harness combination
- C-40 (12) Instrument panel wiring harness and roof wiring harness combination
- C-41 (2) Clutch switch <M/T>
- C-42 (8) LIN cut off control unit <Security alarm system>
- C-43 (12) No connection <6B31>

INSTRUMENT PANEL <LHD> (CONTINUED)



AC900146AD

- | | | | |
|---------------|--|---------------|---|
| C-101 (6-GR) | Headlamp levelling switch <Headlamp manual levelling system> | C-121 (4) | Power transistor |
| C-102 (6) | ASC off switch | C-122 (24) | Hands free-ECU <Vehicles with bluetooth function and without USB adapter> |
| C-103 (6-L) | Sonar switch <Reversing sensor system> | C-123 (2) | Interior temperature sensor |
| C-104 (40) | KOS-ECU | C-124 (6-B) | Accelerator pedal position sensor |
| C-105 (24) | J/C (CAN 1) | C-125 (20-B) | Corner sensor/back sensor-ECU <Reversing sensor system> |
| C-106 (16) | Centre panel unit | C-126 (4-B) | Stop lamp switch |
| C-107 (2) | Radio antenna | C-127 (16-B) | Diagnosis connector |
| C-108 (5) | Outside/inside air selection damper control motor | C-128 (12) | Instrument panel wiring harness and front door wiring harness (Driver's side) combination |
| C-109 (5) | Mode selection damper control motor | C-129 (24-BR) | Instrument panel wiring harness and front door wiring harness (Driver's side) combination |
| C-110 (16-B) | A/C-ECU | C-130 (16) | 4WD-ECU |
| C-111 (20-B) | A/C-ECU | C-131 (22) | Front wiring harness and floor wiring harness combination |
| C-112 (26) | Headlamp automatic levelling-ECU | C-132 (10-B) | Fuel additive-ECU <4HN> |
| C-113 (12) | Instrument panel wiring harness and front door wiring harness (Passenger's side) combination | C-133 (2-B) | Exhaust gas temperature sensor <4HN> |
| C-114 (24-BR) | Instrument panel wiring harness and front door wiring harness (Passenger's side) combination | C-134 (4-B) | Oxygen sensor (Front) <4B1> |
| C-115 (2) | Blower motor | C-135 (22) | CVT-ECU <4B1> |
| C-116 (5) | Air mixing damper control motor | C-136 (26) | CVT-ECU <4B1> |
| C-117 (2) | Accessory socket (Rear floor console) | C-137 (22) | A/T-ECU <6B31> |
| C-118 (6-B) | Audio and video adapter | C-138 (26) | A/T-ECU <6B31> |
| C-119 (2) | Fin thermo sensor | C-140 (6-B) | Audio adapter |
| C-120 (12) | A/C control panel | | |

MSB-09E54_80_90-001 (09RV015)

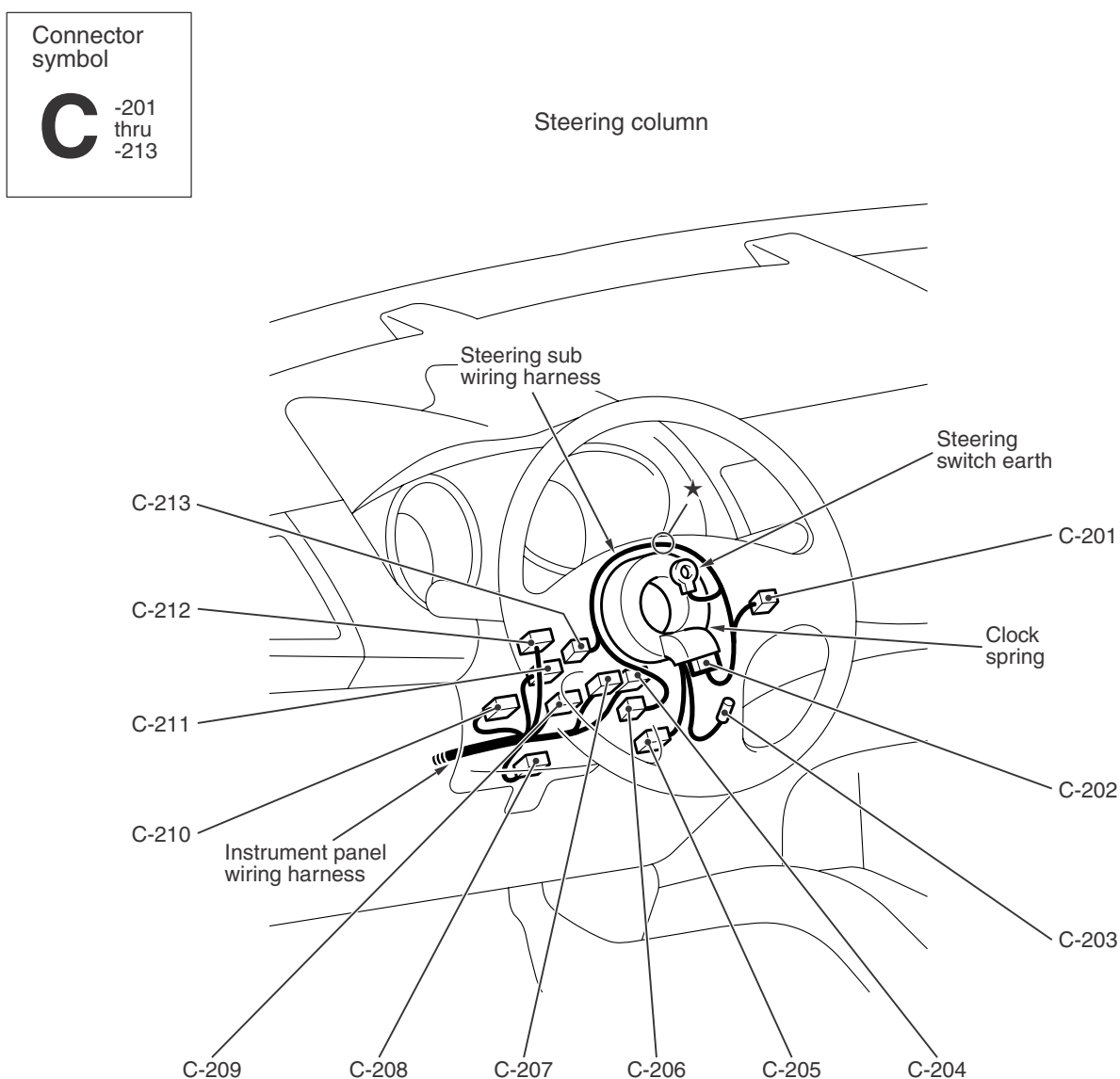
65

80-4

CONFIGURATION DIAGRAMS
INSTRUMENT PANEL <LHD>

- C-141 (16) Shift lever <TC-SST>
- C-142 (4) AFS control switch
- C-143 (8) Stop lamp relay
- C-144 (28) USB box <Vehicles without bluetooth function and with USB adapter> or no connection
- C-145 (28) Instrument panel wiring harness and hands free-ECU wiring harness combination <Vehicles with bluetooth function and without USB adapter>
- C-146 (16-BR) Floor wiring harness and 4WD-ECU sub wiring harness combination
- C-147 (28) Hands free-ECU <Vehicles with bluetooth function and with USB adapter>

INSTRUMENT PANEL <LHD> (CONTINUED)



AC900147AB

C-201 (4-L) Cruise control switch

C-202 (5) Clock spring and steering sub wiring harness combination

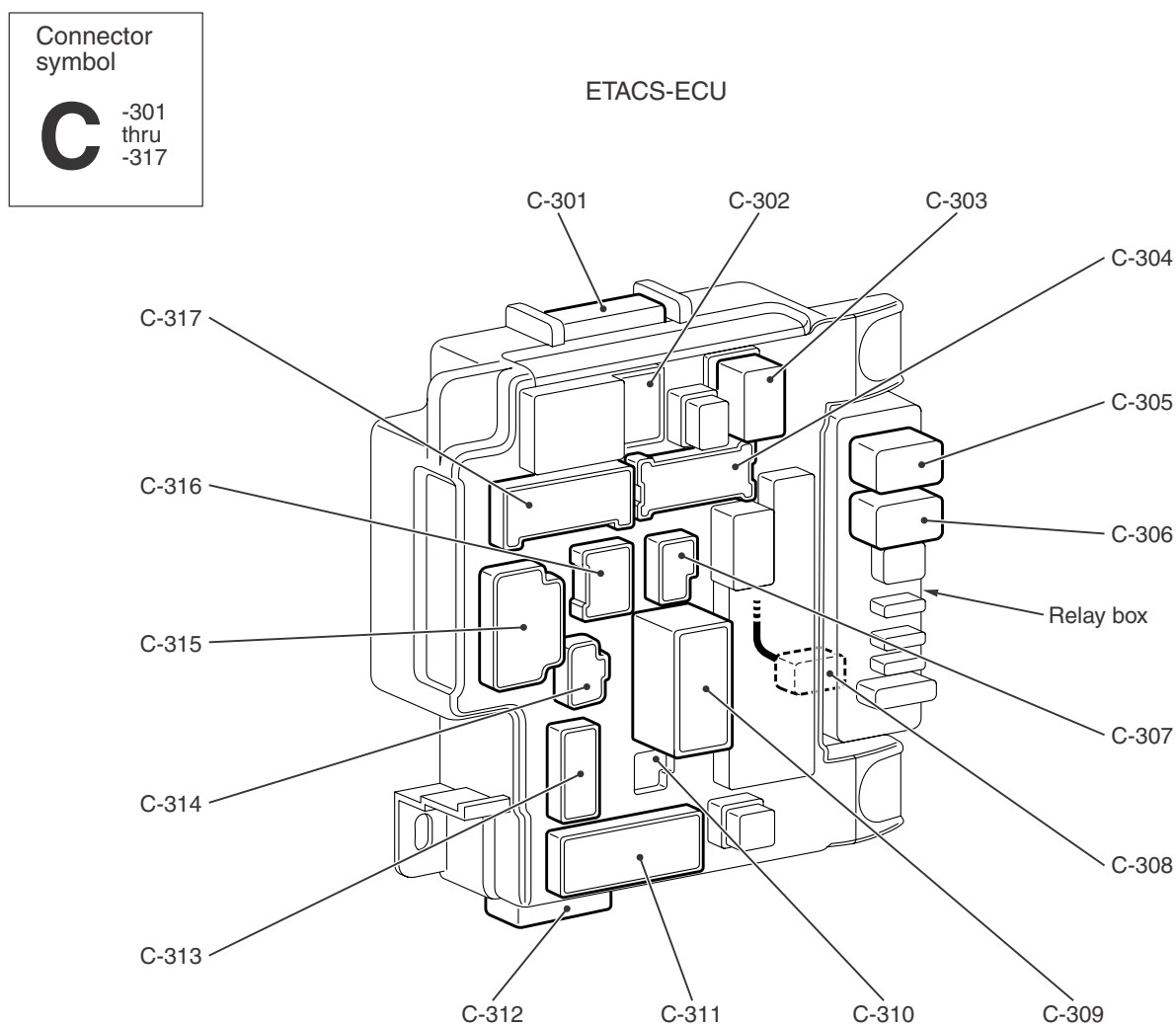
CONFIGURATION DIAGRAMS

INSTRUMENT PANEL <LHD>

80-5

C-203 (1)	Horn switch
C-204 (6)	Clock spring
C-205 (4-Y)	Driver's air bag module (squib)
C-206 (4-Y)	Steering wheel voice control switch
C-207 (4-Y)	Clock spring
C-208 (3)	Paddle shift switch
C-209 (5)	Steering wheel sensor <Vehicles with ASC or AFS>
C-210 (6)	Ignition switch
C-211 (12)	Key reminder switch
C-212 (10)	Column switch
C-213 (5-R)	Steering wheel audio remote control switch

INSTRUMENT PANEL <LHD> (CONTINUED)



AC602621AB

C-301 (24)	Instrument panel wiring harness and ETACS-ECU combination	C-306 (4)	Rear window defogger relay
C-302 (4)	No connection	C-307 (2-B)	Front wiring harness and ETACS-ECU combination
C-303 (4)	Blower relay	C-308 (1-GR)	Instrument panel wiring harness and Relay box combination
C-304 (16)	Front wiring harness and ETACS-ECU combination	C-309 (2-B)	Front wiring harness and ETACS-ECU combination
C-305 (4)	Heated seat relay		

MSB-09E54_80_90-001 (09RV015)

80-6**CONFIGURATION DIAGRAMS
INSTRUMENT PANEL <LHD>**

C-310	(4)	No connection
C-311	(20)	Floor wiring harness and ETACS-ECU combination
C-312	(16)	Front wiring harness and ETACS-ECU combination
C-313	(16-BR)	Floor wiring harness and ETACS-ECU combination
C-314	(2)	Floor wiring harness and ETACS-ECU combination
C-315	(19)	Instrument panel wiring harness and ETACS-ECU combination
C-316	(6)	Roof wiring harness and ETACS-ECU combination
C-317	(15)	Instrument panel wiring harness and ETACS-ECU combination

GROUP 90

CIRCUIT DIAGRAMS

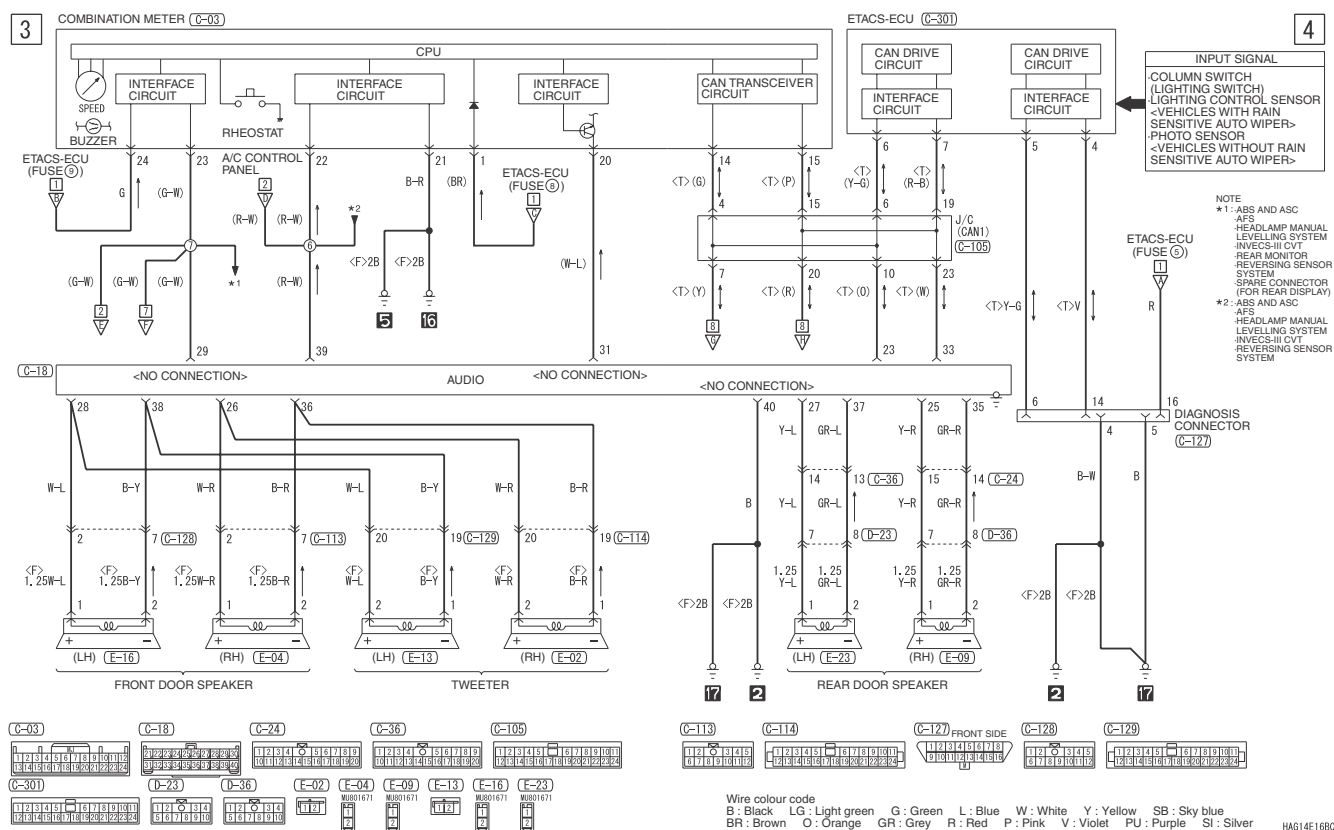
CONTENTS

AUDIO SYSTEM	90-2	HANDS-FREE CELLULAR PHONE SYSTEM <VEHICLES FOR RUSSIA WITHOUT AUDIO AMPLIFIER AND WITH HANDS-FREE CELLULAR PHONE SYSTEM>	90-2
AUDIO SYSTEM <VEHICLES FOR RUSSIA WITH AUDIO AMPLIFIER AND WITH HANDS- FREE CELLULAR PHONE SYSTEM>	90-6	HANDS-FREE CELLULAR PHONE SYSTEM <VEHICLES FOR RUSSIA WITH BLUETOOTH FUNCTION AND WITH USB ADAPTER>	90-12
		CAN <VEHICLES FOR RUSSIA> ...	90-16

CIRCUIT DIAGRAMS AUDIO SYSTEM

90-3

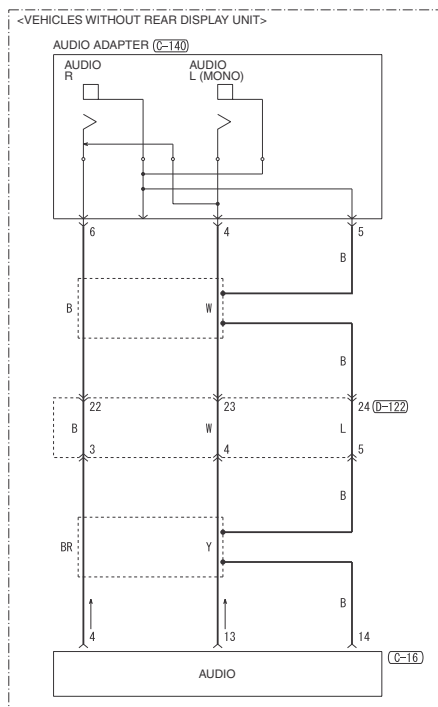
AUDIO SYSTEM <VEHICLES FOR RUSSIA WITHOUT AUDIO AMPLIFIER AND WITH HANDS-FREE CELLULAR PHONE SYSTEM> (CONTINUED)



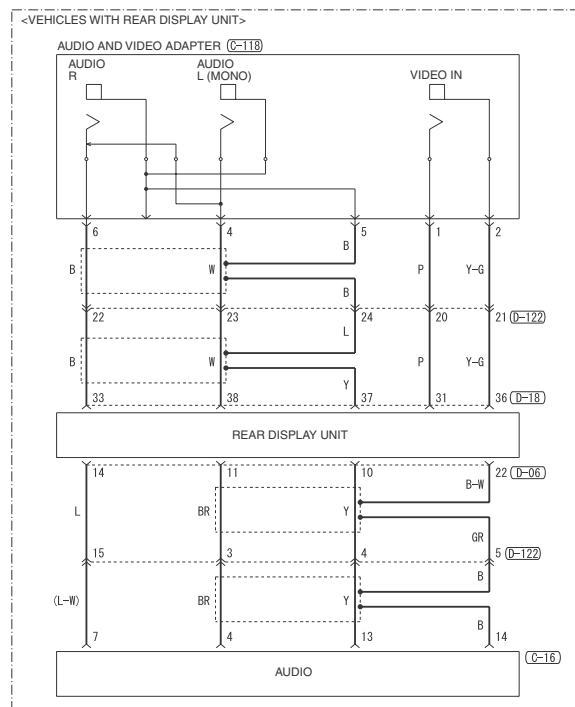
90-4

CIRCUIT DIAGRAMS
AUDIO SYSTEMAUDIO SYSTEM <VEHICLES FOR RUSSIA WITHOUT AUDIO AMPLIFIER AND WITH HANDS-FREE
CELLULAR PHONE SYSTEM> (CONTINUED)

5



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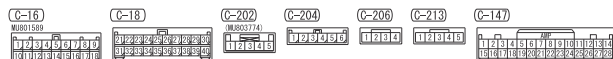
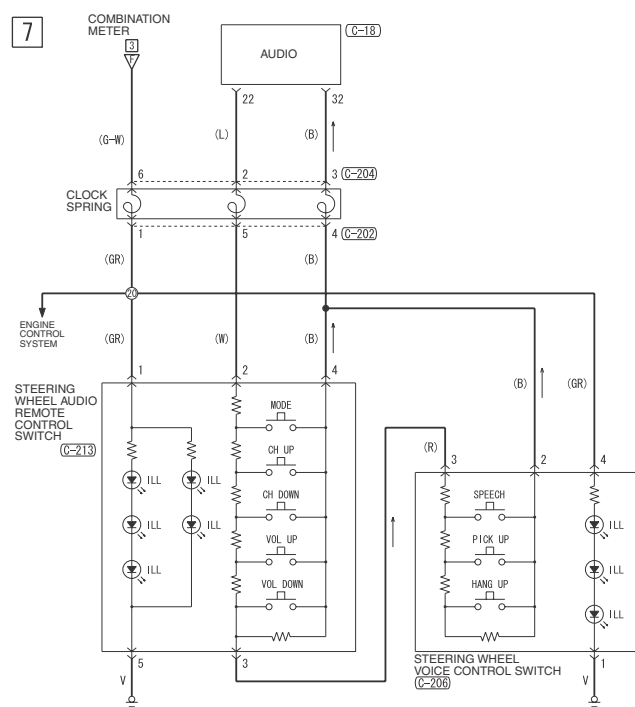


Wire colour code
 B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Grey R : Red P : Pink V : Violet PU : Purple SI : Silver
 HA614E160C

CIRCUIT DIAGRAMS AUDIO SYSTEM

90-5

AUDIO SYSTEM <VEHICLES FOR RUSSIA WITHOUT AUDIO AMPLIFIER AND WITH HANDS-FREE CELLULAR PHONE SYSTEM> (CONTINUED)



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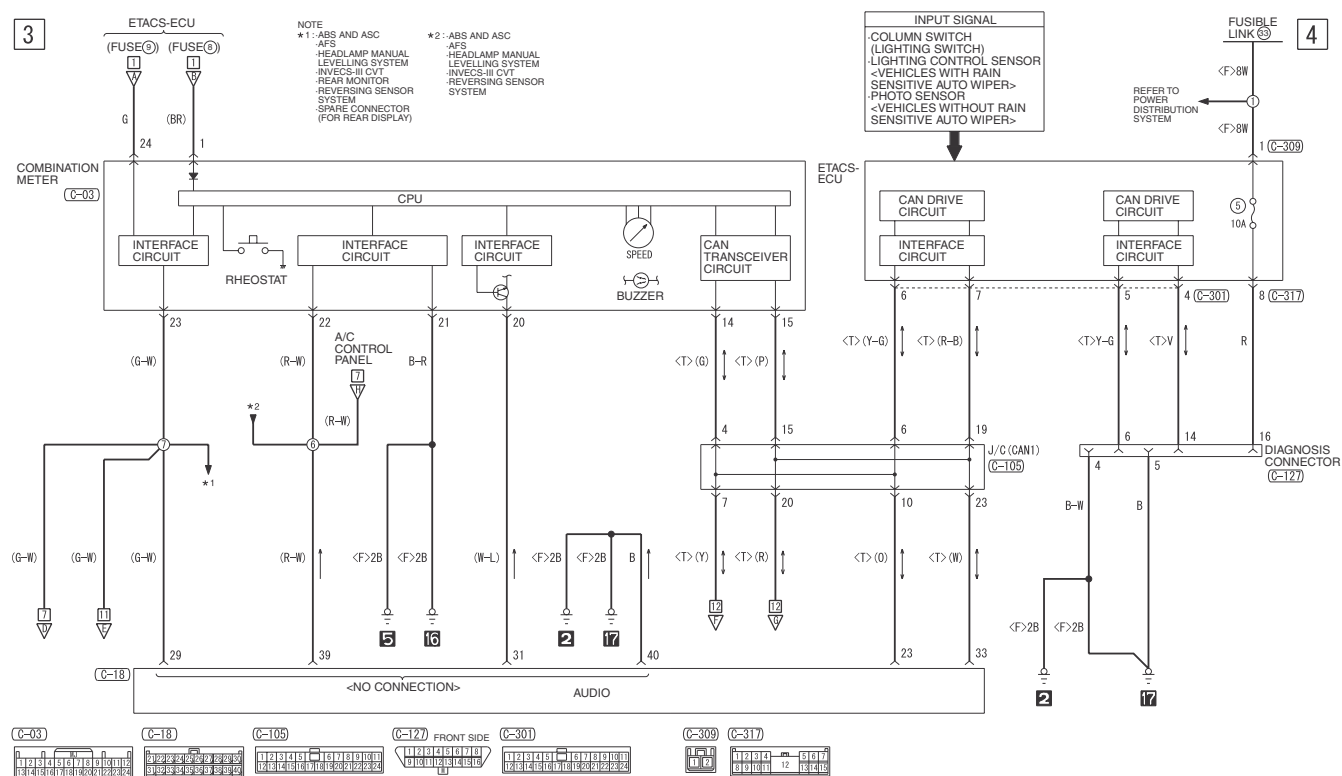
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CIRCUIT DIAGRAMS

AUDIO SYSTEM

90-7

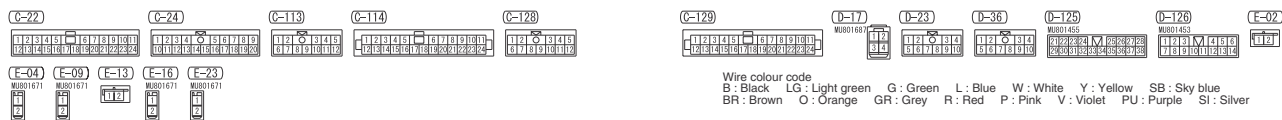
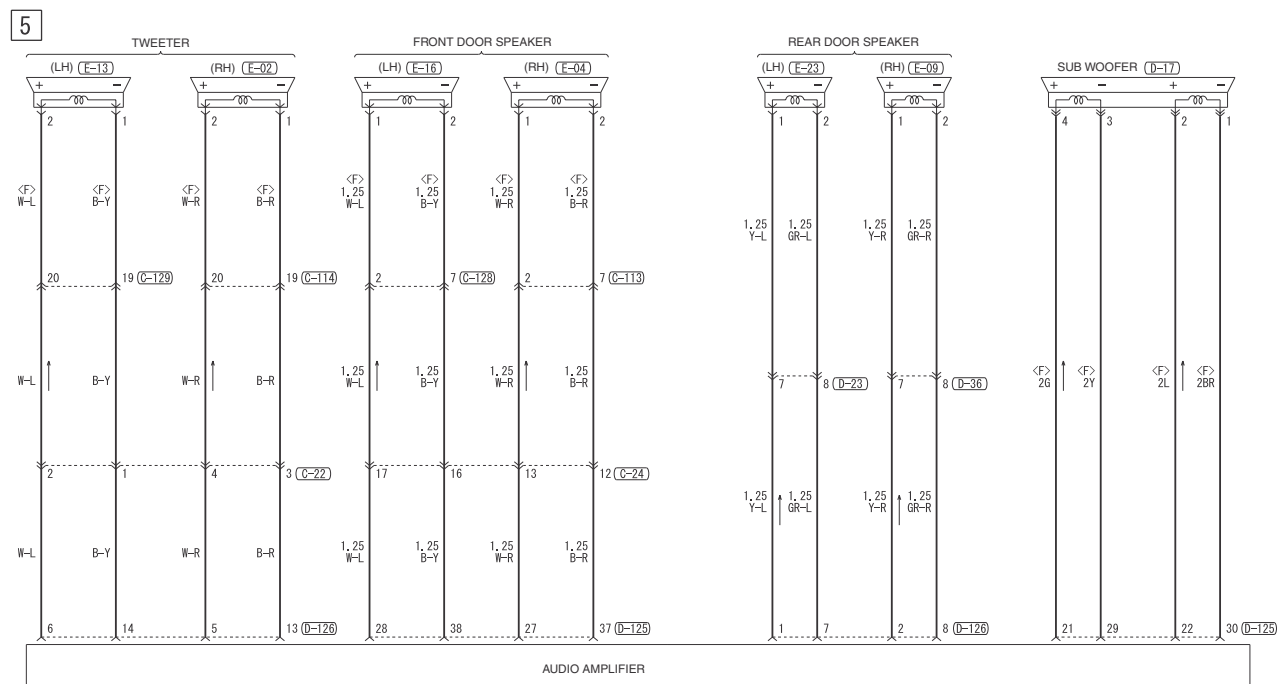
AUDIO SYSTEM <VEHICLES FOR RUSSIA WITH AUDIO AMPLIFIER AND WITH HANDS-FREE CELLULAR PHONE SYSTEM> (CONTINUED)



90-8

CIRCUIT DIAGRAMS
AUDIO SYSTEM

AUDIO SYSTEM <VEHICLES FOR RUSSIA WITH AUDIO AMPLIFIER AND WITH HANDS-FREE CELLULAR PHONE SYSTEM> (CONTINUED)

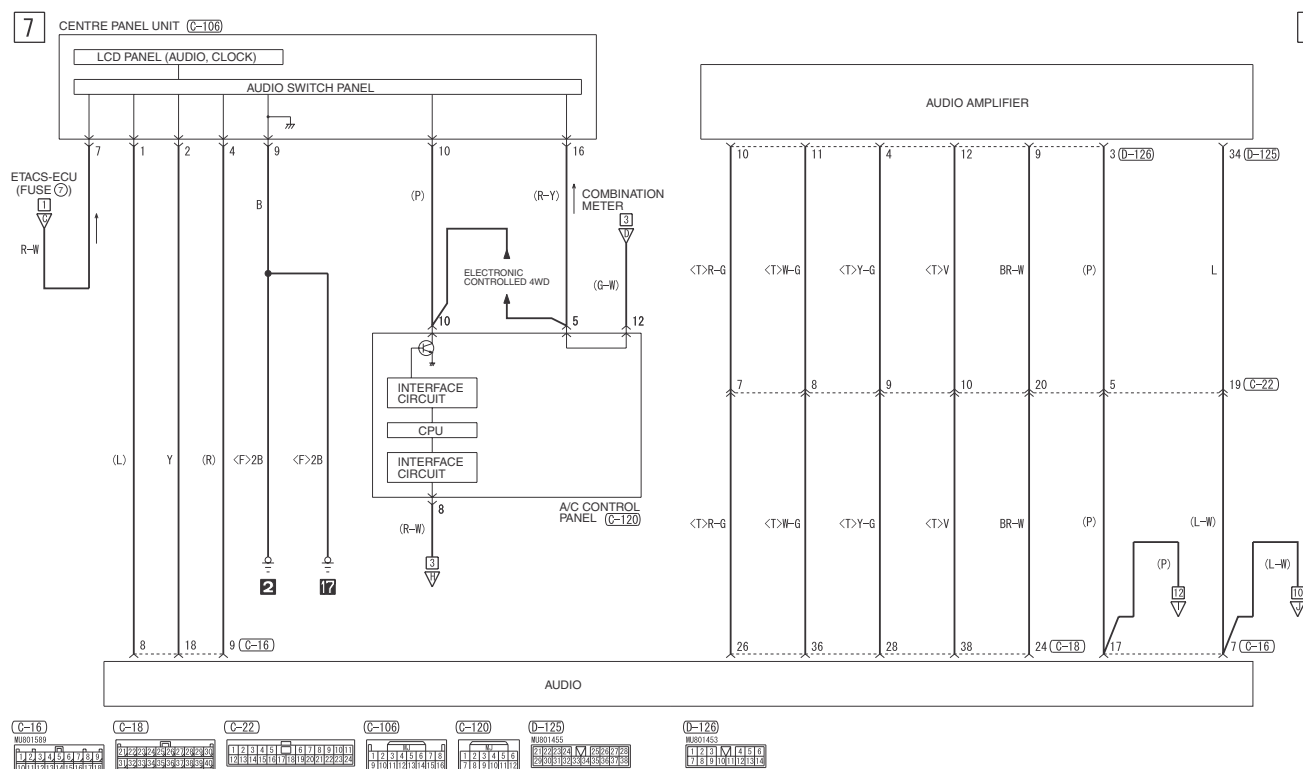


CIRCUIT DIAGRAMS

AUDIO SYSTEM

90-9

AUDIO SYSTEM <VEHICLES FOR RUSSIA WITH AUDIO AMPLIFIER AND WITH HANDS-FREE CELLULAR PHONE SYSTEM> (CONTINUED)

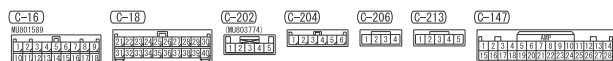
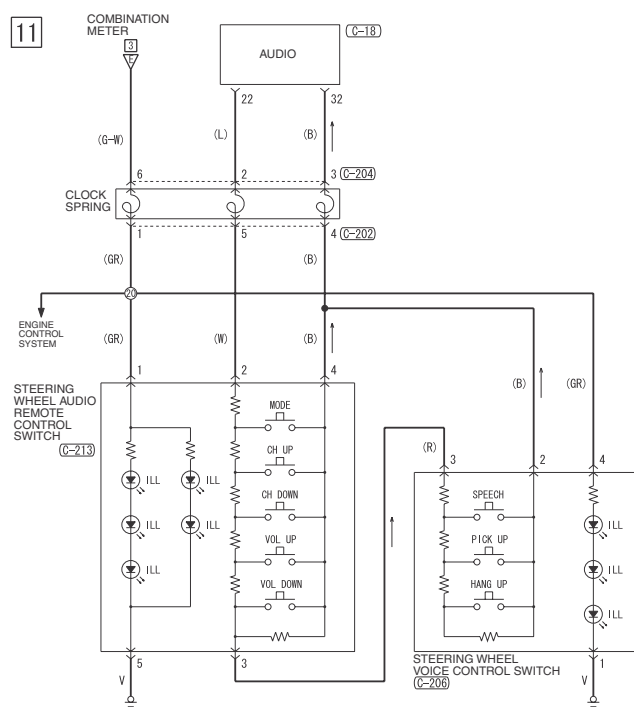


CIRCUIT DIAGRAMS

AUDIO SYSTEM

90-11

AUDIO SYSTEM <VEHICLES FOR RUSSIA WITH AUDIO AMPLIFIER AND WITH HANDS-FREE CELLULAR PHONE SYSTEM> (CONTINUED)

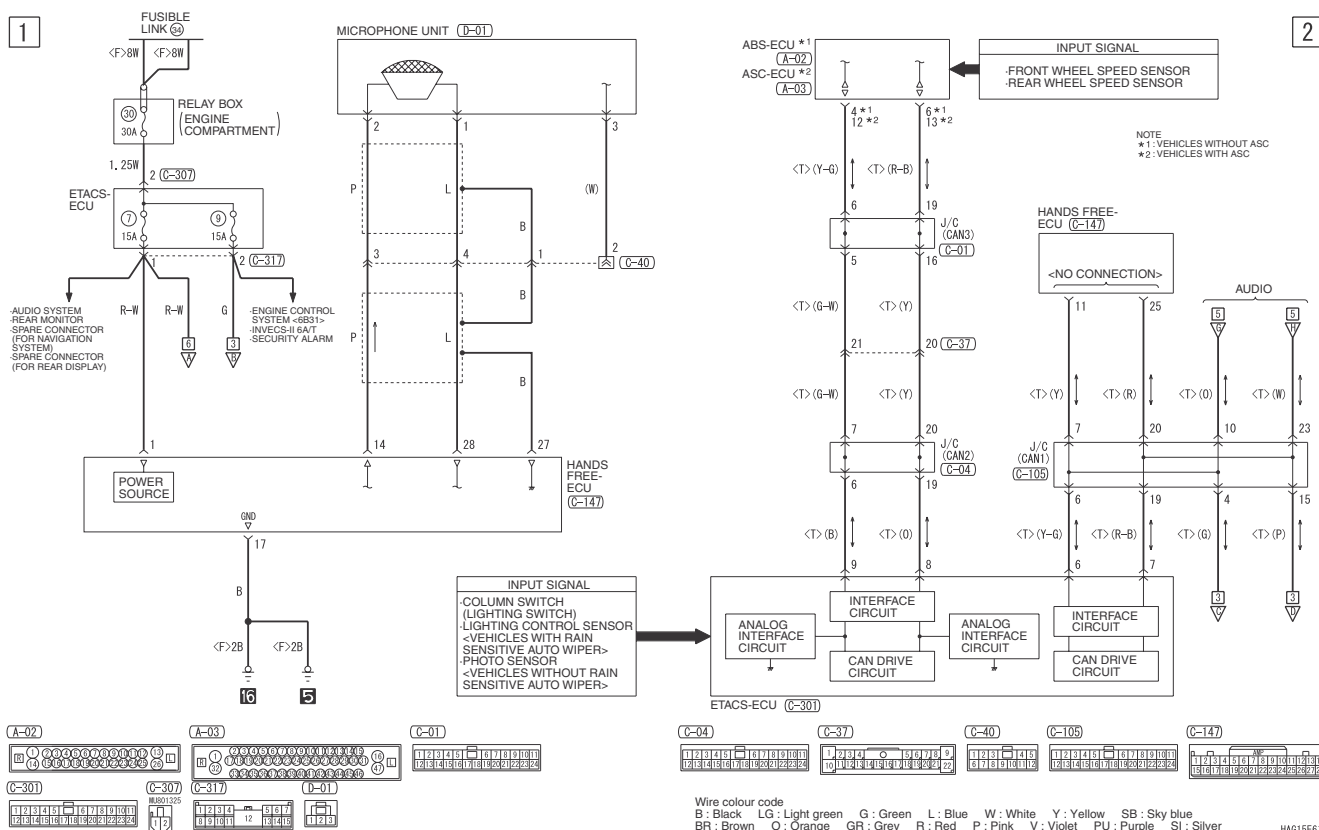


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HANDS-FREE CELLULAR PHONE SYSTEM <VEHICLES FOR RUSSIA WITH BLUETOOTH FUNCTION AND WITH USB ADAPTER>

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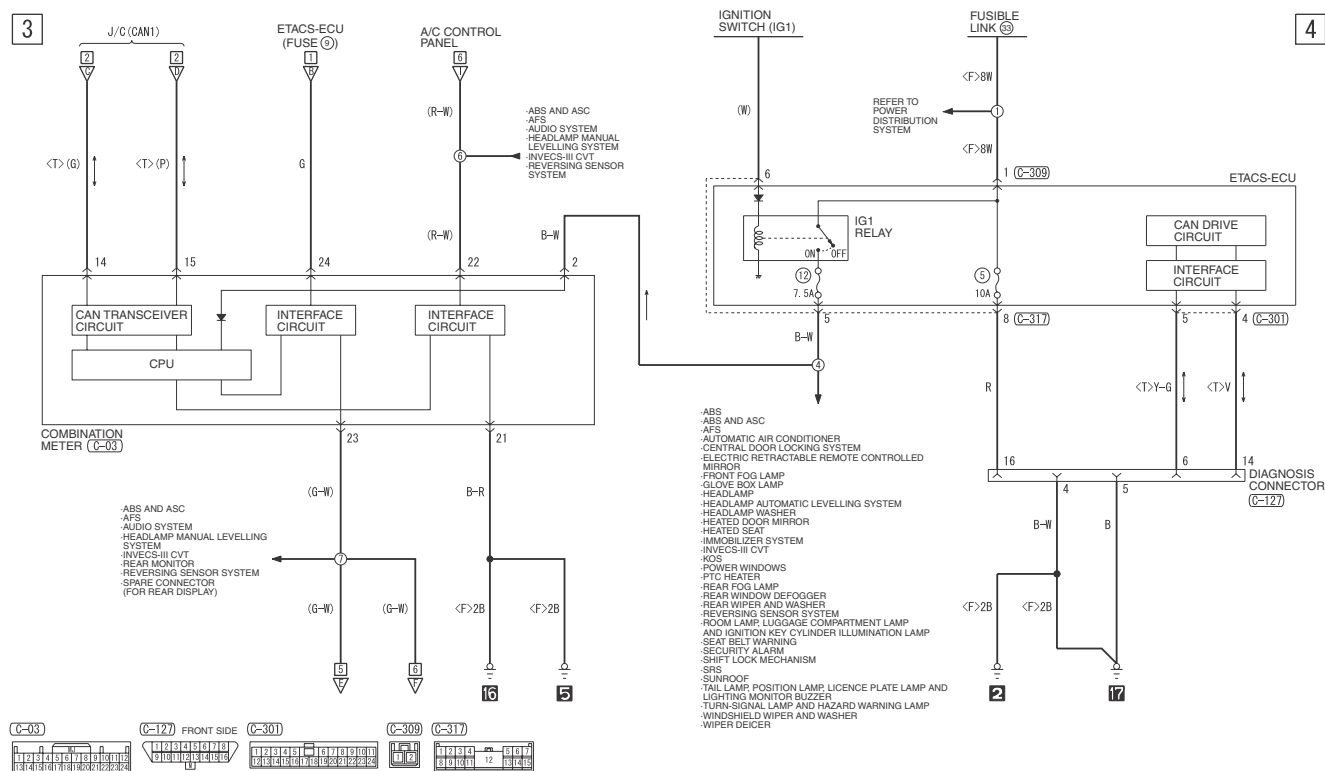


CIRCUIT DIAGRAMS

90-13

HANDS-FREE CELLULAR PHONE SYSTEM <VEHICLES FOR RUSSIA WITH BLUETOOTH FUNCTION AND WITH USB ADAPTER>

HANDS-FREE CELLULAR PHONE SYSTEM <VEHICLES FOR RUSSIA WITH BLUETOOTH FUNCTION AND WITH USB ADAPTER> (CONTINUED)



Wire colour code
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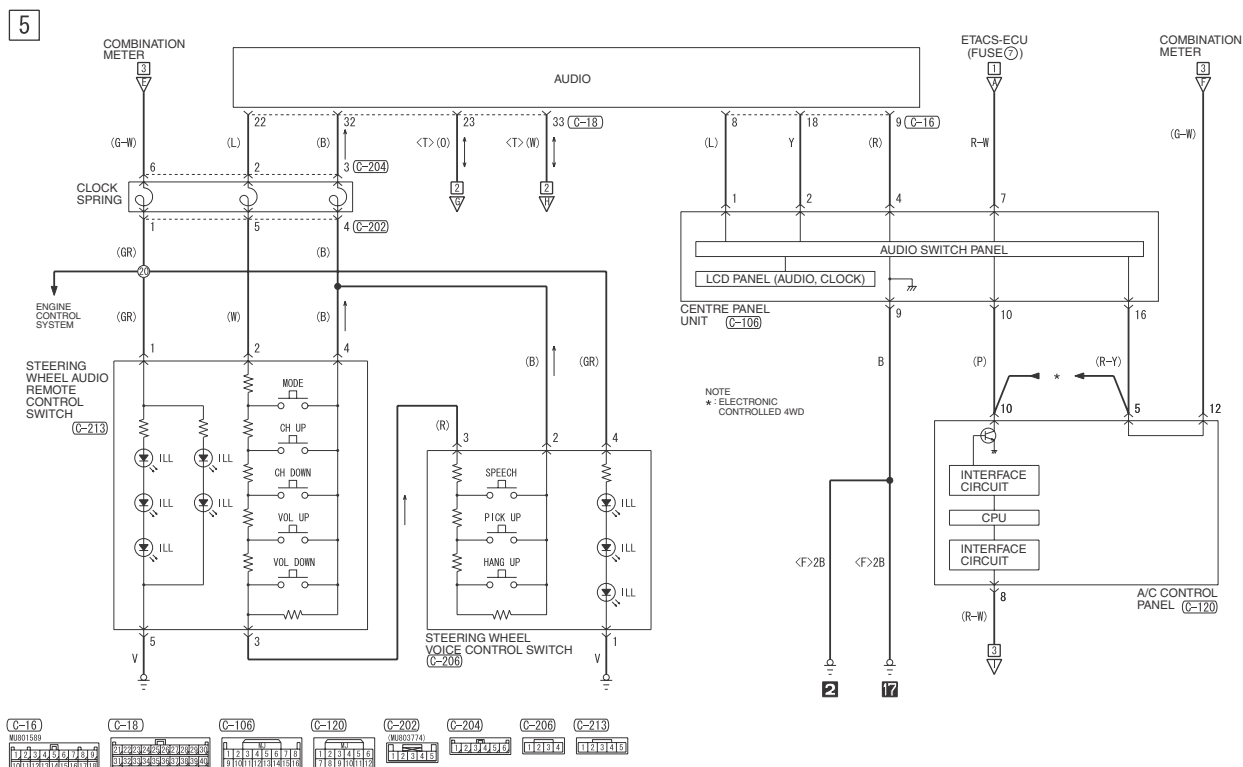
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90-14

CIRCUIT DIAGRAMS

HANDS-FREE CELLULAR PHONE SYSTEM <VEHICLES FOR RUSSIA WITH BLUETOOTH FUNCTION AND WITH USB ADAPTER>

HANDS-FREE CELLULAR PHONE SYSTEM <VEHICLES FOR RUSSIA WITH BLUETOOTH FUNCTION AND WITH USB ADAPTER> (CONTINUED)

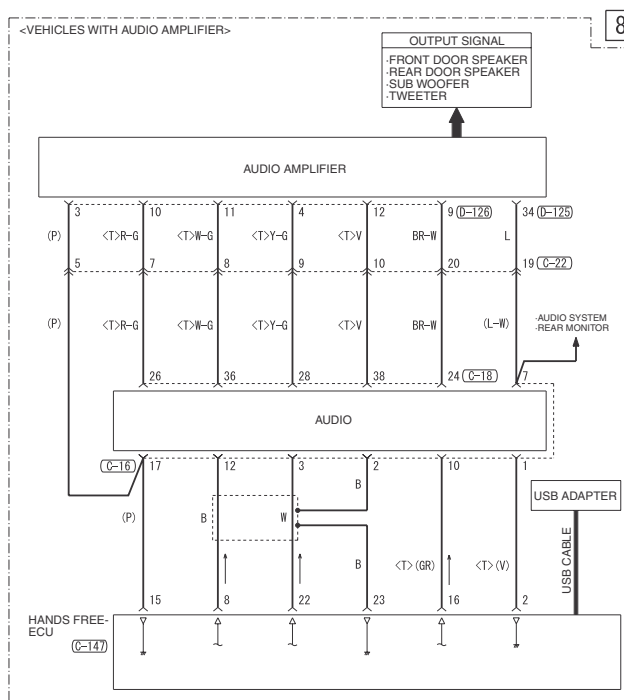
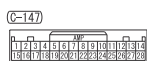
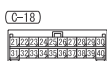
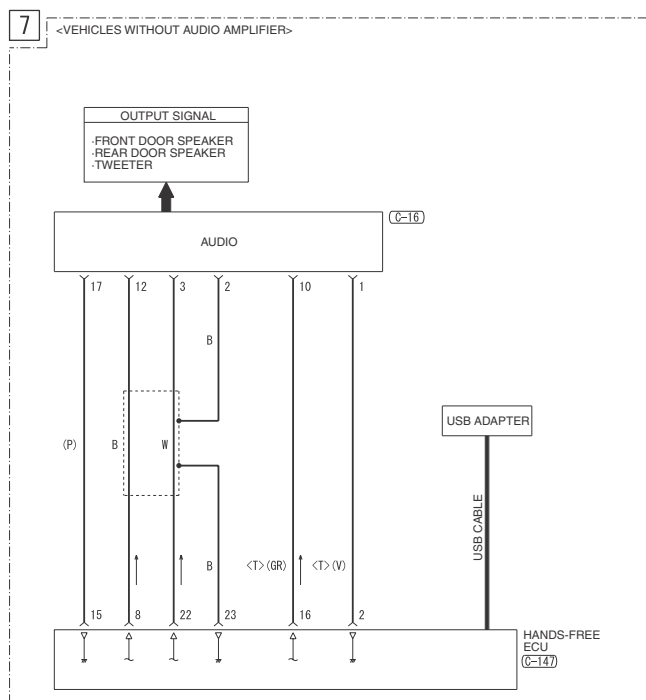


CIRCUIT DIAGRAMS

90-15

HANDS-FREE CELLULAR PHONE SYSTEM <VEHICLES FOR RUSSIA WITH BLUETOOTH FUNCTION AND WITH USB ADAPTER>

HANDS-FREE CELLULAR PHONE SYSTEM <VEHICLES FOR RUSSIA WITH BLUETOOTH FUNCTION AND WITH USB ADAPTER> (CONTINUED)

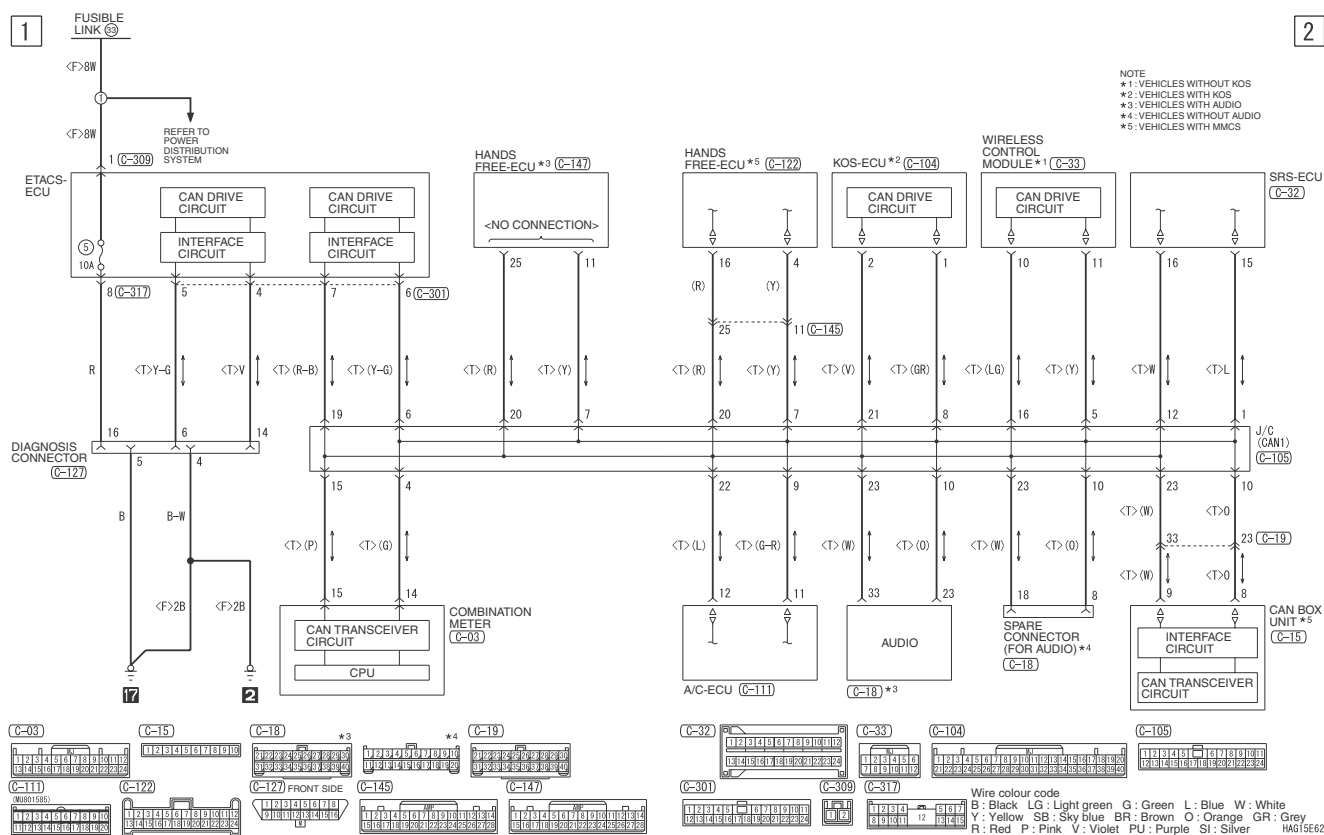


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CAN <VEHICLES FOR RUSSIA>

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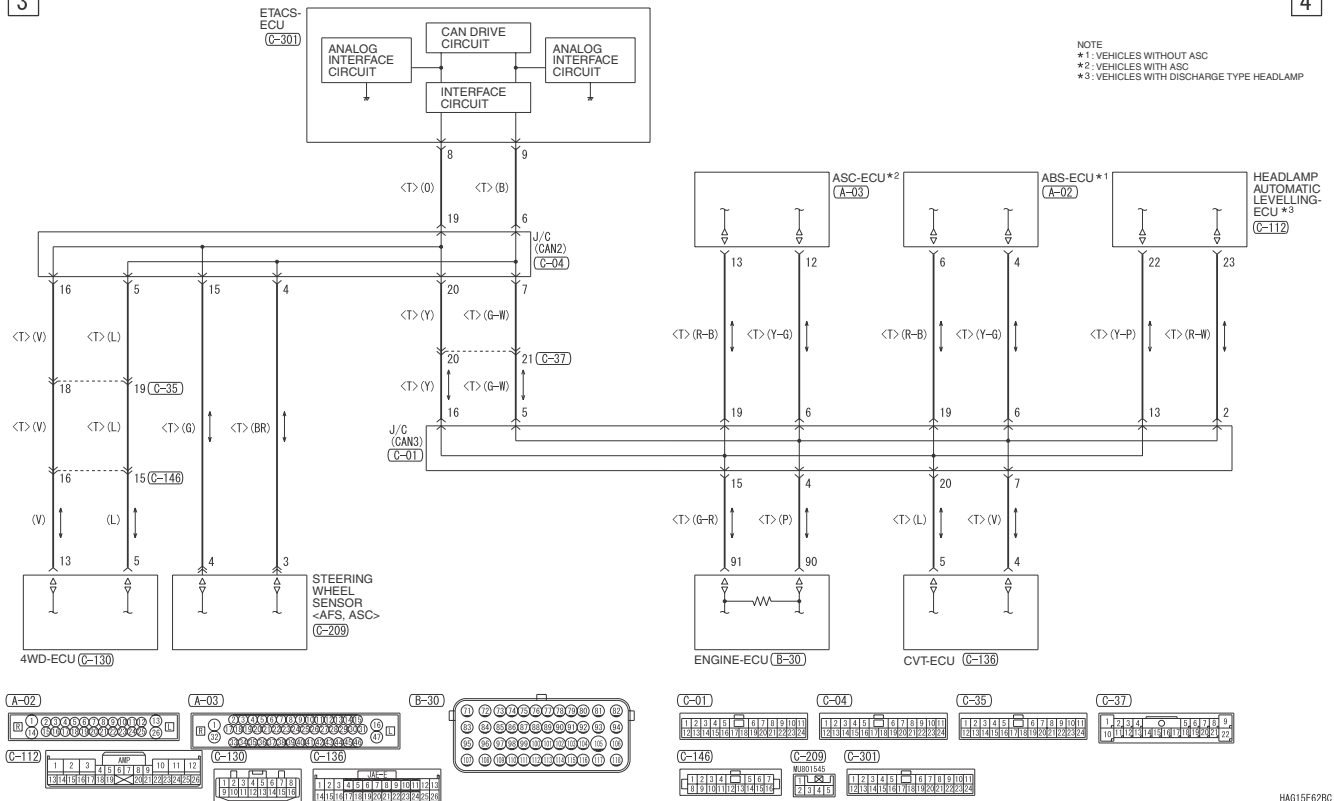
CIRCUIT DIAGRAMS CAN <VEHICLES FOR RUSSIA>

90-17

CAN <VEHICLES FOR RUSSIA> (CONTINUED)

3

4



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