GROUP 54B

SIMPLIFIED WIRING SYSTEM (SWS)

CONTENTS

GENERAL DESCRIPTION

COMMUNICATION METHOD

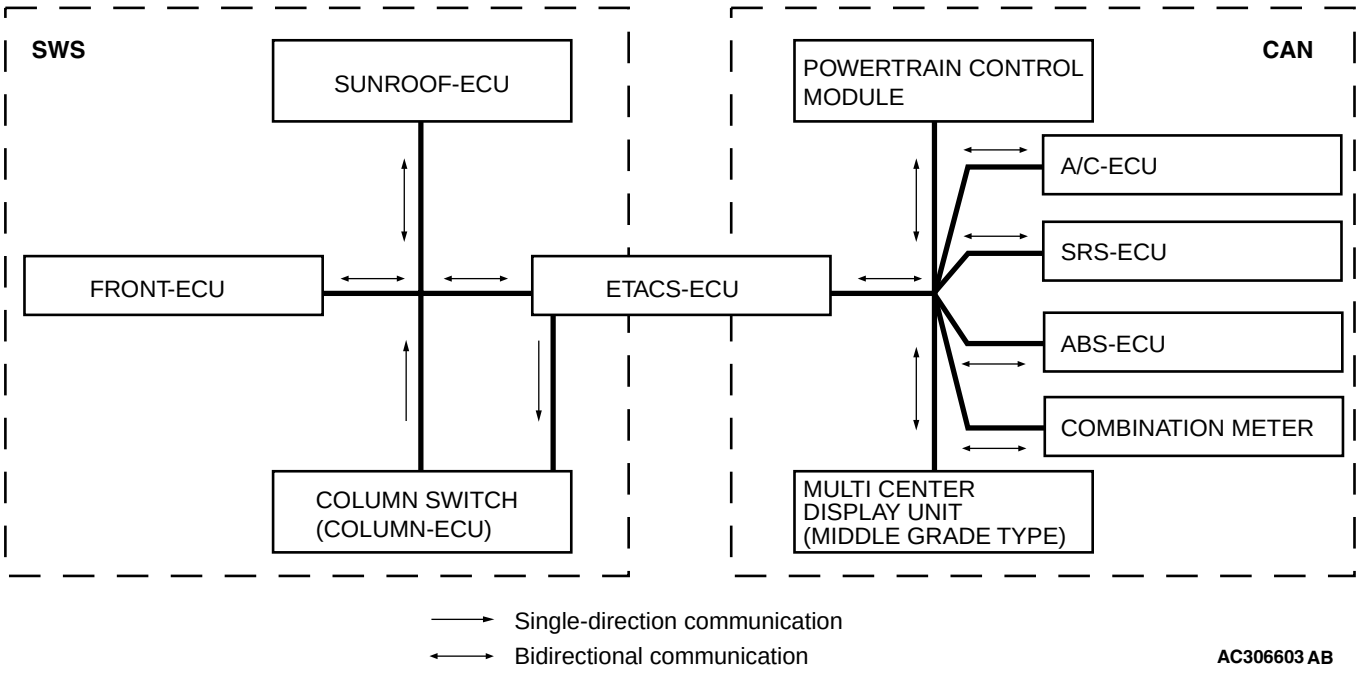
M1549013000547

As shown in the figure, SWS communications connect the ETACS*1-ECU, the column switch (in the column-ECU), the front-ECU, and the sunroof-ECU. CAN*2*3 communications connect the ETACS-ECU, the powertrain control module, the A/C-ECU, the SRS-ECU, the combination meter, the ABS-ECU, and the middle-grade multi center display. These two communications groups are connected to form a dedicated network for sending multiplex data.

*NOTE: *1 ETACS: Electronic Time and Alarm Control System*

*NOTE: *2 CAN: Controller Area Network*

*NOTE: *3: For details on CAN, see Group 54C.*



OPERATION

M1549013100566

TONE ALARM FUNCTION

IGNITION KEY REMINDER TONE ALARM FUNCTION

When the driver's door is opened with the ignition key inserted in the ignition key cylinder (ignition switch is in the OFF position,) the tone alarm sounds intermittently to indicate that the ignition key has not been removed.

LIGHT REMINDER TONE ALARM FUNCTION

When the taillights or headlights are ON, if the ignition key is removed and the driver's door is opened, a tone alarm will sound continuously to warn that the light is illuminated. However, if the taillights or headlights have been turned off by the headlight automatic-shutdown function, the tone alarm will not sound.

SEAT BELT TONE ALARM FUNCTION

If any of the following conditions is met with the ignition switch at "ON" or "ST", the ETACS-ECU sounds the tone alarm by using the driver's seat belt switch signal and the vehicle speed signal sent from the combination meter.

- Sounds the tone alarm for six seconds when the ignition switch is turned "ON" with the seat belt switch on (the driver's seat belt is not fastened). This is called "Timer function".
- Sounds the tone alarm 12 cycles (after 0.5 seconds) if any of the following conditions is met when sixty seconds or more have elapsed since the ignition switch is turned "ON". One cycle consists of five-seconds "on" and then three-seconds "off".
  a. The vehicle speed has reached 8 km/h (5 mph) while the seat belt switch is turned on (driver's seat belt is not fastened) with the ignition switch "ON.
  b. The seat belt switch has been turned on (driver's seat belt has not been fastened) for at least ten seconds while the ignition switch has been turned "ON" and the vehicle speed has been 8 km/h (5 mph) or more.

  NOTE: Once the tone alarm has sounded 12 cycles, it does not sound again until the vehicle speed reduces to 3 km/h (2 mph) or less even if any of the following conditions is met.
- The tone alarm stops sounding if the ignition switch or the seat belt switch is turned off (the driver's seat belt is fastened) while the timer operation is active.

DOOR AJAR WARNING BUZZER

The buzzer is sounded 4 times by the ETACS-ECU to warn the driver if any door is open when the ignition is switched ON and the vehicle speed reaches 8 km/h (5 mph) or faster. The buzzer will continue to sound for 4 times even if the ignition, door status, or vehicle speed requirements are not maintained.

MULTI CENTER DISPLAY OPERATION TONE <VEHICLES WITH MULTI CENTER DISPLAY (MIDDLE GRADE TYPE)>

The ETACS-ECU sounds the buzzer when the buzzer signal is sent from the multi center display.

TURN-SIGNAL LIGHT BUZZER

The ETACS-ECU sounds the buzzer in sync with the turn-signal lights or hazard warning lights.

CENTRAL DOOR LOCKING SYSTEM

CENTRAL DOOR LOCKING SYSTEM OPERATION

Door unlocking by operating the driver’s door lock key cylinder:

- When the ignition key is inserted in the driver’s door lock key cylinder and turned clockwise to unlock the driver’s door, the ETACS-ECU operates its door unlock relay and passes a current through the door lock actuator of the driver’s door for 0.25 seconds to unlock only the driver’s door.
- When the ignition key is turned clockwise again, the ETACS-ECU operates its door unlock relay and passes a current through the door lock actuators of all doors for 0.25 seconds and to unlock all doors.

Door locking or unlocking by operating the driver’s or front passenger’s door lock switch:

- When the door is locked by the driver’s or front passenger’s door lock switch, the ETACS-ECU operates its door lock relay and passes a current through the door lock actuators of all doors for 0.25 seconds to lock all doors.
- When the door is unlocked by the driver’s or front passenger's door lock switch, the ETACS-ECU operates its door unlock relay and passes a current through the door lock actuators of all doors for 0.25 seconds to unlock all doors.
- When the door is locked and unlocked by driver’s or front passenger's door lock switch consecutively, the ETACS-ECU operates its door lock relay and passes a current through the door lock actuators of all doors for 0.25 seconds to lock all doors. Then, the ETACS-ECU operates its door unlock relay and passes a current through the door lock actuators of all doors for 0.25 seconds to unlock all doors. Due to this, there may be a time lag between the driver’s or front passenger's door lock switch actuation and the time when all doors are unlocked.

FORGOTTEN KEY PREVENTION FUNCTION

- If the driver's door is locked while it is open and when the key is still in the ignition key cylinder, approximately 0.3 second later the ETACS-ECU activates the unlock relay output for 0.25 second to prevent the door from being locked with the key inside the vehicle. In addition, if locking the door was not prevented, a re-try current is sent (an unlock relay output ON is sent for 0.25 second up to 5 times including the first attempt).
- If the passenger's door or driver's door are locked while the passenger's door is open and when the key is still in the ignition key cylinder, approximately 0.3 second later the ETACS-ECU activates the unlock relay output for 0.25 second to prevent the door from being locked with the key inside the vehicle. In addition, if locking the door was not prevented, a re-try current is sent (an unlock relay output ON is sent for 0.25 second up to 5 times including the first attempt).

POWER WINDOW RELAY CONTROL

POWER WINDOW RELAY OPERATION

If the ignition switch is turned to "ON" position, the power window relay is energized to activate the power windows.

POWER WINDOW TIMER FUNCTION

Even after the ignition is switched off, the ETACS-ECU keeps the power window relay activated for approximately 30 seconds, enabling raising and lowering of the power windows by using the power window switches. After approximately 30 seconds, the power window relay is deactivated. During this timed operation, if the driver or passenger doors are opened, the power window relay is deactivated from that moment.

KEYLESS ENTRY SYSTEM

KEYLESS ENTRY HAZARD ANSWER-BACK FUNCTION

If the keyless entry transmitter is used to send a lock signal to the ETACS-ECU, all doors, the liftgate, and the glass hatch are locked and the hazard warning lights flash once. If an unlock signal is sent, the driver's door is unlocked first, and if a second signal is sent, all doors, the liftgate, and the glass hatch are unlocked. Each time the unlock signal is sent, the hazard warning lights flash twice.

KEYLESS ENTRY HORN ANSWERBACK FUNCTION

If the keyless entry transmitter is used to send 2 lock signals to the ETACS-ECU, the first signal locks all doors, the liftgate, and the glass hatch, while the second signal sounds the horn once.

TRUNK UNLOCK FUNCTION

Press the "TRUNK" button twice within 5 seconds and the trunk lid will be unlocked.

TIMED LOCKING MECHANISM

After unlocking the doors with the keyless entry transmitter, if no doors are opened or if the ignition key is not inserted, the ETACS-ECU automatically locks the doors in 30 seconds.

SUNROOF CONTROL

SUNROOF TIMER FUNCTION

The ETACS-ECU enables opening and closing of the sunroof for 30 seconds after the ignition is switched off. During this timed operation, if the driver's or front passenger's door is opened, the sunroof timer function is deactivated from that moment.

WINDSHIELD WIPERS AND WASHERS

LOW SPEED WIPER, HIGH SPEED WIPER CONTROL

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

INTERMITTENT CONTROL

ETACS-ECU uses the dial position of the variable intermittent wiper control switch and the vehicle speed signal sent by the combination meter to calculate the interval to be sent to the front-ECU. The front-ECU determines the intermittent time from the input SWS data signal, and turns ON the windshield wiper drive signal. When the wiper is at the STOP position, the windshield wiper auto-stop signal goes OFF to turn OFF the windshield wiper drive signal. After the intermittent time from when the windshield wiper drive signal turned ON, the windshield wiper drive signal is turned ON again and the above operation is repeated.

MIST WIPER CONTROL

When the ignition switch is in the ACC or ON position, and the windshield mist wiper switch of the column switch is turned ON, the front-ECU turns ON the windshield wiper drive signal. At the same time, the wiper speed switching relay is turned ON (HIGH-SPEED). While the windshield mist wiper switch is ON, the windshield wiper will operate at high speed. Then, if the windshield mist wiper switch is turned off, the wiper operates at low speed until it stops at the predetermined park position.
When the windshield mist switch is turned on briefly, the wiper operates once at low speed.
At the point the windshield mist switch is turned ON, if the windshield wiper has been operating intermittently, the same operations as the above will be performed while the windshield mist wiper switch is ON. After the windshield mist wiper switch goes OFF, the intermittent operations will be set again after the windshield wiper auto-stop signal last is turned ON.

WASHER CONTROL

When the ignition switch is in the ACC or ON position, and the windshield washer switch of the column switch is turned ON, the front-ECU turns ON the windshield washer relay. The windshield wiper drive signal is turned ON in 0.15 seconds until 2 seconds after the windshield washer switch goes OFF to operate the windshield wiper continuously. When the windshield washer switch is turned ON, if the windshield wiper is operating intermittently, intermittent operations will be continued after continuous operations.

HEADLIGHT

HEADLIGHT AUTOMATIC SHUTDOWN FUNCTION

Even if the lighting switch (tail light switch or headlight switch) is ON, the headlights and tail lights will automatically go off in the following conditions to prevent the battery from discharging:
When the ignition key is turned from "ON" to "LOCK" (OFF) or "ACC" position with the lighting switch turned ON, and this state continues for three minutes, the light will automatically be turned off. If the driver's seat door is opened during these three minutes, the light will go off one second later.

HIGH-BEAM INDICATOR

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

FLASHER TIMER

TURN-SIGNAL LIGHT

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

HAZARD WARNING LIGHT

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

TURN-SIGNAL INDICATORS

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

FOG LIGHT

FOG LIGHT

The fog lights will illuminate only when the fog light switch is operated while the low-beam headlights are on.
The fog lights will be switched off when any of the following conditions is met. The fog lights will also be switched off automatically by headlight automatic shutdown function.

- When the high-beam headlights are switched on, the fog lights will be switched off. If the low-beam headlights are switched on again, the fog lights will illuminate again.
- When the headlight switch is turned off while the tail lights are on or the tail lights and headlights are off, the fog lights will be switched off. If the low-beam headlights are switched on again, the fog lights will not illuminate again.

FOG LIGHT INDICATOR

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

INTERIOR LIGHT

ETACS-ECU makes it possible to force operation of all ON and OFF light switches in the overhead console (the dome light, reading light, cargo area light, rear personal lights, front door lights, and front foot lights). This function is assigned higher priority than the controls for the interior light switch that are performed when the doors are in certain positions.

- When the lights are forced on, the illumination level is 100% as all interior lights are switched on (the dome light, reading light, cargo area light, rear personal lights, front door lights, and front foot lights). Even when all lights are forced on, the interior light automatic shutoff function is active.
- When the lights are forced off, all interior lights are immediately switched off (the dome light, reading light, cargo area light, rear personal lights, front door lights, and front foot lights).

When the interior light switch is at DOOR position, the ETACS-ECU controls the interior lights as follows:

- When a door is opened with the ignition switch off, the interior lights up to a luminance of 100 percent. When a door is closed, the interior lights dims a luminance of 65 percent, and goes off 30 seconds later. However, if the ignition switch is turned ON or if a door is locked while the interior lights is dimming, the dome light will go off at that point.
- When a door is opened with the ignition switch ON, the interior lights up at a luminance of 100 percent. When all doors are closed, the interior lights go off.
- When the ignition key is removed with all doors closed, the interior lights up at a luminance of 100 percent, and goes off 30 seconds later. However, if the ignition key is inserted again or if a door is locked while the interior lights is lighting, the interior lights will go off at that point.
- To check keyless entry operations more easily, the interior lights will flash twice when doors are locked. When doors are unlocked, the interior lights up at a luminance of 100 percent, and goes off 15 seconds later.

INTERIOR LIGHT AUTOMATIC SHUTDOUN FUNCTION

Illuminated interior lights such as the front dome light, etc. (all lights using the dome light fuse as the power supply) will automatically go off in the following conditions to prevent the battery from discharging as a result of forgetting to turn off the lights or incomplete closing of the door.

- When the ignition switch is turned off and more than 30 minutes pass by with the interior light illuminated, the interior lights will go off automatically.
- When the ignition switch is turned off and one of the door switches remains open for 30 minutes continuously, the interior lights will go off automatically.

SEAT BELT INDICATOR

If any of the following conditions is met with the ignition switch at "ON" or "ST", the ETACS-ECU illuminates, flashes or extinguishes the seat belt indicator by using the driver's seat belt switch signal and the vehicle speed signal sent from the combination meter.

- Illuminates when the ignition switch is at "ON" and the seat belt switch is turned on (the driver's seat belt is unfastened).
- Flashes and illuminates the indicator 12 cycles (after 0.5 seconds) if any of the following conditions is met when sixty seconds or more have elapsed since the ignition switch is turned "ON". One cycle consists of five-second "flashing" and then three-second "illumination".
  a. The vehicle speed has reached 8 km/h (5 mph) while the seat belt switch is turned on (driver's seat belt is not fastened) with the ignition switch "ON.
  b. The seat belt switch has been turned on (driver's seat belt has not been fastened) for at least ten seconds while the ignition switch has been turned "ON" and the vehicle speed has been 8 km/h (5 mph) or more.

  NOTE: Once this timer operation has been activated, it will not be activated again until the vehicle speed reduces to 3 km/h (2 mph) or less even if any of the following conditions is met.

- The indicator stops illuminating if the ignition switch or the seat belt switch is turned off (the driver's seat belt is fastened) while the timer operation is active.

DOOR-AJAR INDICATOR LIGHT

The combination meter receives the signal sent from the ETACS-ECU about whether each door (including the tailgate and glass hatch) is open or closed and turns the door ajar indicator light on and off. While the door ajar indicator is illuminated, the door ajar warning function is activated and the door ajar indicator light flashes 4 times. If the door remains open even after the 4 warning flashes, the door ajar indicator light will be illuminated again.

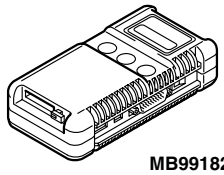
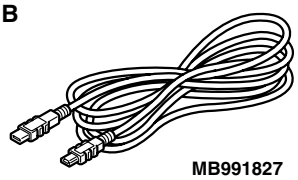
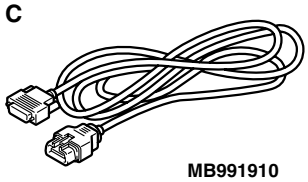
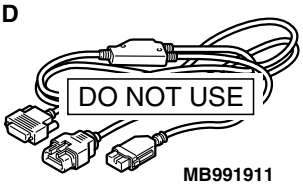
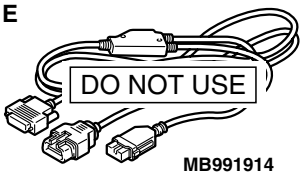
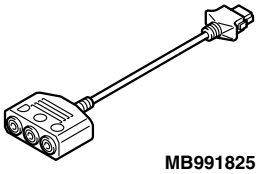
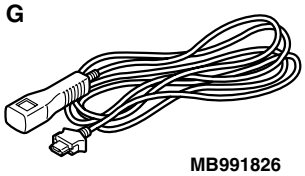
CONFIGURATION FUNCTION

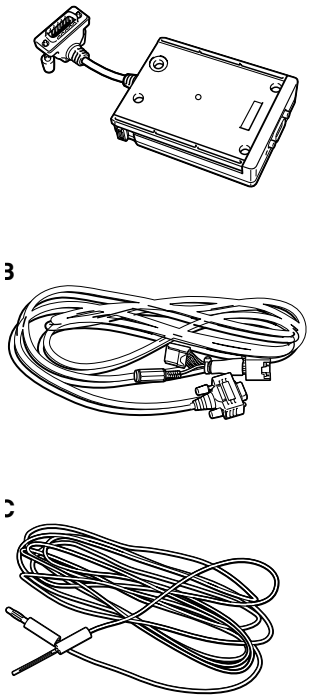
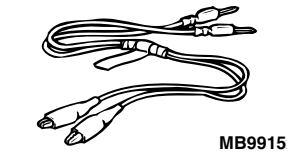
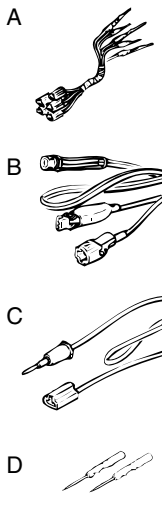
The following functions can be adjusted by operating the middle-grade multi center display (if equipped).

- Keyless entry horn answerback function
- Keyless entry hazard light answerback function
- Timed locking mechanism
- Turn-signal light buzzer
- Door ajar warning buzzer
- Adjustment of door unlocking operation on keyless entry system
- Vehicle speed-dependent wiper function
- Headlight automatic shutdown function
- Delay-off time of the dome light
- Interior light automatic shutoff function
- Initialization of above mentioned functions

SPECIAL TOOL

M1549000301035

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

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 B991813	MB991813 A: MB991806 B: MB991812 C: MB991822 SWS monitor kit A: SWS monitor cartridge B: SWS monitor harness (for column-ECU) C: Probe harness	-	SWS communication line check (ECU check and service data)
 MB991529	MB991529 Diagnostic trouble code check harness	Tool not necessary if the scan tool (MUT-III) is available	Checking input signal when using a voltmeter
 MB991223AD	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 Harness set A: test harness B: LED harness C: LED harness adaptor D: Probe	General service tools	Making voltage and resistance measurement during troubleshooting A: Connector pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection

SWS DIAGNOSIS

GENERAL DESCRIPTION

BEFORE CARRYING OUT TROUBLESHOOTING

M1549014700710

Before carrying out troubleshooting, check the following two items.

- Make sure that the ETACS-ECU, the junction block (J/B), the front-ECU and the engine compartment relay box are connected securely.
- Make sure that fuses and fusible links related to relevant systems are not blown.

DIAGNOSTIC FUNCTION

M1549028900245

ON-BOARD DIAGNOSTICS

If an error occurs in the ECU or the SWS or CAN communication line which performs the SWS or CAN communication, the DTC is memorized in ETACS-ECU. The DTCs have 11 items. The DTCs are checked to connect scan tool MB991958 (MUT-III sub assembly). The memorized DTCs are not erased even if the ignition switch is turned to the LOCK (OFF) position. The DTCs are erased to operate scan tool MB991958 (MUT-III sub assembly).

*NOTE: *1: For vehicles that do not have a sunroof, the diagnosis code is always sent but it does not indicate a problem.*

*NOTE: *2: The diagnosis code for the current problem is not sent.*

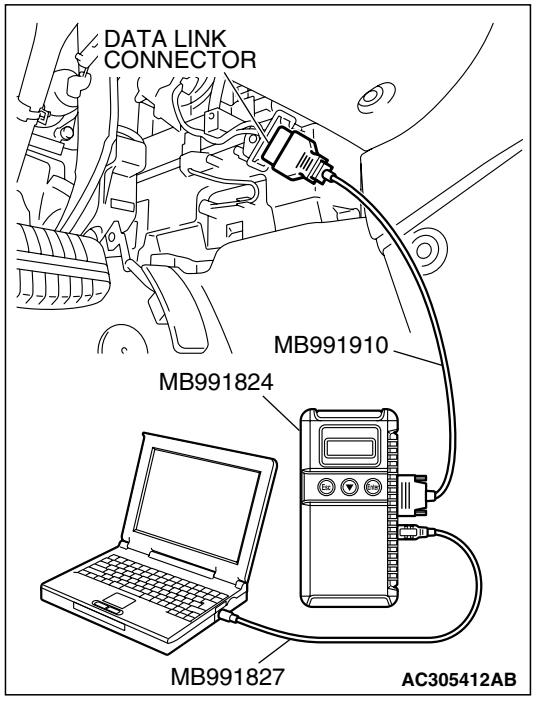
*NOTE: *3: For vehicles that do not have a multi center display (middle grade type), the diagnosis code is always sent but it does not indicate a problem.*

CODE NUMBER	TROUBLE CONTENT
001	Malfunction of SWS communication line or ETACS-ECU
002	Malfunction of column switch
003	Malfunction of front-ECU
004*1	Malfunction of sunroof-ECU
010*2	Bus Off
011	Powertrain control module time-out (related to engine)
012	Powertrain control module time-out (related to A/T)
013	A/C-ECU time-out
014	Combination meter time-out
015*3	Multi center display unit (middle-grade type) time-out
021	Failure information on combination meter

HOW TO CONNECT THE SCAN TOOL (MUT-III)

Required Special Tools:

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



⚠ CAUTION

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

1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect special tool MB991827 to special tool MB991824 and the personal computer.
4. Connect special tool MB991910 to special tool MB991824.
5. Connect special tool MB991910 to the data link connector.
6. Turn the power switch of special tool MB991824 to the "ON" position.

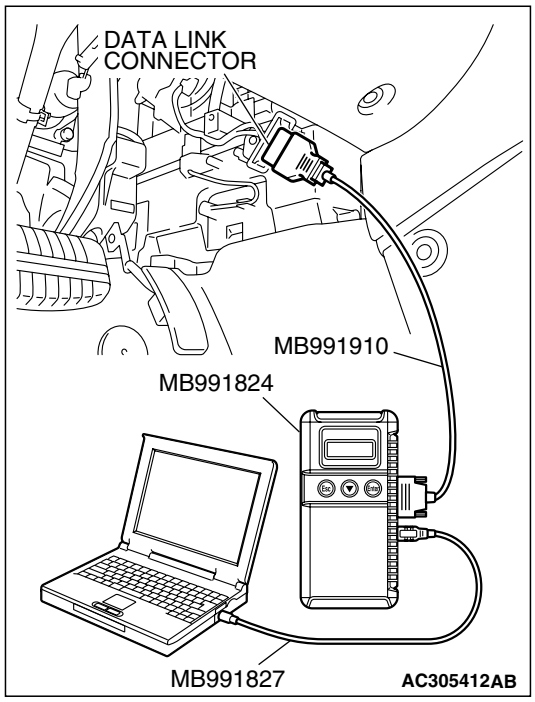
   NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the MUT-III system on the personal computer.

NOTE: Disconnecting scan tool MB991958 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.

HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

Required Special Tools:

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



⚠ CAUTION

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

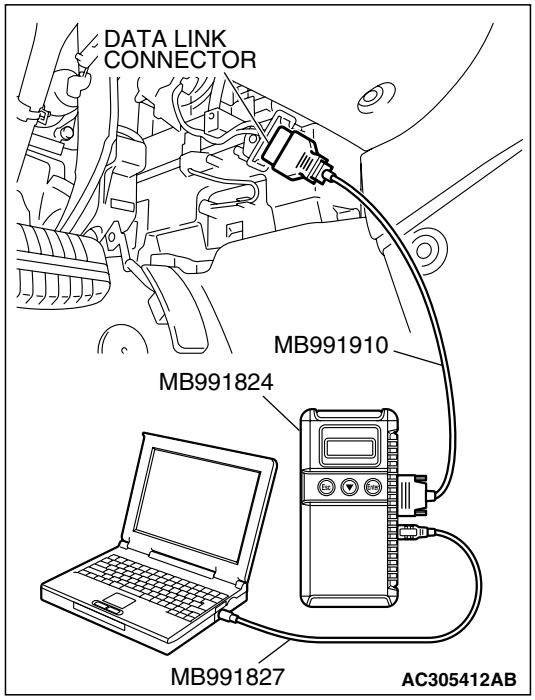
NOTE: If the battery voltage is low, diagnostic trouble codes will not be set. Check the battery if scan tool MB991958 does not display.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "ETACS" from the "BODY" tab.
6. Select "Diagnostic Trouble Code."
7. If a DTC is set, it is shown.
8. Choose "Erase DTCs" to erase the DTC.

HOW TO DIAGNOSE THE CAN BUS LINES

Required Special Tools:

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



⚠ CAUTION

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

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "CAN bus diagnosis" from the start-up screen.
4. When the vehicle information is displayed, confirm that it matches the vehicle being diagnosed.
   - If they match, go to step 8.
   - If not, go to step 5.
5. Select the "view vehicle information" button.
6. Enter the vehicle information and select the "OK" button.
7. When the vehicle information is displayed, confirm again that it matches the vehicle being diagnosed.
   - If they match, go to step 8.
   - If not, go to step 5.
8. Select the "OK" button.
9. When the optional equipment screen is displayed, choose the one which the vehicle is fitted with, and then select the "OK" button.

SWS DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1549000500906

1. Gather information about the problem from the customer.
2. Verify that the condition described by the customer exists.

   NOTE: If an error occurs in the SWS communication line, the ECU isolated from the communication line performs a fail-safe or backup operation, so the problem may not match the one shown in the Trouble Symptom Chart. However, the cause of the failure can be tracked down by performing the following troubleshooting with the SWS monitor.
3. Version number and destination check

   Check whether the SWS version number (1) and destination (North America) meet the vehicle specifications. If they are different, replace the ETACS-ECU with a correct one.
4. Use scan tool MB991958 (MUT-III Sub Assembly) to select "ECU COMM Check" on the SWS monitor display.

   Check whether the communication status of the input- or output-signal-side ECU associated with the defective function is normal.
   - If "OK" is displayed for all related ECUs, they communicate with each other normally and the input or output signal circuit system may be defective. Therefore, check SWS monitor service data.
   - If "NG" is displayed for any of the related ECUs, something may be wrong with the ECU for which "NG" appears, its power supply or grounding system, or a wiring harness or connector between the SWS monitor and the ECU. Check the wiring harness and connectors associated with the ECU and examine the ECU itself.
5. Service data on the SWS monitor

   Select the defective function from the function-specific diagnostic menu, and check the service data that appears for each function item.

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When the SWS communication line is monitored, you can determine whether the problem lies in the input or output signal circuit system by checking whether communication data is correct:

- If the switch condition does not meet the service data display, the input signal is defective.
- If the switch condition meets the service data display, the output signal system is defective.

NOTE: In addition to the function-specific diagnostic menu, a service data menu is available for SWS monitor service data to check all items for each ECU.

6. Check the input signal circuit system

   Check the relevant switch, sensor, input signal-side ECU and their wiring harness and connector.
7. Check the output signal circuit system

   Check an output signal-side ECU, electrical load components and their wiring harness and connector.

HOW TO CONNECT SWS MONITOR

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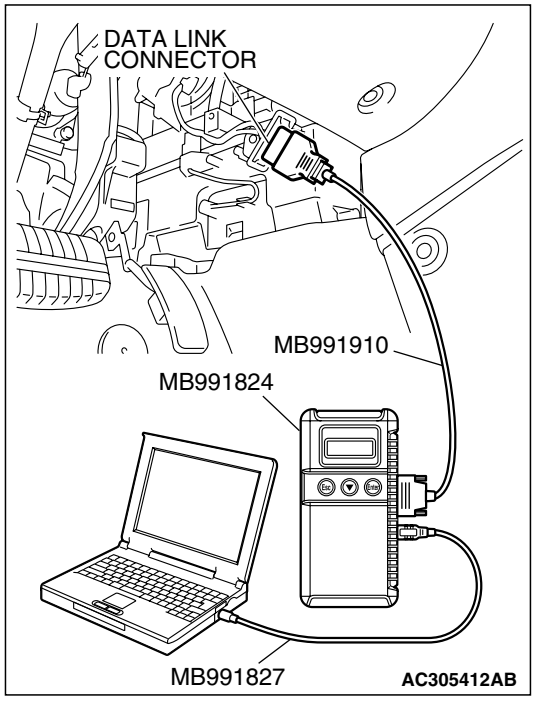
Required Special Tools:

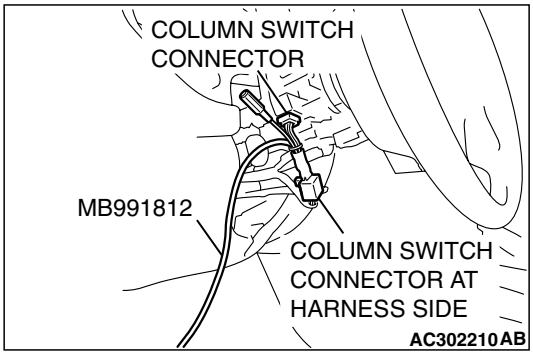
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991813: SWS Monitor Kit
  - MB991806: SWS Monitor Cartridge
  - MB991812: SWS Monitor Harness (For Column-ECU)
  - MB991822: Probe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

⚠ CAUTION

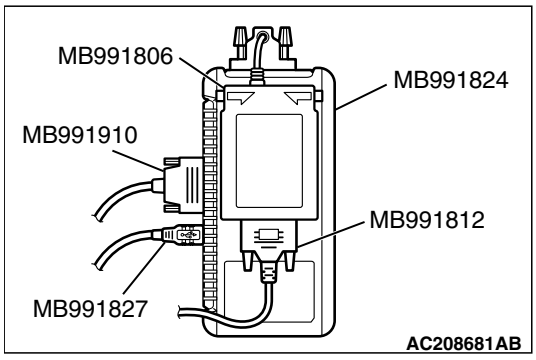
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958. Connect the main harness A MB991910 before connecting the SWS monitor harness (for column-ECU) MB991812. Be sure to connect SWS monitor cartridge MB991806 after turning on the V.C.I. MB991924.



1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect special tool MB991827 to special tool MB991824 and the personal computer.
4. Connect special tool MB991910 to special tool MB991824.
5. Connect special tool MB991910 to the data link connector.



6. Remove the steering column cover.
7. Remove the steering column switch connector.
8. Connect special tool MB991812 to the column switch connector.



9. Connect special tool MB991812 to special tool MB991806.
10. Connect special tool MB991806 to special tool MB991824.
11. Turn the power switch of special tool MB991824 to the "ON" position.

    NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
12. Start the MUT-III system on the personal computer.

HOW TO USE SWS MONITOR

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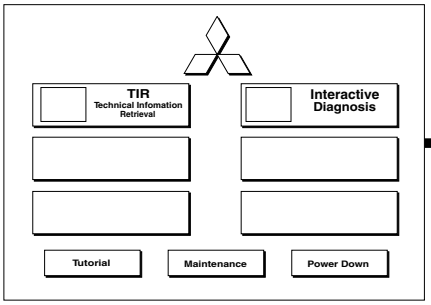
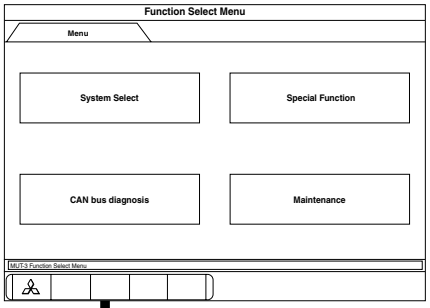
To carry out troubleshooting, operate scan tool MB991958 (MUT-III Sub Assembly) as follows.

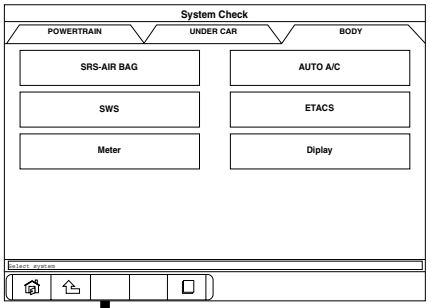


Start-up the MUT-III system.

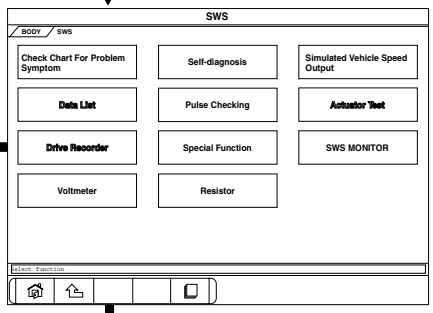
Select "Interactive Diagnosis"



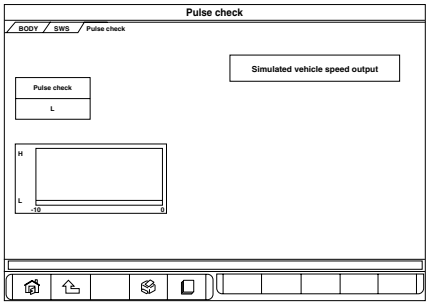
Select "System Select".



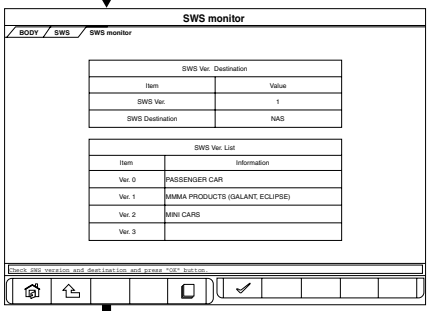
Select "SWS" from the "BODY" tab.



For the pulse check, select "Pulse Checking".



For the SWS monitor, select "SWS MONITOR".



Confirm the SWS version and destination.

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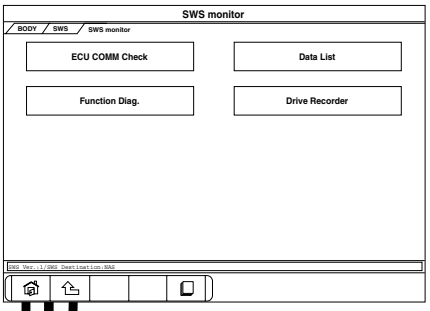
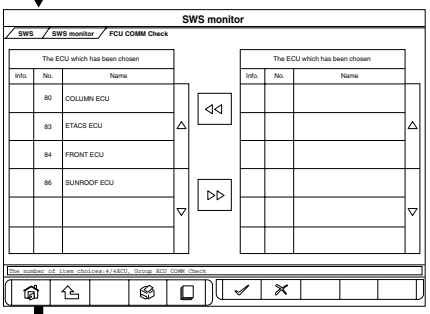
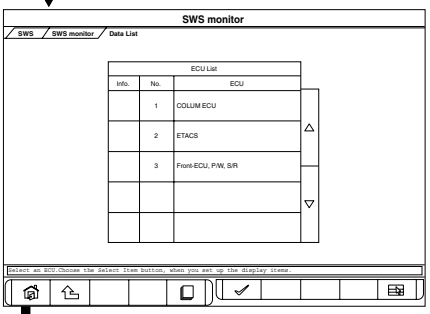


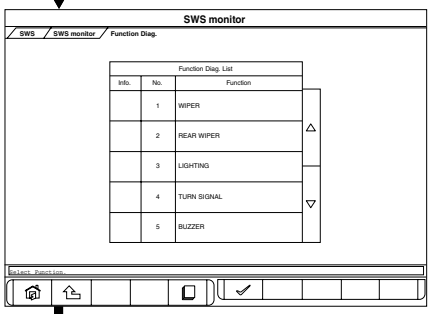
For the ECU comm check, select "ECU COMM Check".

For the data list, select "Data List".

For the function diagnosis, select "Function Diag".



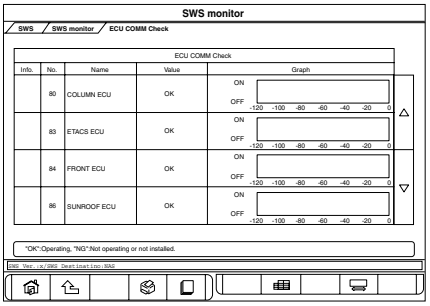


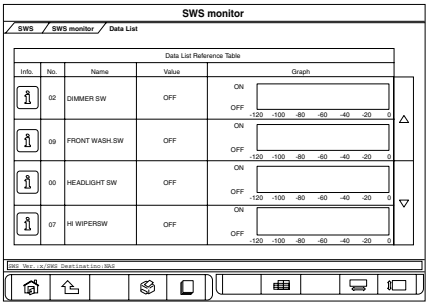


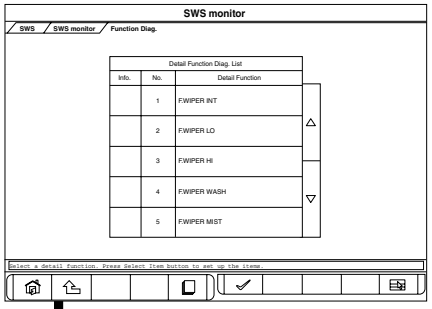
Press the "OK" button.

Select the ECU, and then press the "OK" button.

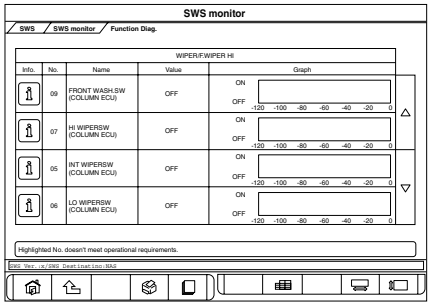
Select the desired item from "Function", and then press the "OK" button.







Select the desired function from "Detail Function", and then press the "OK" button.



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HOW TO CHECK ECUS

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1. Use the scan tool MB991958 (MUT-III Sub Assembly) and the SWS monitor kit to check ECUs.
2. The following ECUs can be checked by using the scan tool MB991958 (MUT-III Sub Assembly) and the SWS monitor kit.

NOTE: The "ECU COMM Check" function checks the communication status of ECUs. "NG" does not always mean ECU malfunction. If a malfunction is found by the "ECU COMM Check", proceed to "Symptom Procedure" (Refer to P.54B-59).

SWS monitor kit-compatible ECUs and their conditions

ITEM No.	ECUS TO BE CHECKED	DISPLAY ON SCAN TOOL	NORMAL CONDITION	ECU CONDITION
80	Column switch (column-ECU)	COLUMN ECU	OK*1	All of the column switch, power supply, ground and interconnecting communication lines are normal
83	ETACS-ECU	ETACS-ECU	OK	All of the ETACS-ECU switch, power supply, ground and interconnecting communication lines are normal
84	Front-ECU	FRONT ECU	OK*2	All of the front-ECU, power supply, ground and interconnecting communication lines are normal
86	Sunroof motor assembly (sunroof-ECU)	SUNROOF ECU	OK*2	All of the sunroof motor assembly, power supply, ground and interconnecting communication lines are normal

NOTE:

- **1: If the ignition switch is turned to "LOCK" (OFF) or "ACC" when "NG" is displayed beside "ETACS ECU" or the signal request line is abnormal, the scan tool shows "NG" beside the "COLUMN ECU".*
- **2: When "NG" is displayed beside "ETACS ECU", the scan tool shows "NG" beside the "FRONT ECU" and "SUNROOF ECU".*

SERVICE DATA CHECK

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Use the scan tool MB991958 (MUT-III Sub Assembly) and the SWS monitor kit to check "Data List" or "Function Diag.". This "Data List" or "Function Diag." check is applicable for signals, which are transmitted and received through the SWS communication line. For input signals, which are not compatible with the SWS monitor kit, refer to the Pulse Check procedure (by using the scan tool or voltmeter) P.54B-26.

1. The following input signals can be checked by using the scan tool MB991958 (MUT-III Sub Assembly) and the SWS monitor kit.

   NOTE: If a problem is found in the "Service Data" check, refer to Input Signal Chart P.54B-63.

<DATA LIST REFERENCE TABLE>

The table below shows the service data and their normal condition, which are displayed during the "Data List."

COLUMN ECU

CHECK ITEM	ITEM NO.	DISPLAY ON SCAN TOOL	CHECK CONDITION	NORMAL CONDITION
Dimmer switch	02	DIMMER SW	Dimmer switch: ON	ON
			Dimmer switch: OFF	OFF
Windshield washer switch	09	FRONT WASH.SW	Windshield washer switch: ON	ON
			Windshield washer switch: OFF	OFF
Headlight switch	00	HEADLIGHT SW	Lighting switch: HEAD	ON
			Lighting switch: Other than HEAD	OFF
Windshield high-speed wiper switch	07	HI WIPER SW	Wiper switch: HI	ON
			Wiper switch: Other than HI	OFF
With or without windshield intermittent wiper interval adjusting knob	15	INT WIPE KNOB	Vehicles with intermittent wiper control	EQUIP
			Vehicles without intermittent wiper control	NON
Windshield intermittent wiper switch	05	INT WIPER SW	Wiper switch: INT	ON
			Wiper switch: Other than INT	OFF
Windshield low-speed wiper switch	06	LO WIPER SW	Wiper switch: LO	ON
			Wiper switch: Other than LO	OFF
Windshield mist wiper switch	08	MIST WIPER SW	Wiper switch: Mist	ON
			Wiper switch: Other than "Mist" position	OFF
Passing light switch	03	PASSING SW	Passing light switch: ON	ON
			Passing light switch: OFF	OFF
Tail light switch	01	TAILLIGHT SW	Lighting switch: TAIL	ON
			Lighting switch: OFF	OFF
Turn-signal light switch (LH)	11	T/S LH SW	Turn-signal light switch: LH	ON
			Turn-signal light switch: Other than LH	OFF
Turn-signal light switch (RH)	10	T/S RH SW	Turn-signal light switch: RH	ON
			Turn-signal light switch: Other than RH	OFF

ETACS

CHECK ITEM	ITEM NO.	DISPLAY ON SCAN TOOL	CHECK CONDITION	NORMAL CONDITION
Tone alarm	43	BUZZER	1. Ignition switch: LOCK (OFF) 2. Key reminder switch: ON 3. Front door switch: ON (front door open)	ON
			When requirements for sounding each warning tone alarm are not satisfied	OFF
Front fog lights	36	F.FOG LIGHT	1. Lighting switch: HEAD 2. Fog light switch: ON	ON
			Other than the condition above	OFF
Driver's door switch	32	FRONT DOOR SW	Driver's door switch and Front passenger's door switch is on	ON
			Driver's door switch and Front passenger's door switch is off	OFF
Headlight automatic shutoff function	35	H/L AUTO-CUT	1. Lighting switch: Other than OFF 2. Ignition switch: from ON or START to LOCK (OFF) or ACC 3. Front door switch: ON (front door open)	OFF to ON (after approximately one second)
			When requirements for the headlight automatic shutoff are not satisfied	OFF
Ignition switch (ACC)	31	IG SW (ACC)	Ignition switch: ACC or ON	ON
			Ignition switch: LOCK (OFF) or START	OFF
Ignition switch (IG1)	30	IG SW (IG1)	Ignition switch: ON or START	ON
			Ignition switch: LOCK (OFF) or ACC	OFF
Windshield intermittent wiper interval	37	INT WIPE TIME	1. Ignition switch: ACC or ON 2. Operate the intermittent wiper control, and change the wiper interval	The scan tool MB991958 (MUT-III Sub Assembly) displays intermittent wiper interval in response to the intermittent wiper control positions.

NOTE: For item No.43, the scan tool MB991958 (MUT-III Sub Assembly) also displays "ON" when the light reminder tone alarm or the seat belt tone alarm function is triggered.

Front-ECU, P/W, S/R

CHECK ITEM	ITEM NO.	DISPLAY ON SCAN TOOL	CHECK CONDITION	NORMAL CONDITION
Response by the front-ECU	70	FRONT ECU ACK	Lighting switch: Other than OFF (excluding when high-beam is on) or the wiper switch is at position other than OFF (ignition switch: ACC or ON)	NORMAL ACK
			• Ignition switch: Other than ON • Lighting switch: OFF • Wiper switch: OFF	SLEEP ACK
			• Lighting switch: HEAD • Headlights: at high beam	HI-BEAM ACK
			Other than the condition above	NO ACK
Response by the sunroof-ECU	72	S/R ECU ACK	1. Door switch: OFF 2. Ignition switch: ON → OFF 3. While sunroof is off	NORMAL ACK → SLEEP ACK (after approximately 30 seconds)
			1. Ignition switch: ON or START 2. One of the sunroof switches is on	INPUT CHECK to NORMAL ACK
			Other than the above conditions	NO ACK

NOTE: For item No.70, the scan tool MB991958 (MUT-III Sub Assembly) also displays "NG" under "ECU COMM Check" when it displays "NO ACK" under the front-ECU check.

NOTE: For item No.72, the scan tool MB991958 (MUT-III Sub Assembly) also displays "NG" under "ECU COMM Check" when it displays "NO ACK" under the sunroof-ECU check.

<FUNCTION DIAGNOSIS>

The table below shows the service data and their normal condition, which are displayed during the "Function Diag." The column "Normal condition" shows values that are shown when each operation is made.

WIPER

ITEM	ITEM NO.	INPUT SIGNAL	DISPLAY ON SCAN TOOL	NORMAL CONDITION
F.WIPER HI	05	Windshield intermittent wiper switch	INT WIPER SW (COLUMN ECU)	OFF
	06	Windshield low-speed wiper switch	LO WIPER SW (COLUMN ECU)	OFF
	07	Windshield high-speed wiper switch	HI WIPER SW (COLUMN ECU)	ON
	08	Windshield mist wiper switch	MIST WIPER SW (COLUMN ECU)	OFF
	09	Windshield washer switch	FRONT WASH.SW (COLUMN ECU)	OFF
	31	Ignition switch (ACC)	IG SW (ACC) (ETACS ECU)	ON
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK or HI-BEAM ACK
F.WIPER INT	05	Windshield intermittent wiper switch	INT WIPER SW (COLUMN ECU)	ON
	06	Windshield low-speed wiper switch	LO WIPER SW (COLUMN ECU)	OFF
	07	Windshield high-speed wiper switch	HI WIPER SW (COLUMN ECU)	OFF
	08	Windshield mist wiper switch	MIST WIPER SW (COLUMN ECU)	OFF
	09	Windshield washer switch	FRONT WASH.SW (COLUMN ECU)	OFF
	31	Ignition switch (ACC)	IG SW (ACC) (ETACS ECU)	ON
	37	Windshield intermittent wiper interval	INT WIPE TIME (ETACS ECU)	The scan tool MB991958 (MUT-III Sub Assembly) displays intermittent wiper interval in response to the intermittent wiper control positions.
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK or HI-BEAM ACK

ITEM	ITEM NO.	INPUT SIGNAL	DISPLAY ON SCAN TOOL	NORMAL CONDITION
F.WIPER LO	05	Windshield intermittent wiper switch	INT WIPER SW (COLUMN ECU)	OFF
	06	Windshield low-speed wiper switch	LO WIPER SW (COLUMN ECU)	ON
	07	Windshield high-speed wiper switch	HI WIPER SW (COLUMN ECU)	OFF
	08	Windshield mist wiper switch	MIST WIPER SW (COLUMN ECU)	OFF
	09	Windshield washer switch	FRONT WASH.SW (COLUMN ECU)	OFF
	31	Ignition switch (ACC)	IG SW (ACC) (ETACS ECU)	ON
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK or HI-BEAM ACK
F.WIPER MIST	05	Windshield intermittent wiper switch	INT WIPER SW (COLUMN ECU)	OFF
	06	Windshield low-speed wiper switch	LO WIPER SW (COLUMN ECU)	OFF
	07	Windshield high-speed wiper switch	HI WIPER SW (COLUMN ECU)	OFF
	08	Windshield mist wiper switch	MIST WIPER SW (COLUMN ECU)	ON
	09	Windshield washer switch	FRONT WASH.SW (COLUMN ECU)	OFF
	31	Ignition switch (ACC)	IG SW (ACC) (ETACS ECU)	ON
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK or HI-BEAM ACK
F.WIPER WASH	08	Windshield mist wiper switch	MIST WIPER SW (COLUMN ECU)	OFF
	09	Windshield washer switch	FRONT WASH.SW (COLUMN ECU)	ON
	31	Ignition switch (ACC)	IG SW (ACC) (ETACS ECU)	ON
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK or HI-BEAM ACK

LIGHTING

ITEM	ITEM NO.	INPUT SIGNAL	DISPLAY ON SCAN TOOL	NORMAL CONDITION
H/L AUTO-CUT	00	Headlight switch	HEADLIGHT SW (COLUMN ECU)	Either is ON
	01	Taillight switch	TAILLIGHT SW (COLUMN ECU)	
	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	OFF
	32	Front door switch	FRONT DOOR SW (ETACS ECU)	ON
	35	Headlight automatic shutoff function	H/L AUTO-CUT (ETACS ECU)	ON
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK or SLEEP ACK
OFF	00	Headlight switch	HEADLIGHT SW (COLUMN ECU)	OFF
	01	Tail light switch	TAILLIGHT SW (COLUMN ECU)	OFF
	03	Passing light switch	PASSING SW (COLUMN ECU)	OFF
	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	ON or OFF
	35	Headlight automatic shutoff function	H/L AUTO-CUT (ETACS ECU)	OFF
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK or SLEEP ACK
HEADLIGHT HI	00	Headlight switch	HEADLIGHT SW (COLUMN ECU)	ON
	02	Dimmer switch	DIMMER SW (COLUMN ECU)	ON or OFF
	03	Passing light switch	PASSING SW (COLUMN ECU)	OFF
	30	Ignition switch (IG1)	IG SW (IG1) (COLUMN ECU)	ON
	35	Headlight automatic shutoff function	H/L AUTO-CUT (COLUMN ECU)	OFF
	70	Response by the front-ECU	FRONT ECU ACK (COLUMN ECU)	HI-BEAM ACK

ITEM	ITEM NO.	INPUT SIGNAL	DISPLAY ON SCAN TOOL	NORMAL CONDITION
HEADLIGHT LO	00	Headlight switch	HEADLIGHT SW (COLUMN ECU)	ON
	03	Passing light switch	PASSING SW (COLUMN ECU)	OFF
	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	ON or OFF
	35	Headlight automatic shutoff function	H/L AUTO-CUT (ETACS ECU)	OFF
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK
PASSING LIGHT	03	Passing light switch	PASSING SW (COLUMN ECU)	ON
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK or HI-BEAM ACK
F.FOG LIGHT	00	Headlight switch	HEADLIGHT SW (COLUMN ECU)	ON
	36	Front fog light switch	F.FOG LIGHT (COLUMN ECU)	ON
	35	Headlight automatic shutoff function	H/L AUTO-CUT (ETACS ECU)	OFF
	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	ON or OFF
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK or HI-BEAM ACK
TAIL LIGHT	00	Headlight switch	HEADLIGHT SW (COLUMN ECU)	OFF
	01	Tail light switch	TAILLIGHT SW (COLUMN ECU)	ON
	03	Passing light switch	PASSING SW (COLUMN ECU)	OFF
	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	ON or OFF
	35	Headlight automatic shutoff function	H/L AUTO-CUT (ETACS ECU)	OFF
	70	Response by the front-ECU	FRONT ECU ACK (FRONT ECU)	NORMAL ACK

NOTE: When checking the input signals (off, tail, low-beam or high-beam), tum the ignition switch to the "ON" position in order to disable the headlight automatic shutoff function. However, since the headlight operation does not depend on the ignition switch positions, the scan tool MB991958 (MUT-III Sub Assembly) does not display the title "IGNITION SWITCH".

For checking item "HEADLIGHT HI", the scan tool MB991958 (MUT-III Sub Assembly) displays "OFF" on the item No.2 "DIMMER SW" when the headlights are at high-beam. Therefore, the scan tool MB991958 (MUT-III Sub Assembly) should display "ON" momentarily when the dimmer switch is operated.

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TURN SIGNAL

ITEM	ITEM NO.	INPUT SIGNAL	DISPLAY ON SCAN TOOL	NORMAL CONDITION
TURN-SIG.LH	10	Turn-signal light switch (RH)	T/S RH SW (COLUMN ECU)	OFF
	11	Turn-signal light switch (LH)	T/S LH SW (COLUMN ECU)	ON
	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	ON
TURN-SIG.RH	10	Turn-signal light switch (RH)	T/S RH SW (COLUMN ECU)	ON
	11	Turn-signal light switch (LH)	T/S LH SW (COLUMN ECU)	OFF
	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	ON

BUZZER

ITEM	ITEM NO.	INPUT SIGNAL	DISPLAY ON SCAN TOOL	NORMAL CONDITION
KEY REMND.ALM	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	OFF
	32	Front door switch	FRONT DOOR SW (ETACS ECU)	ON
	43	Tone alarm	BUZZER (ETACS ECU)	ON
LGT MONI.ALRM	00	Headlight switch	HEADLIGHT SW (COLUMN ECU)	Either is ON
	01	Tail light switch	TAILLIGHT SW (COLUMN ECU)	
	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	OFF
	32	Front door switch	FRONT DOOR SW (ETACS ECU)	ON
	35	Headlight automatic shutoff function	H/L AUTO-CUT (ETACS ECU)	OFF
	43	Tone alarm	BUZZER (ETACS ECU)	ON
OTHER ALARM	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	ON
	43	Tone alarm	BUZZER (ETACS ECU)	ON

NOTE: The headlight automatic shutoff function operates approximately one second after the lighting monitor tone alarm starts sounding, and then the tone alarm ceases sounding.

SUNROOF

ITEM	ITEM NO.	INPUT SIGNAL	DISPLAY ON SCAN TOOL	NORMAL CONDITION
SUNROOF OPE.	30	Ignition switch (IG1)	IG SW (IG1) (ETACS ECU)	ON
	72	Response by the sunroof-ECU	S/R ECU ACK (SUNROOF ECU)	INPUT CHECK (only momentarily when switch is operated)

PULSE CHECK

M1549015100562

1. The input signals (signals other than SWS communication line signals), which are compatible with the SWS monitor by using the scan tool MB991958 (MUT-III Sub Assembly) or voltmeter, can be confirmed by the Pulse Check.

Switches and their conditions, which are applicable for Pulse Check

INPUT SIGNAL	REQUIREMENTS FOR SOUNDING TONE ALARM
Key reminder switch	When the ignition key is pulled out
Hazard warning light switch	When the switch is turned from off to on
Door switches	A door is opened when all the doors are closed
Door lock key cylinder switch	When a door is locked or unlocked by a key cylinder
Door lock actuators	Move the door lock knob from lock position to unlock position or vice versa
Door lock switch (incorporated in the power window main switch and front power window sub switch)	When a door is locked or unlocked by a door lock switch
Keyless entry transmitter	When the switch is turned from off to on
Interior light loaded signal	Illuminates the interior lights

2. Use the scan tool MB991958 (MUT-III Sub Assembly) or voltmeter to check the following input signals.

NOTE: If a problem is found in the Pulse Check, refer to Input Signal Chart P.54B-63.

DIAGNOSTIC TROUBLE CODE CHART

M1549000700461

DIAGNOSTIC TROUBLE CODE NO.	DESCRIPTION	REFERENCE PAGE
001	Trouble in SWS communication line or ETACS-ECU	P.54B-27
002	Trouble in column switch	P.54B-31
003	Trouble in front-ECU	P.54B-34
004	Trouble in sunroof-ECU	P.54B-37
010	Bus Off	P.54B-40
011	Powertrain control module time-out (related to engine)	P.54B-41
012	Powertrain control module time-out (related to A/T)	
013	A/C-ECU time-out	P.54B-45
014	Combination meter time-out	P.54B-48
015	Multi center display unit (middle grade type) time-out	P.54B-52
021	Failure information on combination meter	P.54B-55

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC 001: Trouble in SWS communication line or ETACS-ECU

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

⚠ CAUTION
If DTC 001 is set in the ETACS-ECU, always diagnose the CAN main bus line.

TROUBLE JUDGMENT

The ETACS-ECU communicates with the column switch, the front-ECU and the sunroof-ECU through the SWS communication line. If there is any trouble in the SWS communication line and the ETACS-ECU, DTC 001 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

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

Past trouble

- If DTC 001 is set as past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the SWS communication line. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

DIAGNOSIS

Required Special Tools:

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

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

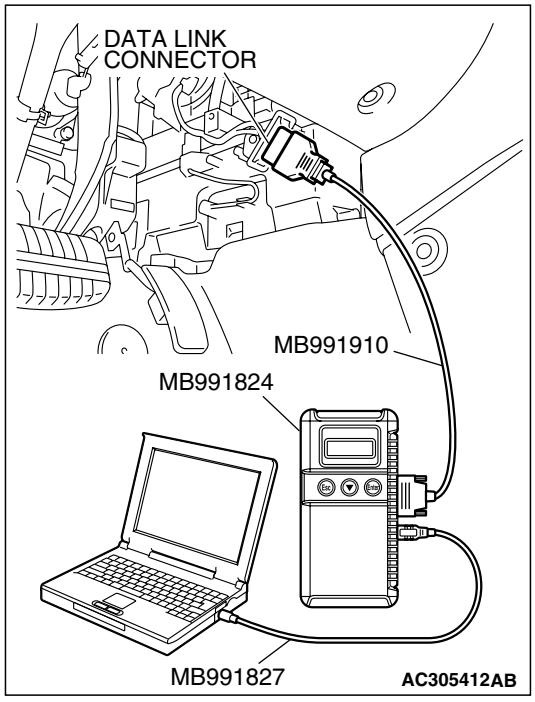
⚠ CAUTION

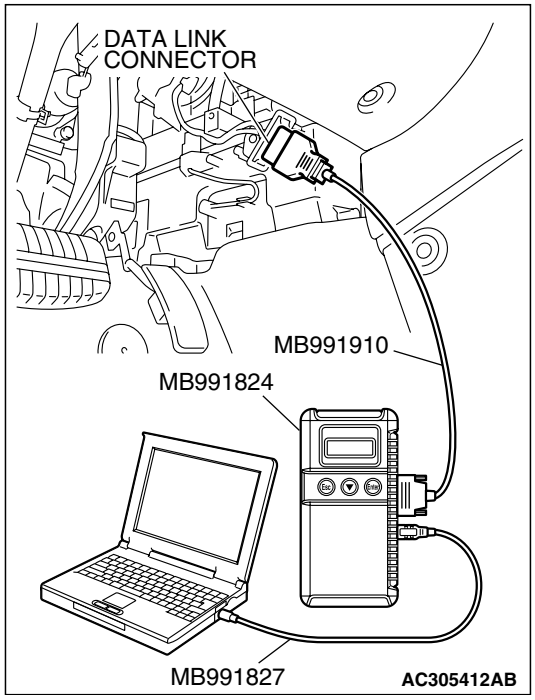
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).





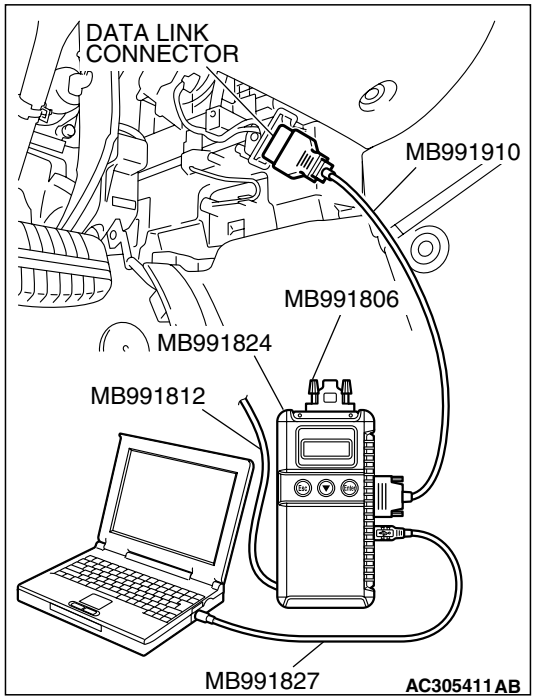
STEP 2. Recheck for diagnostic trouble code.

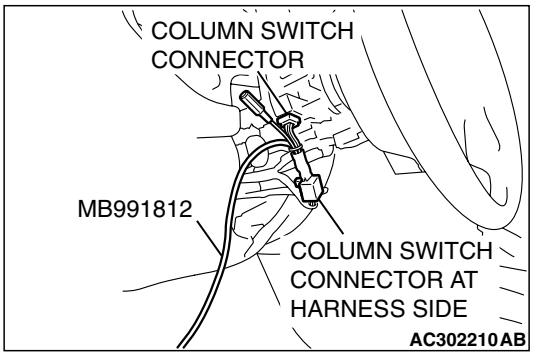
Check again if the DTC is set.
(1) Erase the DTC.
(2) Turn the ignition switch to the "ON" position.
(3) Check if the DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Go to Step 3.

NO : There is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).





STEP 3. Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.

Check the following ECUs:

- ETACS-ECU
- Column switch (column-ECU)
- Front-ECU
- Sunroof-ECU <Vehicles with sunroof only>

⚠ CAUTION

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

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

Q: Are "OK" displayed for the "ETACS ECU," "COLUMN ECU," "FRONT ECU" and "SUNROOF ECU" menus?

"OK" are displayed for all the items : It is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

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

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

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

"NG" is displayed for the "SUNROOF ECU" menu : Refer to Inspection Procedure A-5 "Communication with the sunroof-ECU is not possible P.54B-93."

DTC 002: Trouble in Column Switch

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

⚠ CAUTION
If DTC 002 is set in the ETACS-ECU, always diagnose the CAN main bus line.

TROUBLE JUDGMENT

The ETACS-ECU communicates with the column switch through the SWS communication line. If there is any trouble in that communication, DTC 002 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble
- The column switch, the ETACS-ECU, connector(s), or wiring harness between the two may be defective.

Past trouble
- If DTC 002 is set as past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the column switch and the ETACS-ECU or power supply to the column switch. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

DIAGNOSIS

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

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

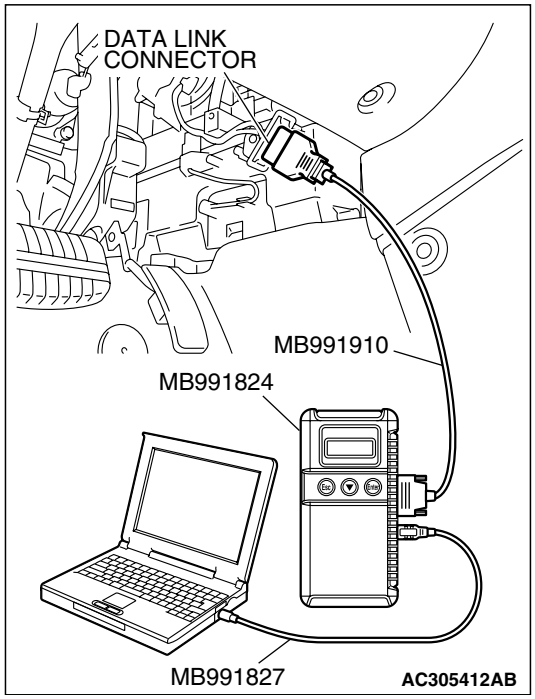
⚠ CAUTION

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

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

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).

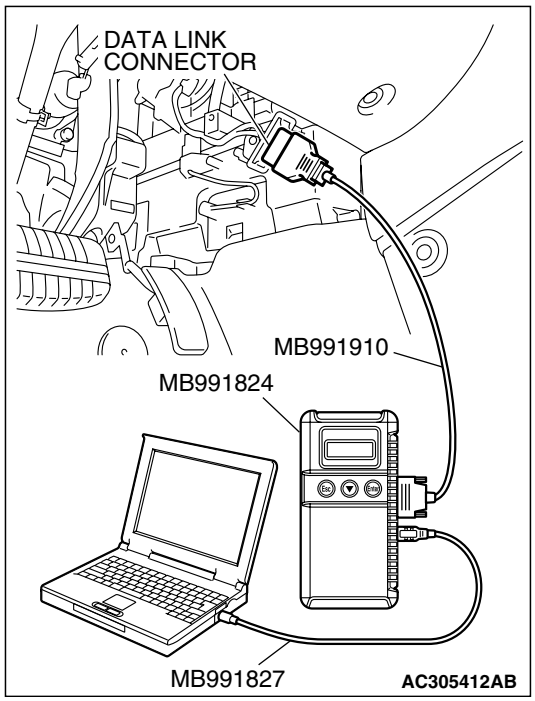


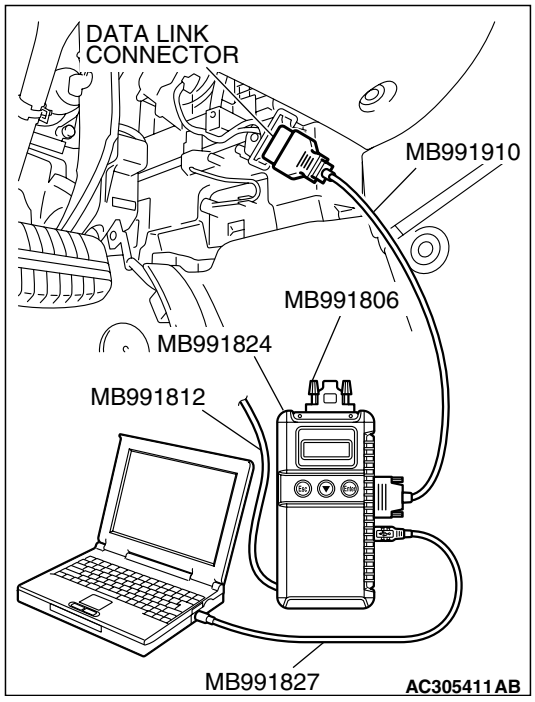
STEP 2. Recheck for diagnostic trouble code.

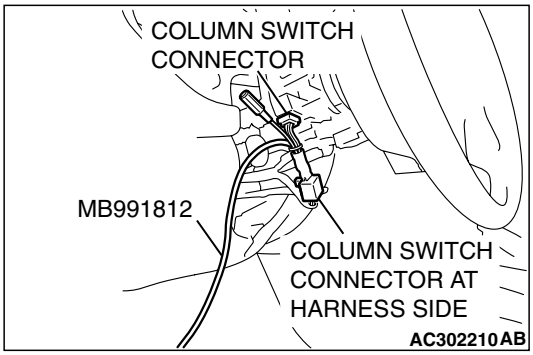
Check again if the DTC is set.
(1) Erase the DTC.
(2) Turn the ignition switch to the "ON" position.
(3) Check if the DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Go to Step 3.
NO : There is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-16).







STEP 3. Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.

Check the following ECUs:

- Column-ECU
- ETACS-ECU

⚠ CAUTION

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

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

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

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

a. Select "Interactive Diagnosis."
b. Select "System select."
c. Select "SWS."
d. Select "SWS MONITOR."
e. Select "ECU COMM Check."

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

Q: Are "OK" displayed for both the "COLUMN ECU" and "ETACS ECU" menus?

"OK" are displayed for all the items : It is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-16).

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

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

DTC 003: Trouble in Front-ECU

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

⚠ CAUTION
If DTC 003 is set in the ETACS-ECU, always diagnose the CAN main bus line.

TROUBLE JUDGMENT

The ETACS-ECU communicates with the front-ECU through the SWS communication line. If there is any trouble in that communication, DTC 003 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The front-ECU, the ETACS-ECU, connector(s), or wiring harness between the two may be defective.

Past trouble

- If DTC 003 is set as past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the front-ECU and the ETACS-ECU or power supply to the front-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to cope with past trouble P.00-16).

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

DIAGNOSIS

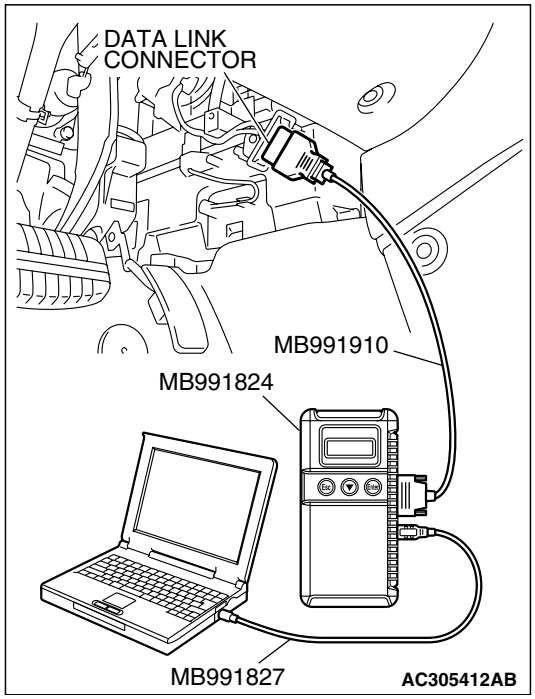
Required Special Tools:

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

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

⚠ CAUTION

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

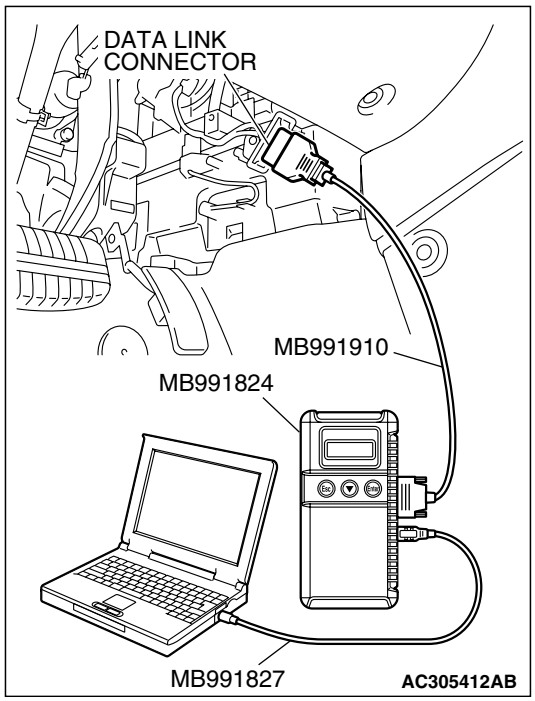


(1) Connect scan tool MB991958. Refer to "How to connect SWS monitor P.54B-13."
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).

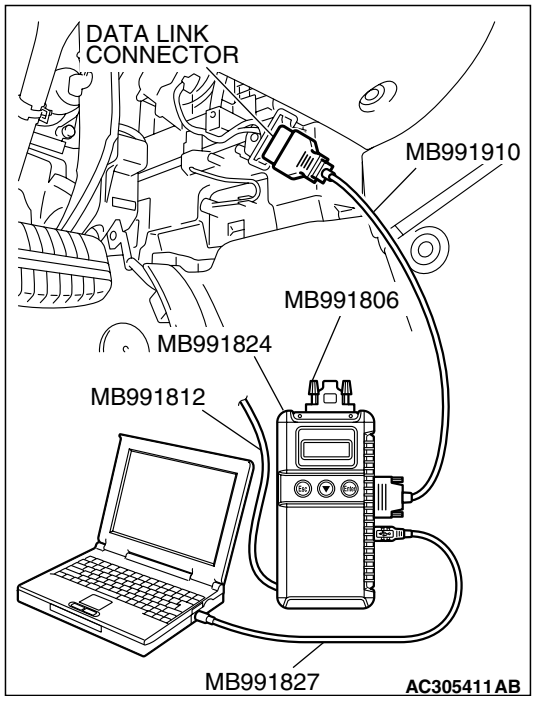
STEP 2. Recheck for diagnostic trouble code.

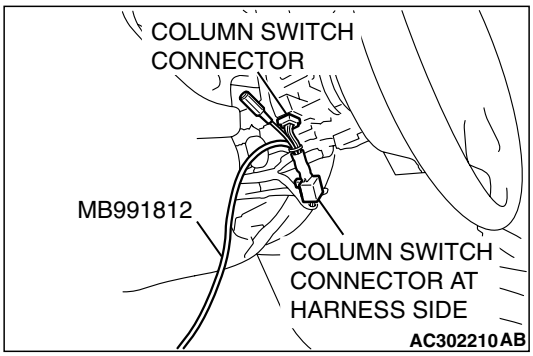


Check again if the DTC is set.
(1) Erase the DTC.
(2) Turn the ignition switch to the "ON" position.
(3) Check if the DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Go to Step 3.
NO : There is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).





STEP 3. Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.

Check the following ECUs:

- Front-ECU
- ETACS-ECU

⚠ CAUTION

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

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

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

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

a. Select "Interactive Diagnosis."
b. Select "System select."
c. Select "SWS."
d. Select "SWS MONITOR."
e. Select "ECU COMM Check."

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

Q: Are "OK" displayed for both the "ETACS ECU" and "FRONT ECU" menus?

"OK" are displayed for all the items : It is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

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

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

DTC 004: Trouble in Sunroof-ECU

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

⚠ CAUTION
DTC 004 may also set on vehicles without sunroof, but there is no fault.

⚠ CAUTION
If DTC 004 is set in the ETACS-ECU, always diagnose the CAN main bus line.

TROUBLE JUDGMENT

The ETACS-ECU communicates with the front-ECU through the SWS communication line. If there is any trouble in that communication, DTC 004 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble
- The sunroof-ECU, the ETACS-ECU, connector(s), or wiring harness between the two may be defective.

Past trouble
- If DTC 004 is set as past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the sunroof-ECU and the ETACS-ECU or power supply to the sunroof-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

DIAGNOSIS

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

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

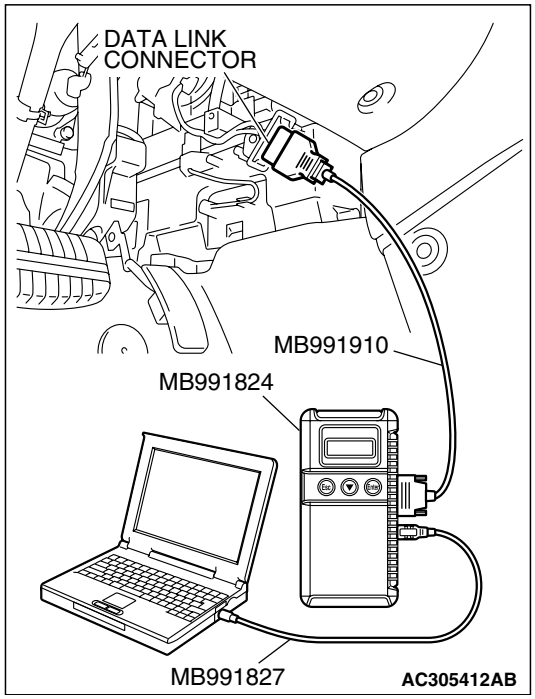
⚠ CAUTION

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

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

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).

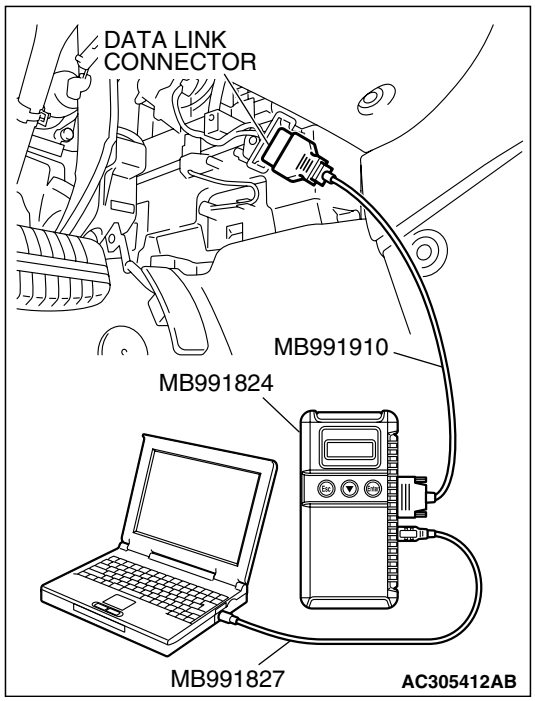


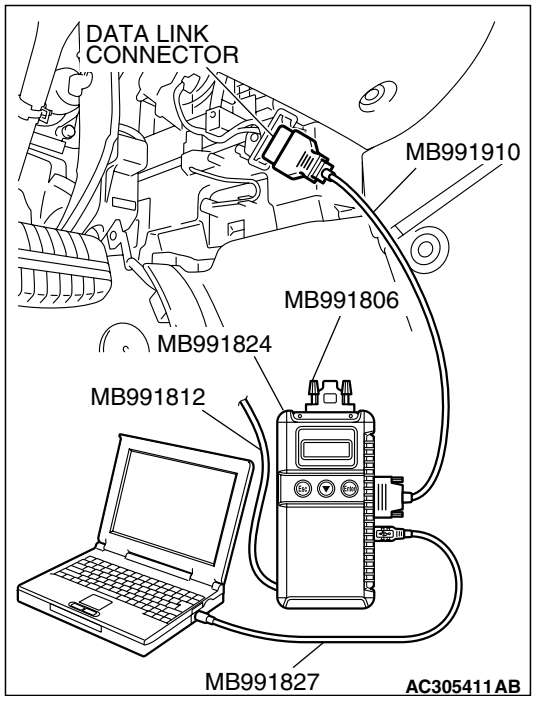
STEP 2. Recheck for diagnostic trouble code.

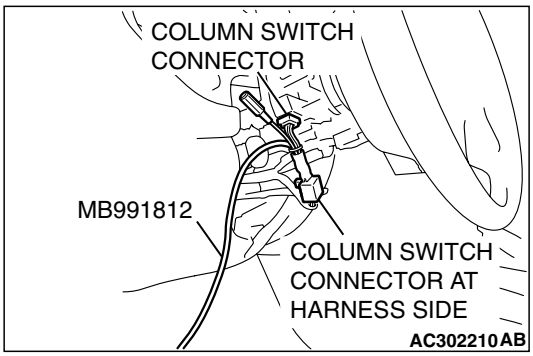
Check again if the DTC is set.
(1) Erase the DTC.
(2) Turn the ignition switch to the "ON" position.
(3) Check if the DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Go to Step 3.
NO : There is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).







STEP 3. Use scan tool MB991958 to select "ECU COMM Check" on the SWS monitor display.

Check the following ECUs:

- Sunroof-ECU
- ETACS-ECU

⚠ CAUTION

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

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

Q: Are "OK" displayed for both the "SUNROOF ECU" and "ETACS ECU" menus?

"OK" are displayed for all the items : It is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

"NG" is displayed for the "SUNROOF ECU" menu : Refer to Inspection Procedure A-5 "communication with the sunroof-ECU is not possible P.54B-93."

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

DTC 010: Bus Off

⚠ CAUTION
If DTC 010 is set in the ETACS-ECU, always diagnose the CAN main bus line.

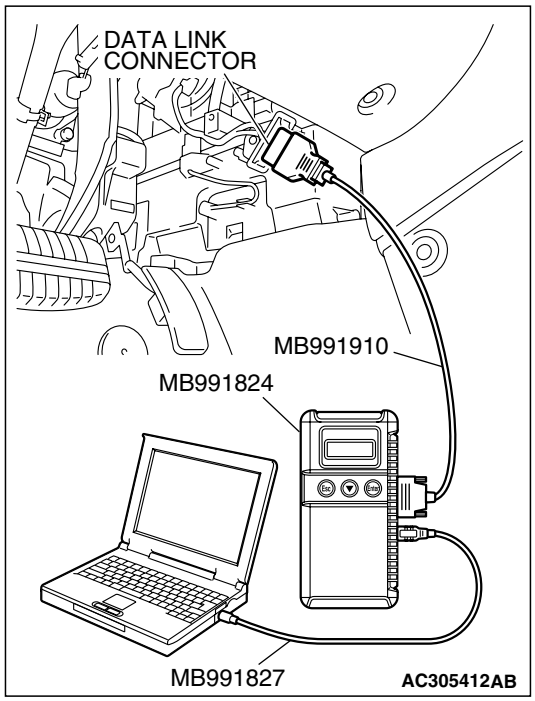
⚠ CAUTION
If the DTC is set as past trouble, the ECU cannot be defective. Do not replace it.

TROUBLE JUDGMENT
DTC 010 will be stored when the ETACS-ECU ceases CAN communication (bus off) and then resumes the communication by turning the ignition switch to the "LOCK" (OFF) position

TECHNICAL DESCRIPTION (COMMENT)
Carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus lines. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

TROUBLESHOOTING HINTS
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

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



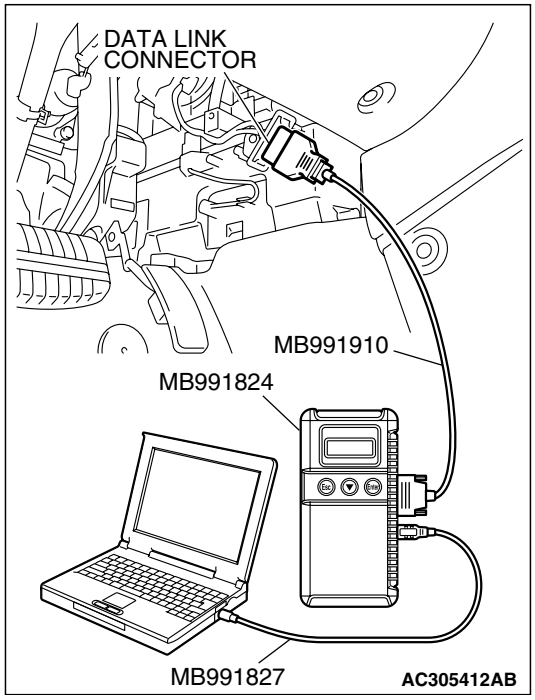
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

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

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

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).



STEP 2. Recheck for diagnostic trouble code.
Check again if the DTC is set.
(1) Erase the DTC.
(2) Turn the ignition switch to the "ON" position.
(3) Check if the DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the ETACS-ECU. After replacement, verify that the DTC is not reset.

NO : There is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC 011: Powertrain Control Module Time-out (Related to Engine)
DTC 012: Powertrain Control Module Time-out (Related to A/T)

⚠ CAUTION
If DTC 011 or 012 is set in the ETACS-ECU, always diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

DTC 011

- The ETACS-ECU receives engine control system-related signal from the powertrain control module. If the ECU cannot receive the signal, DTC 011 will be set.

DTC 012

- The ETACS-ECU receives automatic transaxle control system-related signal from the powertrain control module. If automatic transaxle control system-related signal cannot be received, DTC 012 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the powertrain control module and the ETACS-ECU, the power supply system to the powertrain control module, the powertrain control module itself, or the ETACS-ECU may be defective.

Past trouble

- If DTC 011 or 012 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line between the ETACS-ECU and the powertrain control module, and the power supply system to the powertrain control module. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

  NOTE: You cannot find a past trouble, by the MUT-III CAN bus diagnostics even if there is a failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14 and check the CAN bus lines.

You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN Bus Line Diagnostic Flow P.54C-6).

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.
- The powertrain control module may be defective.
- The ETACS-ECU may be defective.

DIAGNOSIS

Required Special Tools:

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

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

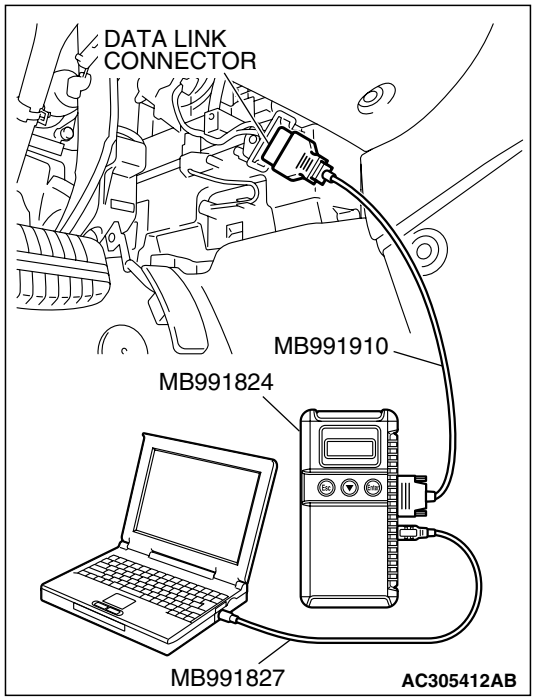
⚠ CAUTION

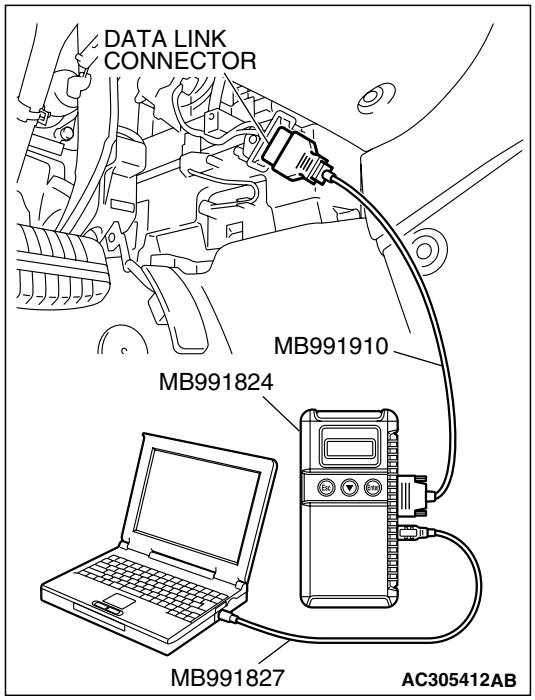
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).





STEP 2. Using scan tool MB991958, read the powertrain control module diagnostic trouble code.

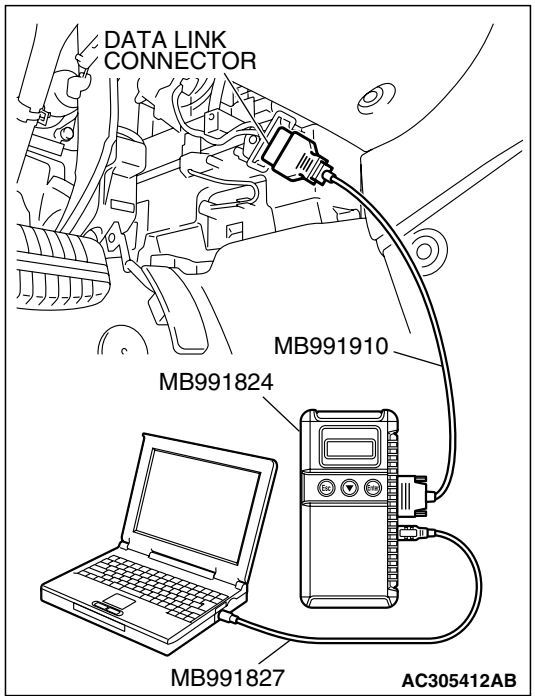
Check whether engine and automatic transaxle DTCs are set or not.

(1) Turn the ignition switch to the "ON" position.
(2) Check for engine and automatic transaxle DTCs.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Diagnose the powertrain control module (Refer to GROUP 13A, Diagnosis P.13A-33 <2.4 L> or P.13B-34 <3.8 L>).

NO : Go to Step 3.



STEP 3. Using scan tool MB991958, read the for any diagnostic trouble code.

Check if a DTC, which relates to CAN communication-linked systems below, is set.

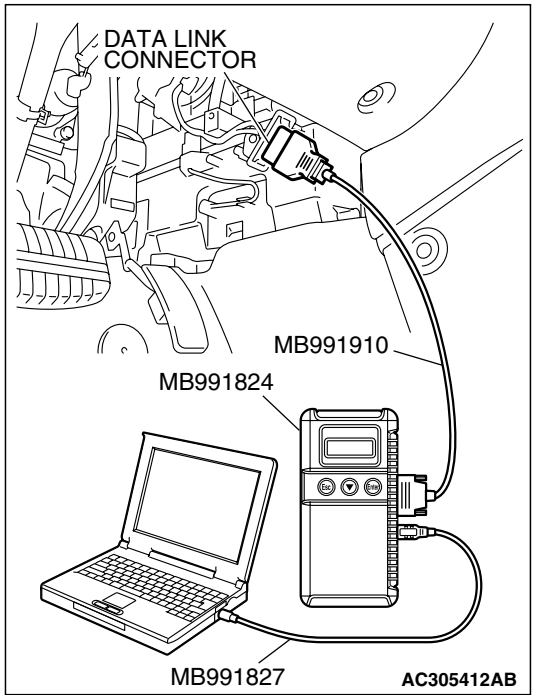
- Combination meter
  DTC indicating a time-out error related to the engine or automatic transaxle control system
- A/C
  DTC indicating a time-out error related to the engine or automatic transaxle control system

(1) Turn the ignition switch to the "ON" position.
(2) Check for a DTC related to the relevant system.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Go to Step 4.

NO : Go to Step 5.



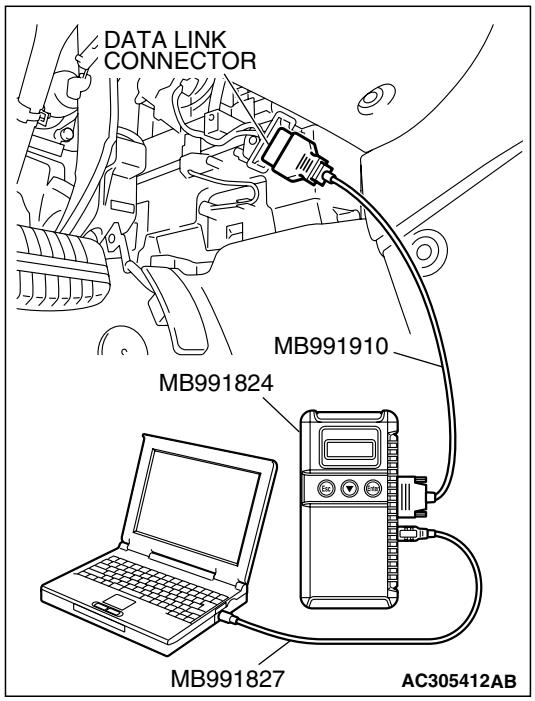
STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Check if the DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the powertrain control module. On completion, verify that the DTC is not reset.

NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the powertrain control module and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).



STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Check if the DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the ETACS-ECU. On completion, verify that the DTC is not reset.

NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the powertrain control module and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC 013: A/C-ECU Time-out.

⚠ CAUTION
If DTC 013 is set in the ETACS-ECU, always diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The ETACS-ECU receives air conditioning system-related signal from the A/C-ECU. If an air conditioning control system-related signal cannot be received, DTC 013 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the A/C-ECU and the ETACS-ECU, the power supply system to the A/C-ECU, the A/C-ECU, or the ETACS-ECU may be defective.

Past trouble

- If DTC 013 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line between the A/C-ECU and the ETACS-ECU, and the power supply system to the A/C-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

  NOTE: You cannot find a past trouble, by the MUT-III CAN bus diagnostics even if there is a failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN Bus Line Diagnostic Flow P.54C-6).

TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

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

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

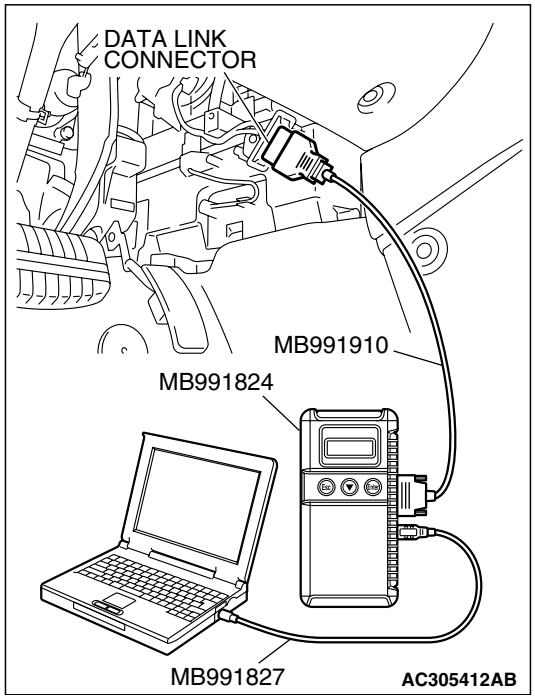
⚠ CAUTION

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

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

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).

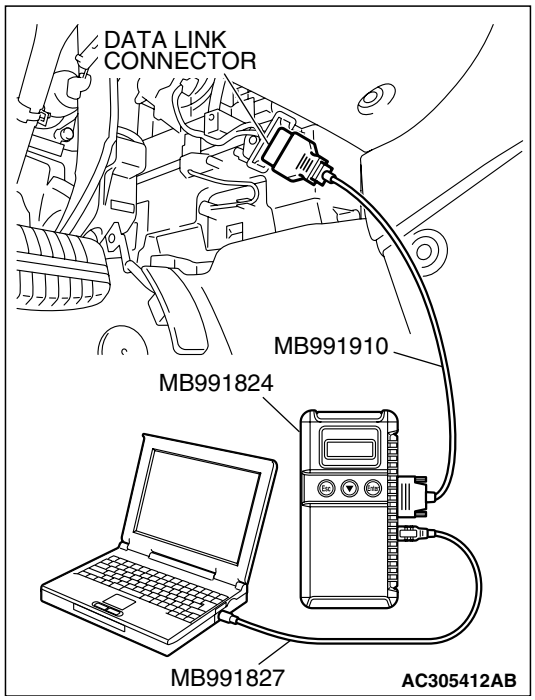


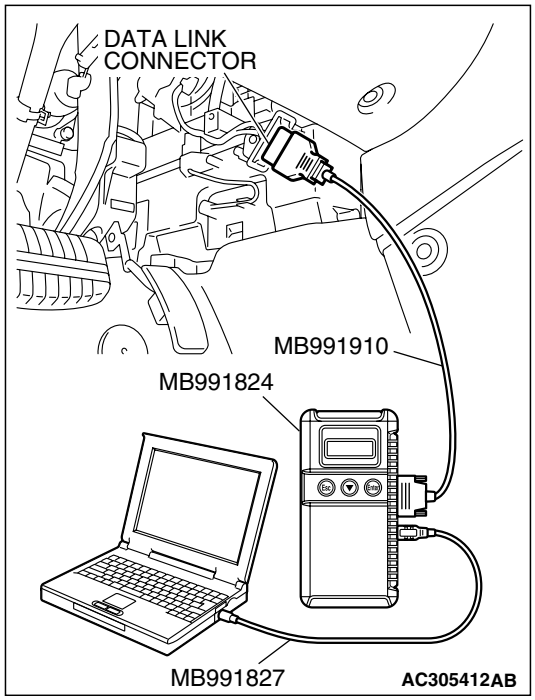
STEP 2. Using scan tool MB991958, read the A/C diagnostic trouble code.

Check if an A/C-ECU DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Check whether A/C system-related DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Diagnose the air conditioning system (Refer to GROUP 55A, Diagnosis P.55A-58).
NO : Go to Step 3.





STEP 3. Using scan tool MB991958, read the for any diagnostic trouble code.

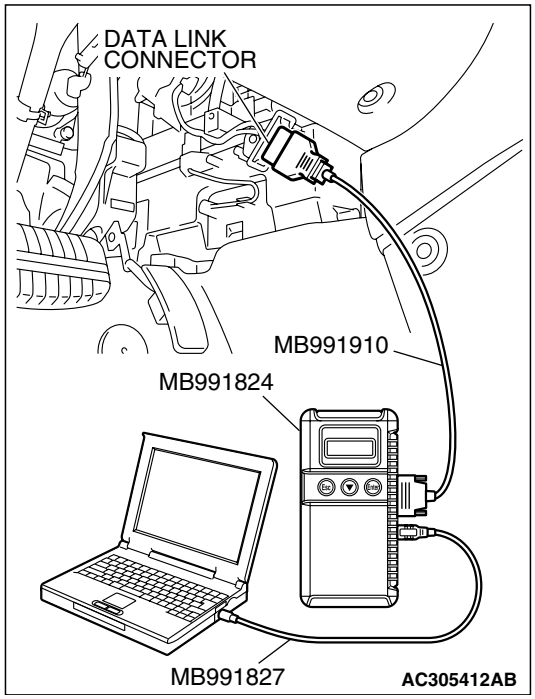
Check if a DTC, which relates to CAN communication-linked systems below, is set.

- Combination meter
  A/C-related time-out DTC
- Multi center display (middle-grade type) <Vehicles with multi center display (middle-grade type)>
  A/C-related time-out DTC

(1) Turn the ignition switch to the "ON" position.
(2) Check for a DTC related to the relevant system.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

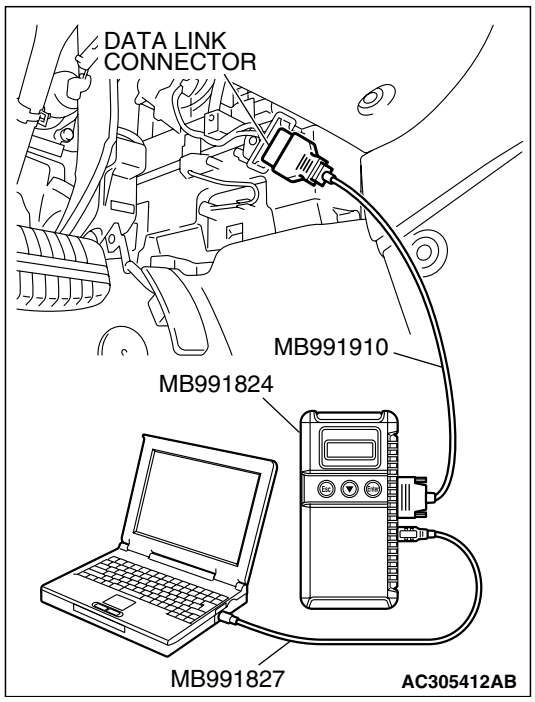


STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Check if the DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the A/C-ECU. On completion, verify that the DTC is not reset.
NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the A/C-ECU and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).



STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Check if the DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the ETACS-ECU. On completion, verify that the DTC is not reset.

NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the A/C-ECU and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC 014: Combination Meter Time-out.

⚠ CAUTION
If DTC 014 is set in the ETACS-ECU, always diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The ETACS-ECU receives combination meter-related signal from the combination meter. If the ECU cannot receive the signal, DTC 014 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the combination meter and the ETACS-ECU, the power supply system to the combination meter, the combination meter itself, or the ETACS-ECU may be defective.

Past trouble

- If DTC 014 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line between the combination meter and the ETACS-ECU, and the power supply system to the combination meter. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

  NOTE: You cannot find a past trouble, by the MUT-III CAN bus diagnostics even if there is a failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN Bus Line Diagnostic Flow P.54C-6).

TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

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

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

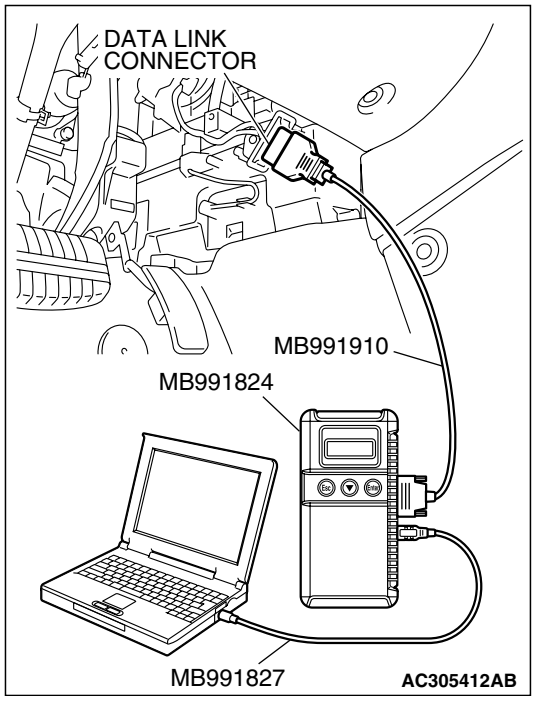
⚠ CAUTION

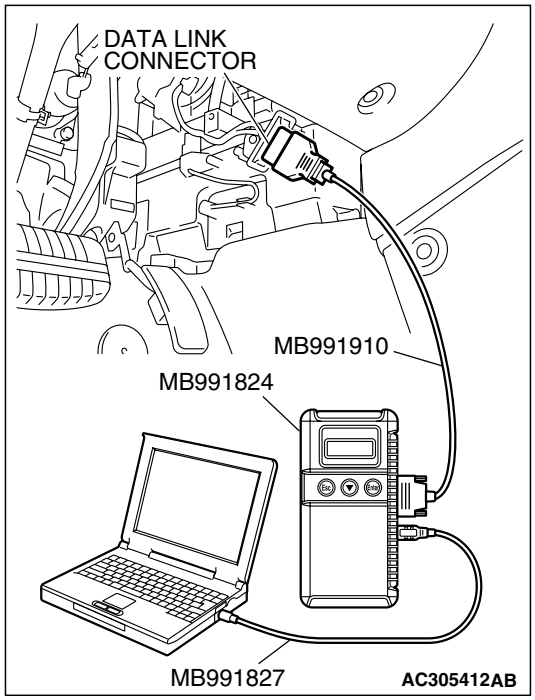
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).



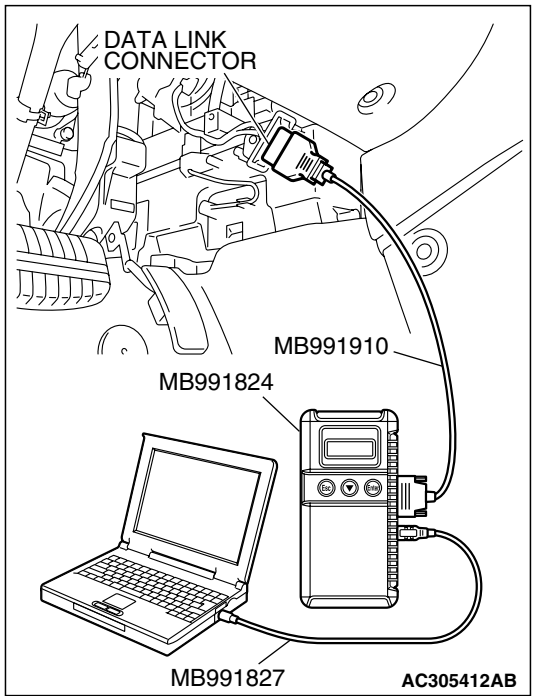


STEP 2. Using scan tool MB991958, read the combination meter diagnostic trouble code.

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

Q: Is the DTC set?

YES : Diagnose the combination meter (Refer to GROUP 54A, Diagnosis P.54A-52).
NO : Go to Step 3.



STEP 3. Using scan tool MB991958, read the for any diagnostic trouble code.

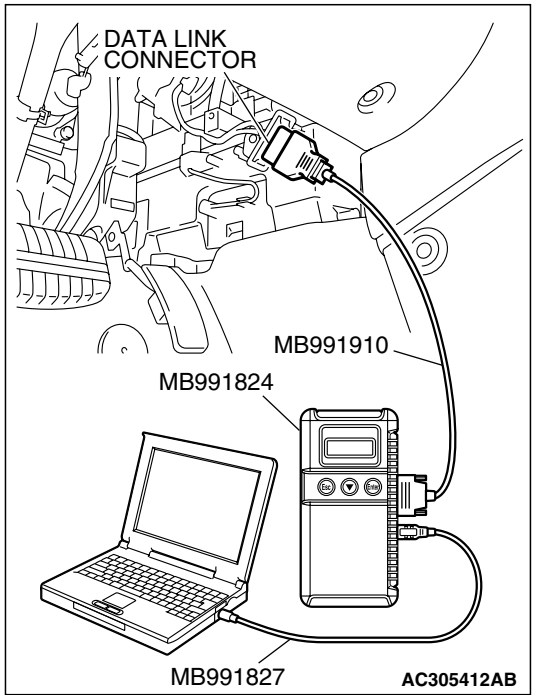
Check if a DTC, which relates to CAN communication-linked systems below, is set.

- Engine
  Meter-related time-out DTC
- Multi center display (middle-grade type) <Vehicles with multi center display (middle-grade type)>
  Meter-related time-out DTC

(1) Turn the ignition switch to the "ON" position.
(2) Check for a DTC related to the relevant system.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.



STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set.

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

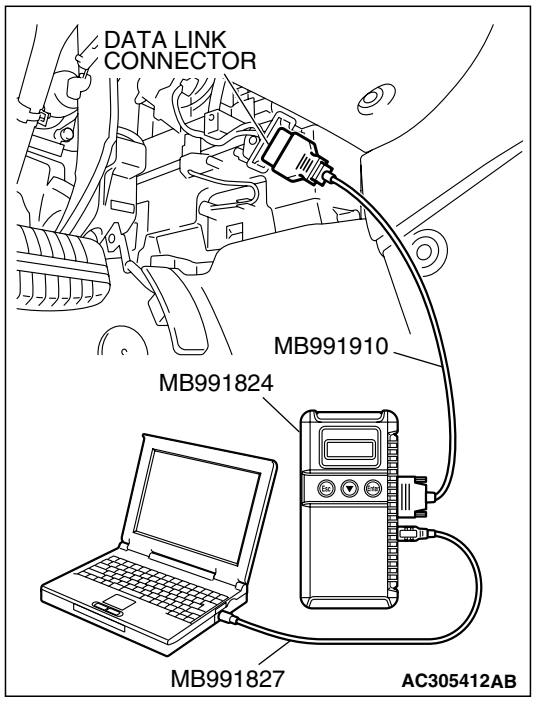
(2) Check if the DTC is set.

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

Q: Is the DTC set?

YES : Replace the combination meter. On completion, verify that the DTC is not reset.

NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the combination meter and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).



STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set.

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

(2) Check if the DTC is set.

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

Q: Is the DTC set?

YES : Replace the ETACS-ECU. On completion, verify that the DTC is not reset.

NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the combination meter and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC 015: Multi center Display Unit (Middle Grade Type) Time-out.

⚠ CAUTION
DTC 015 may also be set on vehicles with the multi center display (low-grade type). This is because the display unit does not communicate through the CAN bus lines, and there is no fault.

⚠ CAUTION
If DTC 015 is set in the ETACS-ECU, always diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The ETACS-ECU receives multi center display-related signal from the multi center display (middle-grade type). If the ECU cannot receive the signal, DTC 015 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the multi center display unit (middle-grade type) and the ETACS-ECU, the power supply system to the multi center display unit (middle-grade type), the multi center display unit (middle-grade type) itself, or the ETACS-ECU may be defective.

Past trouble

- If DTC 015 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line between the multi center display unit (middle-grade type) and the ETACS-ECU, and the power supply system to the multi center display unit (middle-grade type). For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

  NOTE: You cannot find a past trouble, by the MUT-III CAN bus diagnostics even if there is a failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN Bus Line Diagnostic Flow P.54C-6).

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of the multi center display (middle-grade type)
- The ETACS-ECU may be defective

DIAGNOSIS

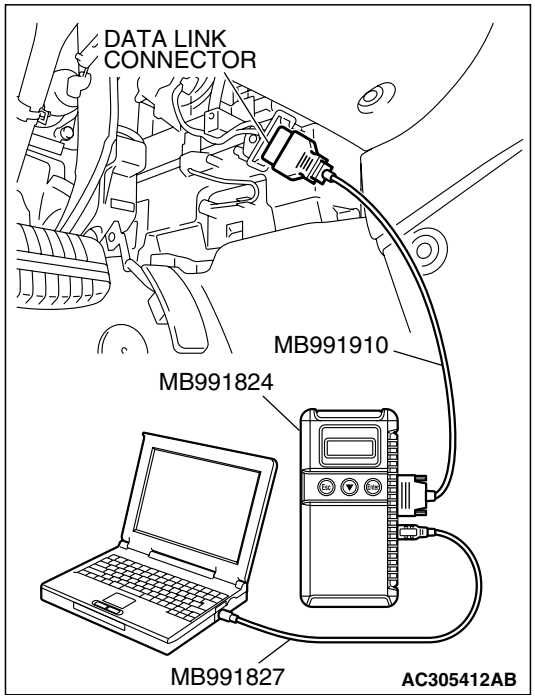
Required Special Tools:

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

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

⚠ CAUTION

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

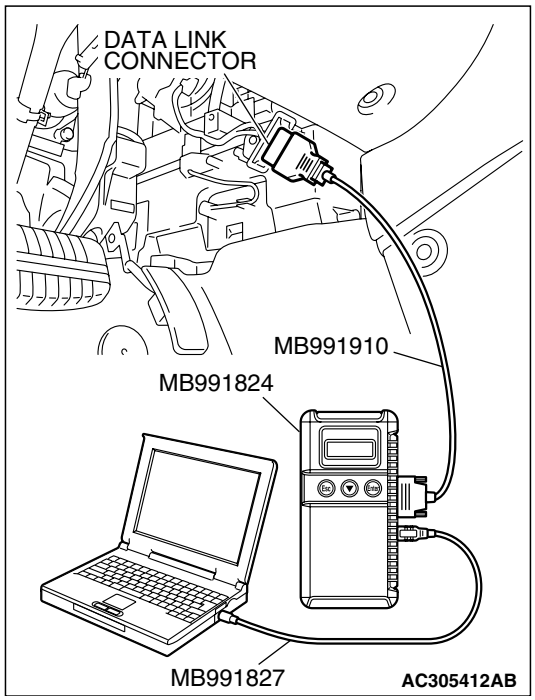


(1) Connect scan tool MB991958. Refer to "How to connect SWS monitor P.54B-13."
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).

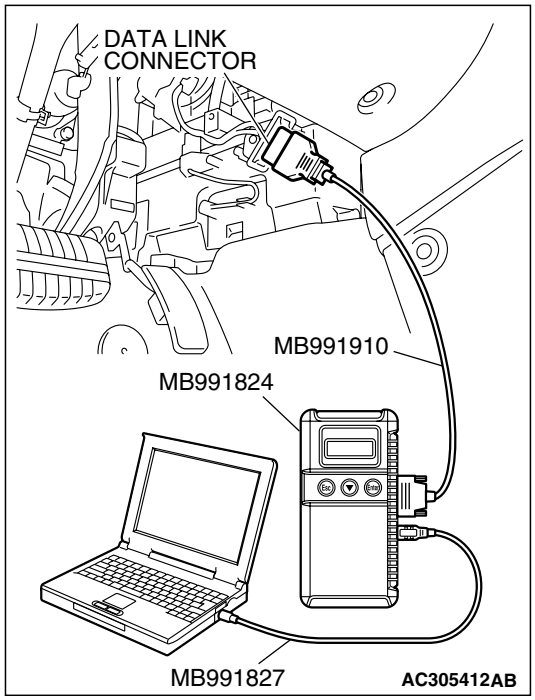
STEP 2. Using scan tool MB991958, read the multi center display diagnostic trouble code.



Check that the multi center display unit sets a DTC.
(1) Turn the ignition switch to the "ON" position.
(2) Check if the multi center display DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Diagnose the multi center display unit (middle-grade type) (Refer to GROUP 54A, Diagnosis P.54A-224).
NO : Go to Step 3.



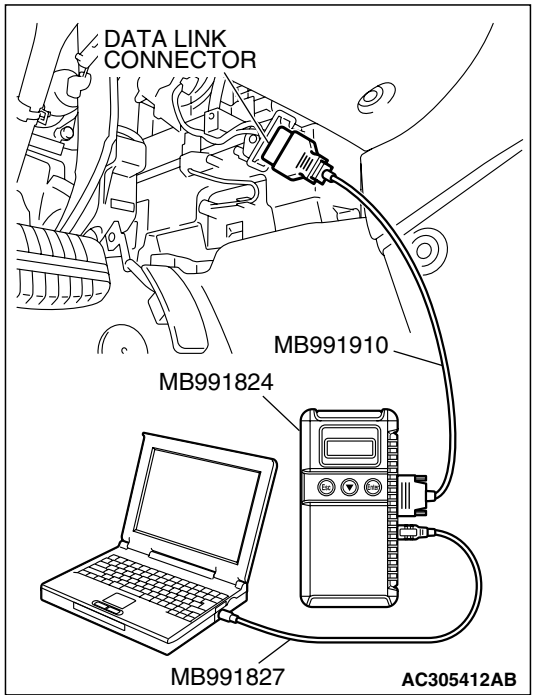
STEP 3. Using scan tool MB991958, read the A/C diagnostic trouble code.

Check if a multi center display-related DTC is set in the A/C system.

(1) Turn the ignition switch to the "ON" position.
(2) Check whether A/C system-related DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.



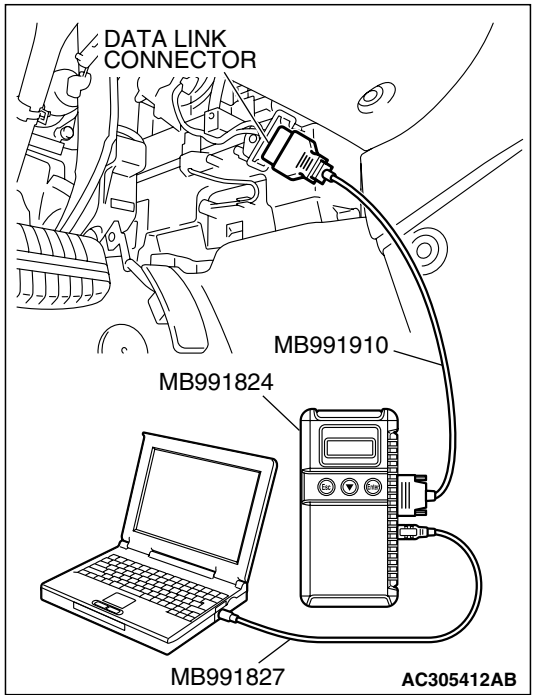
STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set.

(1) Turn the ignition switch to the "ON" position.
(2) Check if the DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the multi center display (middle-grade type). On completion, verify that the DTC is not reset.
NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the multi center display (middle-grade type) and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).



STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Check if the DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the ETACS-ECU. On completion, verify that the DTC is not reset.

NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the multi center display (middle-grade type) and the ETACS-ECU (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC 021: Failure Information on Combination Meter.

⚠ CAUTION
If DTC 021 is set in the ETACS-ECU, always diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

⚠ CAUTION
The combination meter- related DTC may be set when DTC 021 is set. (For details refer to GROUP 00, Intersystem Affiliated DTC Reference Table P.00-17.) Diagnose the combination meter first when the combination meter- related DTC is set.

TROUBLE JUDGMENT

The ETACS-ECU receives combination meter-related signal from the combination meter via the CAN bus lines. If a fail-safe related data is contained in the signal from the combination meter, DTC 021 will be stored.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The wiring harness wire or connectors may have loose, corroded, or damage terminals, or terminals pushed back in the connector, the power-train control module, the combination meter or the ETACS-ECU may be defective.

Past trouble

- If DTC 021 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line between the combination meter and the ETACS-ECU, and the power supply system to the combination meter. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

NOTE: You cannot find a past trouble, by the MUT-III CAN bus diagnostics even if there is a failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14 and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN Bus Line Diagnostic Flow P.54C-6).

TROUBLESHOOTING HINTS

- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:

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

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

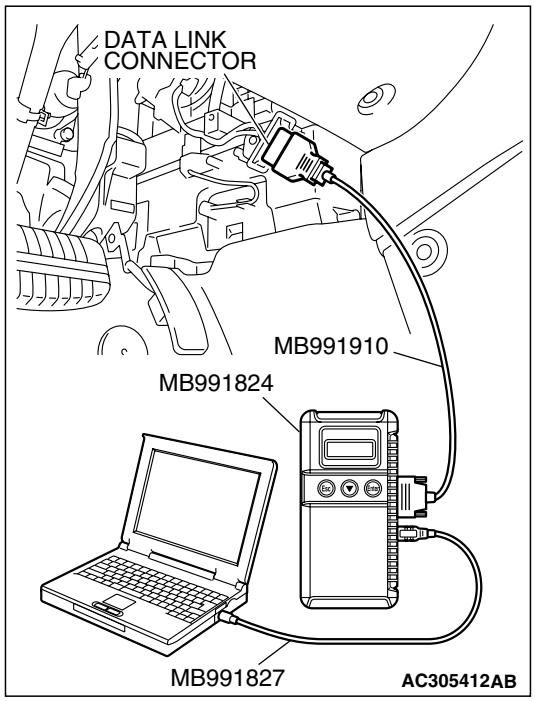
⚠ CAUTION

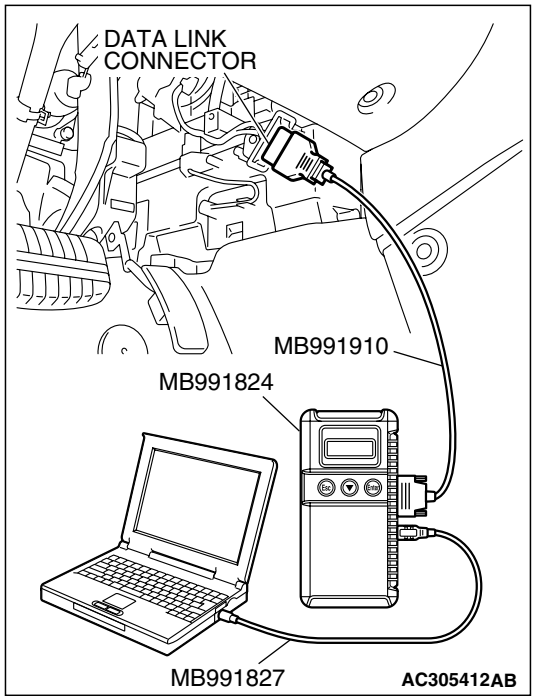
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14).





STEP 2. Using scan tool MB991958, read the powertrain control module diagnostic trouble code.

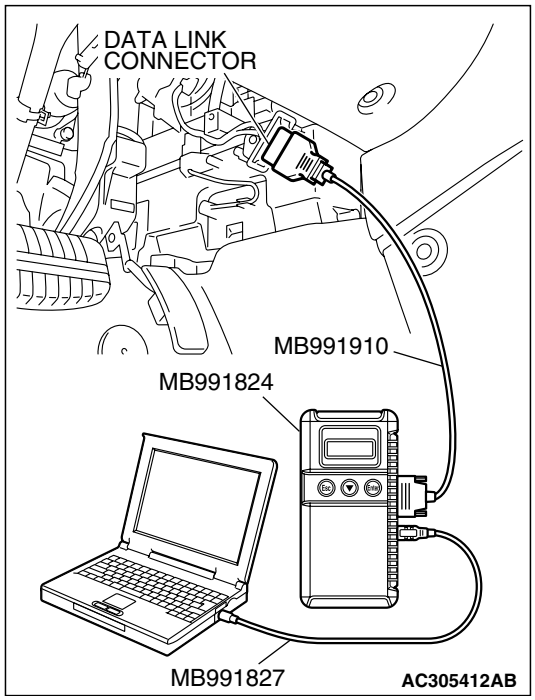
Check whether engine and automatic transaxle DTCs are set or not.

(1) Turn the ignition switch to the "ON" position.
(2) Check for engine and automatic transaxle DTCs.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Diagnose the powertrain control module (Refer to GROUP 13A, Diagnosis P.13A-33 <2.4 L> or P.13B-34 <3.8 L>).

NO : Go to Step 3.



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

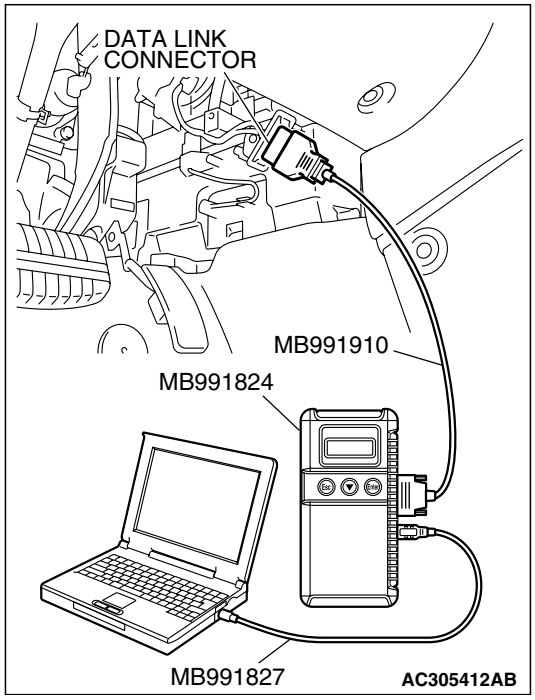
Check whether the combination meter-related DTC is set.

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

Q: Is the DTC set?

YES : Diagnose the combination meter (Refer to GROUP 54A, Diagnosis P.54A-52).

NO : Go to Step 4.



STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set.

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

(2) Check if the DTC is set.

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

Q: Is the DTC set?

YES : Replace the ETACS-ECU. On completion, verify that the DTC is not reset.

NO : There is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

SYMPTOM CHART

M1549000801159

ECU COMMUNICATION SYSTEM

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Communication with the SWS monitor kit is not possible.	A-1	P.54B-64
Communication with the column switch (column-ECU) is not possible.	A-2	P.54B-71
Communication with the ETACS-ECU is not possible.	A-3	P.54B-78
Communication with the front-ECU is not possible.	A-4	P.54B-86
Communication with the sunroof-ECU is not possible.	A-5	P.54B-93

FUNCTION SYSTEM

SYSTEM	SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Tone alarm	General description concerning the tone alarm	–	P.54B-101
	Ignition key reminder tone alarm function does not work normally.	B-1	P.54B-108
	Light reminder tone alarm function does not work normally.	B-2	P.54B-112
	Seat belt tone alarm function does not work normally.	B-3	P.54B-115
	Door ajar warning buzzer function does not work normally.	B-4	P.54B-120
	The multi center display does not sound normally when it is operated. <multi center display (middle-grade type)>	B-5	P.54B-126
	Turn-signal light buzzer function does not work normally.	B-6	P.54B-130
Central door locking system	General description concerning central door locking system	–	P.54B-132
	The central door locking system does not work at all.	C-1	P.54B-137
	Some doors do not lock or unlock.	C-2	P.54B-145
	All the doors do not lock or unlock with just the door lock switch operation.	C-3	P.54B-158
	All the doors do not lock or unlock with just the door lock key cylinder key operation.	C-4	P.54B-160
	All the doors do not lock or unlock with just the driver's or front passenger's inside lock knob operation.	C-5	P.54B-162
	Forgotten key prevention function does not work normally.	C-6	P.54B-164

SYSTEM	SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Power windows	General description concerning the power windows	–	P.54B-167
	Power windows do not work at all.	D-1	P.54B-171
	The power window timer function does not work normally.	D-2	P.54B-182
	Only the front door window (LH) does not work by operating power window main switch.	D-3	P.54B-186
	Power windows do not work normally by operating the front passenger's or rear passenger's sub switches.	D-4	P.54B-189
	Front or rear passenger's power windows do not work at all by operating the power window main switch.	D-5	P.54B-211
Keyless entry system	General description concerning the keyless entry system	–	P.54B-213
	Keyless entry system does not operate.	E-1	P.54B-218
	The dome light, the turn-signal lights and the hom do not operate through the answerback function.	E-2	P.54B-220
	Encrypted code cannot be registered.	E-3	P.54B-230
	The trunk is not opened when the keyless entry transmitter "TRUNK" button is operated.	E-4	P.54B-232
Sunroof	General description concerning the sunroof	–	P.54B-237
	Sunroof does not operate.	F-1	P.54B-239
	Any of the sunroof switch positions is defective.	F-2	P.54B-250
	Sunroof timer function does not work normally.	F-3	P.54B-252
Windshield wiper and washer	General description concerning the windshield wiper and washer	–	P.54B-255
	The windshield wiper do not work at all.	G-1	P.54B-259
	The windshield wipers do not work when the windshield wiper switch is at "INT" or "MIST" position or the windshield washer switch is at "ON" position. However, the wipers work at low speed when the windshield wiper switch is at "LO" or "HI."	G-2	P.54B-266
	All of the windshield wiper switch positions are defective.	G-3	P.54B-268
	Windshield wipers does not stop at the predetermined park position.	G-4	P.54B-273
	The windshield intermittent wiper interval cannot be adjusted by using the variable intermittent wiper control switch.	G-5	P.54B-279
	The windshield intermittent wiper interval is not changed according to the vehicle speed.	G-6	P.54B-281
	The windshield washer does not work.	G-7	P.54B-284

SYSTEM	SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Headlight and taillight	General description concerning the headlight and taillight	–	P.54B-290
	The taillights do not illuminate normally.	H-1	P.54B-297
	The headlights (low-beam) do not illuminate normally.	H-2	P.54B-302
	The headlights (high-beam) do not illuminate normally.	H-3	P.54B-307
	When the passing switch is turned "ON," the headlights (low-beam or high-beam) do not illuminate.	H-4	P.54B-311
	Headlights do not illuminate when the lighting switch is at "TAIL," and "PASSING" position, but illuminate at low-beam when the switch is at "HEAD" position. At this position, the headlights cannot be changed to high beam by operating the dimmer switch.	H-5	P.54B-313
	The taillights, the position lights, front parking lights, the front side marker lights or the license plate light do not illuminate.	H-6	P.54B-315
	One of the headlights does not illuminate. <2-bulb type>	H-7	P.54B-339
	One of the headlights does not illuminate. <4-bulb type>		P.54B-348
	The high-beam indicator light does not illuminate.	H-8	P.54B-358
	Headlight automatic shutoff function does not work normally.	H-9	P.54B-362
	Headlight dimmer switch automatic resetting function does not work normally.	H-10	P.54B-365
Flasher timer	General description concerning the flasher timer	–	P.54B-366
	Turn-signal lights do not flash when the turn-signal light switch is turned on.	I-1	P.54B-369
	Hazard warning lights do not flash when the hazard warning light switch is turned on.	I-2	P.54B-375
	One of the turn-signal lights does not illuminate.	I-3	P.54B-377
	The turn-signal light indicator does not illuminate normally.	I-4	P.54B-391
Fog light	General description concerning the fog lights	–	P.54B-395
	Fog lights do not illuminate when the fog light switch is turned on.	J-1	P.54B-398
	Fog lights do not go out when the headlights (low-beam) are turned off while the fog lights are on.	J-2	P.54B-404
	One of the fog lights does not illuminate.	J-3	P.54B-404
	The fog light indicator does not illuminate normally.	J-4	P.54B-410

SYSTEM	SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Interior light	General description concerning the interior light	–	P.54B-414
	The dome light do not illuminate and go out normally.	K-1	P.54B-420
	The front dome light, rear dome light or trunk light do not illuminate or go out normally.	K-2	P.54B-427
	Dome light dimming function does not work normally.	K-3	P.54B-438
	The ignition key hole illumination light does not illuminate or go out normally.	K-4	P.54B-443
	The interior light automatic shutoff function does not work normally.	K-5	P.54B-451
	The door ajar indicator lights do not illuminate or go out normally	K-6	P.54B-456
	The seat belt warning light do not illuminate or go out normally	K-7	P.54B-460
Can not customize the functions by operating the multi center display (middle-grade type).		L-1	P.54B-464

INPUT SIGNAL CHART

M1549024200501

SWS MONITOR

If a problem is found in the Data List inspection, observe the table below.

SYMPTOM		INSPECTION PROCEDURE	REFERENCE PAGE
ETACS-ECU does not receive any signal from the ignition switch (ACC).		M-1	P.54B-467
ETACS-ECU does not receive any signal from the ignition switch (IG1).		M-2	P.54B-470
ETACS-ECU does not receive any signal from the fog light switch.		M-3	P.54B-473
ETACS-ECU does not receive any signal from the front door switches.		M-4	P.54B-477
Column switch	ETACS-ECU does not receive any signal from the tail light switch.	M-5	P.54B-484
	ETACS-ECU does not receive any signal from the headlight switch.		
	ETACS-ECU does not receive any signal from the passing light switch.		
	ETACS-ECU does not receive any signal from the dimmer switch.		
	ETACS-ECU does not receive any signal from the turn-signal light switch.		
	ETACS-ECU does not receive any signal from the windshield mist wiper switch.	M-6	P.54B-488
	ETACS-ECU does not receive any signal from the windshield intermittent wiper switch.		
	ETACS-ECU does not receive any signal from the windshield low-speed wiper switch.		
	ETACS-ECU does not receive any signal from the windshield high-speed wiper switch.		
	ETACS-ECU does not receive any signal from the variable intermittent wiper control switch.	M-7	P.54B-491
	ETACS-ECU does not receive any signal from the windshield washer switch.	M-6	P.54B-488
Sunroof switch	ETACS-ECU does not receive any signal from the up, open or close/down switch.	M-8	P.54B-494

SCAN TOOL OR VOLTMETER

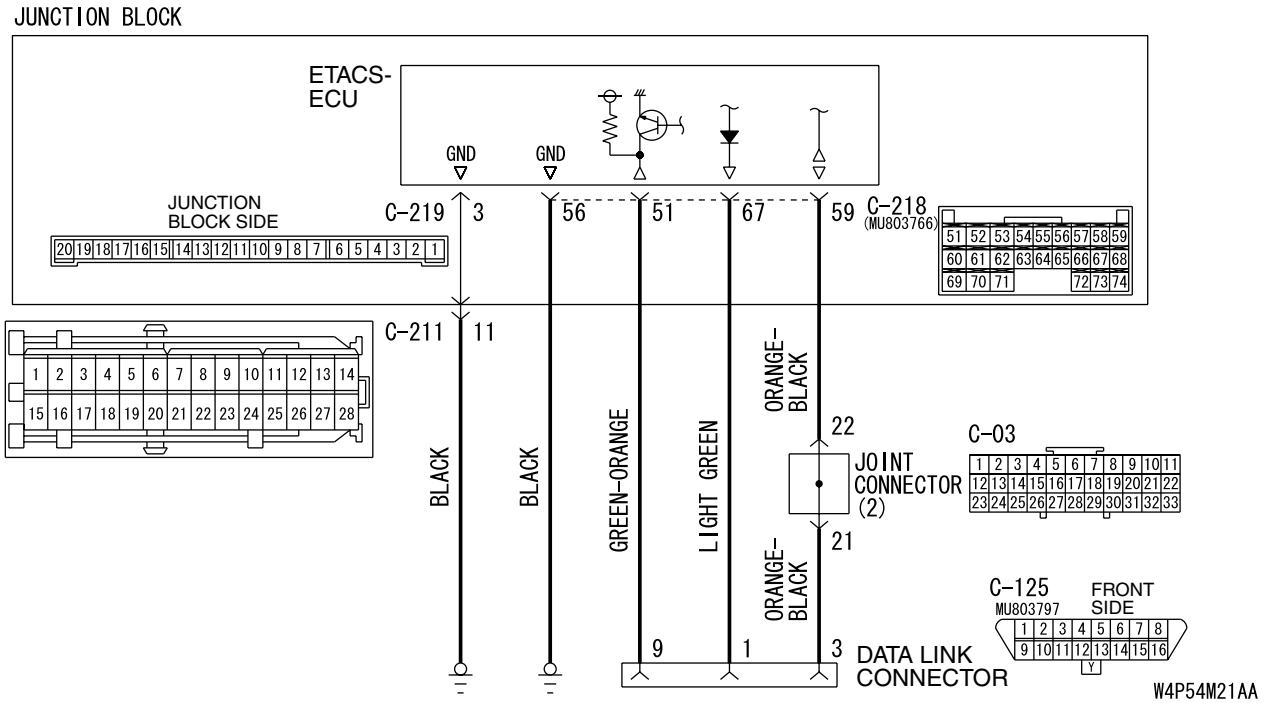
If a problem is found in the Pulse Check, observe the table below.

SYMPTOM		INSPECTION PROCEDURE	REFERENCE PAGE
ETACS-ECU does not receive any signal from the key reminder switch.		N-1	P.54B-497
ETACS-ECU does not receive any signal from the hazard warning light switch.		N-2	P.54B-501
ETACS-ECU does not receive any signal from any of the door switches.		N-3	P.54B-505
ETACS-ECU does not receive any signal from the door lock key cylinder switch.		N-4	P.54B-512
ETACS-ECU does not receive any signal from the front door lock actuator.		N-5	P.54B-517
ETACS-ECU does not receive any signal from the door lock switch (incorporated in the power window main switch and front power window sub switch).		N-6	P.54B-527
ETACS-ECU does not receive any signal from the trunk lid latch assembly.		N-7	P.54B-537
Transmitter	ETACS-ECU does not receive any signal from the lock, unlock, trunk or panic switch.	N-8	P.54B-540
ETACS-ECU does not receive any interior light loaded signal.		N-9	P.54B-542

SYMPTOM PROCEDURES

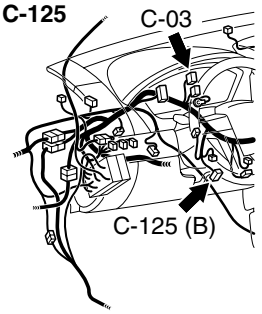
INSPECTION PROCEDURE A-1: Communication with the SWS Monitor Kit is not Possible.

Scan Tool Communication and ETACS-ECU Ground Circuit



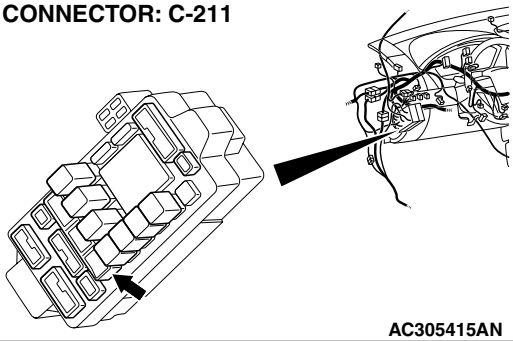
TSB Revision

CONNECTORS: C-03, C-125



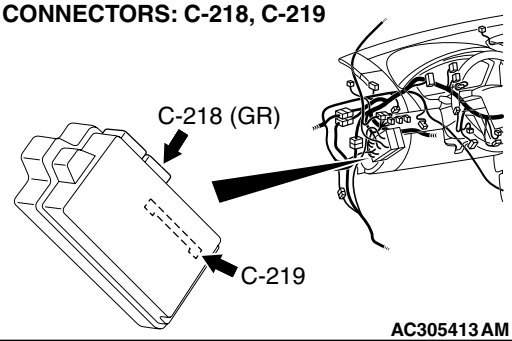
AC305231BJ

CONNECTOR: C-211



AC305415AN

CONNECTORS: C-218, C-219



AC305413AM

TECHNICAL DESCRIPTION (COMMENT)

The SWS monitor kit may be connected improperly.

TROUBLESHOOTING HINTS

- The SWS monitor body (I/F cartridge) may be defective
- The SWS monitor harness may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:

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

STEP 1. Verify SWS monitor kit MB991813 for proper connection.

Q: Is SWS monitor kit MB991813 connected with the column switch properly?

YES : Go to Step 2.

NO : Connect SWS monitor kit MB991813 to the column switch securely.

STEP 2. Verify the power supply circuit to the ETACS-ECU.

Q: Does the system communicate with scan tool MB991958 when the ignition switch is turned to the "ON" position?

YES : Refer to Inspection Procedure A-3 "Communication with the ETACS-ECU is not possible P.54B-78."

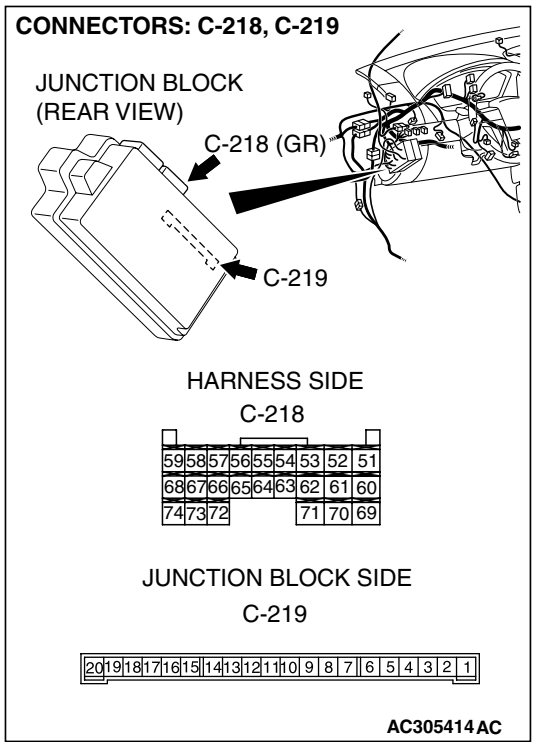
NO : Go to Step 3.

STEP 3. Check ETACS-ECU connectors C-218 and C-219 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ETACS-ECU connectors C-218 and C-219 in good condition?

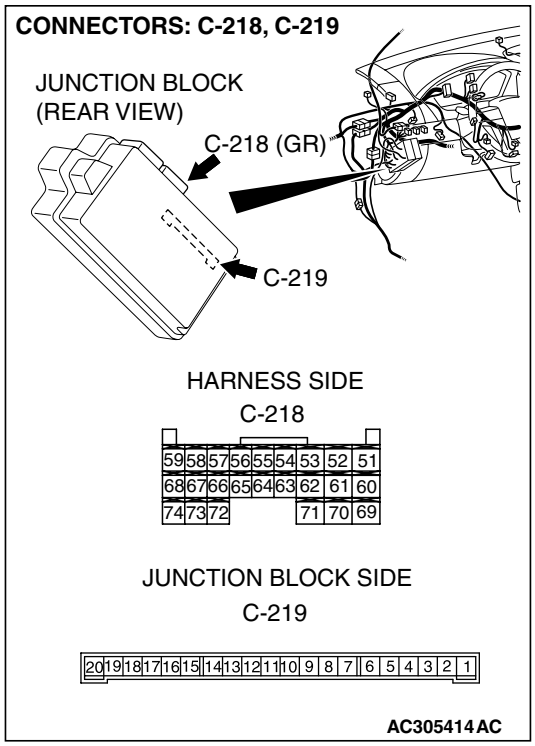
YES : Go to Step 4.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the system should communicate with the SWS monitor normally.

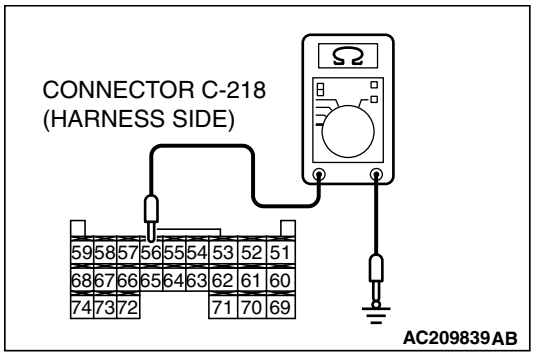


STEP 4. Check the ground circuit to the ETACS-ECU.
Measure the resistance at ETACS-ECU connectors C-218 and C-219.

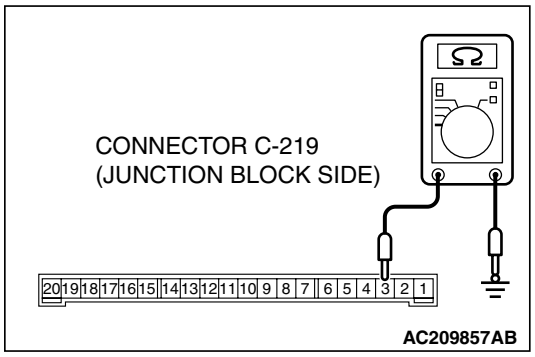
(1) Disconnect ETACS-ECU connectors C-218 and C-219, and measure the resistance available at the junction block side of the connector.



(2) Measure the resistance value between ETACS-ECU connector C-218 terminal 56 and ground.
- The resistance should be 2 ohms or less.



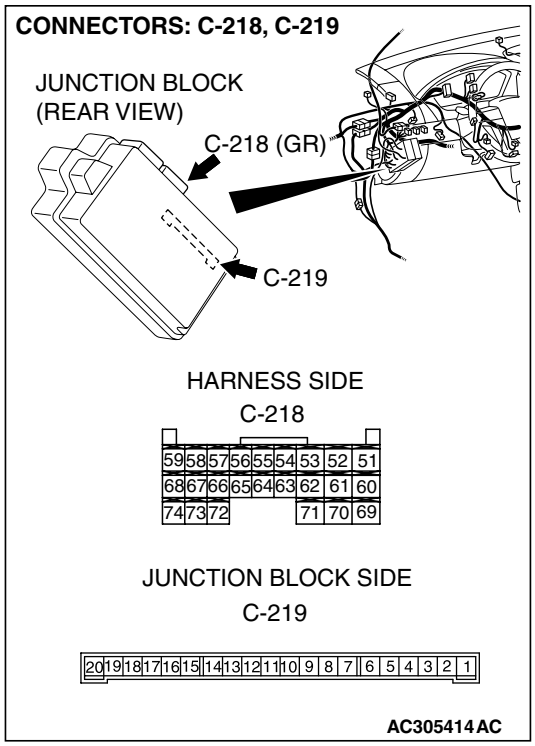
Measure the resistance value between ETACS-ECU connector C-219 terminal 3 and ground.
- The resistance should be 2 ohms or less.

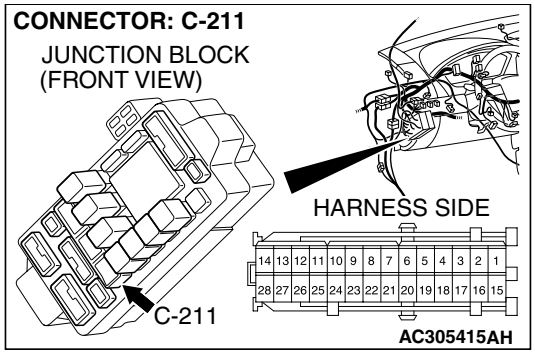


Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check the wiring harness between ETACS-ECU connector C-218 (terminal 56) or ETACS-ECU connector C-219 (terminal 3) and ground.





NOTE: Also check junction block connector C-211 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-211 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between ETACS-ECU connector C-218 (terminal 56) or ETACS-ECU connector C-219 (terminal 3) and ground in good condition?

YES : No action is necessary and testing is complete.

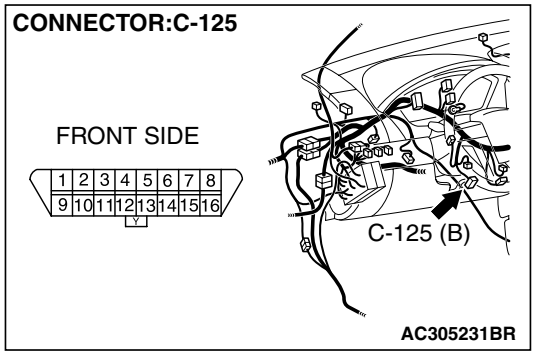
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the system should communicate with the SWS monitor kit normally.

STEP 6. Check data link connector C-125 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

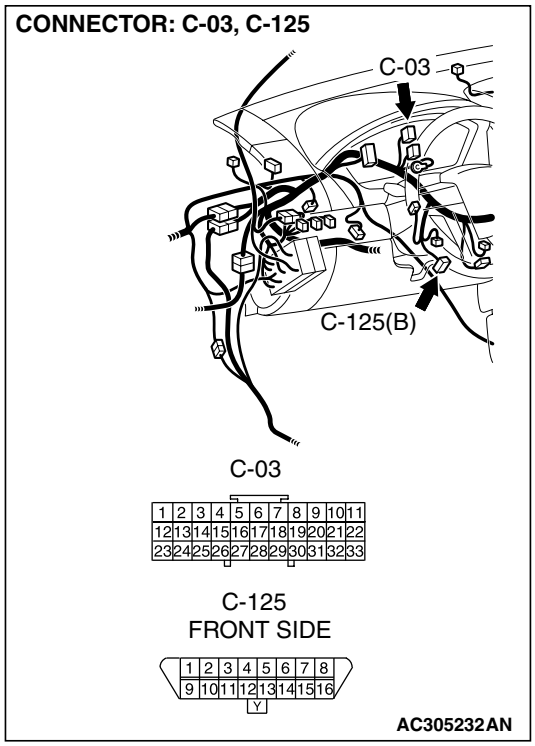
Q: Is data link connector C-125 in good condition?

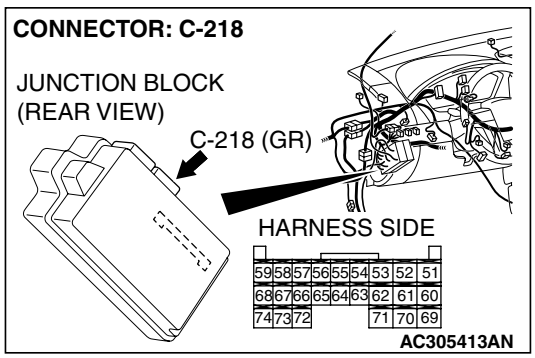
YES : Go to Step 7.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the system should communicate with the SWS monitor kit normally.



STEP 7. Check the wiring harness between ETACS-ECU connector C-218 (terminals 51, 59 and 67) and data link connector C-125 (terminals 9, 3 and 1).





NOTE: Also check joint connector C-03 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-03 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between ETACS-ECU connector C-218 (terminals 51, 59 and 67) and data link connector C-125 (terminals 9, 3 and 1) in good condition?

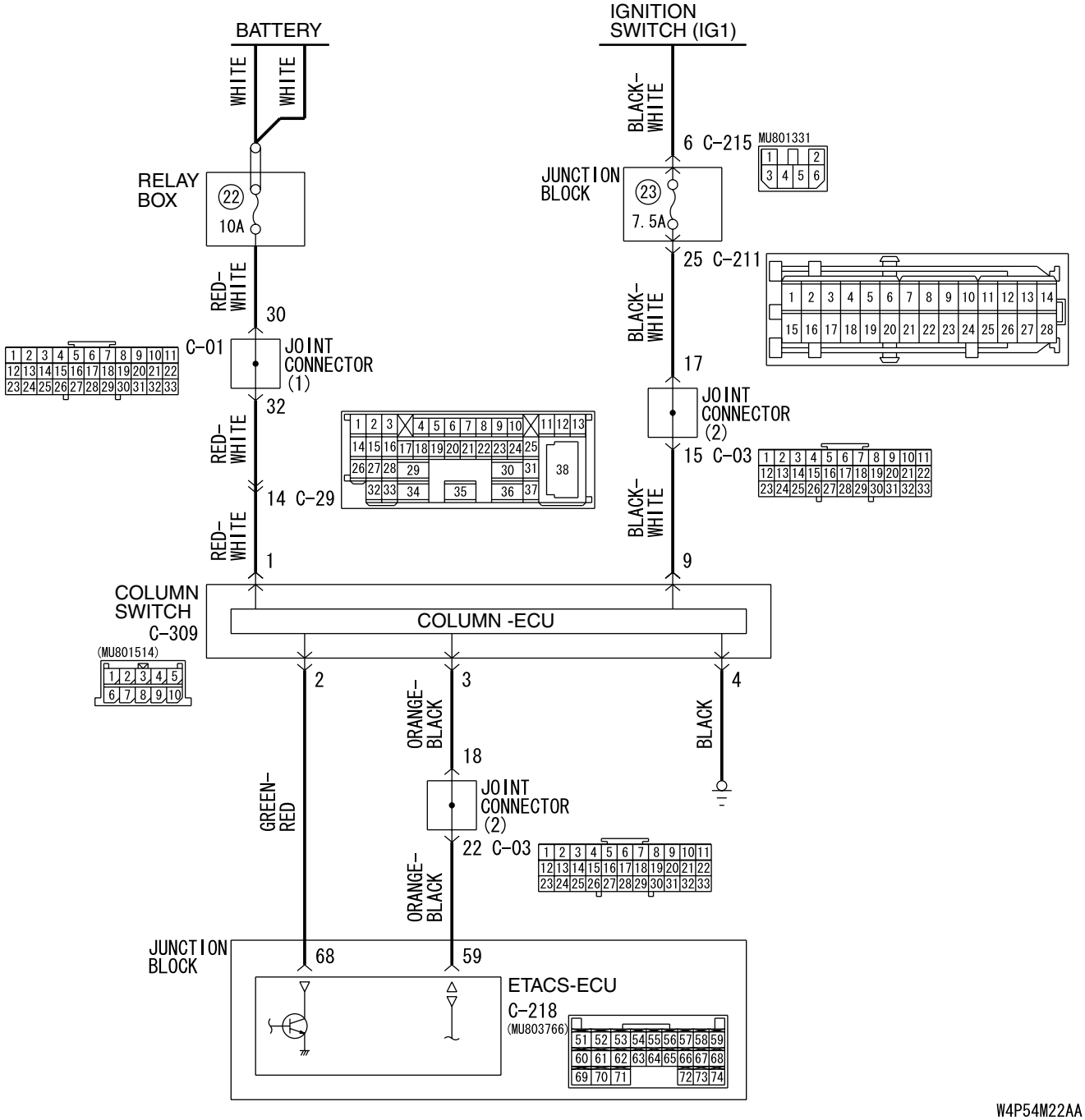
YES : Replace the ETACS-ECU. The system should communicate with the SWS monitor kit normally.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the system should communicate with the SWS monitor kit normally.

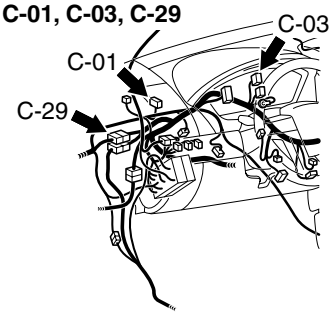
INSPECTION PROCEDURE A-2: Communication with the Column Switch (column-ECU) is not Possible.

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

Column Switch Power Supply and SWS Communication Circuit

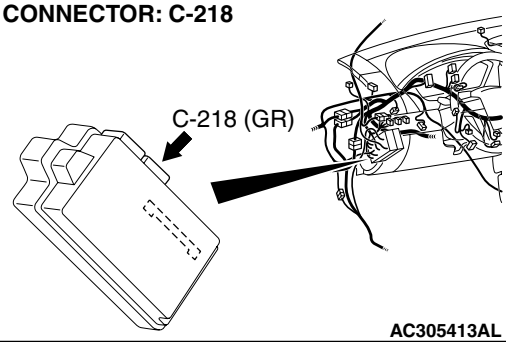


CONNECTORS: C-01, C-03, C-29



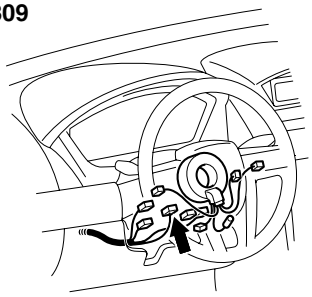
AC305231CJ

CONNECTOR: C-218



AC305413AL

CONNECTOR: C-309



AC305235AC

CIRCUIT OPERATION

- The power supply to the column switch is provided by the battery and the ignition switch (IG1).
- If the power supply system from the battery is defective, the system operates by the power supply from the ignition switch (IG1).

TECHNICAL DESCRIPTION (COMMENT)

The power supply circuit to the column switch (column-ECU) may be defective. If the battery power supply circuit (terminal 1 of the column switch) to the ECU is damaged, also check the power supply circuit from the ignition switch (IG1) (terminal 9 of the column switch), and repair if necessary.

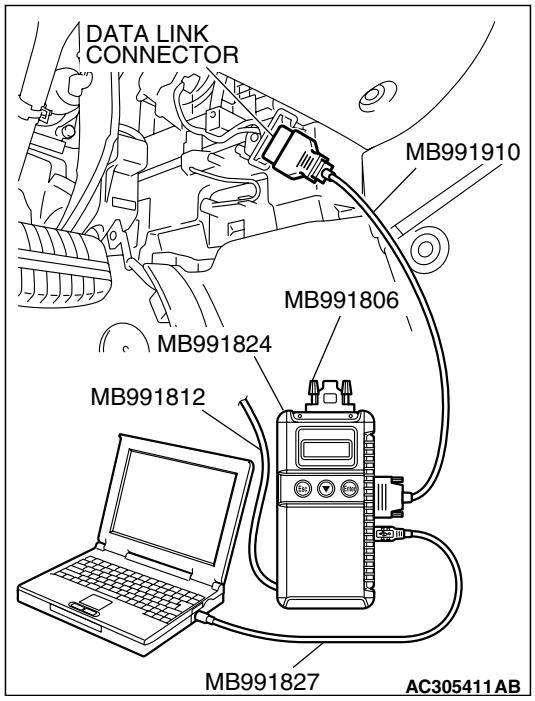
TROUBLESHOOTING HINTS

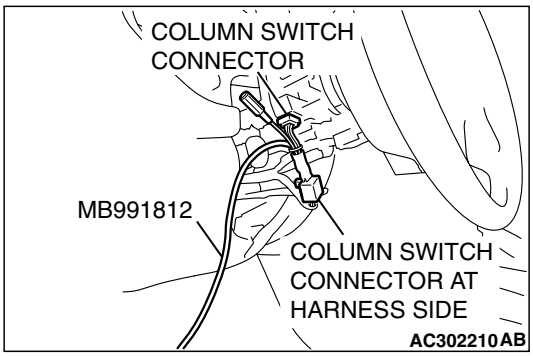
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The column switch may be defective
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:

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





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

Check the following ECUs:

- ETACS-ECU
- Column-ECU

⚠ CAUTION

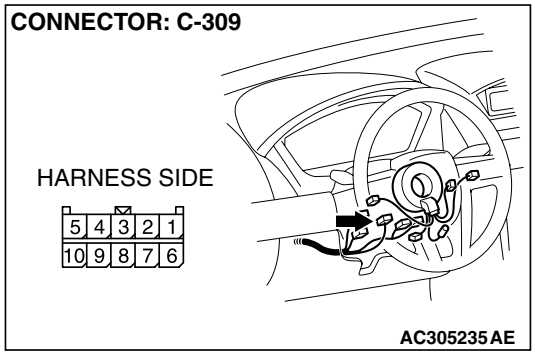
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

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

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

"OK" is displayed for all the items : Go to Step 2.
"NG" is displayed for the "COLUMN ECU" menu : Go to Step 6.
"NG" is displayed for the "ETACS ECU" menu : Refer to Inspection Procedure A-3 "Communication with the ETACS-ECU is not possible P.54B-78."
"NG" is displayed for all the items : Refer to Inspection Procedure A-3 "Communication with the ETACS-ECU is not possible P.54B-78."

STEP 2. Check column switch connector C-309 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

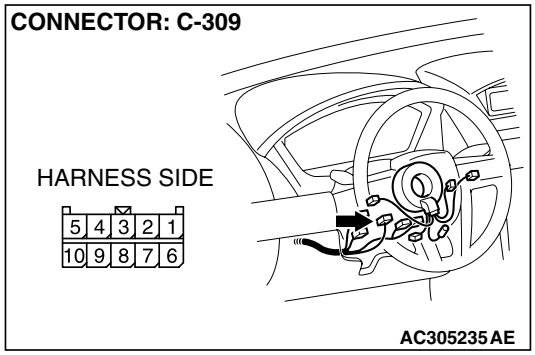


Q: Is column switch connector C-309 in good condition?

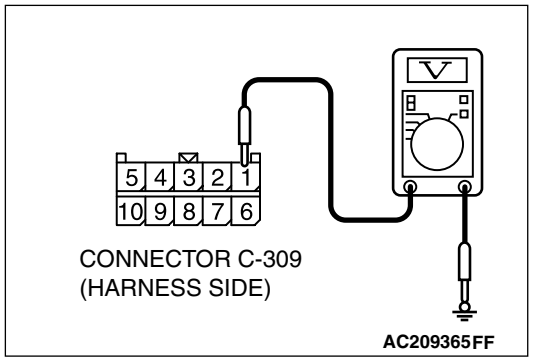
YES : Go to Step 3.

NO : Repair or replace the damaged component(s). The system should communicate with the column switch (column-ECU) normally.

STEP 3. Check the power supply circuit to the column switch. Measure the voltage at column switch connector C-309.



(1) Disconnect column switch connector C-309 and measure the voltage available at the wiring harness side of the connector.



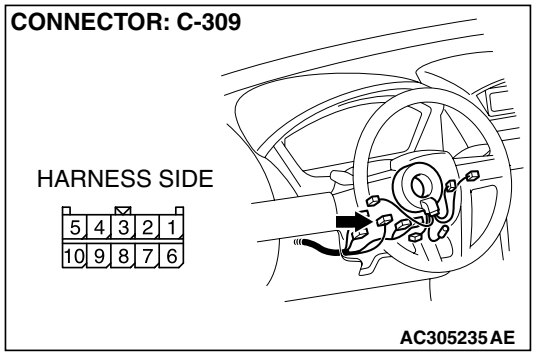
(2) Measure the voltage between terminal 1 and ground by backprobing.
- The voltage should measure approximately 12 volts (battery positive voltage).

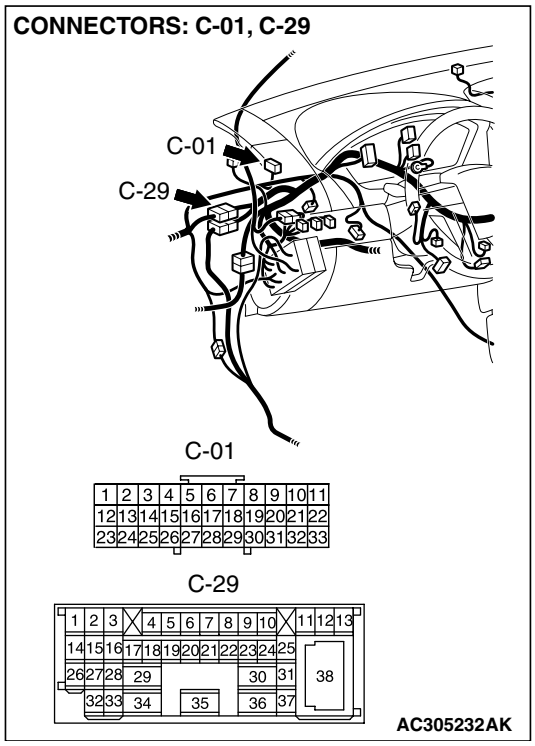
Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

YES : Go to Step 5.

NO : Go to Step 4.

STEP 4. Check the wiring harness between column switch connector C-309 (terminal 1) and the battery.





NOTE: Also check intermediate connector C-29 and joint connector C-01 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-29 or joint connector C-01 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

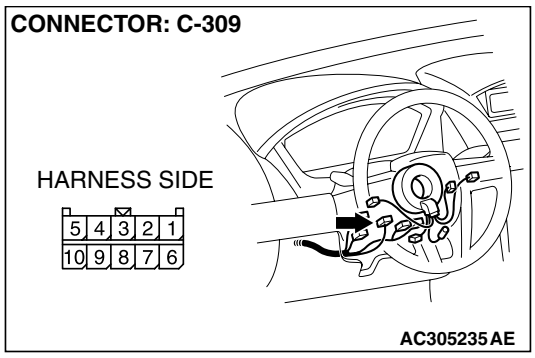
Q: Is the wiring harness between column switch connector C-309 (terminal 1) and the battery in good condition?

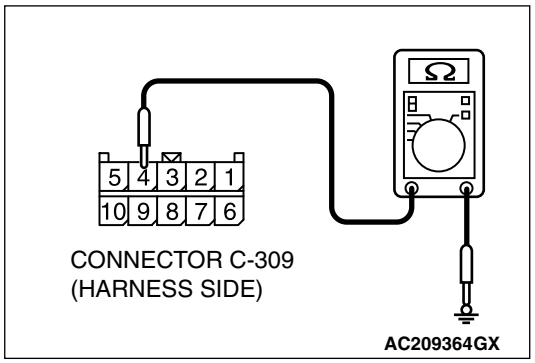
YES : No action is necessary and testing is complete.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the column switch (column-ECU) normally.

STEP 5. Check the ground circuit to the column switch. Measure the resistance at column switch connector C-309.

(1) Disconnect column switch connector C-309 and measure the resistance available at the wiring harness side of the connector.



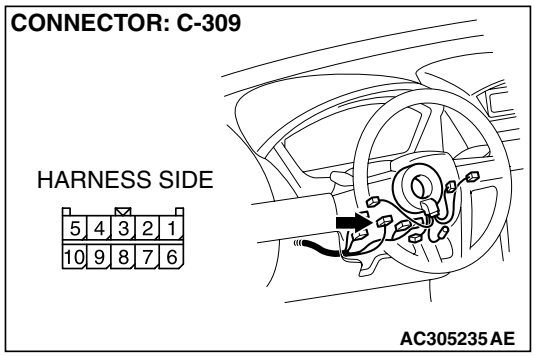


(2) Measure the resistance value between terminal 4 and ground.
- The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 7.

NO : Go to Step 6.

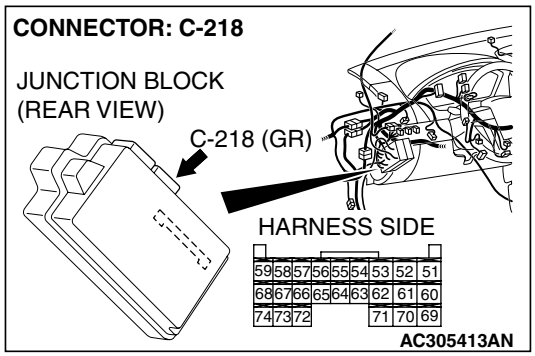


STEP 6. Check the wiring harness between column switch connector C-309 (terminal 4) and ground.

Q: Is the wiring harness between column switch connector C-309 (terminal 4) and ground in good condition?

YES : No action is necessary and testing is complete.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the column switch (column-ECU) normally.



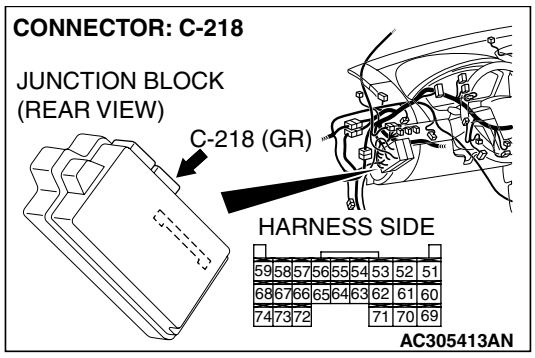
STEP 7. Check ETACS-ECU connector C-218 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

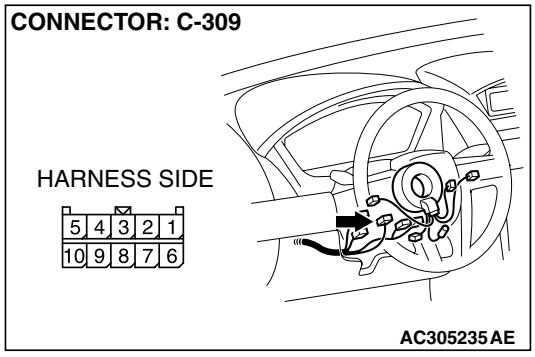
Q: Is ETACS-ECU connector C-218 in good condition?

YES : Go to Step 8.

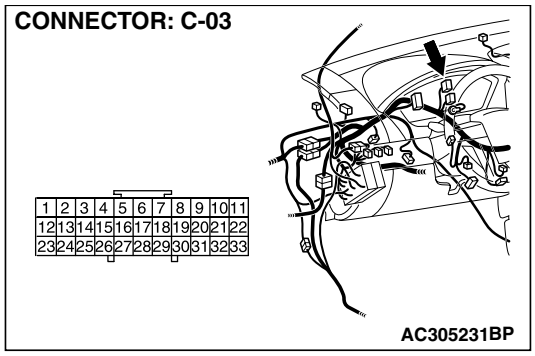
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The system should communicate with the column switch (column-ECU) normally.

STEP 8. Check the wiring harness between column switch connector C-309 (terminal 3) and ETACS-ECU connector C-218 (terminal 59).





TSB Revision



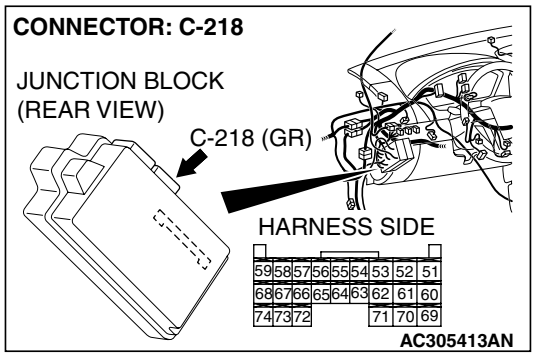
NOTE: Also check joint connector C-03 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-03 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between column switch connector C-309 (terminal 3) and ETACS-ECU connector C-218 (terminal 59) in good condition?

YES : Go to Step 9.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the column switch (column-ECU) normally.

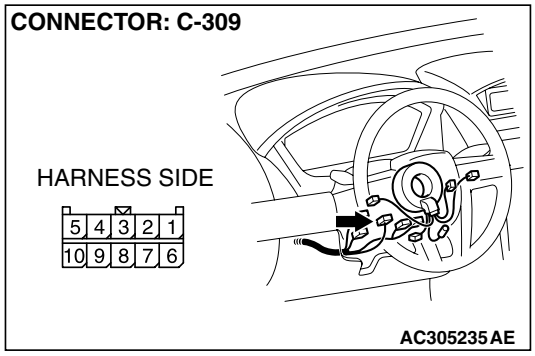
STEP 9. Check the wiring harness between column switch connector C-309 (terminal 2) and ETACS-ECU connector C-218 (terminal 68).



Q: Is the wiring harness between column switch connector C-309 (terminal 2) and ETACS-ECU connector C-218 (terminal 68) in good condition?

YES : Go to Step 10.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the column switch (column-ECU) normally.



STEP 10. Replace the column switch.

(1) Replace the column switch.

(2) The system should communicate with the column switch (column-ECU) normally.

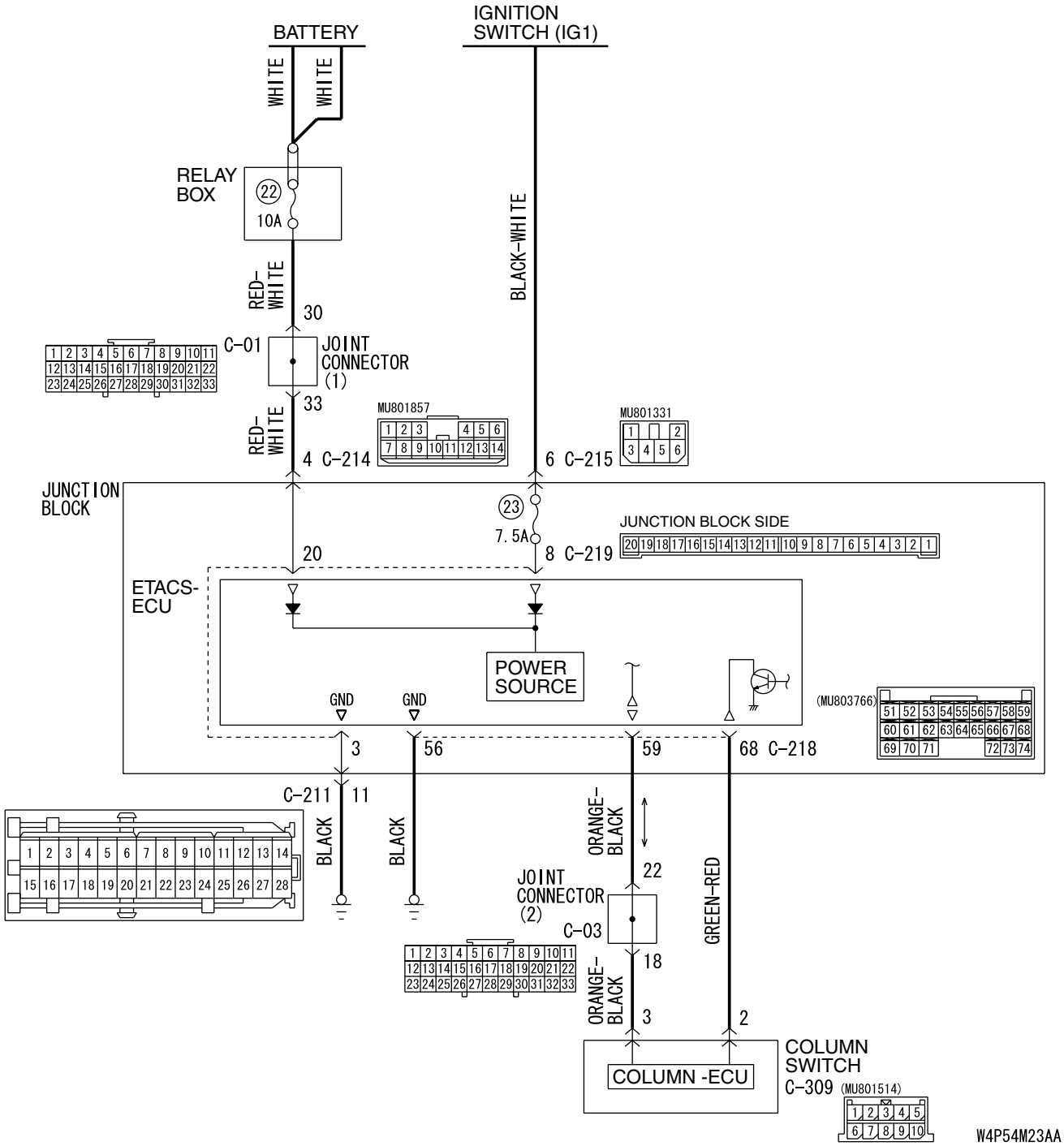
Q: Can the system communicate with the column switch (column-ECU)?

YES : No action is necessary and testing is complete.

NO : Replace the ETACS-ECU. The system should communicate with the column switch (column-ECU) normally.

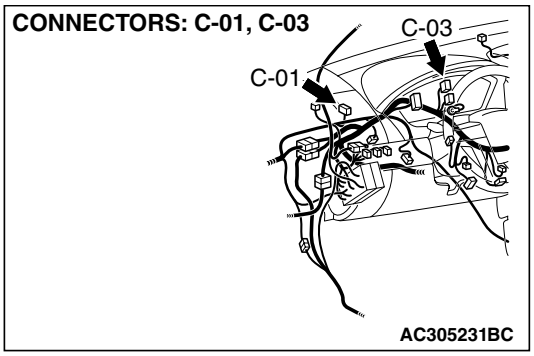
INSPECTION PROCEDURE A-3: Communication with the ETACS-ECU is not Possible.

ETACS-ECU Power Supply and SWS Communication Circuit

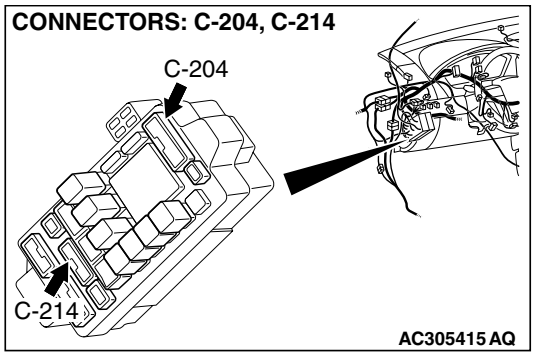


TSB Revision

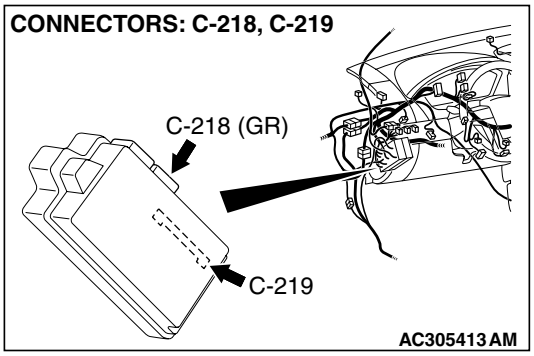
CONNECTORS: C-01, C-03



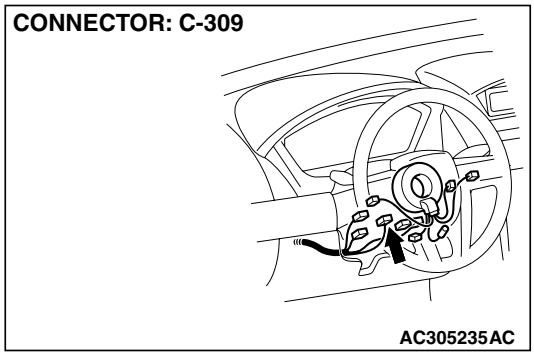
CONNECTORS: C-204, C-214



CONNECTORS: C-218, C-219



CONNECTOR: C-309



CIRCUIT OPERATION

- The power supply to the ETACS-ECU is provided by the battery and the ignition switch (IG1).
- If the power supply system from the battery is defective, the system operates by the power supply from the ignition switch (IG1).

TECHNICAL DESCRIPTION (COMMENT)

It is suspected that the power supply circuit to the ETACS-ECU is defective, or the wiring harness between the SWS monitor kit and the ETACS-ECU or their connector(s) is damaged. If the battery power supply circuit to the ECU (terminal 20 of the ETACS-ECU) is damaged, also check the power supply circuit from the ignition switch (IG1) (terminal 8 of the ETACS-ECU), and repair if necessary. If the ground circuit to the ECU (terminal 3 of the ETACS-ECU) is damaged, also check the ground circuit to the sensor (terminal 56 of the ETACS-ECU), and repair if necessary.

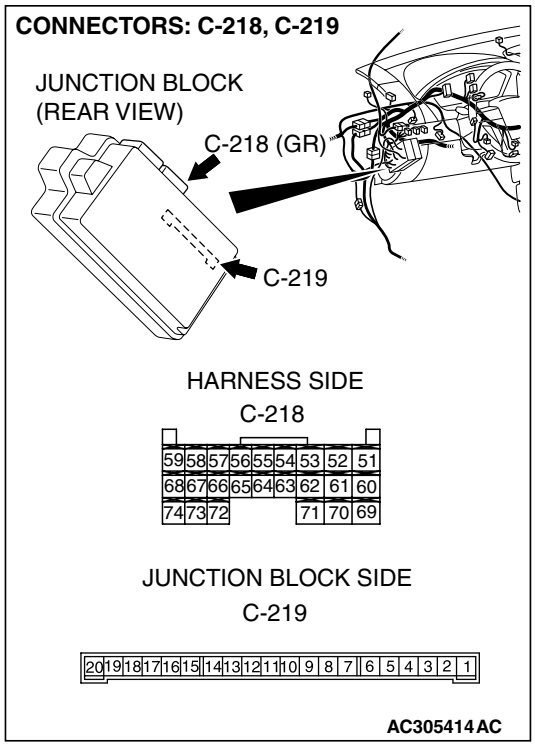
TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

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

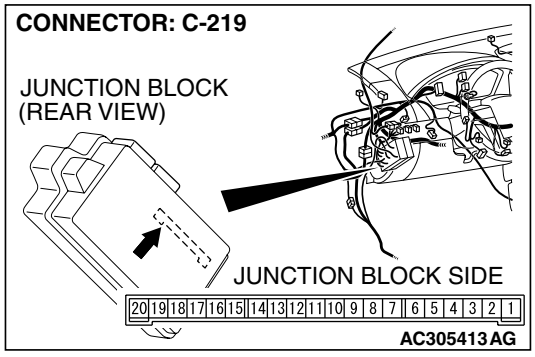


STEP 1. Check ETACS-ECU connectors C-218 and C-219 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ETACS-ECU connectors C-218 and C-219 in good condition?

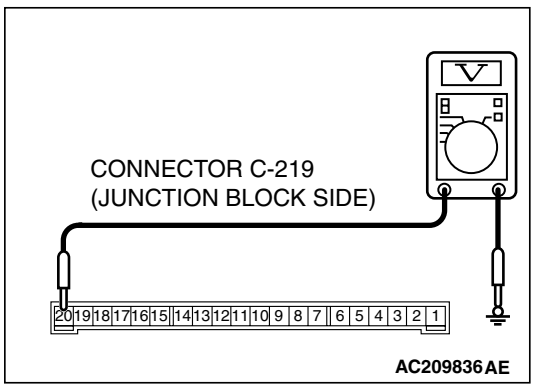
YES : Go to Step 2.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The system should communicate with the ETACS-ECU normally.



STEP 2. Check the battery power supply circuit to the ETACS-ECU. Measure the voltage at ETACS-ECU connector C-219.

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



(2) Measure the voltage between terminal 20 and ground.

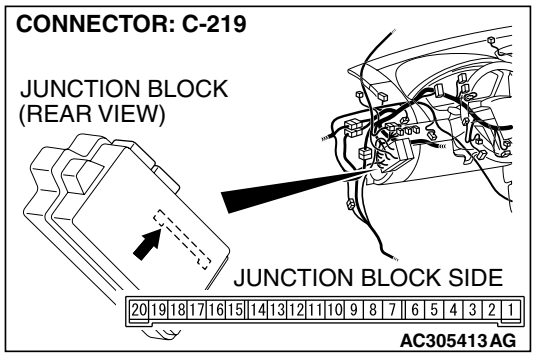
- The voltage should measure approximately 12 volts (battery positive voltage).

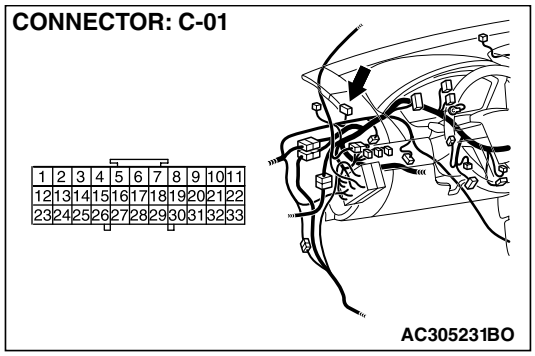
Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

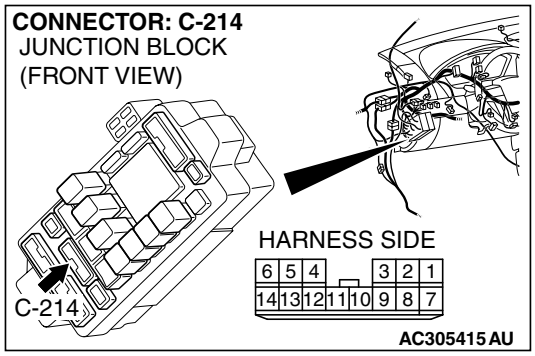
YES : Go to Step 4.

NO : Go to Step 3.

STEP 3. Check the wiring harness between ETACS-ECU connector C-219 (terminal 20) and the battery.







NOTE: Also check joint connector C-01 and junction block connector C-214 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-01 or junction block connector C-214 are damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

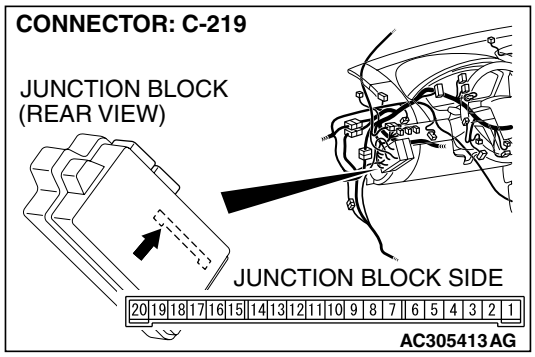
Q: Is the wiring harness between ETACS-ECU connector C-219 (terminal 20) and the battery in good condition?

YES : No action is necessary and testing is complete.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the ETACS-ECU normally.

STEP 4. Check the ground circuit to the ETACS-ECU.
Measure the resistance at ETACS-ECU connector C-219.

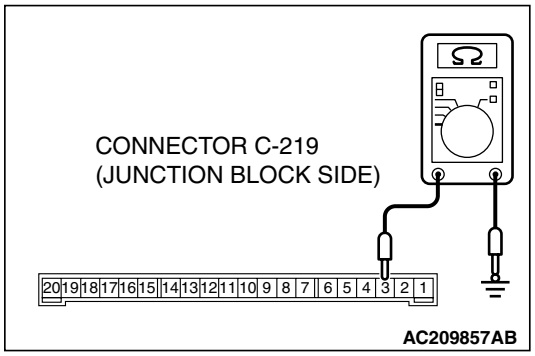
(1) Disconnect ETACS-ECU connector C-219 and measure the resistance available at the junction block side of the connector.



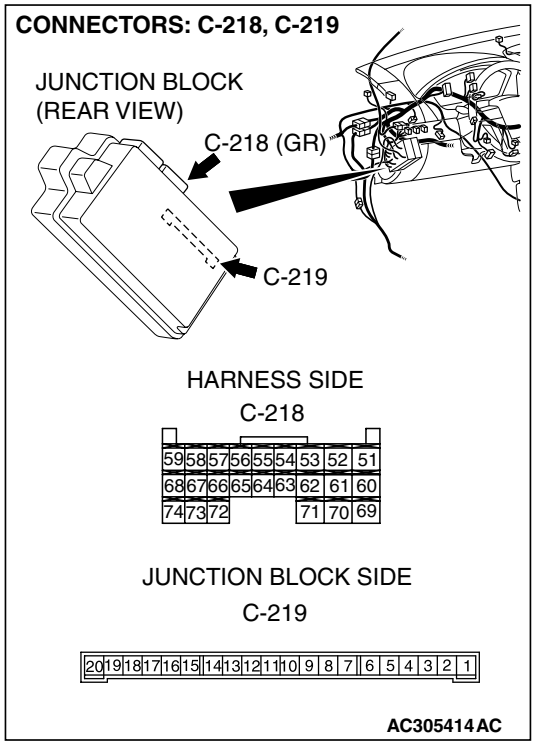
(2) Measure the resistance value between terminal 3 and ground.
- The resistance should be 2 ohms or less.

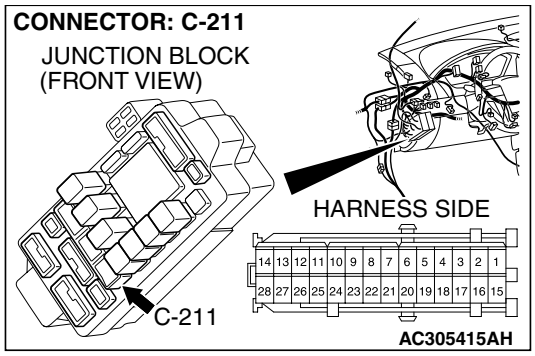
Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 6.
NO : Go to Step 5.



STEP 5. Check the wiring harness between ETACS-ECU connector C-218 (terminal 56), C-219 (terminal 3) and ground.





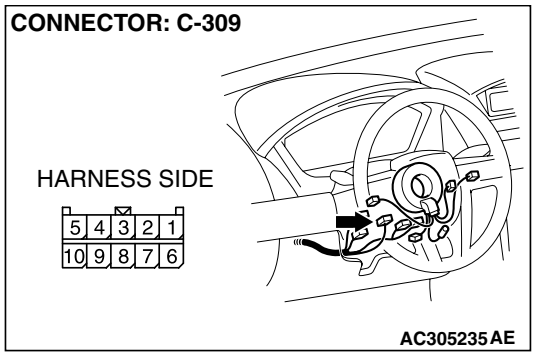
NOTE: Also check junction block connector C-211 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-211 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between ETACS-ECU connector C-218 (terminal 56), C-219 (terminal 3) and ground in good condition?

YES : No action is necessary and testing is complete.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the ETACS-ECU normally.

STEP 6. Check column switch connector C-309 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Is column switch connector C-309 in good condition?

YES : Go to Step 7.

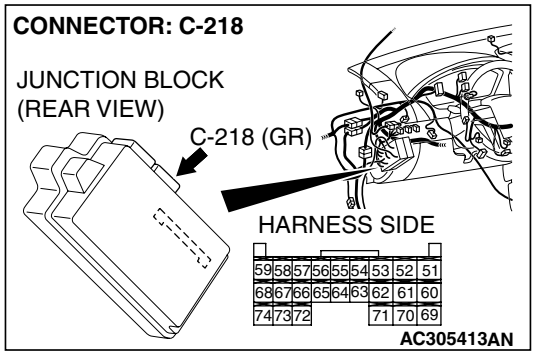
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The system should communicate with the ETACS-ECU normally.

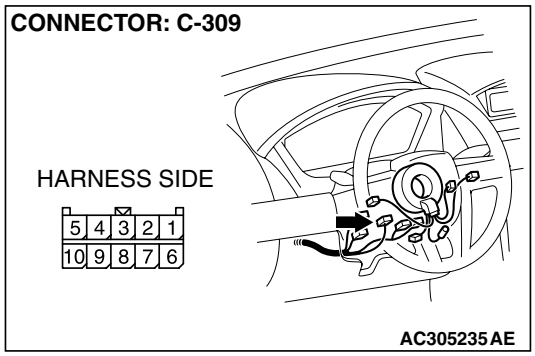
STEP 7. Check the wiring harness between column switch connector C-309 (terminal 2) and ETACS-ECU connector C-218 (terminal 68).

Q: Is the wiring harness between column switch connector C-309 (terminal 2) and ETACS-ECU connector C-218 (terminal 68) in good condition?

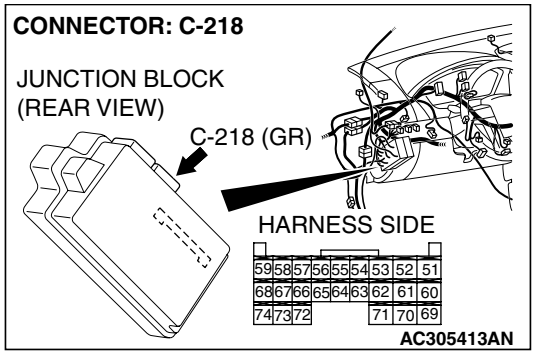
YES : Go to Step 8.

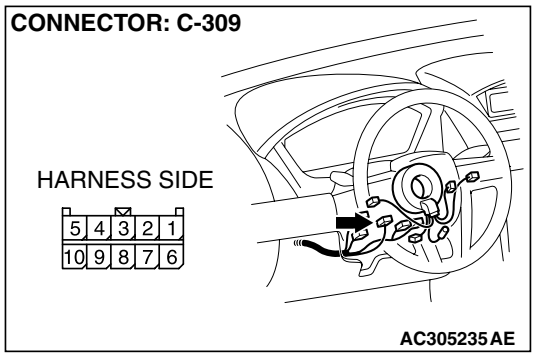
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the ETACS-ECU normally.

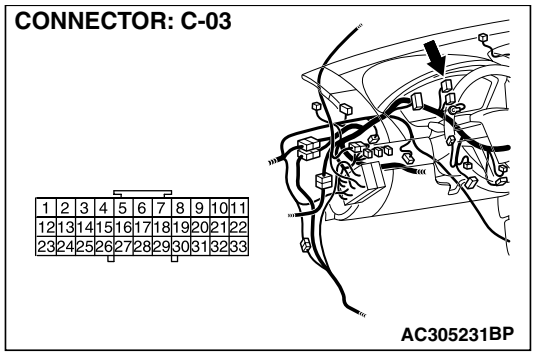




STEP 8. Check the wiring harness between column switch connector C-309 (terminal 3) and ETACS-ECU connector C-218 (terminal 59).







NOTE: Also check joint connector C-03 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-03 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between column switch connector C-309 (terminal 3) and ETACS-ECU connector C-218 (terminal 59) in good condition?

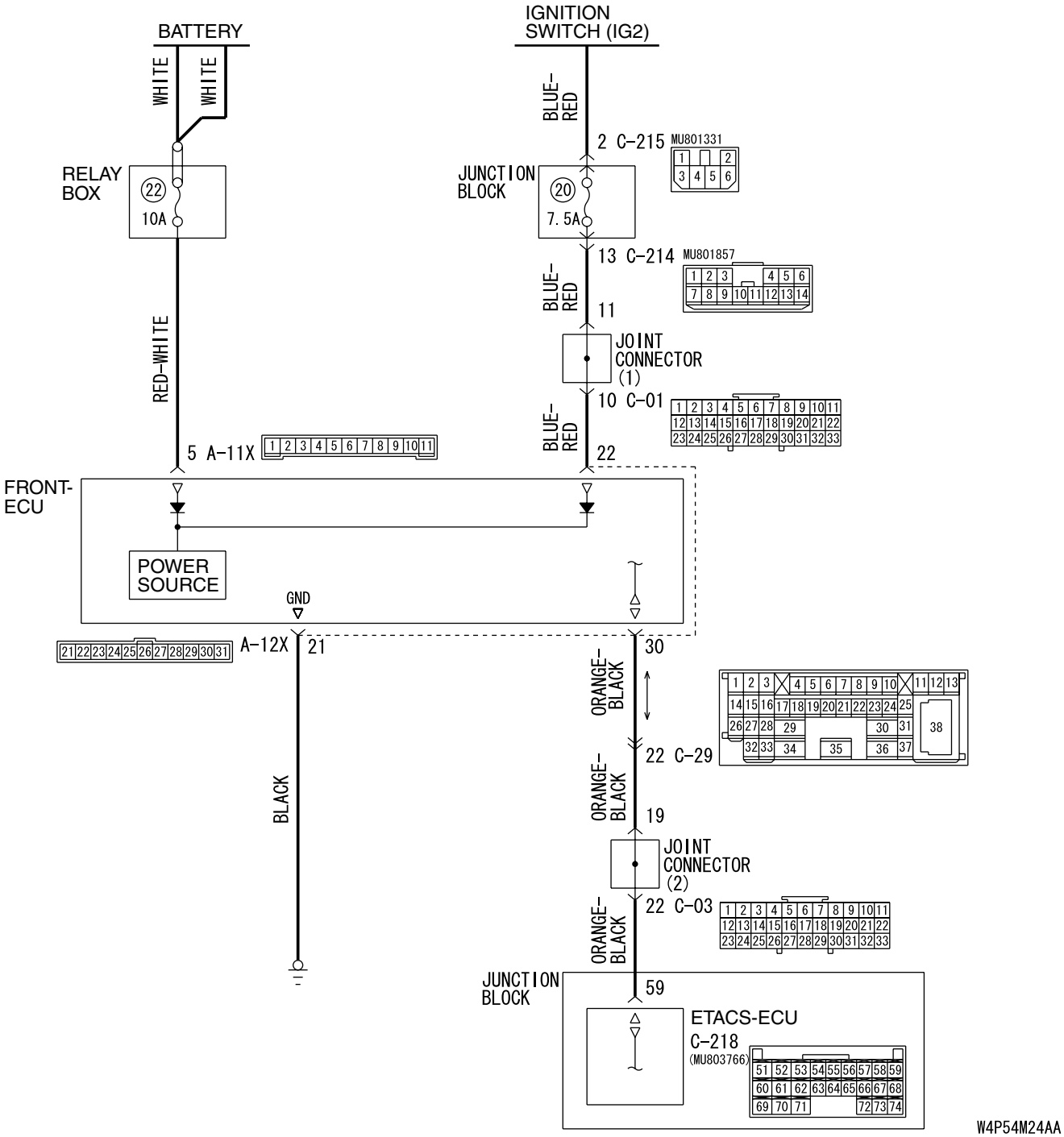
YES : Replace the ETACS-ECU. The system should communicate with the ETACS-ECU normally.

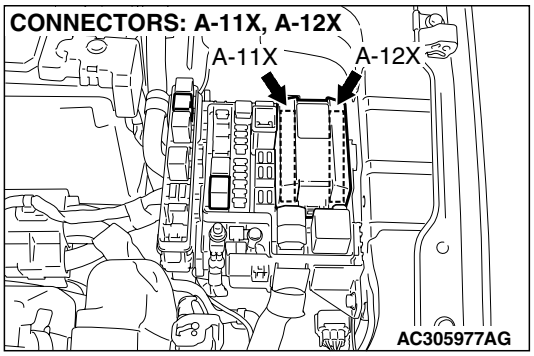
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the ETACS-ECU normally.

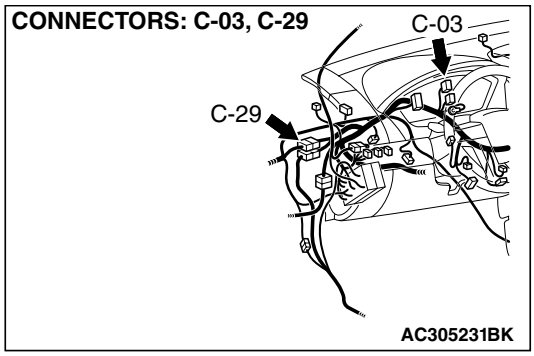
INSPECTION PROCEDURE A-4: Communication with the Front-ECU is not Possible.

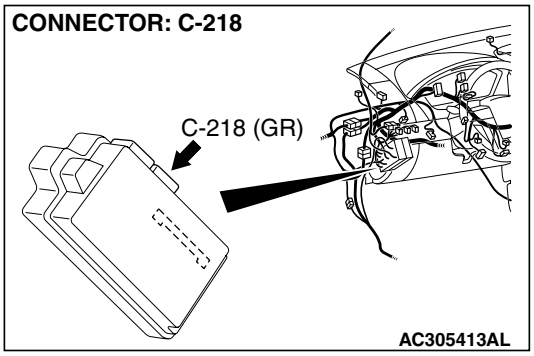
NOTE: This troubleshooting procedure requires the use of scan tool MB991958 and SWS monitor kit MB991813. For details on how to use the SWS monitor, refer to "How to use SWS monitor P.54B-15."

Front-ECU Power Supply and SWS Communication Circuit









CIRCUIT OPERATION

- The power supply to the front-ECU is provided by the battery and the ignition switch (IG2).
- If the power supply system from the battery is defective, the system operates by the power supply from the ignition switch (IG2).

TECHNICAL DESCRIPTION (COMMENT)

It is suspected that the power supply circuit to the front-ECU is defective, or the wiring harness between the SWS monitor kit and the front-ECU or their connector(s) is damaged. If the battery power supply circuit to the ECU (terminal 5 of the front-ECU) is damaged, also check the power supply circuit from the ignition switch (IG2) (terminal 22 of the front-ECU), and repair if necessary.

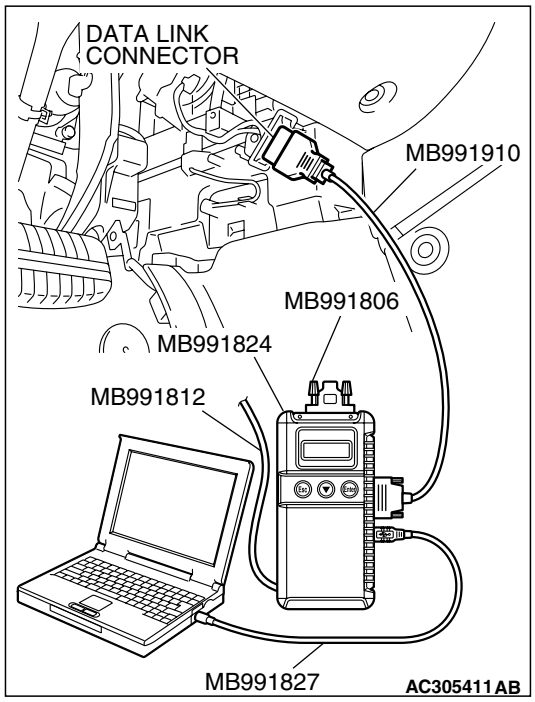
TROUBLESHOOTING HINTS

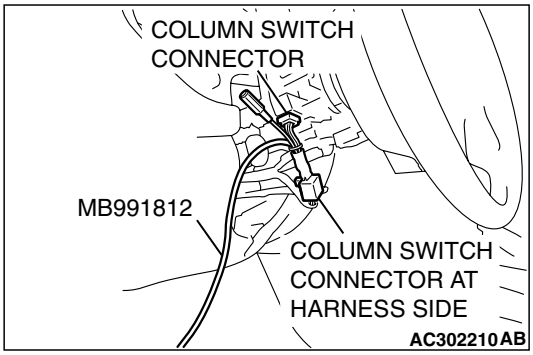
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The front-ECU may be defective
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:

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





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

Check the ETACS-ECU.

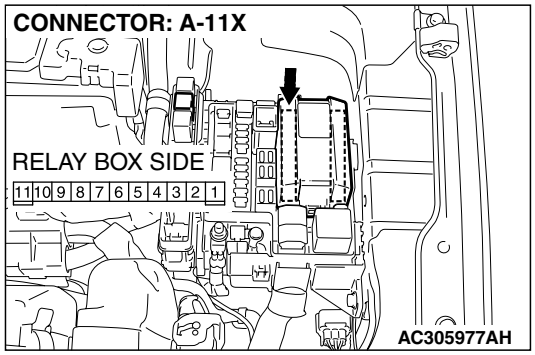
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958. Connect special tool MB991910 before connecting special tool MB991812. Be sure to connect special tool MB991806 after turning on special tool MB991824.

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

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

YES : Go to Step 2.
NO : Refer to Inspection Procedure A-3 "Communication with the ETACS-ECU is not possible P.54B-78."

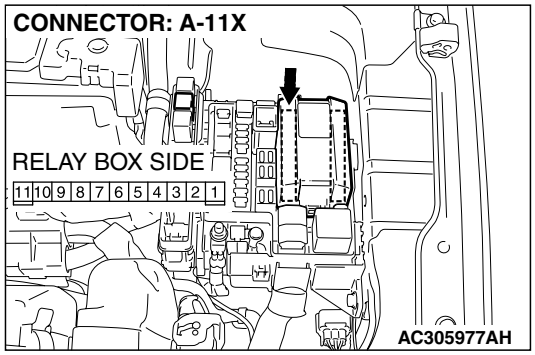


STEP 2. Check front-ECU connector A-11X for loose, corroded or damaged terminals, or terminals pushed back in the connector.

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

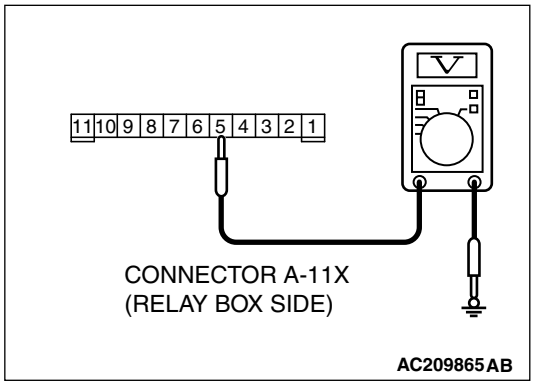
YES : Go to Step 3.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The system should communicate with the front-ECU normally.



STEP 3. Check the battery power supply circuit to the front-ECU. Measure the voltage at front-ECU connector A-11X.

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



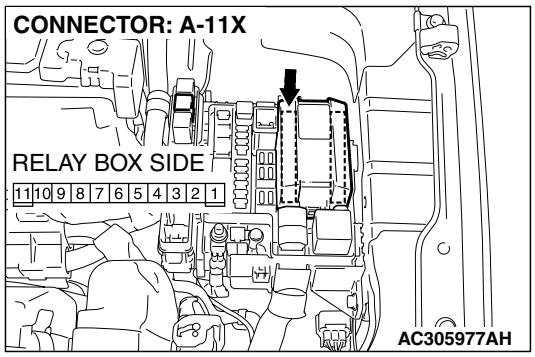
(2) Measure the voltage between terminal 5 and ground.

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

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

YES : Go to Step 5.

NO : Go to Step 4.

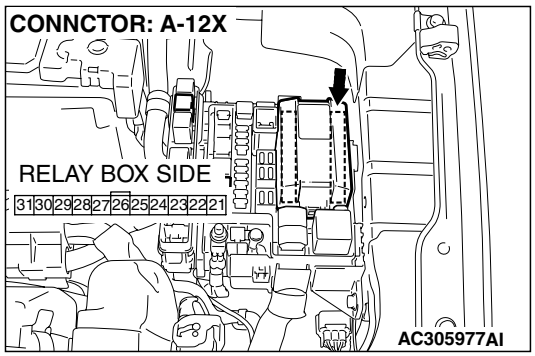


STEP 4. Check the wiring harness between front-ECU connector A-11X (terminal 5) and the battery.

Q: Is the wiring harness between front-ECU connector A-11X (terminal 5) and the battery in good condition?

YES : No action is necessary and testing is complete.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the front-ECU normally.

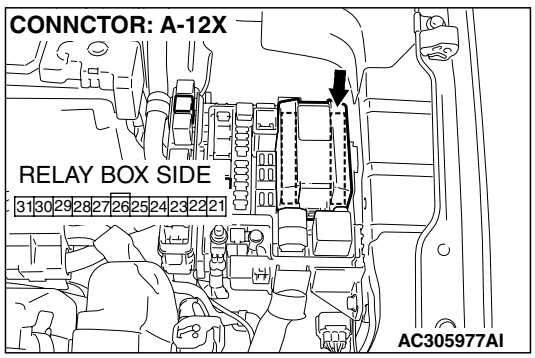


STEP 5. Check front-ECU connector A-12X for loose, corroded or damaged terminals, or terminals pushed back in the connector.

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

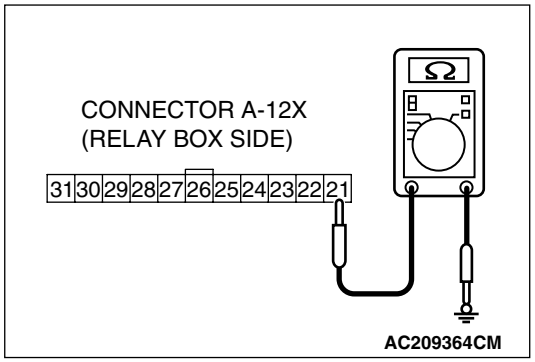
YES : Go to Step 6.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The system should communicate with the front-ECU normally.



STEP 6. Check the ground circuit to the front-ECU.
Measure the resistance at front-ECU connector A-12X.

(1) Disconnect front-ECU connector A-12X and measure the resistance available at the relay box side of the connector.

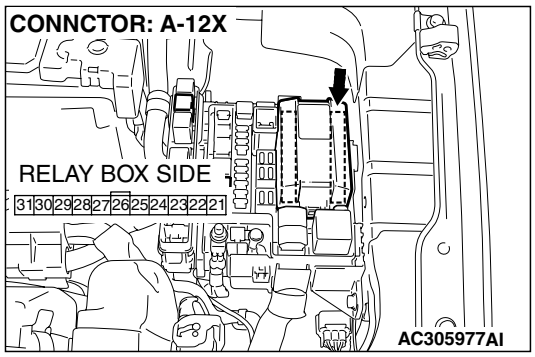


(2) Measure the resistance value between terminal 21 and ground.
- The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 8.

NO : Go to Step 7.

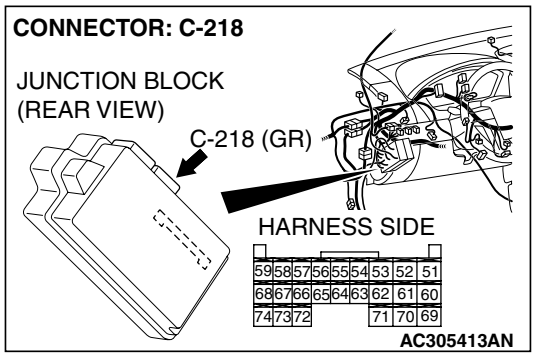


STEP 7. Check the wiring harness between front-ECU connector A-12X (terminal 21) and ground.

Q: Is the wiring harness between front-ECU connector A-12X (terminal 21) and ground in good condition?

YES : No action is necessary and testing is complete.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the front-ECU normally.



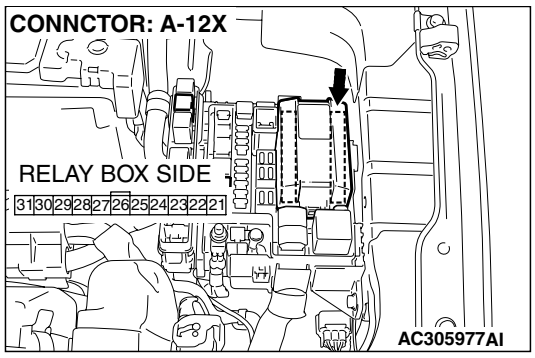
STEP 8. Check ETACS-ECU connector C-218 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

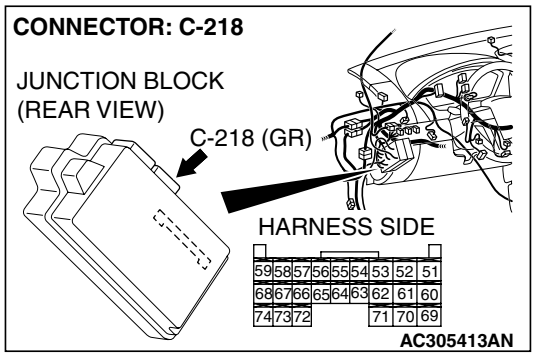
Q: Is ETACS-ECU connector C-218 in good condition?

YES : Go to Step 9.

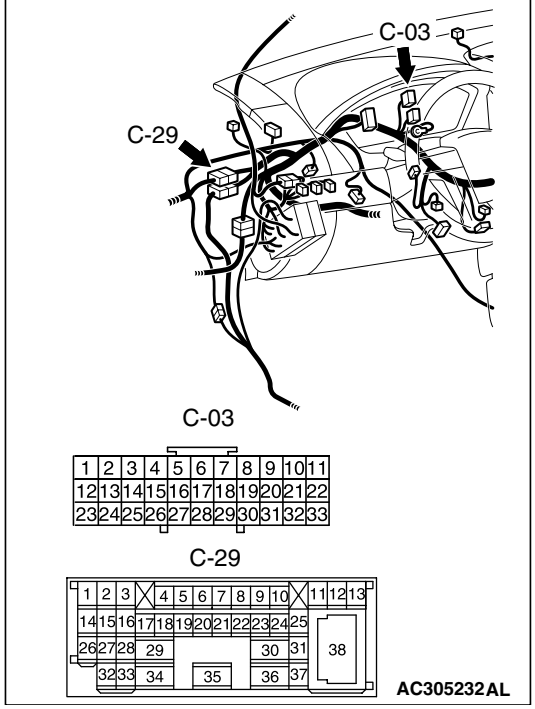
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The system should communicate with the front-ECU normally.

STEP 9. Check the wiring harness between front-ECU connector A-12X (terminal 30) and ETACS-ECU connector C-218 (terminal 59).





CONNECTOR: C-03, C-29



NOTE: Also check joint connector C-03 and intermediate connector C-29 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-03 or intermediate connector C-29 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between front-ECU connector A-12X (terminal 30) and ETACS-ECU connector C-218 (terminal 59) in good condition?

YES : Go to Step 10.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the front-ECU normally.

STEP 10. Replace the front-ECU.

(1) Replace the front-ECU.
(2) The system should communicate with the front-ECU normally.

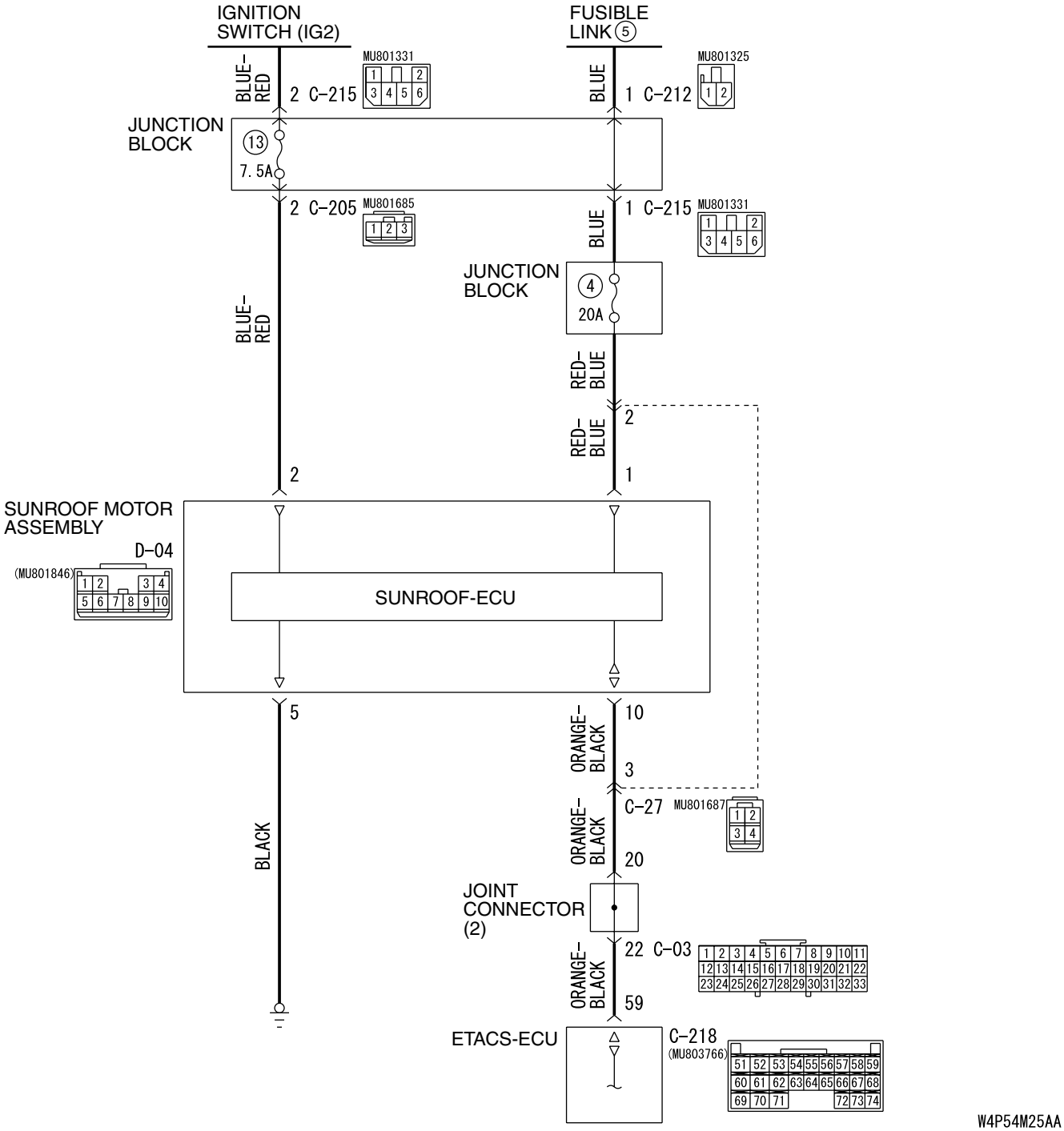
Q: Can the system communicate with the front-ECU?

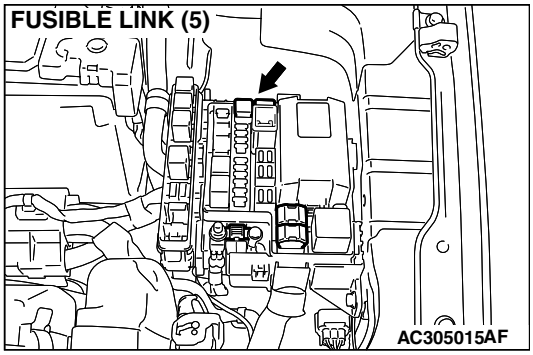
YES : No action is necessary and testing is complete.

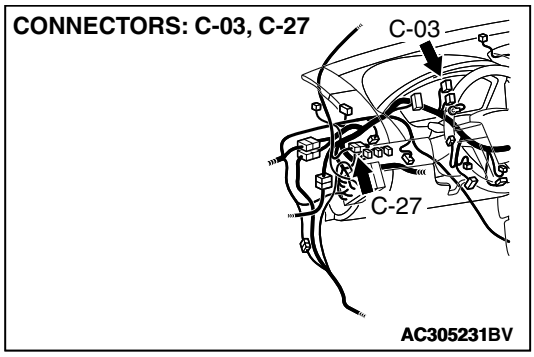
NO : Replace the ETACS-ECU. The system should communicate with the front-ECU normally.

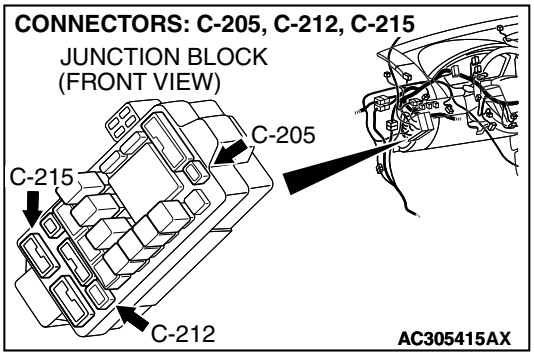
INSPECTION PROCEDURE A-5: Communication with the Sunroof-ECU is not Possible.

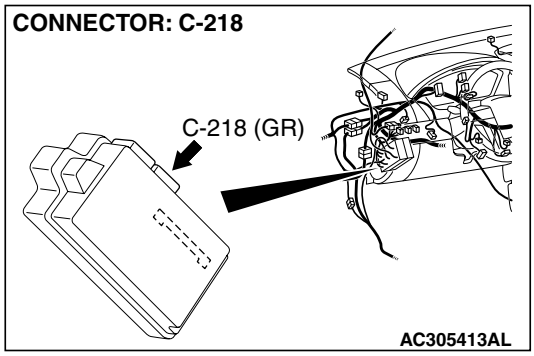
Sunroof Motor Assembly (Sunroof-ECU) and SWS Communication Circuit

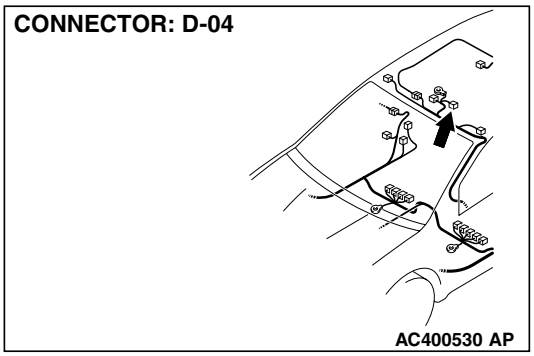












CIRCUIT OPERATION

- Power to the sunroof motor assembly is supplied through fusible link (5).
- When the ignition switch (IG2) signal is on, the sunroof motor assembly is ready to operate.

TECHNICAL DESCRIPTION (COMMENT)

The power supply circuit or the communication circuit to the sunroof motor assembly or the sunroof motor assembly may be defective.

TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

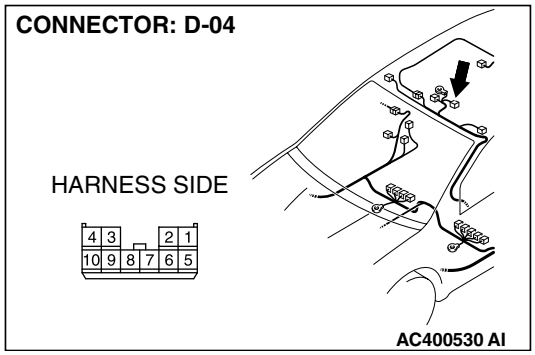
- MB991223: Harness Set
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A

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

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

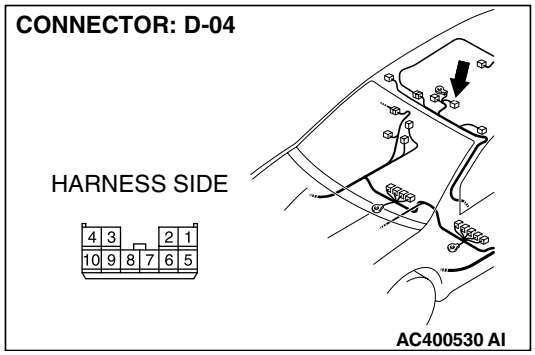
YES : Go to Step 2.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The system should communicate with the sunroof-ECU normally.



STEP 2. Check the fusible link (5) line of power supply circuit to the sunroof motor assembly. Measure the voltage at sunroof motor assembly connector D-04.

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



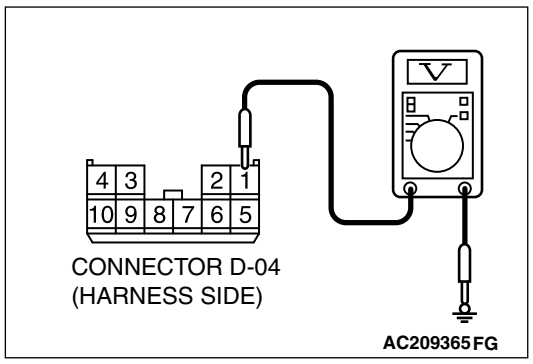
(2) Measure the voltage between terminal 1 and ground.

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

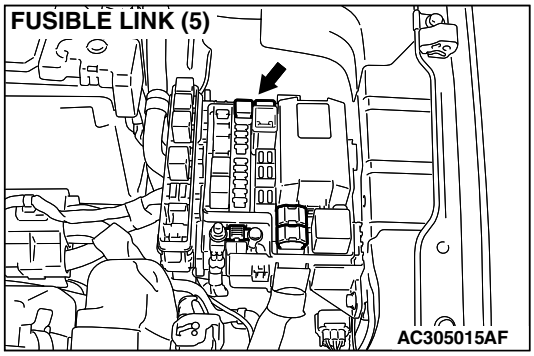
Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

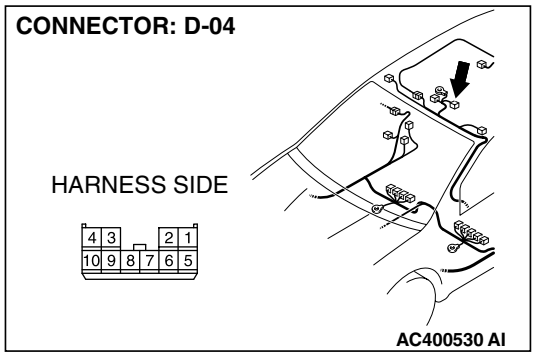
YES : Go to Step 4.

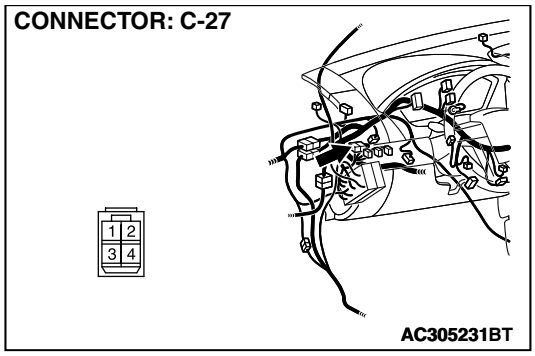
NO : Go to Step 3.

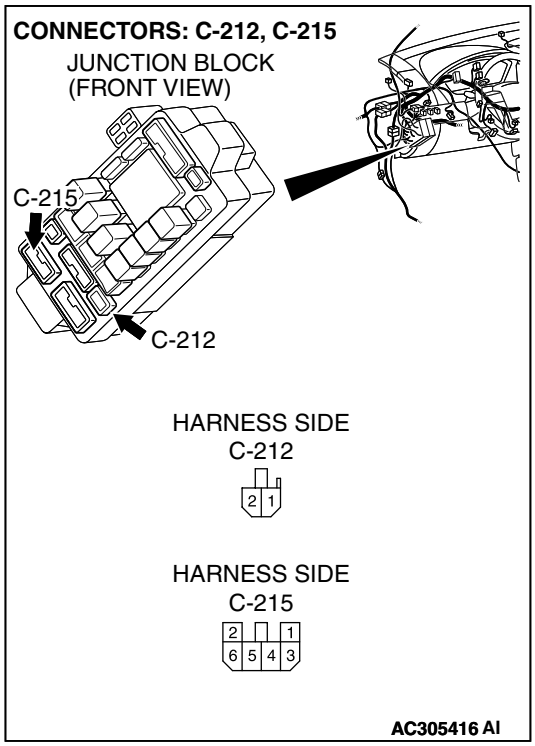


STEP 3. Check the wiring harness between sunroof motor assembly connector D-04 (terminal 1) and fusible link (5).







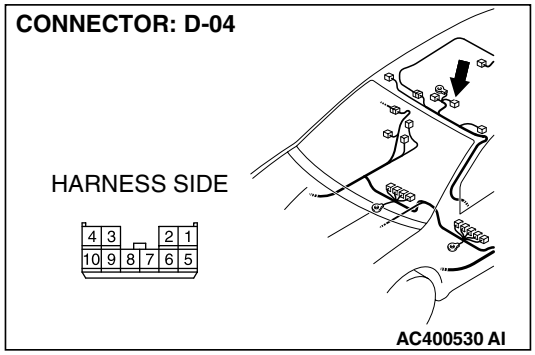


NOTE: Also check junction block connectors C-212, C-215 and intermediate connector C-27 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-212, C-215 or intermediate connector C-27 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between sunroof motor assembly connector D-04 (terminal 1) and fusible link (5) in good condition?

YES : No action is necessary and testing is complete.

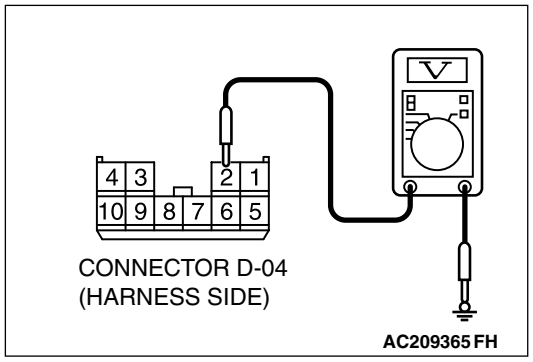
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the sunroof-ECU normally.



STEP 4. Check the ignition switch (IG2) circuit to the sunroof motor assembly. Measure the voltage at sunroof motor assembly connector D-04.

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

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



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

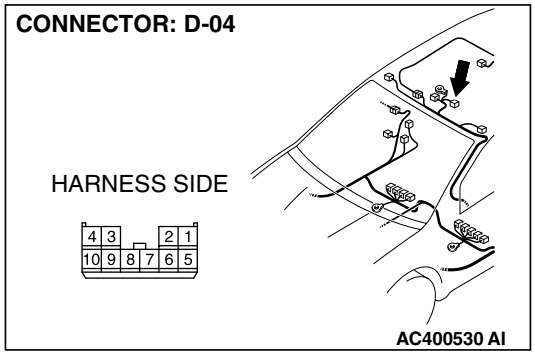
- The voltage should measure approximately 12 volts (battery positive voltage).

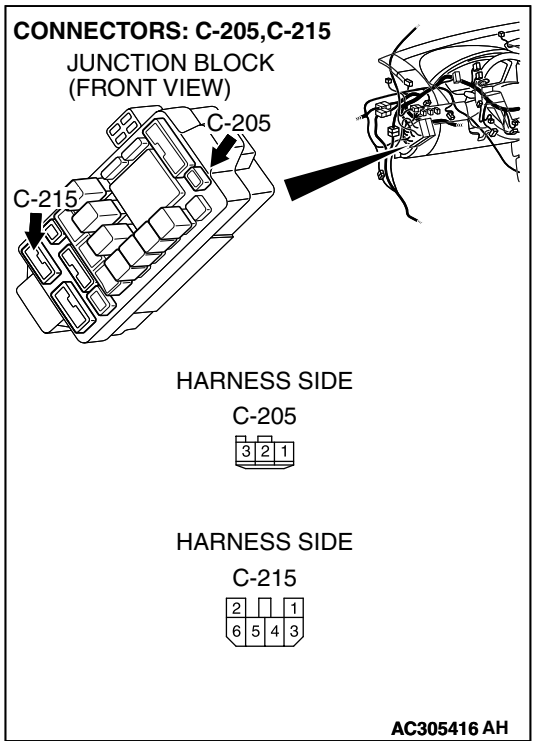
Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

YES : Go to Step 6.

NO : Go to Step 5.

STEP 5. Check the wiring harness between sunroof motor assembly connector D-04 (terminal 2) and ignition switch (IG2).





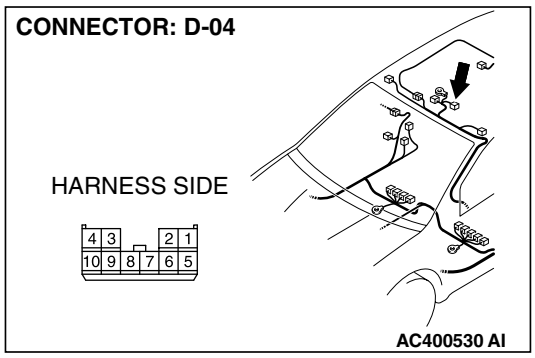
NOTE: Also check junction block connectors C-215 and C-205 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-215 or C-205 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between sunroof motor assembly connector D-04 (terminal 2) and the ignition switch (IG2) in good condition?

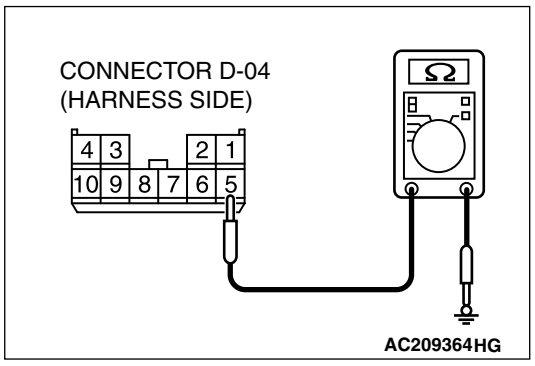
YES : No action is necessary and testing is complete.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the sunroof-ECU normally.

STEP 6. Check the ground circuit to the sunroof motor assembly. Measure the resistance at sunroof motor assembly connector D-04.



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

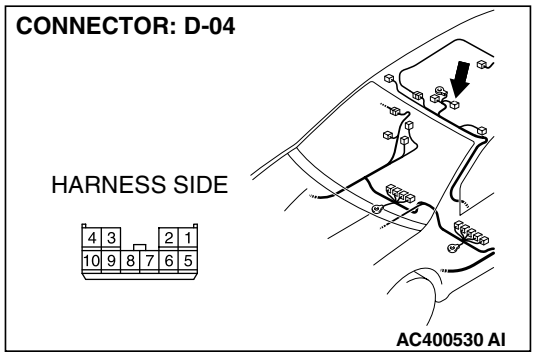


(2) Measure the resistance value between terminal 5 and ground.
- The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 8.

NO : Go to Step 7.

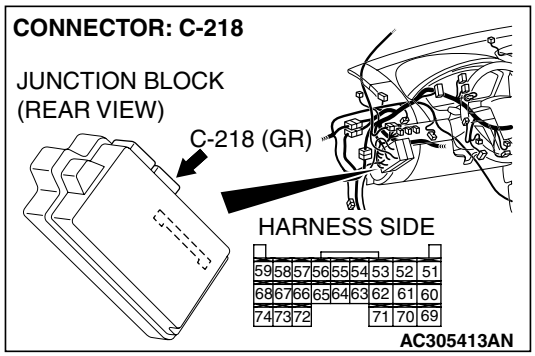


STEP 7. Check the wiring harness between sunroof motor assembly connector D-04 (terminal 5) and ground.

Q: Is the wiring harness between sunroof motor assembly connector D-04 (terminal 5) and ground in good condition?

YES : No action is necessary and testing is complete.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the sunroof-ECU normally.



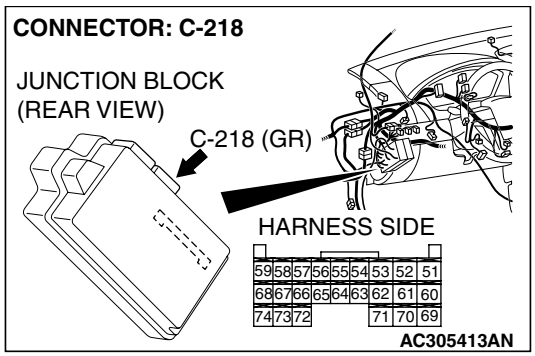
STEP 8. Check ETACS-ECU connector C-218 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

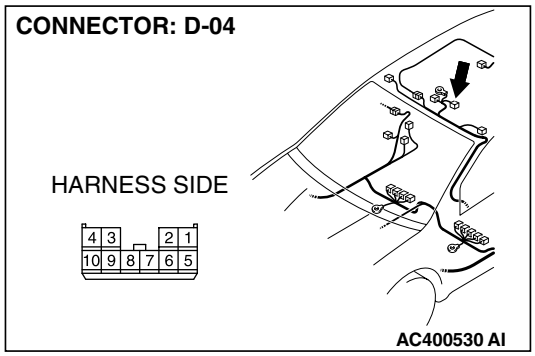
Q: Is ETACS-ECU connector C-218 in good condition?

YES : Go to Step 9.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The system should communicate with the sunroof-ECU normally.

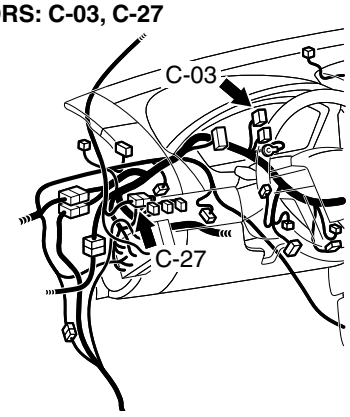
STEP 9. Check the wiring harness between sunroof motor assembly connector D-04 (terminal 10) and ETACS-ECU connector C-218 (terminal 59).



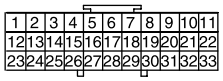


TSB Revision

CONNECTORS: C-03, C-27



C-03 HARNESS SIDE



C-27

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NOTE: Also check intermediate connector C-27 and joint connector C-03 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-27 or joint connector C-03 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between sunroof motor assembly connector D-04 (terminal 10) and ETACS-ECU connector C-218 (terminal 59) in good condition?

YES : Go to Step 10.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the sunroof-ECU normally.

STEP 10. Replace the sunroof motor assembly.

(1) Replace the sunroof motor assembly.
(2) The system should communicate with the sunroof-ECU normally.

Q: Can the system communicate with the sunroof-ECU?

YES : No action is necessary and testing is complete.

NO : Replace the ETACS-ECU. The system should communicate with the sunroof-ECU normally.

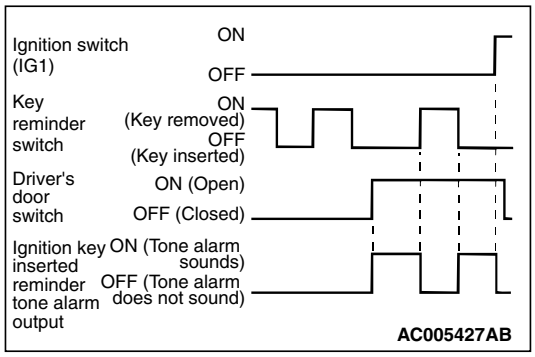
TONE ALARM

GENERAL DESCRIPTION CONCERNING THE TONE ALARM

M1549021000326

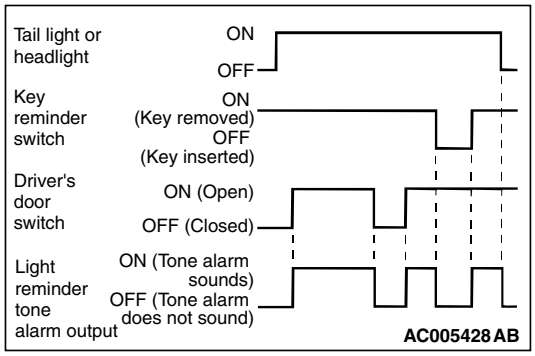
The tone alarm functions are as follows. These functions are controlled by relevant ECUs.

FUNCTION	CONTROL ECU
Ignition key reminder tone alarm function	ETACS-ECU
Light reminder tone alarm function	ETACS-ECU, column switch
Seat belt tone alarm function	ETACS-ECU
Door ajar warning buzzer	ETACS-ECU
Center display operation tone <vehicles with multi center display (middle-grade type)>	ETACS-ECU
Turn-signal light buzzer	ETACS-ECU, column switch



Ignition key reminder tone alarm function

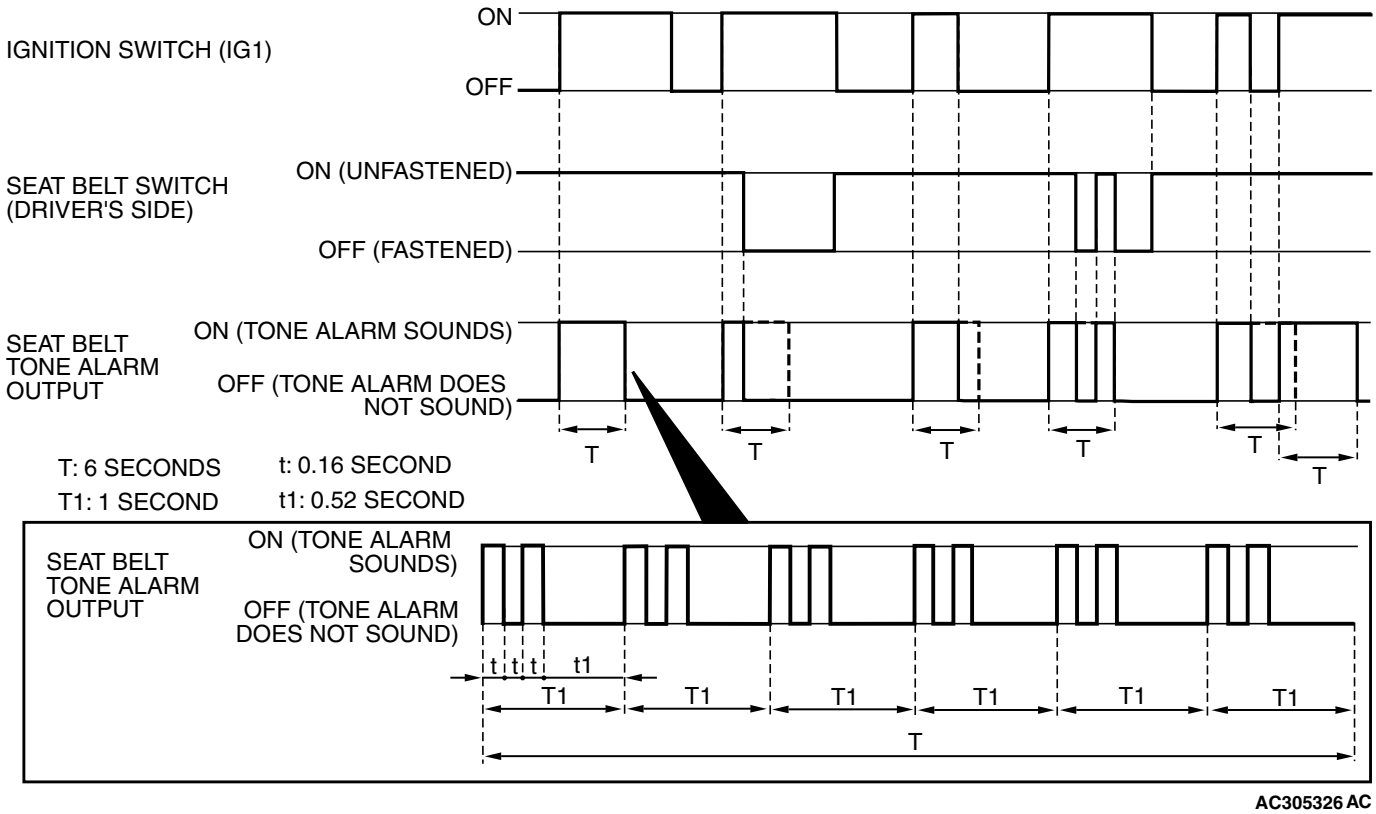
When the driver's door is opened with the ignition key inserted in the ignition key cylinder (ignition switch is in the OFF position,) the tone alarm sounds intermittently to indicate that the ignition key has not been removed.

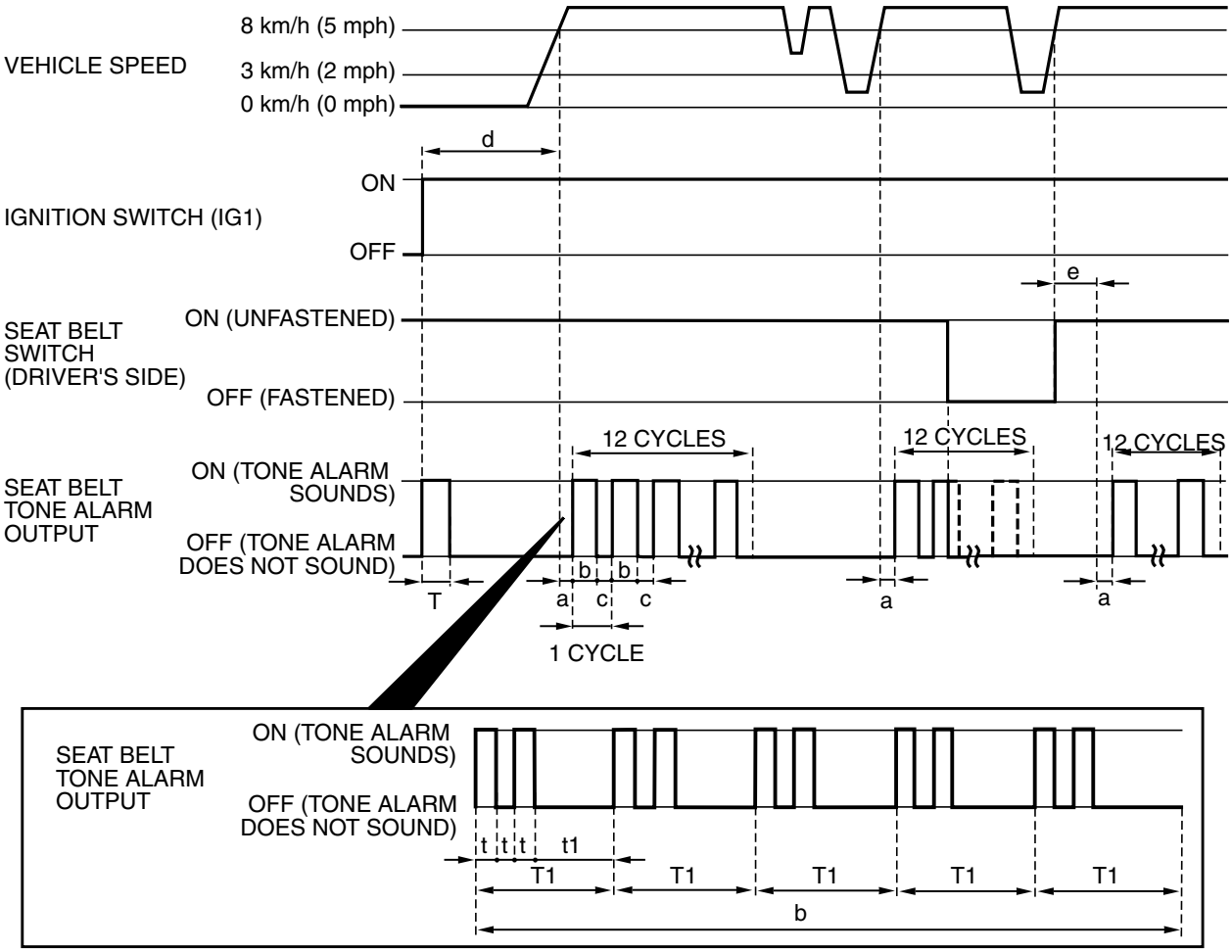


Light reminder tone alarm function

When the taillights or headlights is the ON position, if the ignition key is removed and the driver's door is opened, a tone alarm will sound continuously to warn that the lights are on. However, if the taillights or headlights have been turned off by the headlight automatic-shutoff function, the tone alarm will not sound.

Seat belt tone alarm function





T: 6 SECONDS t: 0.16 SECOND a: 0.5 SECOND c: 3 SECONDS e: 10 SECONDS
T1: 1 SECOND t1: 0.52 SECOND b: 5 SECONDS d: 60 SECONDS OR MORE

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If any of the following conditions is met with the ignition switch at "ON" or "ST", the ETACS-ECU sounds the tone alarm by using the driver's seat belt switch signal and the vehicle speed signal sent from the combination meter.

- Sounds the tone alarm for six seconds when the ignition switch is turned "ON" with the seat belt switch on (the driver's seat belt is not fastened). This is called "Timer function".
- Sounds the tone alarm 12 cycles (after 0.5 seconds) if any of the following conditions is met when sixty seconds or more have elapsed since the ignition switch is turned "ON". One cycle consists of five-second "on" and then three-second "off".
  a. The vehicle speed has reached 8 km/h (5 mph) while the seat belt switch is turned on (driver's seat belt is not fastened) with the ignition switch "ON.
  b. The seat belt switch has been turned on (driver's seat belt has not been fastened) for at least ten seconds while the ignition switch has been turned "ON" and the vehicle speed has been 8 km/h (5 mph) or more.

  NOTE: Once the tone alarm has sounded 12 cycles, it does not sound again until the vehicle speed reduces to 3 km/h (2 mph) or less even if any of the following conditions is met.
- The tone alarm stops sounding if the ignition switch or the seat belt switch is turned off (the driver's seat belt is fastened) while the timer operation is active.

Door ajar warning buzzer

The buzzer is sounded 4 times by the ETACS-ECU to warn the driver if any door is open when the ignition is switched ON and the vehicle speed reaches 8 km/h (5 mph) or faster. The buzzer will continue to sound for 4 times even if the ignition, door status, or vehicle speed requirements are not maintained.

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

Multi center display operation tone <vehicles with multi center display (middle-grade type)>

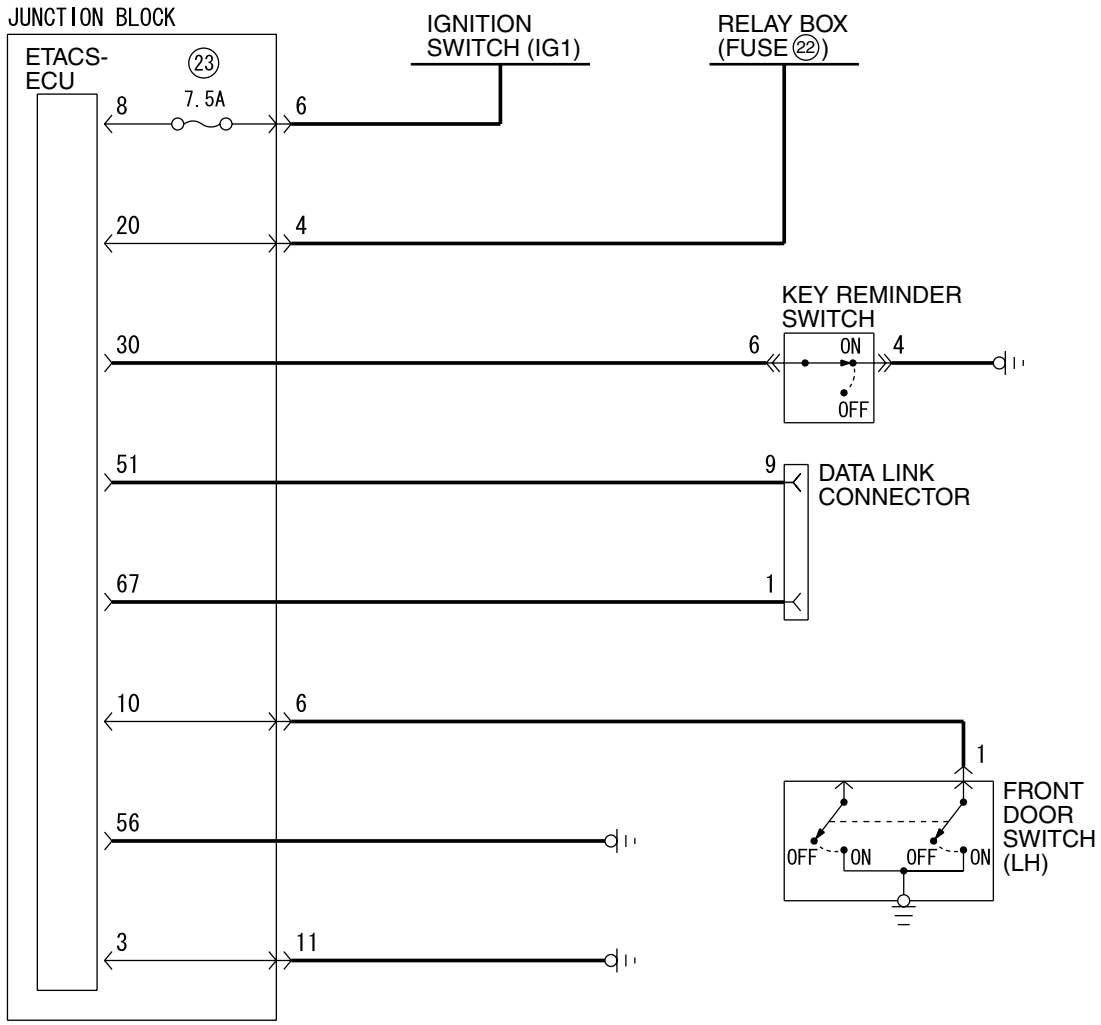
The ETACS-ECU sounds the buzzer when the buzzer signal is sent from the center display.

Turn-signal light buzzer

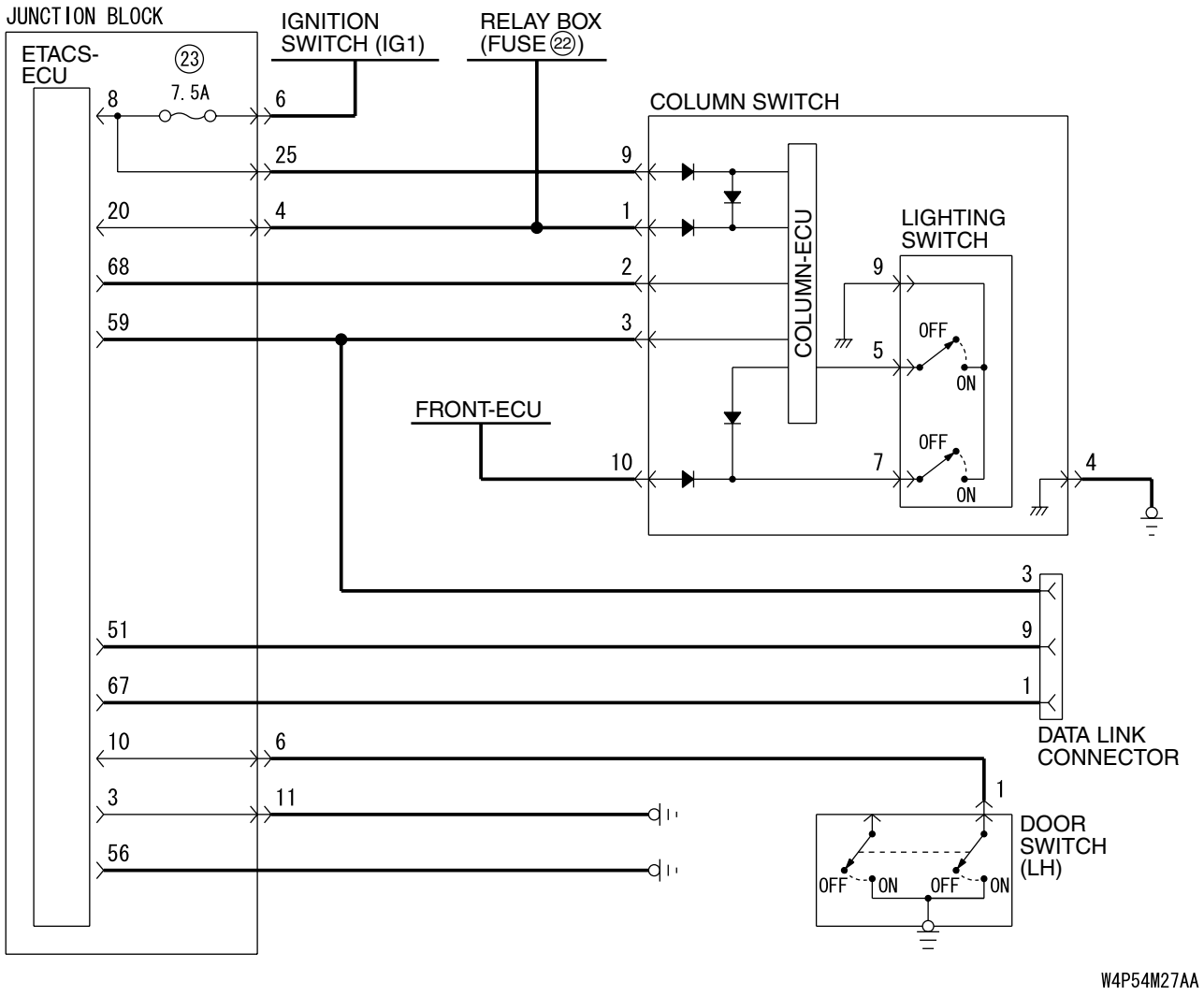
The ETACS-ECU sounds the buzzer in sync with the turn-signal lights or hazard warning lights.

NOTE: The turn-signal light buzzer can be customized on vehicles equipped with a multi center display (middle grade type). Refer to P.54B-555.

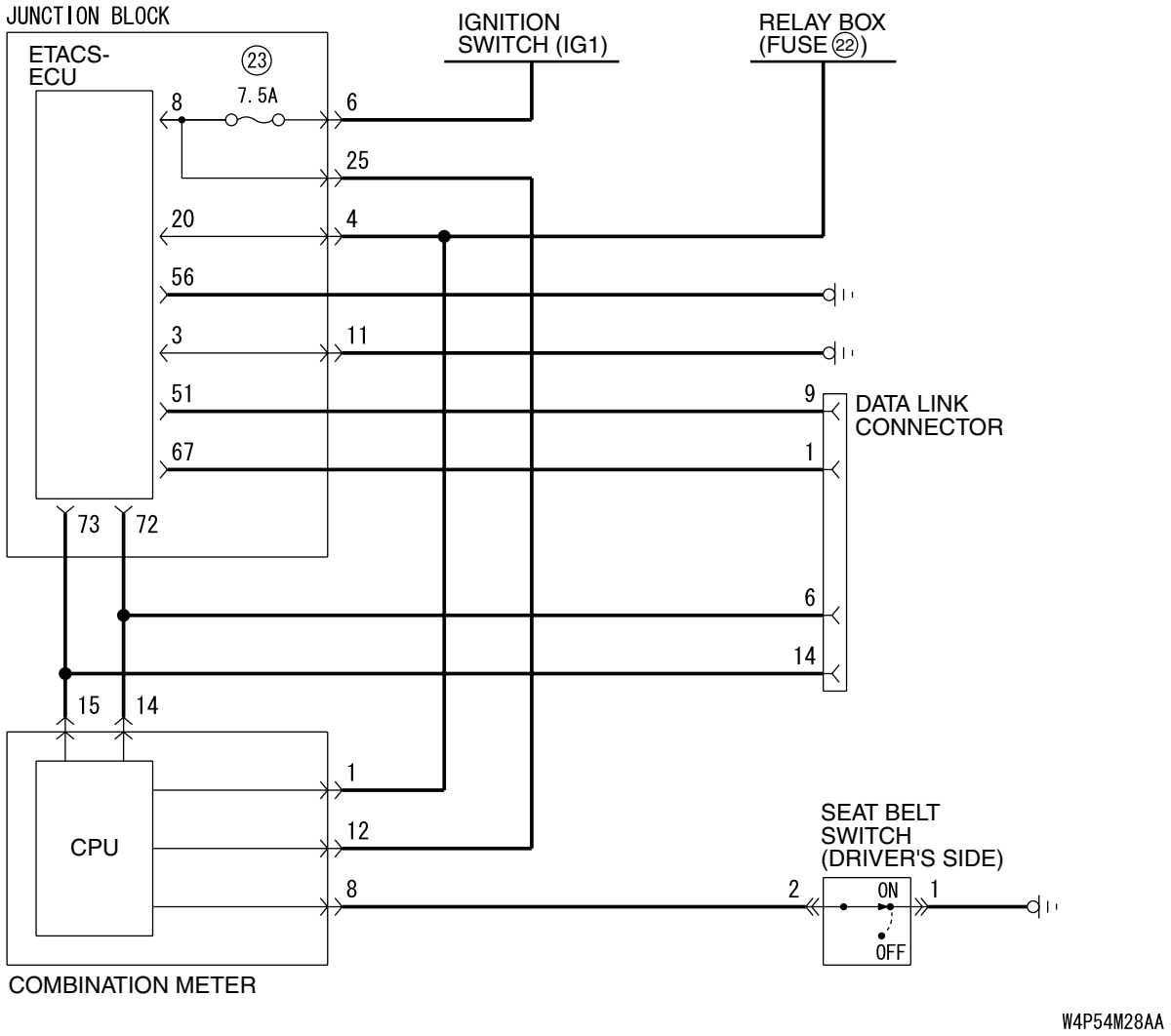
General circuit diagram for ignition key reminder tone alarm function



General circuit diagram for light reminder tone alarm function



General circuit diagram for seat belt tone alarm function



NEXT>>